SPEC®
Stock Precision Engineered Components

Catalogue World-wide Solutions

A business of BARNES GROUP INC

UNITED KINGDOM
Associated Spring SPEC
European Headquarters
Unit 4 Grosvenor Business Centre
Vale Park
Evesham
Worcestershire
WR11 1GS
Tel: (44) 1386 443366
Fax: (44) 1386 446669
E-mail: sales@assocspring.co.uk
www.assocspring.co.uk

BRAZIL
Associated Spring Raymond
Rua Wallace Barnes 301A
Distrito Industrial
Caixa Postal 1288
Campinas, SP Brazil
CEP 13054-701
Tel: (55) 193 725 1083
Fax: (55) 193 725 1084
E-mail: cfranco@asbg.com.br
www.asbg-spec.com.br

CANADA
Associated Spring Raymond
3100 Mainway
Burlington. Ont. L7M 1A3
Tel: 800 263 4256
Fax: 814 664 0312
www.asbg.com

CZECH REPUBLIC
Cecho – Bohumil Cempírek S.R.O
Polnicka 151
591 01 Zdár nad Sázavou
Tel: 00 420 566 620705
Fax: 00 420 566 620706
E-mail: pruziny@cecho.cz
www.cecho.cz

DENMARK
SODEMANN INDUSTRIFJEDRE A/S
Industrivej 21
DK 8260 Viby-J
Denmark
Tel: (45) 86 72 00 99
Fax: (45)86 29 97 86
E-mail: sif@fjedre.dk
www.fjedre.dk

FINLAND AND RUSSIA
Meconet Oy
Honkanummentie 8
FI-01260 Vantaa
Tel: +358 (0) 207 699 300
Fax: +358 (0) 207 699 335
E-mail: reino.heikkinen@meconet.net
www.meconet.net

FRANCE
Ressorts SPEC
Bâtiment HERMES 2
ZA de Pissaloup
4 rue Edouard Branly
78190 TRAPPES
Tel: (33) 01 30 68 6363
Fax: (33) 01 30 68 4050
E-mail: info@ressortsspec.com
www.ressortsspec.com

GERMANY
Febrotec GmbH
Frankfurter Strasse 76
D-58553 Halver
Tel: (49) 2353 4866
Fax: (49) 2353 4301
E-mail: federn@febrotec.de
www.febrotec.de

HUNGARY
Biotek KFT
1165 Budapest
Bokenyfoldi UT 104
Hungary
Tel: (36) 1 434 2900
Fax: (36) 1 260 8635
E-mail: biotek@biotek.hu

INDIA
STAR CIRCLIPS & ENGINEERING LTD
Hingna Industrial Estate
Nagpur-440 016
Tel : (91) 7104 234742
Fax : (91) 7104 237628
E-mail: sales@starcirclips.net
www.starcirclips.com

EIRE
Raymond Distribution (Ireland) Ltd
Tel: (353) 93 35100
Fax: (353) 93 35102
E-mail: sales@raymonddistribution.ie
www.raymonddistribution.ie

ISRAEL
Delta Elkon Mechanical Products Ltd.
P.O. Box 8262
New Industrial Zone
South Netaneya 42504
Tel: (972) 9 865 8478
Fax: (972) 9 865 8492
E-mail: natash@inergamal.co.il
www.delta-elkon.co.il

ITALIA
Metersprings Srl
Via S. FILIPPO,1
13900 Biella (BI)
Tel: (39) 015 23581
Fax: (39) 015 23646
E-mail: meter@meterspec.it
www.meterspec.it

MEXICO
Raymond Distribution - Mexico SA de CV
Blvd. Rogelio Gonzalez Caballero No 500
Parque Industrial Stiva Aeropuerto
Apodaca
Nuevo Leon
C.P. 66600
Tel: 52 (81) 81 45 0680
Fax: 52 (81) 81 45 0679
E-mail: ventas@asraymond.com
www.asraymond.com.mx

THE NETHERLANDS
Amatec
Jac P Thijsseweg 14
NL-2408 ER
Alphen Aan Den Rijn
The Netherlands
Tel: (31) 172 439359
Fax: (31) 172 440313
E-mail: info@amatec.nl
www.amatec. nl

POLAND
FCPK-BYTÓW Sp. z.o.o.
ul.Lęborska 26
77-100 Bytów
Tel: (48) 59 822 2026
Fax: (48) 59 822 9703
E-mail: fcpk@fcpk.com.pl
www.fcpk.com.pl

SINGAPORE
Associated Spring Raymond Asia Pte Ltd.
15A Tuas Road
Jurong
Singapore 638517
Tel: (65) 6863 5636
Fax: (65) 6863 6325
E-mail: sales@raymondasia.com
www.raymondasia.com

SPAIN
Barnes Group Spain, S.R.L.
La Peña 6 - Pab. 5
01013 Vitoria-Gasteiz
Tel: (34) 945 147542
Fax: (34) 945 137655
E-mail: ventas@bgespana.com
www.bgespana.com

SWEDEN
EWES STÅLFJÄDER AB
Lundavagen 45
S-330 10 Bredaryd
Tel: (46) 370 86700
Fax: (46) 370 86249
E-mail: info@ewes.se
www.ewes.se

USA
Associated Spring Raymond – SPEC
Division Headquarters
1705 Indian Wood Circle – Suite 210
Maumee, OH 43537
Tel: (1) 419 891 9292
Fax: (1) 419 891 9879
www.asraymond.com

Europe: www.barnesgroupeurope.com
US: www.asraymond.com
Asia: www.raymondasia.com

Whilst all reasonable efforts are made to ensure the correctness of the information provided, we cannot be held responsible for any inaccuracies in, or omissions from, this brochure.
Re-Order Code MBL 14742-1

UK

HOW TO ORDER
1. Identify item required by part number.
2. Email, telephone, fax or post Part Number, quantity required, your name and address to your local office.

SOFTWARE PROGRAM
The SPEC Select program available on CD ROM is written so that the designer can set constraints and let the software do the difficult work searching the entire catalogue.

SPECIAL ORDER SERVICES
Our Special Order Departments handle orders from one to a few thousand custom springs and metal parts. We welcome experimental and prototype orders which will be supported by our local engineering team.

F

COMMENT COMMANDER
1. Identifiez la pièce souhaitée par son numéro de référence.
2. Passez commande par fax, courrier ou courriel en précisant le numéro de référence, la quantité désirée et vos coordonnées au 01 30 68 40 50, à Ressorts SPEC, BP141, 78196 Trappes Cedex, ou à info@ressortsspec.com.

LOGICIEL DE SELECTION
Le logiciel SPEC SELECT, disponible gratuitement sur CD Rom, est conçu pour faciliter la recherche de ressorts standards en prenant en compte les contraintes de votre application.

SERVICE COMMANDES SPECIALES
Notre service Commandes Spéciales est là pour vos ressorts sur mesures, de l'unité à la moyenne série. Notre équipe technique vous apportera son savoir-faire pour la réalisation de vos prototypes ou de vos ressorts de test.

E

COMO HACER UN PEDIDO
1. Identificar el producto por el número de referencia.
2. Infórmenos a través del correo electrónico, teléfono, fax o por correo ordinario la cantidad que desean, su nombre, datos de entrega y domicilio social.

PROGRAMA DE SOFTWARE
El programa de selección de la gama SPEC que esta disponible en CD ROM esta concebido para que el diseñador pueda poner cuotas y de ese modo dejar que el software realice el arduo trabajo de buscar en todo el catálogo.

PEDIDOS ESPECIALES
Nuestro departamento de pedidos especiales se encarga de gestionar pedidos especiales de muelles y otras piezas metálicas desde una unidad hasta miles de ellas. Nuestro equipo de ingenieros atenderá con gusto los pedidos de prototipos y proyectos similares.

D

BESTELLUNG
1. Ermitteln Sie den benötigten Artikel nach Teilenummer.
2. Senden Sie uns die Teilenummer, die benötigte Menge, Ihren Namen und Ihre Adresse per E-Mail, Fax oder Post oder rufen Sie unsere lokale Niederlassung an.

SOFTWARE-PROGRAMM
Das auf CD ROM erhältliche SPEC-Select-Programm ist so geschrieben, dass der Designer Bedingungen einstellen kann, damit die Software die schwere Arbeit durchführt und den gesamten Katalog absucht.

SONDERBESTELLUNGSDIENST
Unsere Abteilung für Sonderbestellungen bearbeitet Bestellungen von einem Artikel bis zu mehreren Tausend maßgefertigten Federn und Metallteilen. Wir nehmen gern Versuchs- und Prototypenbestellungen an, die von unserem lokalen technischen Team unterstützt werden.

I

COME ORDINARE
1. Identificate il particolare sul catalogo, annotate il nr. di particolare.
2. Ordinate per posta, telefono o fax specificando il nr. di particolare e la quantità richiesta, specificando il vs. nome e indirizzo al distributore SPEC.

SOFTWARE PER SELEZIONE MOLLE
Il programma SPEC Select è disponibile su CD ROM e permette la ricerca immediata del codice desiderato senza dover consultare tutto il catalogo.

SERVIZIO ORDINI SPECIALI
Il nostro reparto ordini speciali si occupa costantemente di ordini di molle ed altri componenti speciali, a disegno. Gli ordini speciali, anche per piccole quantità, prototipi ed esperimenti, ci sono estremamente graditi, in quanto, in qualità di più grande costruttore di molle al mondo.

P

COMO PEDIR
1. Identifique o item requerido pelo nro de catalogo
2. Passe via e-mail, fax, ou pelo correio seu pedido com o nro da peça, a quantidade juntamente com seu nome e endereço

PROGRAMA DE COMPUTADOR
O Spec Select é um programa disponivel em cd , desenhado para identificar a ajudar a achar as molas de catalogo.

PEDIDOS ESPECIAS
Nosso departamento de pedidos especias esta apto a aceitar pedidos desde pequenas à quantitades de milhares. Estaremos aceitando pedidos experimentais e de prototipo que serão desenvolvidos por nossos engenheiros de projetos.

UK

COMPRESSION SPRINGS

SPEC compression springs provide design engineers, draughtsmen, production and maintenance departments with precision engineered springs in an economical and time-saving way. The Spec service saves time and therefore money, as design work and calculations are no longer required.

MATERIALS
'C' part numbers
Music wire: ASTM A228 or AMS 5112

STAINLESS STEEL / INOX: Type 302 as per ASTM A313 or AMS 5688 spring temper

'D' part numbers
Music wire: DIN 17223 or JIS G4314 SWP-A/B or AMS 5112

STAINLESS STEEL / INOX: Type 301, 302 or 304 as per DIN 17224 or JIS G4314 SUS 302/304 or AMS 5688 spring temper

TOLERANCES
'C' part numbers

Outside Diameter	
1.45 to 3.02mm	+/- 0.08mm
3.05 to 6.10mm	+/- 0.13mm
6.12 to 12.70mm	+/- 0.20mm
12.73 to 25.40mm	+/- 0.38mm
25.43 to 31.12mm	+/- 0.51mm
31.14 to 37.08mm	+/- 0.76mm
37.11 to 50.08mm	+/- 1.02mm
Load P	+/- 10%
Spring Rate R	+/- 10%

'D' part numbers
All dimensions and forces to DIN 2095 (Grade 2)

KEY TO MEASUREMENTS
Do = Outside Diameter
d = Wire diameter
Sh = Approx. Solid Height
Lo = Free Length
L_1 = Loaded Length
P_1 = Load at L_1
R = Spring Rate

F

RESSORTS DE COMPRESSION

Les ressorts de compression SPEC offrent aux Ingénieurs des Bureaux d'Etudes, aux Dessinateurs, et aux Services de Production et de Maintenance, des ressorts de précision économiques et efficaces. Le service SPEC permet de réaliser des économies de temps et donc d'argent, les calculs et dessins n'étant plus nécessaires.

MATÉRIAUX
Références commençant par 'C'
Corde à piano suivant DIN 17223, Classe C. No. 1,1200. - BS5216 ND3 ou HD3 - AMS 5112.

Fil en acier inoxydable suivant DIN 17224, No. 1,4310, BS2056 EN58A. Commercial 302 AMS 5688 acier trempé pour ressorts.

Références commençant par 'D'
Corde à Piano suivant DIN 17223 ou JIS G4314 SWP-A/B ou AMS 5112.

Fil en acier inoxydable type 301, 302 ou 304 suivant DIN 17224 ou JIS G4314 SUS 302/304 ou AMS 5688 acier trempé pour ressorts.

TOLÉRANCES
Références commençant par 'C'

Do=Diamètre extérieur	
1.45 à 3.02 mm	± 0.08mm
3.05 à 6.10 mm	± 0.13mm
6.12 à 12.70 mm	± 0.20mm
12.73 à 25.40 mm	± 0.38mm
25.43 à 31.12 mm	± 0.51mm
31.14 à 37.08 mm	± 0.76mm
37.11 à 50.08 mm	± 1.02mm
Charge P	± 10%
Raideur H/mm, R	± 10%

Références commençant par 'D'
Toutes les dimensions et charges sont conformes à la DIN 2095 (catégorie 2).

INDEX DES MESURES
Do = Diamètre extérieur
d = Diamètre du fil
Sh = Hauteur solide approximative
Lo = Longueur libre (pour référence)
L_1 = Longueur en charge
P_1 = Charge à L_1, Newton
R = Raideur N/mm

E

MUELLES/RESORTES DE COMPRESION

Nuestro catálogo de muelles/resortes de compresión de SPEC ofrece a ingenieros proyectistas, delineantes y los departamentos de producción y mantenimiento muelles/resortes de precisión de una forma económica y ágil. Gracias al servicio de SPEC, se ahorra tiempo y, por consiguiente, dinero, puesto que no se requieren trabajos de diseño ni cálculos.

MATERIALES
Referencias 'C'
Alambre de piano: ASTM A228 ó AMS 5112

Acero inoxidable : Tipo 302 según ASTM A313 ó templado de resorte AMS 5688.

Referencias 'D'
Alambre de piano: DIN 17223 ó JIS G4314 SWP-A/B ó AMS 5112

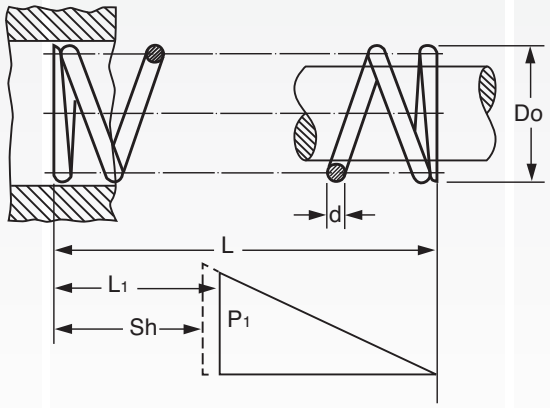
Acero inoxidable: Tipo 301, 302 ó 304 según DIN 17224 ó JIS G4314 SUS 302/304 ó templado de resorte AMS 5688.

TOLERANCIAS
Referencias 'C'

Diámetro externo	
1.45 a 3.02 mm	±0.08mm
3.05 a 6.10 mm	±0.13mm
6.12 a 12.70 mm	±0.20mm
12.73 a 25.40 mm	±0.38mm
25.43 a 31.12 mm	±0.51mm
31.14 a 37.08 mm	±0.76mm
37.11 a 50.08 mm	±1.02mm
Carga, P	±10%
Coeficiente compresión de muelle, R	±10%

Referencias 'D'
Dimensiones y fuerzas según DIN2095 (grado 2)

CLAVES DE CARACTERISTICAS
Do = Diámetro exterior
d = Diámetro del alambre
Sh = Altura maciza aprox.
Lo = Longitud libre
L_1 = Longitud cargada
P_1 = Carga a L_1
R = Coeficiente compresión



D

DRUCKFEDERN

SPEC Druckfedern versehen Konstrukteure, Zeichner, Produktion und Wartung Abteilungen mit Präzision ausgeführten Federn in einer ökonomischen und zeitsparenden Weise. Der SPEC Service spart Zeit und folglich Geld, da Designarbeit und -berechnungen nicht mehr angefordert werden.

WERKSTOFFE
'C' Teilen
Gezogener Federstahldraht: ASTM A228 oder AMS 5112

Rostfreier Federstahldraht: 302 nach ASTM A313 oder AMS 5688 gehärte Feder.

'D' Teilen
Gezogener Federstahldraht: DIN 17223 oder JIS G4314 A313 SWP-A/B oder AMS 5112

Rostfreier Federstahldraht: 301, 302 oder 304 nach DIN 17224 oder JIS G4314 SUS 302/304 oder AMS 5688 gehärte feder.

TOLERANZEN
'C' Teilen

Außerer Durchmesser	
1.45 bis 3.02 mm	±0.08mm
3.05 bis 6. 10 mm	±0.13mm
6.12 bis 12.70 mm	±0.20mm
12.73 bis 25.40 mm	±0.38mm
25.43 bis 31.12 mm	±0.51mm
31.14 bis 37.08 mm	±0.76mm
37.11 bis 50.08 mm	±1.02mm
Federkraft, P	±10%
Federrate, R	±10%

'D' Teilen
Massangaben und Kräften nach DIN 2095 (Klasse 2).

KENNZEICHNEN DER ABMESSUNGEN
Do = Äußerer Windungsdurchmesser
d = Drahtdurchmesser
Sh = Blocklänge der Feder
Lo = Länge der unbelasteten Feder
L_1 = Länge der belasteten Feder
P_1 = Federkraft bei Federlänge L_1
R = Federrate

I

MOLLE A COMPRESSIONE

Le molle a compressione SPEC forniscono a progettisti, disegnatori, ai reparti di produzione e manutenzione, molle di precisione nel modo più rapido ed economico.

Il servizio SPEC vi fa risparmiare tempo ed i costi di progettazione e di calcolo non sono più necessari.

MATERIALE
Codici 'C' iniziale
Filo Armonico: ASTM A228 o AMS 5112

Acciaio inox: Type 302 secondo ASTM A313 o AMS 5688 molla temprata

Codici 'D' iniziale
Filo Armonico: DIN 17223 o JIS G4314 SWP-A/B or AMS 5112

Acciaio inossidabile: Type 301, 302 o 304 secondo DIN 17224 o JIS G4314 SUS 302/304 o AMS 5688
Molla temprata

TOLLERANZE
Codici 'C' iniziale

Do = Diametro esterno	
da 1.45 a 3.02 mm	±0.08mm
da 3.05 a 6.10 mm	±0.13mm
da 6.12 a 12.70 mm	±0.20mm
da 12.73 a 25.40 mm	±0.38mm
da 25.43 a 31.12 mm	±0.51mm
da 31.14 a 37.08 mm	±0.76mm
da 37.11 a 50.08 mm	±1.02mm
Carico P	±10%
Compressione R	±10%

Codici 'D' iniziale
Tutte le dimensioni e forze secondo DIN 2095 (Grado 2)

LEGENDA
Do = Diametro esterno
d = Diametro filo
Sh = Lunghezza a blocco
(misura di riferimento approssimativa)
Lo = Lunghezza libera
L_1 = Lunghezza minima di lavoro
P_1 = Carico a L_1
R = Carico di flessione unitaria

P

MOLAS DE COMPRESSÃO

Por intermédio do catálogo de molas de compressão SPEC, os engenheiros projectistas, os desenhadores e os departamentos de produção e de manutenção, podem dispor de molas de precisão de forma económica e rápida. O serviço SPEC, permite poupar tempo e portanto dinheiro, uma vez que não são necessárias tarefas de desenho, nem cálculos.

MATERIAIS
PEÇAS " C "
Arame de aço conforme à especificação DIN 17223 Classe C. No. 1,1200, BS5216 ou HD3 – MAS 5112.

Arame de aço inoxidável conforme à especificação DIN 17224 No. 1,4310 BS 2056 EN58A. Têmpera de molas comercial 302 AMS 5688.

PEÇAS 'D'
Fio Armonico: DIN 17223 o JIS G4314 SWP-A/B or AMS 5112

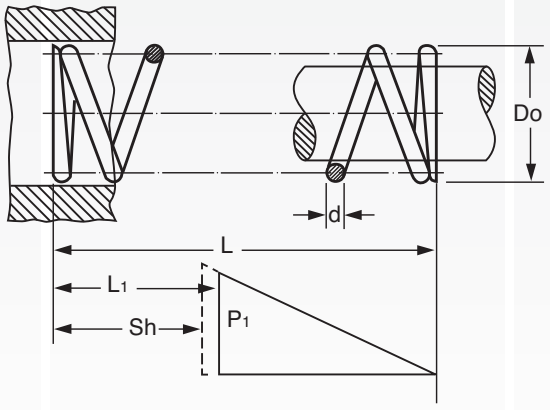
AÇO inoxidavel Type 301, 302 o 304 secondo DIN 17224 o JIS G4314 SUS 302/304 o AMS 5688

TOLERÂNCIAS
PEÇAS " C "

Do = Diâmetro exterior	
1.45 a 3.02 mm	± 0.08mm
3,05 a 6,10 mm	± 0,13mm
6,12 a 12,70 mm	± 0,20mm
12,73 a 25,40 mm	± 0,38mm
25,43 a 31,12 mm	± 0,51mm
31,14 a 37,08 mm	± 0,76mm
37,11 a 50,08 mm	± 1,02mm
Carga, P	±10%
Coeficiente de compressão de mola, R	±10%

PEÇAS 'D'
Todas as dimensões e forças em DIN 2095 (Grau 2)

LEGENDA
Do = Diâmetro exterior
d = Diâmetro do arame
Sh = Altura maciça aproximada
Lo = Comprimento livre (só para efeitos de referência)
L_1 = Comprimento em carga (comprimento mínimo de trabalho)
P_1 = Carga a L_1
R = Coeficiente de compressão



UK

ADDITIONAL TECHNICAL DATA

COMPRESSION SPRINGS

Music wire is not recommended for applications where temperature exceeds 121°C (250°F) STAINLESS STEEL / INOX is not recommended for applications where temperature exceeds 260°C (500°F) STAINLESS STEEL / INOX is slightly magnetic due to cold working during manufacturing. STAINLESS STEEL / INOX springs may have a slight residue of nickel on the surface of the wire; this is normal and will not affect the function.

ENDS
'C' part numbers
Outside diameter 1.45/2.24 – squared and unground.
Outside diameter >2.24 – squared and ground.

'D' part numbers
Wire up to 0.8mm, squared and unground.
Wire over 1.0mm, squared and ground.

SURFACE FINISH
Music wire – oiled.
STAINLESS STEEL / INOX – plain wire.
Shot-peened and plated finishes supplied on request.

LOADS
Load values shown are based on a service life of 50,000 cycles at 0.50 stress range.

For normal service, springs should not be compressed below L_1. To determine the load at any working length use rate proposed deflection. P=(L-Lx) x R where Lx is the new load height. Reference only.

1 lb = 4.448 Newtons
1 Newton = 0.225 lb

1 kg. = 9.80665 Newtons
1 Newton = 0.10197 kg

F

DONNEES TECHNIQUES ADDITIONNELLES

RESSORTS DE COMPRESSION

La corde à piano n'est pas recommandée pour des applications où la température excède 121°C (250°F). L'acier inoxydable n'est pas recommandé pour des applications où la température excède 260°C (500°F). L'acier inoxydable est légèrement magnétique, ceci étant du au travail à froid pendant la fabrication. Les ressorts en acier inoxydable peuvent avoir un léger résidu de nickel sur la surface du fil ; c'est normal et cela n'en affectera pas leur fonction.

EXTRÉMITÉS
Références commençant par 'C'
Diamètre extérieur 1.45 / 2.24 : équarri et non meulé.
Diamètre extérieur > 2.24 : équarri et meulé.

Références commençant par 'D'
Diamètre de fil jusqu'à 0.8mm: équarri et non meulé.
Diamètre de fil à partir de 1mm: équarri et meulé.

ETAT DE SURFACE
Corde à piano : huilé.
Acier inoxydable : brut.
Finition par grenaillage et traitements de surface fournis à la demande.

CHARGES
Les valeurs de charge indiquées sont basées sur une longévité de 50 000 cycles à 50% de la tension admissible. En service normal, les ressorts ne doivent pas être compressés en dessous de L_1. Pour déterminer la charge à toute longueur de fonctionnement, multipliez la raideur par la déflexion proposée (pour référence seulement).

1 kg. = 9,80665 Newtons
1 Newton = 0,10197 kg

E

INFORMACIÓN TÉCNICA ADICIONAL

MUELLES/RESORTES DE COMPRESION

El alambre de piano no se recomienda para usos donde la temperatura exceda de 121°C (250°F). El acero inoxidable no se recomienda para usos donde la temperatura exceda de 260°C (500°F) El acero inoxidable es levemente magnético debido a la conformación en frío durante la fabricación. Los muelles/resortes del acero inoxidable pueden tener un residuo leve del níquel en la superficie del alambre; esto es normal y no afectará a su rendimiento.

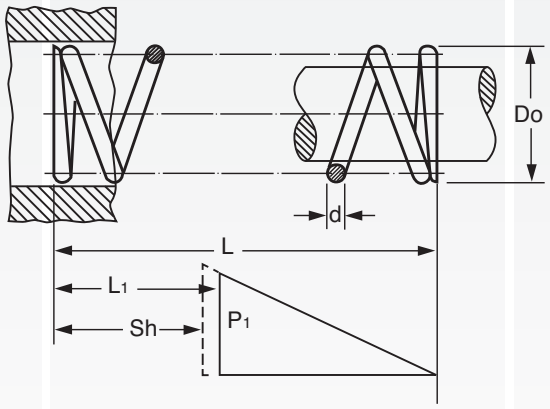
EXTREMOS
Referencias 'C'
Diámetro externo 1.45/2.24 – refrentado y sin rectificar.
Diámetro externo >2.24 – refrentado y rectificado.

Referencias 'D'
Alambre de hasta 0,8 mm, refrentado y sin rectificar.
Alambre de más de 1,0 mm, refrentado y rectificado.

ACABADO SUPERFICIAL
Alambre de piano lubricado.
Acero inoxidable – alambre normal.
Bajo pedido granallado y con acabados especiales.

CARGAS
Los valores de carga se basan en una vida útil de 50.000 ciclos bajo una margen de tensíon de 0.50. Para optimizar la vida de los muelles/resortes, éstos no deberían comprimirse por debajo de L_1. Para determinar la carga en cualquier longitud de trabajo, utilice el coeficiente de compresión x deflexión propuesta.

1 kg. = 9,80665 Newtons
1 Newton = 0,10197 kg



D

ZUSÄTZLICHE TECHNISCHEN ANGABEN

DRUCKFEDERN

Federstahldraht wird nicht für Anwendungen empfohlen, in denen Temperatur 121°C übersteigt (250°F). Das rostfreier Stahl nicht für Anwendungen empfohlen wird, in denen Temperatur rostfreien Stahl 260°C (500°F). Das rostfreier Stahl liegt etwas magnetisches wegen der Herstellung. Rostfreien Stahlfedern können einen geringfügigen überrest des Nickels auf der Oberfläche der Leitung haben; dieses ist normal und wird nicht die Funktion beeinflussen.

ENDWINDUNGEN
'C' Teilen
Aussendurchmesser 1,45/2,24mm nur angelegt.
Aussendurchmesser >2,24mm angelegt und geschliffen.

'D' Teilen
Aussendurchmesser bis 2,24mm nur angelegt.
Aussendurchmesser über 2,24mm angelegt und geschliffen.

OBERFLÄCHE
Gezogener Federstahldraht: Leicht eingeölt.
Rostfreier Federstahldraht: Nicht weiterbehandelt.
Kügelgestrahlt und andere sondern Behandlungen verfügbar.

KRAFTWERTE
Die Kraftwerte sind, für gezogenen Stahldraht, basierend auf einer Lebensdauer von 50.000 Zyklen bei einem Stressfaktor von 0,5. Für den Optimalbetrieb sollten Federn nicht über L_1 hinaus belastet werden.
Um die Kraft bei einer bestimmten Federlänge auszurechnen, P=(Lo-Lx) x P/f, wo Lx die neue Belastetenlänge ist.

1 kg. = 9,80665 Newtons
1 Newton = 0,10197 kg

I

ULTERIORI INFORMAZIONI TECNICHE

MOLLE A COMPRESSIONE

L'utilizzo del filo armonico non è consigliato per le applicazioni che superano i 121°C (250°F). L'utilizzo dell'acciaio inox non è consigliato per le applicazioni dove la temperatura supera supera i 260°C (500°F) L'acciaio inox e leggermente magnetico dovuto alla lavorazione a freddo durante la produzione. Le molle in acciaio inox possono avere residui di nickel sulla superficie del filo, questo è normale e non ne altera la funzione.

ESTREMITÀ
Codici 'C' iniziale
Diametro esterno da 1.45 a 2.24 – squadrato ma non rettificato.
Diametro esterno >2.24 – squadrato e rettificato

Codici 'D' iniziale
Filo fino a 0.8 mm squadrato ma non rettificato
Filo oltre 1.0 mm squadrato e rettificato

FINITURA SUPERFICI
Acciaio Armonico : Filo normale oliato.
Acciaio inossidabile : Filo liscio
Su richiesta si forniscono finitura pallinata e placcata.

CARICHI
I carichi indicati in tabella fanno riferimendio ad un ciclo di vita media di 50000 cicli a 0.50 di flessione. La molla non dovrebbe essere compressa sotto L_1.
Per finiture speciali la consegna è da concordare. Per determinare il carico per ogni lunghezza utilizzata moltiplicare il carico di flessione unitaria x la deflessione necessaria.

1 kg. = 9,80665 Newtons
1 Newton = 0,10197 kg

P

INFORMAÇÕES TECNICAS ADICIONAIS

MOLAS DE COMPRESSÃO

Fio corda de piano é recomendada para temperaturas acima de 121 graus celcius(250 graus F),
Aço inoxidavel não é recomendado para aplicações acima de 260 graus celcius(500 graus F). Aço inox é um pouco magnético em razão da sua fabricação a frio.
As peças em inox podem apresentar um pouco de resíduo de níquel na superfície, isso é portanto, normal e não afeta a função da peça.

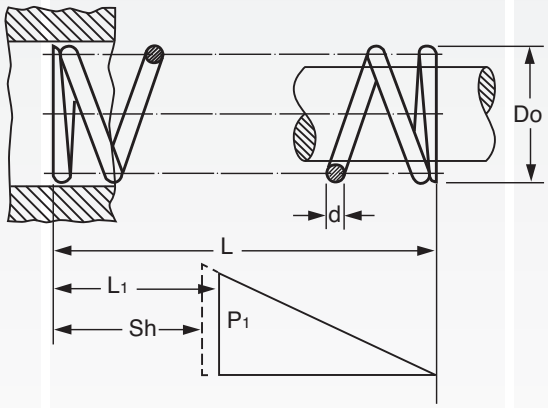
EXTREMIDADES
PECAS " C "
Diâmetro exterior de 1,45/2,24 quadrado, sem rectificação.
Diâmetro exterior > 2,24 quadrado e rectificado.

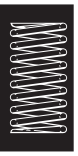
PEÇAS " D "
Arame até 0,8 mm, quadrado e sem rectificação.
Arame com mais de 1,0 mm, quadrado e rectificado.

ACABAMENTO DE SUPERFICIE
Arame normal lubrificado. A pedido, podem ser fornecidas com acabamento granulado, e com acabamentos galvanizados. Deve ser tido em conta um período adicional para entrega de produtos com acabamento especial.

CARGAS
Os valores de carga têm por base uma vida útil de 50.000 ciclos com uma variação de esforço de 0,50.
Em caso de molas para trabalhos normais, a compressão não deve ser inferior a L_1.
Para determinar a carga em qualquer comprimento de trabalho, multiplique o coeficiente de compressão pela deflexão proposta.

1 kg. = 9,80665 Newtons
1 Newton = 0,10197 kg





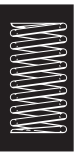
COMPRESSION SPRINGS - MUSIC WIRE

Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)
D10100			2.00	1.40	1.30		4.91
D10110			2.70	1.90	1.70		3.12
D10120	1.20		3.90	2.60	2.30	2.57	2.03
D10130			5.50	3.60	3.10		1.38
D10140		0.20	7.80	5.00	4.30		0.92
D10150			2.30	1.50	1.30		2.83
D10160			3.20	1.90	1.70		1.81
D10170	1.40		4.60	2.70	2.30	2.27	1.16
D10180			6.50	3.70	3.10		0.80
D10190			9.30	5.10	4.30		0.54
C0057-006-0120M			3.05	1.50	1.12		0.67
C0057-006-0190M			4.83	2.16	1.52		0.39
C0057-006-0250M			6.35	2.69	1.91		0.28
C0057-006-0310M			7.87	3.38	2.24		0.23
C0057-006-0380M		0.15	9.65	4.34	2.54	1.023	0.19
C0057-006-0440M			11.18	4.67	3.00		0.16
C0057-006-0500M			12.70	5.41	3.30		0.14
C0057-006-0560M			14.22	6.93	3.28		0.14
C0057-006-0620M			15.75	7.39	3.61		0.12
C0057-007-0120M			3.05	1.68	1.35		1.23
C0057-007-0190M			4.83	2.41	1.88		0.70
C0057-007-0250M			6.35	3.23	2.26		0.54
C0057-007-0310M			7.87	3.86	2.74		0.42
C0057-007-0380M		0.18	9.65	4.57	3.30	1.69	0.33
C0057-007-0440M			11.18	5.49	3.63		0.30
C0057-007-0500M	1.45		12.70	6.27	4.01		0.26
C0057-007-0560M			14.22	6.76	4.55		0.23
C0057-007-0620M			15.75	7.70	4.78		0.21
C0057-008-0120M			3.05	1.83	1.55		2.19
C0057-008-0190M			4.83	2.72	2.18		1.26
C0057-008-0250M			6.35	3.48	2.69		0.93
C0057-008-0310M			7.87	4.24	3.23		0.74
C0057-008-0380M		0.20	9.65	5.16	3.81	2.67	0.60
C0057-008-0440M			11.18	5.92	4.37		0.51
C0057-008-0500M			12.70	6.60	4.95		0.44
C0057-008-0560M			14.22	7.29	5.51		0.39
C0057-008-0620M			15.75	8.13	5.69		0.35
D10350			2.40	1.80	1.63		6.95
D10360			3.30	2.40	2.13		4.42
D10370		0.25	4.70	3.30	2.88	4.11	2.86
D10380			6.60	4.50	3.88		1.94
D10390			9.40	6.30	5.38		1.32
D10200			3.00	1.50	1.30		1.20
D10210			4.40	2.00	1.70		0.77
D10220	1.80	0.20	6.40	2.80	2.30	1.80	0.49
D10230			9.20	3.80	3.10		0.34
D10240			13.30	5.30	4.30		0.23
D10400			3.00	1.80	1.63		2.93
D10410			4.30	2.40	2.13		1.86
D10420	1.85	0.25	6.20	3.40	2.88	3.37	1.20
D10430			8.70	4.60	3.88		0.83
D10440			12.50	6.50	5.38		0.55
D10600			3.10	2.30	2.08		7.86
D10610			4.40	3.10	2.72		5.00
D10620	1.92	0.32	6.30	4.20	3.68	6.57	3.24
D10630			8.70	5.80	4.96		2.20
D10640			12.50	8.10	6.88		1.49
D10250			4.00	1.50	1.30		0.61
D10260			5.90	2.10	1.70		0.38
D10270			8.70	2.90	2.30	1.49	0.25
D10280	2.20	0.20	12.60	4.00	3.10		0.18
D10290			18.30	5.60	4.30		0.12
C0088-008-0120M			3.05	1.52	1.09	1.69	1.10
C0088-008-0190M			4.83	2.06	1.40		0.61
C0088-008-0250M			6.35	2.64	1.63		0.46
C0088-008-0310M			7.87	3.28	1.85		0.37
C0088-008-0380M			9.65	3.96	2.13		0.30
C0088-008-0440M	2.24	0.20	11.18	4.75	2.34	1.69	0.26
C0088-008-0500M			12.70	5.28	2.57		0.23
C0088-008-0560M			14.22	5.46	2.92		0.19
C0088-008-0620M			15.75	6.10	3.02		0.18

STAINLESS STEEL / INOX

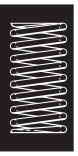
Part Number	P_1 (N)	R (N/mm)
D20100		4.09
D20110		2.60
D20120	2.14	1.69
D20130		1.15
D20140		0.77
D20150		2.36
D20160		1.51
D20170	1.89	0.97
D20180		0.67
D20190		0.45
C0057-006-0120S		0.55
C0057-006-0190S		0.32
C0057-006-0250S		0.23
C0057-006-0310S		0.19
C0057-006-0380S	0.85	0.16
C0057-006-0440S		0.13
C0057-006-0500S		0.12
C0057-006-0560S		0.12
C0057-006-0620S		0.10
C0057-007-0120S		1.02
C0057-007-0190S		0.58
C0057-007-0250S		0.45
C0057-007-0310S		0.35
C0057-007-0380S	1.41	0.28
C0057-007-0440S		0.25
C0057-007-0500S		0.22
C0057-007-0560S		0.19
C0057-007-0620S		0.17
C0057-008-0120S		1.82
C0057-008-0190S		1.05
C0057-008-0250S		0.77
C0057-008-0310S		0.61
C0057-008-0380S	2.22	0.50
C0057-008-0440S		0.42
C0057-008-0500S		0.36
C0057-008-0560S		0.32
C0057-008-0620S		0.29
D20350		5.79
D20360		3.68
D20370	3.42	2.38
D20380		1.62
D20390		1.10
D20200		1.00
D20210		0.64
D20220	1.50	0.41
D20230		0.28
D20240		0.19
D20400		2.44
D20410		1.55
D20420	2.81	1.00
D20430		0.69
D20440		0.46
D20600		6.55
D20610		4.17
D20620	5.47	2.70
D20630		1.83
D20640		1.24
D20250		0.51
D20260		0.32
D20270	1.24	0.21
D20280		0.15
D20290		0.10
C0088-008-0120S		0.92
C0088-008-0190S		0.51
C0088-008-0250S		0.38
C0088-008-0310S		0.31
C0088-008-0380S	1.41	0.25
C0088-008-0440S		0.22
C0088-008-0500S		0.19
C0088-008-0560S		0.16
C0088-008-0620S		0.15

COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0088-010-0120M			3.05	1.80	1.52		2.15		C0088-010-0120S		1.79
C0088-010-0190M			4.83	2.59	2.06		1.19		C0088-010-0190S		0.99
C0088-010-0250M			6.35	3.30	2.49		0.88		C0088-010-0250S		0.73
C0088-010-0310M			7.87	3.86	3.00		0.67		C0088-010-0310S		0.55
C0088-010-0380M			9.65	5.03	3.30		0.58		C0088-010-0380S		0.48
C0088-010-0440M		0.25	11.18	5.74	3.73	2.67	0.49		C0088-010-0440S	2.22	0.41
C0088-010-0500M			12.70	6.07	4.37		0.40		C0088-010-0500S		0.34
C0088-010-0560M			14.22	6.96	4.70		0.37		C0088-010-0560S		0.31
C0088-010-0620M			15.75	7.72	5.11		0.33		C0088-010-0620S		0.28
C0088-010-0690M			17.53	8.56	5.41		0.30		C0088-010-0690S		0.25
C0088-010-0750M	2.24		19.05	9.53	5.79		0.28		C0088-010-0750S		0.23
C0088-012-0120M			3.05	1.96	1.91		4.31		C0088-012-0120S		3.59
C0088-012-0190M			4.83	2.95	2.54		2.54		C0088-012-0190S		2.12
C0088-012-0250M			6.35	3.76	3.12		1.84		C0088-012-0250S		1.53
C0088-012-0310M			7.87	4.47	3.76		1.40		C0088-012-0310S		1.17
C0088-012-0380M		0.30	9.65	5.49	4.37	4.76	1.14		C0088-012-0380S	3.97	0.95
C0088-012-0440M			11.18	6.40	4.85		1.00		C0088-012-0440S		0.83
C0088-012-0500M			12.70	7.16	5.46		0.86		C0088-012-0500S		0.71
C0088-012-0560M			14.22	8.05	5.97		0.77		C0088-012-0560S		0.64
C0088-012-0620M			15.75	8.59	6.73		0.67		C0088-012-0620S		0.55
C0088-012-0690M			17.53	9.75	6.76		0.61		C0088-012-0690S		0.51
C0088-012-0750M			19.05	10.57	7.44		0.56		C0088-012-0750S		0.47
D10450			3.70	1.90	1.63		1.50		D20450		1.25
D10460			5.50	2.50	2.13		0.95		D20460		0.79
D10470	2.25	0.25	8.00	3.50	2.88	2.81	0.61		D20470	2.34	0.51
D10480			11.40	4.70	3.88		0.42		D20480		0.35
D10490			16.60	6.70	5.38		0.29		D20490		0.24
D10650			3.70	2.30	2.08		4.02		D20650		3.35
D10660			5.30	3.10	2.72		2.57		D20660		2.14
D10670	2.32	0.32	7.70	4.30	3.68	5.63	1.66		D20670	4.69	1.38
D10680			10.90	5.90	4.96		1.13		D20680		0.94
D10690			15.60	8.20	6.88		0.77		D20690		0.64
D10850			3.50	2.70	2.60		9.31		D20850		7.76
D10860			5.00	3.70	3.40		5.88		D20860		4.90
D10870	2.40	0.40	7.00	5.10	4.60	7.45	3.83		D20870	6.21	3.19
D10880			10.00	7.00	6.20		2.61		D20880		2.17
D10890			14.00	9.90	8.60		1.76		D20890		1.47
D10300			5.40	1.60	1.30		0.31		D20300		0.26
D10310			8.20	2.20	1.70		0.20		D20310		0.17
D10320	2.70	0.20	12.40	3.10	2.30	1.20	0.13		D20320	1.00	0.11
D10330			17.90	4.20	3.10		0.08		D20330		0.07
D10340			26.20	5.90	4.30		0.06		D20340		0.05
D10500			4.90	1.90	1.63		0.77		D20500		0.64
D10510			7.30	2.60	2.13		0.49		D20510		0.41
D10520	2.75	0.25	10.90	3.60	2.88	2.31	0.31		D20520	1.92	0.26
D10530			15.70	5.00	3.88		0.22		D20530		0.18
D10540			22.90	7.00	5.38		0.14		D20540		0.12
D10700			4.70	2.40	2.08		2.06		D20700		1.72
D10710			6.80	3.20	2.72		1.31		D20710		1.09
D10720	2.82	0.32	10.00	4.40	3.68	4.69	0.85		D20720	3.91	0.71
D10730			14.20	6.10	4.96		0.58		D20730		0.48
D10740			20.60	8.50	6.88		0.38		D20740		0.32
D10900			4.30	2.80	2.60		4.77		D20900		3.97
D10910			6.30	3.90	3.40		3.04		D20910		2.53
D10920	2.90	0.40	9.10	5.40	4.60	7.16	1.96		D20920	5.96	1.63
D10930			13.00	7.50	6.20		1.33		D20930		1.11
D10940			18.50	10.60	8.60		0.90		D20940		0.75
D11100			4.40	3.50	3.25		11.58		D21100		9.65
D11110			6.10	4.70	4.25		7.42		D21110		6.18
D11120	3.00	0.50	8.70	6.50	5.75	10.40	4.80		D21120	8.66	4.00
D11130			12.00	9.00	7.75		3.27		D21130		2.72
D11140			17.50	12.80	10.75		2.21		D21140		1.84
C0120-010-0250M			6.35	2.57	1.63		0.56		C0120-010-0250S		0.47
C0120-010-0310M			7.87	3.00	1.85		0.44		C0120-010-0310S		0.36
C0120-010-0380M			9.65	3.56	2.11		0.35		C0120-010-0380S		0.29
C0120-010-0440M			11.18	4.01	2.34		0.30		C0120-010-0440S		0.25
C0120-010-0500M	3.05	0.25	12.70	4.57	2.57	2.14	0.26		C0120-010-0500S	1.78	0.22
C0120-010-0560M			14.22	5.51	2.77		0.25		C0120-010-0560S		0.20
C0120-010-0620M			15.75	5.59	3.00		0.21		C0120-010-0620S		0.17
C0120-010-0690M			17.53	6.50	3.28		0.19		C0120-010-0690S		0.16
C0120-010-0750M			19.05	6.86	3.48		0.18		C0120-010-0750S		0.15



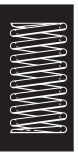
COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0120-010-0810M			20.57	7.04	3.71		0.16		C0120-010-0810S		0.13
C0120-010-0880M			22.35	8.81	3.96		0.16		C0120-010-0880S		0.13
C0120-010-0940M			23.88	8.71	4.19		0.14		C0120-010-0940S		0.12
C0120-010-1000M		0.25	25.40	7.98	4.42	2.14	0.12		C0120-010-1000S	1.78	0.10
C0120-010-1120M			28.45	11.02	4.88		0.12		C0120-010-1120S		0.10
C0120-010-1250M			31.75	11.48	5.36		0.11		C0120-010-1250S		0.09
C0120-010-1500M			38.10	13.72	6.30		0.09		C0120-010-1500S		0.07
C0120-012-0250M			6.35	3.15	2.06		1.10		C0120-012-0250S		0.92
C0120-012-0310M			7.87	3.86	2.36		0.88		C0120-012-0310S		0.73
C0120-012-0380M			9.65	4.60	2.72		0.70		C0120-012-0380S		0.58
C0120-012-0440M			11.18	5.26	3.02		0.60		C0120-012-0440S		0.50
C0120-012-0500M			12.70	6.02	3.33		0.53		C0120-012-0500S		0.44
C0120-012-0560M			14.22	6.50	3.63		0.46		C0120-012-0560S		0.38
C0120-012-0620M			15.75	7.39	3.94		0.42		C0120-012-0620S		0.35
C0120-012-0690M		0.30	17.53	8.05	4.29	3.51	0.37		C0120-012-0690S	2.92	0.31
C0120-012-0750M			19.05	9.02	4.60		0.35		C0120-012-0750S		0.29
C0120-012-0810M			20.57	9.40	4.90		0.32		C0120-012-0810S		0.26
C0120-012-0880M			22.35	10.54	5.26		0.30		C0120-012-0880S		0.25
C0120-012-0940M			23.88	10.49	5.56		0.26		C0120-012-0940S		0.22
C0120-012-1000M			25.40	12.01	5.87		0.26		C0120-012-1000S		0.22
C0120-012-1120M			28.45	12.88	6.48		0.23		C0120-012-1120S		0.19
C0120-012-1250M			31.75	15.04	7.14		0.21		C0120-012-1250S		0.17
C0120-012-1500M			38.10	18.03	8.41		0.18		C0120-012-1500S		0.15
C0120-014-0250M			6.35	3.51	2.57		1.93		C0120-014-0250S		1.60
C0120-014-0310M			7.87	4.24	2.97		1.51		C0120-014-0310S		1.25
C0120-014-0380M			9.65	5.13	3.45		1.21		C0120-014-0380S		1.01
C0120-014-0440M			11.18	5.89	3.86		1.03		C0120-014-0440S		0.86
C0120-014-0500M			12.70	6.68	4.27		0.91		C0120-014-0500S		0.76
C0120-014-0560M			14.22	7.39	4.67		0.81		C0120-014-0560S		0.67
C0120-014-0620M			15.75	8.13	5.08		0.72		C0120-014-0620S		0.60
C0120-014-0690M		0.36	17.53	9.02	5.56	5.47	0.65		C0120-014-0690S	4.56	0.54
C0120-014-0750M			19.05	9.78	5.97		0.60		C0120-014-0750S		0.50
C0120-014-0810M			20.57	10.52	6.38		0.54		C0120-014-0810S		0.45
C0120-014-0880M			22.35	11.58	6.83		0.51		C0120-014-0880S		0.42
C0120-014-0940M			23.88	12.29	7.24		0.47		C0120-014-0940S		0.39
C0120-014-1000M	3.05		25.40	12.90	7.65		0.44		C0120-014-1000S		0.36
C0120-014-1120M			28.45	14.25	8.46		0.39		C0120-014-1120S		0.32
C0120-014-1250M			31.75	16.05	9.35		0.35		C0120-014-1250S		0.29
C0120-014-1500M			38.10	19.71	11.02		0.30		C0120-014-1500S		0.25
C0120-016-0190M			4.83	3.00	2.57		4.48		C0120-016-0190S		3.73
C0120-016-0250M			6.35	3.68	3.02		3.06		C0120-016-0250S		2.55
C0120-016-0310M			7.87	4.55	3.53		2.45		C0120-016-0310S		2.04
C0120-016-0380M			9.65	5.51	4.14		1.98		C0120-016-0380S		1.65
C0120-016-0440M			11.18	6.25	4.75		1.66		C0120-016-0440S		1.39
C0120-016-0500M			12.70	7.11	5.28		1.45		C0120-016-0500S		1.21
C0120-016-0560M		0.41	14.22	7.82	5.87	8.18	1.28		C0120-016-0560S	6.81	1.06
C0120-016-0620M			15.75	8.69	6.38		1.16		C0120-016-0620S		0.96
C0120-016-0690M			17.53	9.53	7.14		1.02		C0120-016-0690S		0.85
C0120-016-0750M			19.05	10.26	7.70		0.93		C0120-016-0750S		0.77
C0120-016-1000M			25.40	14.00	9.60		0.72		C0120-016-1000S		0.60
C0120-016-1120M			28.45	15.47	10.64		0.63		C0120-016-1120S		0.52
C0120-016-1250M			31.75	17.15	11.76		0.56		C0120-016-1250S		0.47
C0120-016-1500M			38.10	21.41	13.82		0.49		C0120-016-1500S		0.41
C0120-018-0190M			4.83	3.25	2.97		7.23		C0120-018-0190S		6.02
C0120-018-0250M			6.35	4.04	3.53		4.94		C0120-018-0250S		4.12
C0120-018-0310M			7.87	4.90	4.22		3.84		C0120-018-0310S		3.20
C0120-018-0380M			9.65	6.02	4.93		3.13		C0120-018-0380S		2.61
C0120-018-0440M			11.18	6.88	5.59		2.66		C0120-018-0440S		2.22
C0120-018-0500M			12.70	7.75	6.30		2.29		C0120-018-0500S		1.91
C0120-018-0560M		0.46	14.22	8.53	7.09	11.39	2.00		C0120-018-0560S	9.49	1.66
C0120-018-0620M			15.75	9.60	7.54		1.86		C0120-018-0620S		1.55
C0120-018-0690M			17.53	10.52	8.43		1.63		C0120-018-0690S		1.36
C0120-018-0750M			19.05	11.38	9.12		1.49		C0120-018-0750S		1.24
C0120-018-1000M			25.40	15.24	11.56		1.12		C0120-018-1000S		0.93
C0120-018-1120M			28.45	17.04	12.83		1.00		C0120-018-1120S		0.83
C0120-018-1250M			31.75	19.00	14.20		0.89		C0120-018-1250S		0.74
C0120-018-1500M			38.10	22.61	16.84		0.74		C0120-018-1500S		0.61
C0120-020-0250M			6.35	4.47	4.14		7.84		C0120-020-0250S		6.53
C0120-020-0310M		0.51	7.87	5.46	4.88	14.72	6.09		C0120-020-0310S	12.26	5.07
C0120-020-0380M			9.65	6.60	5.74		4.85		C0120-020-0380S		4.04
C0120-020-0440M			11.18	7.59	6.50		4.12		C0120-020-0440S		3.43

COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0120-020-0500M			12.70	8.59	7.24		3.57		C0120-020-0500S		2.97
C0120-020-0560M			14.22	9.58	7.98		3.17		C0120-020-0560S		2.64
C0120-020-0620M			15.75	10.57	8.74		2.84		C0120-020-0620S		2.37
C0120-020-0690M			17.53	11.71	9.60		2.54		C0120-020-0690S		2.12
C0120-020-0750M			19.05	12.70	10.34		2.31		C0120-020-0750S		1.92
C0120-020-0810M		0.51	20.57	13.69	11.10	14.72	2.14		C0120-020-0810S	12.26	1.78
C0120-020-0880M			22.35	14.83	11.96		1.96		C0120-020-0880S		1.63
C0120-020-0940M			23.88	15.82	12.70		1.82		C0120-020-0940S		1.52
C0120-020-1000M			25.40	16.81	13.46		1.72		C0120-020-1000S		1.43
C0120-020-1120M			28.45	18.77	14.94		1.52		C0120-020-1120S		1.27
C0120-020-1250M			31.75	20.93	16.56		1.37		C0120-020-1250S		1.14
C0120-020-1500M			38.10	25.02	19.66		1.12		C0120-020-1500S		0.93
C0120-022-0250M			6.35	4.75	4.34		12.36		C0120-022-0250S		10.30
C0120-022-0310M			7.87	5.74	5.31		9.33		C0120-022-0310S		7.77
C0120-022-0380M			9.65	6.91	6.40		7.27		C0120-022-0380S		6.06
C0120-022-0440M			11.18	8.05	7.11		6.37		C0120-022-0440S		5.31
C0120-022-0500M			12.70	9.04	8.10		5.45		C0120-022-0500S		4.54
C0120-022-0560M			14.22	10.19	8.79		4.94		C0120-022-0560S		4.12
C0120-022-0620M			15.75	11.18	9.75		4.36		C0120-022-0620S		3.63
C0120-022-0690M	3.05	0.56	17.53	12.17	11.23	19.93	3.71		C0120-022-0690S	16.60	3.09
C0120-022-0750M			19.05	13.41	11.71		3.54		C0120-022-0750S		2.95
C0120-022-0810M			20.57	14.48	12.55		3.27		C0120-022-0810S		2.72
C0120-022-0940M			23.88	16.64	14.38		2.75		C0120-022-0940S		2.29
C0120-022-1000M			25.40	17.65	15.24		2.57		C0120-022-1000S		2.14
C0120-022-1120M			28.45	20.12	16.94		2.40		C0120-022-1120S		2.00
C0120-022-1250M			31.75	22.02	18.77		2.05		C0120-022-1250S		1.71
C0120-022-1500M			38.10	26.37	22.33		1.70		C0120-022-1500S		1.41
C0120-024-0310M			7.87	6.15	5.82		14.41		C0120-024-0310S		12.00
C0120-024-0380M			9.65	7.44	6.88		11.36		C0120-024-0380S		9.46
C0120-024-0440M			11.18	8.59	7.80		9.63		C0120-024-0440S		8.02
C0120-024-0500M			12.70	9.70	8.71		8.35		C0120-024-0500S		6.96
C0120-024-0560M			14.22	10.82	9.63		7.37		C0120-024-0560S		6.14
C0120-024-0620M			15.75	11.96	10.54		6.60		C0120-024-0620S		5.50
C0120-024-0690M			17.53	13.26	11.61		5.88		C0120-024-0690S		4.90
C0120-024-0750M		0.61	19.05	14.40	12.52	25.04	5.38		C0120-024-0750S	20.86	4.48
C0120-024-0810M			20.57	15.52	13.44		4.96		C0120-024-0810S		4.13
C0120-024-0880M			22.35	16.84	14.50		4.54		C0120-024-0880S		3.78
C0120-024-0940M			23.88	17.96	15.42		4.24		C0120-024-0940S		3.53
C0120-024-1000M			25.40	19.08	16.33		3.96		C0120-024-1000S		3.30
C0120-024-1120M			28.45	21.34	18.16		3.52		C0120-024-1120S		2.93
C0120-024-1250M			31.75	23.77	20.14		3.13		C0120-024-1250S		2.61
C0120-024-1500M			38.10	28.47	23.95		2.61		C0120-024-1500S		2.17
D10550			7.10	2.00	1.63		0.36		D20550		0.30
D10560			10.70	2.80	2.13		0.24		D20560		0.20
D10570	3.45	0.25	16.10	3.80	2.88	1.84	0.16		D20570	1.53	0.13
D10580			23.30	5.30	3.88		0.11		D20580		0.09
D10590			34.10	7.50	5.38		0.07		D20590		0.06
D10750			6.30	2.50	2.08		0.97		D20750		0.81
D10760			9.40	3.30	2.72		0.62		D20760		0.52
D10770	3.52	0.32	14.00	4.60	3.68	3.79	0.40		D20770	3.16	0.33
D10780			20.10	6.30	4.96		0.28		D20780		0.23
D10790			29.30	8.90	6.88		0.19		D20790		0.16
D10950			5.60	2.80	2.60		2.28		D20950		1.90
D10960			8.30	3.90	3.40		1.45		D20960		1.21
D10970	3.60	0.40	12.00	5.40	4.60	6.37	0.94		D20970	5.31	0.78
D10980			17.50	7.50	6.20		0.64		D20980		0.53
D10990			25.50	10.60	8.60		0.43		D20990		0.36
D11150			5.50	3.70	3.25		5.57		D21150		4.64
D11160			7.90	5.10	4.25		3.53		D21160		2.94
D11170	3.70	0.50	11.50	7.10	5.75	10.00	2.28		D21170	8.33	1.90
D11180			16.00	9.80	7.75		1.56		D21180		1.30
D11190			23.50	14.00	10.75		1.05		D21190		0.87
C0148-021-0250M			6.35	4.11	3.63		6.25		C0148-021-0250S		5.21
C0148-021-0310M			7.87	4.98	4.22		4.85		C0148-021-0310S		4.04
C0148-021-0380M			9.65	6.02	4.90		3.85		C0148-021-0380S		3.21
C0148-021-0440M			11.18	6.88	5.51		3.27		C0148-021-0440S		2.72
C0148-021-0500M	3.76	0.53	12.70	7.77	6.10	14.01	2.84		C0148-021-0500S	11.67	2.37
C0148-021-0560M			14.22	8.66	6.68		2.50		C0148-021-0560S		2.08
C0148-021-0620M			15.75	9.53	7.26		2.24		C0148-021-0620S		1.87
C0148-021-0690M			17.53	10.54	7.95		2.01		C0148-021-0690S		1.67
C0148-021-0750M			19.05	11.43	8.53		1.84		C0148-021-0750S		1.53



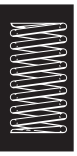
COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0148-021-0810M			20.57	12.32	9.12		1.70		C0148-021-0810S		1.41
C0148-021-0880M			22.35	13.34	9.80		1.56		C0148-021-0880S		1.30
C0148-021-0940M		0.53	23.88	14.22	10.41	14.01	1.45		C0148-021-0940S	11.67	1.21
C0148-021-1000M			25.40	15.09	11.00		1.37		C0148-021-1000S		1.14
C0148-021-1250M			31.75	18.75	13.44		1.07		C0148-021-1250S		0.89
C0148-021-1500M			38.10	22.40	15.90		0.89		C0148-021-1500S		0.74
C0148-023-0250M			6.35	4.37	4.06		9.11		C0148-023-0250S		7.59
C0148-023-0310M			7.87	5.31	4.75		7.02		C0148-023-0310S		5.85
C0148-023-0380M			9.65	6.43	5.54		5.55		C0148-023-0380S		4.62
C0148-023-0440M	3.76		11.18	7.37	6.22		4.71		C0148-023-0440S		3.92
C0148-023-0500M			12.70	8.31	6.91		4.08		C0148-023-0500S		3.40
C0148-023-0560M			14.22	9.25	7.59		3.61		C0148-023-0560S		3.01
C0148-023-0620M			15.75	10.19	8.28		3.24		C0148-023-0620S		2.70
C0148-023-0690M		0.58	17.53	11.28	9.07	17.97	2.89		C0148-023-0690S	14.97	2.41
C0148-023-0750M			19.05	12.22	9.75		2.64		C0148-023-0750S		2.20
C0148-023-0810M			20.57	13.16	10.41		2.43		C0148-023-0810S		2.02
C0148-023-0880M			22.35	14.27	11.23		2.22		C0148-023-0880S		1.85
C0148-023-0940M			23.88	15.21	11.91		2.08		C0148-023-0940S		1.73
C0148-023-1000M			25.40	16.15	12.57		1.94		C0148-023-1000S		1.62
C0148-023-1250M			31.75	20.09	15.42		1.54		C0148-023-1250S		1.28
C0148-023-1500M			38.10	24.00	18.26		1.28		C0148-023-1500S		1.06
D11350			5.50	4.00	4.10		14.02		D21350		11.68
D11360			7.80	5.40	5.36		8.90		D21360		7.41
D11370	3.83	0.63	11.00	7.50	7.25	20.99	5.77		D21370	17.48	4.81
D11380			15.50	10.30	9.77		3.93		D21380		3.27
D11390			22.50	14.70	13.55		2.65		D21390		2.21
D10800			8.70	2.60	2.08		0.50		D20800		0.42
D10810			13.10	3.50	2.72		0.31		D20810		0.26
D10820	4.32	0.32	19.80	4.90	3.68	3.09	0.22		D20820	2.57	0.18
D10830			28.60	6.70	4.96		0.14		D20830		0.12
D10840			41.90	9.50	6.88		0.10		D20840		0.08
D11000			7.50	3.00	2.60		1.17		D21000		0.97
D11010			11.00	4.10	3.40		0.74		D21010		0.62
D11020	4.40	0.40	16.50	5.80	4.60	5.25	0.48		D21020	4.37	0.40
D11030			24.00	8.00	6.20		0.32		D21030		0.27
D11040			35.50	11.40	8.60		0.22		D21040		0.18
D11200			7.00	3.70	3.25		2.83		D21200		2.36
D11210			10.00	5.10	4.25		1.81		D21210		1.51
D11220	4.50	0.50	15.00	7.10	5.75	9.32	1.17		D21220	7.76	0.97
D11230			21.50	9.80	7.75		0.79		D21230		0.66
D11240			31.00	14.00	10.75		0.54		D21240		0.45
C0180-012-0250M			6.35	2.57	1.45		0.63		C0180-012-0250S		0.52
C0180-012-0310M			7.87	3.15	1.57		0.51		C0180-012-0310S		0.42
C0180-012-0380M			9.65	3.68	1.75		0.40		C0180-012-0380S		0.34
C0180-012-0440M			11.18	4.32	1.88		0.35		C0180-012-0440S		0.29
C0180-012-0500M			12.70	4.62	2.03		0.30		C0180-012-0500S		0.25
C0180-012-0560M			14.22	5.08	2.16		0.26		C0180-012-0560S		0.22
C0180-012-0620M			15.75	5.94	2.31		0.25		C0180-012-0620S		0.20
C0180-012-0690M		0.30	17.53	6.10	2.46	2.40	0.21		C0180-012-0690S	2.00	0.17
C0180-012-0750M			19.05	6.58	2.62		0.19		C0180-012-0750S		0.16
C0180-012-0810M			20.57	6.86	2.77		0.18		C0180-012-0810S		0.15
C0180-012-0880M			22.35	8.64	2.92		0.18		C0180-012-0880S		0.15
C0180-012-0940M			23.88	8.53	3.07		0.16		C0180-012-0940S		0.13
C0180-012-1000M			25.40	8.26	3.20		0.14		C0180-012-1000S		0.12
C0180-012-1250M			31.75	12.17	3.78		0.12		C0180-012-1250S		0.10
C0180-012-1500M	4.57		38.10	15.24	4.37		0.11		C0180-012-1500S		0.09
C0180-014-0250M			6.35	2.92	1.75		1.09		C0180-014-0250S		0.90
C0180-014-0310M			7.87	3.53	1.93		0.86		C0180-014-0310S		0.71
C0180-014-0380M			9.65	4.19	2.16		0.68		C0180-014-0380S		0.57
C0180-014-0440M			11.18	4.90	2.34		0.60		C0180-014-0440S		0.50
C0180-014-0500M			12.70	5.33	2.54		0.51		C0180-014-0500S		0.42
C0180-014-0560M			14.22	6.05	2.72		0.46		C0180-014-0560S		0.38
C0180-014-0620M		0.36	15.75	6.48	2.90	3.74	0.40		C0180-014-0620S	3.12	0.34
C0180-014-0690M			17.53	7.34	3.12		0.37		C0180-014-0690S		0.31
C0180-014-0750M			19.05	7.82	3.30		0.33		C0180-014-0750S		0.28
C0180-014-0880M			22.35	9.02	3.71		0.28		C0180-014-0880S		0.23
C0180-014-1000M			25.40	10.16	4.09		0.25		C0180-014-1000S		0.20
C0180-014-1250M			31.75	12.34	4.85		0.19		C0180-014-1250S		0.16
C0180-014-1380M			35.05	13.72	5.26		0.18		C0180-014-1380S		0.15
C0180-014-1500M			38.10	14.40	5.64		0.16		C0180-014-1500S		0.13
C0180-016-0250M		0.41	6.35	2.77	2.03	5.56	1.56		C0180-016-0250S	4.63	1.30

COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0180-016-0310M			7.87	3.63	2.21		1.31		C0180-016-0310S		1.09
C0180-016-0380M			9.65	4.29	2.54		1.03		C0180-016-0380S		0.86
C0180-016-0440M			11.18	4.75	2.84		0.86		C0180-016-0440S		0.71
C0180-016-0500M			12.70	5.21	3.15		0.74		C0180-016-0500S		0.61
C0180-016-0560M			14.22	5.66	3.45		0.65		C0180-016-0560S		0.54
C0180-016-0620M			15.75	6.45	3.66		0.60		C0180-016-0620S		0.50
C0180-016-0690M		0.41	17.53	7.19	3.94	5.56	0.54		C0180-016-0690S	4.63	0.45
C0180-016-0750M			19.05	7.62	4.24		0.49		C0180-016-0750S		0.41
C0180-016-0880M			22.35	9.65	4.70		0.44		C0180-016-0880S		0.36
C0180-016-1000M			25.40	10.97	5.18		0.39		C0180-016-1000S		0.32
C0180-016-1250M			31.75	13.08	6.22		0.30		C0180-016-1250S		0.25
C0180-016-1380M			35.05	15.24	6.76		0.28		C0180-016-1380S		0.23
C0180-016-1500M			38.10	15.42	7.24		0.25		C0180-016-1500S		0.20
C0180-016-1750M			44.45	17.98	8.28		0.21		C0180-016-1750S		0.17
C0180-018-0250M			6.35	3.05	2.39		2.36		C0180-018-0250S		1.97
C0180-018-0310M			7.87	3.96	2.62		2.00		C0180-018-0310S		1.66
C0180-018-0380M			9.65	4.83	2.95		1.63		C0180-018-0380S		1.36
C0180-018-0440M			11.18	5.46	3.30		1.37		C0180-018-0440S		1.14
C0180-018-0500M			12.70	6.07	3.66		1.17		C0180-018-0500S		0.98
C0180-018-0560M			14.22	6.40	4.11		1.00		C0180-018-0560S		0.83
C0180-018-0620M			15.75	7.01	4.45		0.89		C0180-018-0620S		0.74
C0180-018-0690M		0.46	17.53	7.87	4.80	7.83	0.81		C0180-018-0690S	6.52	0.67
C0180-018-0750M			19.05	8.20	5.26		0.72		C0180-018-0750S		0.60
C0180-018-0880M			22.35	10.26	5.77		0.65		C0180-018-0880S		0.54
C0180-018-1000M			25.40	11.43	6.40		0.56		C0180-018-1000S		0.47
C0180-018-1250M			31.75	14.55	7.70		0.46		C0180-018-1250S		0.38
C0180-018-1380M			35.05	15.62	8.38		0.40		C0180-018-1380S		0.34
C0180-018-1500M			38.10	16.81	9.02		0.37		C0180-018-1500S		0.31
C0180-018-1750M			44.45	19.61	10.31		0.32		C0180-018-1750S		0.26
C0180-020-0250M			6.35	3.61	2.87		3.71		C0180-020-0250S		3.09
C0180-020-0310M			7.87	4.34	3.25		2.89		C0180-020-0310S		2.41
C0180-020-0380M			9.65	5.21	3.71		2.29		C0180-020-0380S		1.91
C0180-020-0440M			11.18	5.94	4.09		1.94		C0180-020-0440S		1.62
C0180-020-0500M			12.70	6.68	4.47		1.70		C0180-020-0500S		1.41
C0180-020-0560M			14.22	7.42	4.85		1.51		C0180-020-0560S		1.25
C0180-020-0620M	4.57		15.75	8.15	5.26		1.35		C0180-020-0620S		1.12
C0180-020-0690M		0.51	17.53	9.02	5.69	10.19	1.19		C0180-020-0690S	8.49	0.99
C0180-020-0750M			19.05	9.75	6.07		1.10		C0180-020-0750S		0.92
C0180-020-0880M			22.35	11.35	6.91		0.93		C0180-020-0880S		0.77
C0180-020-1000M			25.40	12.83	7.67		0.81		C0180-020-1000S		0.67
C0180-020-1250M			31.75	15.90	9.30		0.65		C0180-020-1250S		0.54
C0180-020-1380M			35.05	17.50	10.11		0.58		C0180-020-1380S		0.48
C0180-020-1500M			38.10	18.72	10.90		0.53		C0180-020-1500S		0.44
C0180-020-1750M			44.45	22.05	12.50		0.46		C0180-020-1750S		0.38
C0180-022-0250M			6.35	3.66	3.07		5.18		C0180-022-0250S		4.31
C0180-022-0310M			7.87	4.52	3.48		4.15		C0180-022-0310S		3.46
C0180-022-0380M			9.65	5.64	3.91		3.47		C0180-022-0380S		2.89
C0180-022-0440M			11.18	6.48	4.32		2.96		C0180-022-0440S		2.47
C0180-022-0500M			12.70	7.11	4.88		2.49		C0180-022-0500S		2.07
C0180-022-0560M			14.22	7.52	5.56		2.08		C0180-022-0560S		1.73
C0180-022-0620M			15.75	8.18	6.12		1.84		C0180-022-0620S		1.53
C0180-022-0690M		0.56	17.53	9.27	6.58	13.92	1.68		C0180-022-0690S	11.60	1.40
C0180-022-0750M			19.05	9.88	7.11		1.52		C0180-022-0750S		1.27
C0180-022-0810M			20.57	10.29	7.85		1.35		C0180-022-0810S		1.12
C0180-022-0940M			23.88	12.34	8.56		1.21		C0180-022-0940S		1.01
C0180-022-1000M			25.40	13.16	9.02		1.14		C0180-022-1000S		0.95
C0180-022-1120M			28.45	14.73	9.93		1.02		C0180-022-1120S		0.85
C0180-022-1250M			31.75	16.46	10.92		0.91		C0180-022-1250S		0.76
C0180-022-1500M			38.10	19.61	12.85		0.75		C0180-022-1500S		0.63
C0180-022-1750M			44.45	23.60	13.97		0.67		C0180-022-1750S		0.55
C0180-024-0250M			6.35	4.06	3.63		7.41		C0180-024-0250S		6.17
C0180-024-0310M			7.87	4.90	4.17		5.71		C0180-024-0310S		4.76
C0180-024-0380M			9.65	5.89	4.80		4.50		C0180-024-0380S		3.75
C0180-024-0440M			11.18	6.73	5.33		3.82		C0180-024-0440S		3.18
C0180-024-0500M			12.70	7.57	5.89		3.31		C0180-024-0500S		2.76
C0180-024-0560M		0.61	14.22	8.41	6.43	16.95	2.92		C0180-024-0560S	14.12	2.43
C0180-024-0620M			15.75	9.27	6.96		2.61		C0180-024-0620S		2.17
C0180-024-0750M			19.05	11.10	8.13		2.14		C0180-024-0750S		1.78
C0180-024-0880M			22.35	12.93	9.30		1.80		C0180-024-0880S		1.50
C0180-024-1000M			25.40	14.61	10.36		1.58		C0180-024-1000S		1.31
C0180-024-1120M			28.45	16.28	11.43		1.40		C0180-024-1120S		1.17



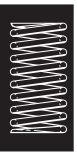
COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P1 (N)	R (N/mm)
C0180-024-1250M			31.75	18.11	12.60		1.24		C0180-024-1250S		1.04
C0180-024-1500M		0.61	38.10	21.64	14.86	16.95	1.03		C0180-024-1500S	14.12	0.86
C0180-024-1750M			44.45	25.15	17.09		0.88		C0180-024-1750S		0.73
C0180-024-2000M			50.80	28.68	19.33		0.77		C0180-024-2000S		0.64
C0180-026-0250M			6.35	4.14	3.78		10.12		C0180-026-0250S		8.43
C0180-026-0310M			7.87	5.16	4.27		8.23		C0180-026-0310S		6.86
C0180-026-0380M			9.65	6.25	4.95		6.57		C0180-026-0380S		5.47
C0180-026-0440M			11.18	7.09	5.61		5.46		C0180-026-0440S		4.55
C0180-026-0500M			12.70	7.92	6.27		4.69		C0180-026-0500S		3.91
C0180-026-0560M			14.22	8.79	6.91		4.12		C0180-026-0560S		3.43
C0180-026-0620M			15.75	9.63	7.57		3.66		C0180-026-0620S		3.05
C0180-026-0690M			17.53	10.72	8.23		3.29		C0180-026-0690S		2.74
C0180-026-0750M		0.66	19.05	11.56	8.94	22.38	2.98		C0180-026-0750S	18.64	2.48
C0180-026-0810M			20.57	12.40	9.58		2.73		C0180-026-0810S		2.27
C0180-026-0880M			22.35	13.51	10.24		2.52		C0180-026-0880S		2.10
C0180-026-1000M			25.40	14.94	11.71		2.14		C0180-026-1000S		1.78
C0180-026-1120M			28.45	16.61	12.93		1.89		C0180-026-1120S		1.58
C0180-026-1250M			31.75	18.57	14.27		1.70		C0180-026-1250S		1.41
C0180-026-1500M			38.10	22.12	16.84		1.40		C0180-026-1500S		1.17
C0180-026-1750M			44.45	25.65	19.41		1.19		C0180-026-1750S		0.99
C0180-026-2000M			50.80	29.13	21.97		1.03		C0180-026-2000S		0.86
C0180-029-0250M			6.35	4.60	4.37		16.30		C0180-029-0250S		13.58
C0180-029-0310M			7.87	5.56	5.28		12.43		C0180-029-0310S		10.35
C0180-029-0380M			9.65	6.71	6.12		9.72		C0180-029-0380S		8.10
C0180-029-0440M			11.18	7.70	6.86		8.20		C0180-029-0440S		6.83
C0180-029-0500M			12.70	8.66	7.59		7.09		C0180-029-0500S		5.91
C0180-029-0560M			14.22	9.65	8.31		6.23		C0180-029-0560S		5.19
C0180-029-0620M			15.75	10.62	9.04		5.57		C0180-029-0620S		4.64
C0180-029-0690M			17.53	11.76	9.91		4.96		C0180-029-0690S		4.13
C0180-029-0750M			19.05	12.73	10.62		4.52		C0180-029-0750S		3.77
C0180-029-0810M		0.74	20.57	13.72	11.35	28.60	4.17		C0180-029-0810S	23.82	3.47
C0180-029-0880M			22.35	14.83	12.22		3.82		C0180-029-0880S		3.18
C0180-029-0940M			23.88	15.82	12.93		3.56		C0180-029-0940S		2.97
C0180-029-1000M			25.40	16.79	13.67		3.33		C0180-029-1000S		2.77
C0180-029-1120M			28.45	18.75	15.14		2.94		C0180-029-1120S		2.45
C0180-029-1250M	4.57		31.75	20.85	16.71		2.63		C0180-029-1250S		2.19
C0180-029-1380M			35.05	22.99	18.29		2.36		C0180-029-1380S		1.97
C0180-029-1500M			38.10	24.94	19.76		2.17		C0180-029-1500S		1.81
C0180-029-1750M			44.45	29.01	22.78		1.86		C0180-029-1750S		1.55
C0180-029-2000M			50.80	33.07	25.83		1.61		C0180-029-2000S		1.34
C0180-032-0310M			7.87	6.05	5.23		21.49		C0180-032-0310S		17.90
C0180-032-0380M			9.65	7.34	6.10		16.99		C0180-032-0380S		14.15
C0180-032-0440M			11.18	8.28	7.11		13.57		C0180-032-0440S		11.30
C0180-032-0500M			12.70	9.25	8.10		11.36		C0180-032-0500S		9.46
C0180-032-0560M			14.22	10.41	8.71		10.31		C0180-032-0560S		8.59
C0180-032-0620M			15.75	11.38	9.70		8.98		C0180-032-0620S		7.48
C0180-032-0690M			17.53	12.80	10.31		8.32		C0180-032-0690S		6.93
C0180-032-0750M			19.05	13.61	11.58		7.23		C0180-032-0750S		6.02
C0180-032-0810M		0.81	20.57	14.55	12.60	39.28	6.53		C0180-032-0810S	32.72	5.44
C0180-032-0880M			22.35	15.65	13.79		5.87		C0180-032-0880S		4.89
C0180-032-0940M			23.88	16.71	14.63		5.48		C0180-032-0940S		4.56
C0180-032-1000M			25.40	17.78	15.44		5.15		C0180-032-1000S		4.29
C0180-032-1120M			28.45	19.69	17.20		4.48		C0180-032-1120S		3.73
C0180-032-1250M			31.75	21.92	19.00		3.99		C0180-032-1250S		3.32
C0180-032-1380M			35.05	24.16	20.80		3.61		C0180-032-1380S		3.01
C0180-032-1500M			38.10	26.16	22.48		3.29		C0180-032-1500S		2.74
C0180-032-1750M			44.45	30.53	25.98		2.82		C0180-032-1750S		2.35
C0180-032-2000M			50.80	34.77	29.46		2.45		C0180-032-2000S		2.04
C0180-035-0380M			9.65	7.67	7.26		23.99		C0180-035-0380S		19.98
C0180-035-0440M			11.18	8.79	8.15		20.08		C0180-035-0440S		16.73
C0180-035-0500M			12.70	9.93	9.04		17.28		C0180-035-0500S		14.39
C0180-035-0560M			14.22	11.07	9.93		15.16		C0180-035-0560S		12.63
C0180-035-0620M			15.75	12.22	10.82		13.52		C0180-035-0620S		11.26
C0180-035-0690M			17.53	13.54	11.86		11.99		C0180-035-0690S		9.99
C0180-035-0750M		0.89	19.05	14.68	12.75	47.77	10.93		C0180-035-0750S	39.79	9.10
C0180-035-0810M			20.57	15.82	13.64		10.05		C0180-035-0810S		8.37
C0180-035-0880M			22.35	17.15	14.68		9.18		C0180-035-0880S		7.65
C0180-035-0940M			23.88	18.29	15.57		8.55		C0180-035-0940S		7.12
C0180-035-1000M			25.40	19.43	16.46		8.00		C0180-035-1000S		6.66
C0180-035-1120M			28.45	21.69	18.24		7.07		C0180-035-1120S		5.89
C0180-035-1250M			31.75	24.16	20.14		6.30		C0180-035-1250S		5.25

COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0180-035-1500M			38.10	28.91	23.85		5.20		C0180-035-1500S		4.33
C0180-035-1750M		0.89	44.45	33.66	27.56	47.77	4.43		C0180-035-1750S	39.79	3.69
C0180-035-2000M			50.80	38.40	31.27		3.85		C0180-035-2000S		3.21
D11400			6.70	4.30	4.10		7.16		D21400		5.96
D11410			9.60	5.80	5.36		4.55		D21410		3.79
D11420		0.63	14.00	8.20	7.25	17.16	2.94		D21420	14.29	2.45
D11430			20.00	11.30	9.77		2.00		D21430		1.67
D11440	4.57		29.00	16.20	13.55		1.35		D21440		1.12
D11600			6.90	5.20	5.20		18.53		D21600		15.44
D11610			9.70	7.00	6.80		11.87		D21610		9.89
D11620		0.80	14.00	9.80	9.20	31.87	7.67		D21620	26.55	6.39
D11630			19.50	13.50	12.40		5.22		D21630		4.35
D11640			28.00	19.10	17.20		3.52		D21640		2.93
C0210-018-0250M			6.35	2.90	2.26		1.93		C0210-018-0250S		1.60
C0210-018-0310M			7.87	3.43	2.51		1.51		C0210-018-0310S		1.25
C0210-018-0380M			9.65	4.09	2.79		1.19		C0210-018-0380S		0.99
C0210-018-0440M			11.18	4.62	3.05		1.02		C0210-018-0440S		0.85
C0210-018-0500M			12.70	5.18	3.30		0.89		C0210-018-0500S		0.74
C0210-018-0560M			14.22	5.74	3.56		0.79		C0210-018-0560S		0.66
C0210-018-0620M			15.75	6.30	3.81		0.70		C0210-018-0620S		0.58
C0210-018-0690M		0.46	17.53	6.93	4.09	6.67	0.63		C0210-018-0690S	5.56	0.52
C0210-018-0750M			19.05	7.49	4.34		0.58		C0210-018-0750S		0.48
C0210-018-0810M			20.57	7.87	4.60		0.53		C0210-018-0810S		0.44
C0210-018-0880M			22.35	8.69	4.88		0.49		C0210-018-0880S		0.41
C0210-018-1000M			25.40	9.53	5.38		0.42		C0210-018-1000S		0.35
C0210-018-1250M			31.75	11.71	6.43		0.33		C0210-018-1250S		0.28
C0210-018-1500M			38.10	14.38	7.47		0.28		C0210-018-1500S		0.23
C0210-018-1750M			44.45	17.25	8.48		0.25		C0210-018-1750S		0.20
C0210-018-2000M			50.80	19.00	9.53		0.21		C0210-018-2000S		0.17
C0210-022-0250M			6.35	3.56	2.87		4.13		C0210-022-0250S		3.44
C0210-022-0310M			7.87	4.27	3.23		3.20		C0210-022-0310S		2.67
C0210-022-0380M			9.65	5.11	3.63		2.54		C0210-022-0380S		2.12
C0210-022-0440M			11.18	5.82	3.99		2.15		C0210-022-0440S		1.79
C0210-022-0500M			12.70	6.53	4.32		1.87		C0210-022-0500S		1.56
C0210-022-0560M			14.22	7.24	4.67		1.65		C0210-022-0560S		1.37
C0210-022-0620M			15.75	7.98	5.03		1.49		C0210-022-0620S		1.24
C0210-022-0690M		0.56	17.53	8.79	5.44	11.52	1.31		C0210-022-0690S	9.60	1.09
C0210-022-0750M			19.05	9.50	5.79		1.21		C0210-022-0750S		1.01
C0210-022-0810M	5.33		20.57	10.21	6.12		1.12		C0210-022-0810S		0.93
C0210-022-0880M			22.35	11.05	6.53		1.02		C0210-022-0880S		0.85
C0210-022-1000M			25.40	12.47	7.24		0.89		C0210-022-1000S		0.74
C0210-022-1250M			31.75	15.44	8.69		0.70		C0210-022-1250S		0.58
C0210-022-1500M			38.10	18.16	10.13		0.58		C0210-022-1500S		0.48
C0210-022-1750M			44.45	21.77	11.58		0.51		C0210-022-1750S		0.42
C0210-022-2000M			50.80	24.36	13.06		0.44		C0210-022-2000S		0.36
C0210-026-0250M			6.35	3.96	3.56		7.72		C0210-026-0250S		6.43
C0210-026-0310M			7.87	4.78	4.04		5.94		C0210-026-0310S		4.95
C0210-026-0380M			9.65	5.72	4.60		4.66		C0210-026-0380S		3.88
C0210-026-0440M			11.18	6.50	5.08		3.94		C0210-026-0440S		3.28
C0210-026-0500M			12.70	7.32	5.56		3.41		C0210-026-0500S		2.84
C0210-026-0560M			14.22	8.13	6.02		3.01		C0210-026-0560S		2.51
C0210-026-0620M			15.75	8.92	6.50		2.70		C0210-026-0620S		2.25
C0210-026-0690M		0.66	17.53	9.86	7.06	18.42	2.40		C0210-026-0690S	15.34	2.00
C0210-026-0750M			19.05	10.67	7.54		2.19		C0210-026-0750S		1.82
C0210-026-0810M			20.57	11.46	8.03		2.01		C0210-026-0810S		1.67
C0210-026-0880M			22.35	12.40	8.59		1.84		C0210-026-0880S		1.53
C0210-026-1000M			25.40	14.00	9.55		1.61		C0210-026-1000S		1.34
C0210-026-1250M			31.75	17.35	11.53		1.28		C0210-026-1250S		1.06
C0210-026-1500M			38.10	20.68	13.54		1.05		C0210-026-1500S		0.88
C0210-026-1750M			44.45	24.03	15.52		0.89		C0210-026-1750S		0.74
C0210-026-2000M			50.80	27.38	17.50		0.79		C0210-026-2000S		0.66
D11050			10.50	3.20	2.60		0.60		D21050		0.50
D11060			16.00	4.50	3.40		0.38		D21060		0.32
D11070	5.40	0.40	24.00	6.40	4.60	4.36	0.25		D21070	3.63	0.21
D11080			35.00	9.00	6.20		0.17		D21080		0.14
D11090			53.00	12.80	8.60		0.11		D21090		0.09
D11250			9.40	3.90	3.25		1.46		D21250		1.22
D11260			14.00	5.40	4.25		0.93		D21260		0.77
D11270	5.50	0.50	20.50	7.60	5.75	8.04	0.61		D21270	6.70	0.51
D11280			30.00	10.60	7.75		0.41		D21280		0.34
D11290			44.50	15.10	10.75		0.27		D21290		0.22



COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
D11450			8.50	4.30	4.10		3.69		D21450		3.07
D11460			12.50	5.80	5.36		2.35		D21460		1.96
D11470	5.63	0.63	18.50	8.20	7.25	15.49	1.55		D21470	12.90	1.29
D11480			26.00	11.30	9.77		1.03		D21480		0.86
D11490			38.50	16.20	13.55		0.70		D21490		0.58
D11650			8.30	5.60	5.20		9.53		D21650		7.94
D11660			12.00	7.70	6.80		6.07		D21660		5.06
D11670	5.80	0.80	17.50	10.90	9.20	25.99	3.92		D21670	21.65	3.27
D11680			24.50	15.10	12.40		2.67		D21680		2.22
D11690			36.00	21.50	17.20		1.80		D21690		1.50
D11850			8.50	6.60	5.50		23.24		D21850		19.36
D11860			12.00	9.00	7.50		14.81		D21860		12.34
D11870	6.00	1.00	17.00	12.60	10.50	43.74	9.57		D21870	36.44	7.97
D11880			24.00	17.40	14.50		6.51		D21880		5.42
D11890			34.50	24.60	20.50		4.40		D21890		3.67
C0240-016-0250M			6.35	2.59	1.78		1.09		C0240-016-0250S		0.90
C0240-016-0310M			7.87	3.02	1.93		0.84		C0240-016-0310S		0.70
C0240-016-0380M			9.65	3.66	2.11		0.68		C0240-016-0380S		0.57
C0240-016-0440M			11.18	4.06	2.26		0.58		C0240-016-0440S		0.48
C0240-016-0500M			12.70	4.65	2.41		0.51		C0240-016-0500S		0.42
C0240-016-0560M			14.22	4.88	2.57		0.44		C0240-016-0560S		0.36
C0240-016-0620M			15.75	5.51	2.72		0.40		C0240-016-0620S		0.34
C0240-016-0690M		0.41	17.53	5.84	2.90	4.09	0.35		C0240-016-0690S	3.41	0.29
C0240-016-0750M			19.05	6.76	3.05		0.33		C0240-016-0750S		0.28
C0240-016-0810M			20.57	6.83	3.20		0.30		C0240-016-0810S		0.25
C0240-016-0880M			22.35	7.75	3.38		0.28		C0240-016-0880S		0.23
C0240-016-1000M			25.40	8.71	3.68		0.25		C0240-016-1000S		0.20
C0240-016-1250M			31.75	10.54	4.32		0.19		C0240-016-1250S		0.16
C0240-016-1500M			38.10	12.14	4.95		0.16		C0240-016-1500S		0.13
C0240-016-1750M			44.45	15.24	5.59		0.14		C0240-016-1750S		0.12
C0240-016-2000M			50.80	17.42	6.22		0.12		C0240-016-2000S		0.10
C0240-018-0250M			6.35	2.92	2.03		1.66		C0240-018-0250S		1.39
C0240-018-0310M			7.87	3.48	2.24		1.30		C0240-018-0310S		1.08
C0240-018-0380M			9.65	4.11	2.44		1.03		C0240-018-0380S		0.86
C0240-018-0440M			11.18	4.67	2.62		0.88		C0240-018-0440S		0.73
C0240-018-0500M			12.70	5.31	2.82		0.77		C0240-018-0500S		0.64
C0240-018-0560M			14.22	5.89	3.00		0.68		C0240-018-0560S		0.57
C0240-018-0620M			15.75	6.38	3.20		0.61		C0240-018-0620S		0.51
C0240-018-0690M		0.46	17.53	7.01	3.40	5.69	0.54		C0240-018-0690S	4.74	0.45
C0240-018-0750M			19.05	7.44	3.58		0.49		C0240-018-0750S		0.41
C0240-018-0810M			20.57	8.13	3.78		0.46		C0240-018-0810S		0.38
C0240-018-0880M			22.35	8.79	3.99		0.42		C0240-018-0880S		0.35
C0240-018-1000M			25.40	9.91	4.37		0.37		C0240-018-1000S		0.31
C0240-018-1250M	6.10		31.75	12.62	5.16		0.30		C0240-018-1250S		0.25
C0240-018-1500M			38.10	14.88	5.92		0.25		C0240-018-1500S		0.20
C0240-018-1750M			44.45	17.35	6.71		0.21		C0240-018-1750S		0.17
C0240-018-2000M			50.80	18.29	7.47		0.18		C0240-018-2000S		0.15
C0240-020-0250M			6.35	3.20	2.31		2.47		C0240-020-0250S		2.06
C0240-020-0310M			7.87	3.84	2.51		1.93		C0240-020-0310S		1.60
C0240-020-0380M			9.65	4.57	2.79		1.52		C0240-020-0380S		1.27
C0240-020-0440M			11.18	5.18	3.00		1.30		C0240-020-0440S		1.08
C0240-020-0500M			12.70	5.82	3.23		1.12		C0240-020-0500S		0.93
C0240-020-0560M			14.22	6.45	3.45		1.00		C0240-020-0560S		0.83
C0240-020-0620M			15.75	7.06	3.68		0.89		C0240-020-0620S		0.74
C0240-020-0690M		0.51	17.53	7.80	3.94	7.78	0.81		C0240-020-0690S	6.48	0.67
C0240-020-0750M			19.05	8.43	4.17		0.74		C0240-020-0750S		0.61
C0240-020-0810M			20.57	8.86	4.37		0.67		C0240-020-0810S		0.55
C0240-020-0880M			22.35	9.65	4.62		0.61		C0240-020-0880S		0.51
C0240-020-1000M			25.40	11.02	5.08		0.54		C0240-020-1000S		0.45
C0240-020-1250M			31.75	13.23	5.99		0.42		C0240-020-1250S		0.35
C0240-020-1500M			38.10	15.88	6.93		0.35		C0240-020-1500S		0.29
C0240-020-1750M			44.45	18.31	7.85		0.30		C0240-020-1750S		0.25
C0240-020-2000M			50.80	21.16	8.79		0.26		C0240-020-2000S		0.22
C0240-022-0250M			6.35	3.23	2.62		3.41		C0240-022-0250S		2.84
C0240-022-0310M			7.87	3.86	2.87		2.64		C0240-022-0310S		2.20
C0240-022-0380M			9.65	4.72	2.92		2.15		C0240-022-0380S		1.79
C0240-022-0440M		0.56	11.18	4.90	3.33	10.63	1.70		C0240-022-0440S	8.85	1.41
C0240-022-0500M			12.70	5.54	3.61		1.49		C0240-022-0500S		1.24
C0240-022-0560M			14.22	6.15	3.91		1.31		C0240-022-0560S		1.09
C0240-022-0620M			15.75	6.78	4.17		1.19		C0240-022-0620S		0.99
C0240-022-0690M			17.53	7.67	4.45		1.09		C0240-022-0690S		0.90

COMPRESSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)	Part Number	P_1 (N)	R (N/mm)
C0240-022-0750M			19.05	8.31	4.78		0.98	C0240-022-0750S		0.82
C0240-022-0810M			20.57	8.94	5.03		0.91	C0240-022-0810S		0.76
C0240-022-1000M			25.40	10.95	5.99		0.74	C0240-022-1000S		0.61
C0240-022-1250M		0.56	31.75	13.36	7.11	10.63	0.58	C0240-022-1250S	8.85	0.48
C0240-022-1500M			38.10	16.41	8.26		0.49	C0240-022-1500S		0.41
C0240-022-1750M			44.45	19.15	9.37		0.42	C0240-022-1750S		0.35
C0240-022-2000M			50.80	21.89	10.49		0.37	C0240-022-2000S		0.31
C0240-024-0380M			9.65	5.05	3.61		2.84	C0240-024-0380S		2.37
C0240-024-0440M			11.18	5.77	3.94		2.40	C0240-024-0440S		2.00
C0240-024-0500M			12.70	6.45	4.27		2.08	C0240-024-0500S		1.73
C0240-024-0560M			14.22	7.16	4.57		1.84	C0240-024-0560S		1.53
C0240-024-0620M			15.75	7.85	4.90		1.65	C0240-024-0620S		1.37
C0240-024-0690M			17.53	8.66	5.28		1.47	C0240-024-0690S		1.23
C0240-024-0750M		0.61	19.05	9.35	5.61	12.99	1.33	C0240-024-0750S	10.82	1.11
C0240-024-0810M			20.57	10.06	5.92		1.23	C0240-024-0810S		1.02
C0240-024-0880M			22.35	10.85	6.30		1.12	C0240-024-0880S		0.93
C0240-024-1000M			25.40	12.24	6.96		0.98	C0240-024-1000S		0.82
C0240-024-1250M			31.75	15.14	8.31		0.79	C0240-024-1250S		0.66
C0240-024-1500M			38.10	18.03	9.63		0.65	C0240-024-1500S		0.54
C0240-024-1750M			44.45	21.29	10.97		0.56	C0240-024-1750S		0.47
C0240-024-2000M			50.80	23.34	12.32		0.47	C0240-024-2000S		0.39
C0240-026-0310M			7.87	4.47	3.51		5.03	C0240-026-0310S		4.19
C0240-026-0380M			9.65	5.46	3.63		4.08	C0240-026-0380S		3.40
C0240-026-0440M			11.18	6.27	3.96		3.48	C0240-026-0440S		2.90
C0240-026-0500M			12.70	7.09	4.29		3.05	C0240-026-0500S		2.54
C0240-026-0560M			14.22	7.57	4.78		2.57	C0240-026-0560S		2.14
C0240-026-0620M			15.75	8.05	5.28		2.22	C0240-026-0620S		1.85
C0240-026-0690M			17.53	8.76	5.79		1.94	C0240-026-0690S		1.62
C0240-026-0750M		0.66	19.05	9.25	6.25	17.13	1.75	C0240-026-0750S	14.27	1.46
C0240-026-0810M			20.57	10.06	6.60		1.63	C0240-026-0810S		1.36
C0240-026-0880M			22.35	10.80	7.14		1.47	C0240-026-0880S		1.23
C0240-026-1000M			25.40	12.19	7.95		1.30	C0240-026-1000S		1.08
C0240-026-1250M			31.75	15.16	9.53		1.03	C0240-026-1250S		0.86
C0240-026-1500M			38.10	18.14	11.10		0.86	C0240-026-1500S		0.71
C0240-026-1750M			44.45	20.60	12.67		0.72	C0240-026-1750S		0.60
C0240-026-2000M	6.10		50.80	23.65	14.25		0.63	C0240-026-2000S		0.52
C0240-029-0380M			9.65	5.72	4.70		5.60	C0240-029-0380S		4.66
C0240-029-0440M			11.18	6.53	5.16		4.73	C0240-029-0440S		3.94
C0240-029-0500M			12.70	7.32	5.61		4.08	C0240-029-0500S		3.40
C0240-029-0560M			14.22	8.10	6.10		3.61	C0240-029-0560S		3.01
C0240-029-0620M			15.75	8.89	6.55		3.22	C0240-029-0620S		2.68
C0240-029-0690M			17.53	9.83	7.09		2.85	C0240-029-0690S		2.37
C0240-029-0750M			19.05	10.62	7.57		2.61	C0240-029-0750S		2.17
C0240-029-0810M			20.57	11.40	8.03		2.40	C0240-029-0810S		2.00
C0240-029-0880M		0.74	22.35	12.32	8.56	22.02	2.21	C0240-029-0880S	18.34	1.84
C0240-029-0940M			23.88	13.13	9.02		2.05	C0240-029-0940S		1.71
C0240-029-1000M			25.40	13.92	9.50		1.93	C0240-029-1000S		1.60
C0240-029-1120M			28.45	15.49	10.41		1.70	C0240-029-1120S		1.41
C0240-029-1250M			31.75	17.22	11.43		1.52	C0240-029-1250S		1.27
C0240-029-1380M			35.05	18.92	12.42		1.37	C0240-029-1380S		1.14
C0240-029-1500M			38.10	20.52	13.36		1.26	C0240-029-1500S		1.05
C0240-029-1750M			44.45	23.83	15.29		1.07	C0240-029-1750S		0.89
C0240-029-2000M			50.80	27.13	17.22		0.93	C0240-029-2000S		0.77
C0240-032-0310M			7.87	5.13	4.24		11.17	C0240-032-0310S		9.30
C0240-032-0380M			9.65	6.40	4.67		9.42	C0240-032-0380S		7.85
C0240-032-0440M			11.18	7.16	5.31		7.56	C0240-032-0440S		6.30
C0240-032-0500M			12.70	7.95	5.89		6.44	C0240-032-0500S		5.36
C0240-032-0560M			14.22	8.74	6.48		5.59	C0240-032-0560S		4.66
C0240-032-0620M			15.75	9.50	7.09		4.90	C0240-032-0620S		4.08
C0240-032-0690M			17.53	10.52	7.70		4.38	C0240-032-0690S		3.65
C0240-032-0750M			19.05	11.05	8.51		3.84	C0240-032-0750S		3.20
C0240-032-0810M		0.81	20.57	11.84	9.12	30.65	3.50	C0240-032-0810S	25.53	2.92
C0240-032-0880M			22.35	12.85	9.75		3.22	C0240-032-0880S		2.68
C0240-032-0940M			23.88	13.64	10.34		2.99	C0240-032-0940S		2.49
C0240-032-1000M			25.40	14.40	10.95		2.78	C0240-032-1000S		2.32
C0240-032-1250M			31.75	17.75	13.36		2.19	C0240-032-1250S		1.82
C0240-032-1380M			35.05	19.43	14.55		1.96	C0240-032-1380S		1.63
C0240-032-1500M			38.10	21.11	15.65		1.80	C0240-032-1500S		1.50
C0240-032-1750M			44.45	24.56	17.96		1.54	C0240-032-1750S		1.28
C0240-032-2000M			50.80	27.76	20.24		1.33	C0240-032-2000S		1.11
C0240-035-0310M		0.89	7.87	5.44	5.23	37.10	15.22	C0240-035-0310S	30.90	12.68



COMPRESSION SPRINGS - MUSIC WIRE

Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)
C0240-035-0380M			9.65	6.50	5.97		11.78
C0240-035-0440M			11.18	7.42	6.60		9.88
C0240-035-0500M			12.70	8.33	7.26		8.49
C0240-035-0560M			14.22	9.25	7.90		7.46
C0240-035-0620M			15.75	10.16	8.53		6.64
C0240-035-0690M			17.53	11.23	9.30		5.88
C0240-035-0750M			19.05	12.14	9.93		5.38
C0240-035-0810M			20.57	13.06	10.57		4.94
C0240-035-0880M			22.35	14.12	11.30		4.50
C0240-035-0940M		0.89	23.88	15.04	11.96	37.10	4.20
C0240-035-1000M			25.40	15.95	12.60		3.92
C0240-035-1250M			31.75	19.76	15.27		3.10
C0240-035-1380M			35.05	21.74	16.66		2.78
C0240-035-1500M			38.10	23.57	17.93		2.56
C0240-035-1750M			44.45	27.38	20.60		2.17
C0240-035-2000M			50.80	31.19	23.27		1.89
C0240-035-2250M			57.15	35.00	25.93		1.68
C0240-035-2500M			63.50	38.81	28.60		1.51
C0240-038-0310M			7.87	5.66	5.28		22.26
C0240-038-0380M			9.65	6.88	6.02		17.77
C0240-038-0440M			11.18	7.85	6.73		14.78
C0240-038-0500M			12.70	8.81	7.47		12.66
C0240-038-0560M			14.22	9.78	8.20		11.07
C0240-038-0620M			15.75	10.77	8.89		9.88
C0240-038-0690M			17.53	11.99	9.63		8.88
C0240-038-0750M			19.05	12.95	10.34		8.07
C0240-038-0810M			20.57	13.92	11.07		7.39
C0240-038-0880M		0.97	22.35	14.96	12.04	49.20	6.65
C0240-038-0940M			23.88	15.75	12.98		6.06
C0240-038-1000M			25.40	16.71	13.74		5.66
C0240-038-1120M			28.45	18.67	15.16		5.03
C0240-038-1250M			31.75	20.85	16.59		4.52
C0240-038-1380M			35.05	23.04	18.06		4.10
C0240-038-1500M			38.10	24.99	19.51		3.75
C0240-038-1750M			44.45	28.22	23.16		3.03
C0240-038-2000M	6.10		50.80	32.21	26.21		2.64
C0240-038-2250M			57.15	36.02	29.24		2.33
C0240-038-2500M			63.50	40.08	32.26		2.10
C0240-040-0310M			7.87	5.92	5.59		27.28
C0240-040-0380M			9.65	7.09	6.96		20.91
C0240-040-0440M			11.18	8.10	7.75		17.42
C0240-040-0500M			12.70	9.12	8.53		14.94
C0240-040-0560M			14.22	10.13	9.30		13.08
C0240-040-0620M			15.75	11.15	10.08		11.63
C0240-040-0690M			17.53	12.32	11.00		10.28
C0240-040-0750M			19.05	13.34	11.79		9.37
C0240-040-0810M			20.57	14.35	12.57		8.60
C0240-040-0880M		1.02	22.35	15.52	13.49	53.51	7.84
C0240-040-0940M			23.88	16.54	14.27		7.30
C0240-040-1000M			25.40	17.55	15.04		6.83
C0240-040-1120M			28.45	19.58	16.61		6.04
C0240-040-1250M			31.75	21.77	18.31		5.36
C0240-040-1380M			35.05	23.98	20.02		4.83
C0240-040-1500M			38.10	25.98	21.56		4.41
C0240-040-1750M			44.45	30.20	24.82		3.77
C0240-040-2000M			50.80	34.42	28.09		3.27
C0240-040-2250M			57.15	38.66	35.99		2.89
C0240-040-2500M			63.50	42.88	34.62		2.59
C0240-042-0380M			9.65	7.24	6.91		26.44
C0240-042-0440M			11.18	8.20	7.87		21.54
C0240-042-0500M			12.70	9.27	8.71		18.56
C0240-042-0560M			14.22	10.34	9.47		16.46
C0240-042-0620M			15.75	11.46	10.19		14.88
C0240-042-0690M			17.53	12.65	11.20		13.13
C0240-042-0750M		1.07	19.05	13.39	12.67	64.01	11.21
C0240-042-0810M			20.57	14.45	13.34		10.51
C0240-042-0880M			22.35	15.77	14.12		9.81
C0240-042-0940M			23.88	16.69	15.24		8.93
C0240-042-1000M			25.40	17.75	16.03		8.41
C0240-042-1120M			28.45	19.89	17.75		7.44
C0240-042-1250M			31.75	22.05	19.76		6.57

STAINLESS STEEL / INOX

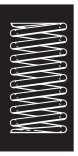
Part Number	P_1 (N)	R (N/mm)
C0240-035-0380S		9.81
C0240-035-0440S		8.23
C0240-035-0500S		7.07
C0240-035-0560S		6.21
C0240-035-0620S		5.53
C0240-035-0690S		4.90
C0240-035-0750S		4.48
C0240-035-0810S		4.12
C0240-035-0880S		3.75
C0240-035-0940S	30.90	3.50
C0240-035-1000S		3.27
C0240-035-1250S		2.58
C0240-035-1380S		2.32
C0240-035-1500S		2.13
C0240-035-1750S		1.81
C0240-035-2000S		1.58
C0240-035-2250S		1.40
C0240-035-2500S		1.25
C0240-038-0310S		18.54
C0240-038-0380S		14.80
C0240-038-0440S		12.31
C0240-038-0500S		10.55
C0240-038-0560S		9.22
C0240-038-0620S		8.23
C0240-038-0690S		7.40
C0240-038-0750S		6.72
C0240-038-0810S		6.16
C0240-038-0880S	40.98	5.54
C0240-038-0940S		5.05
C0240-038-1000S		4.71
C0240-038-1120S		4.19
C0240-038-1250S		3.77
C0240-038-1380S		3.42
C0240-038-1500S		3.12
C0240-038-1750S		2.52
C0240-038-2000S		2.20
C0240-038-2250S		1.94
C0240-038-2500S		1.75
C0240-040-0310S		22.72
C0240-040-0380S		17.42
C0240-040-0440S		14.51
C0240-040-0500S		12.45
C0240-040-0560S		10.90
C0240-040-0620S		9.69
C0240-040-0690S		8.56
C0240-040-0750S		7.81
C0240-040-0810S		7.16
C0240-040-0880S	44.57	6.53
C0240-040-0940S		6.08
C0240-040-1000S		5.69
C0240-040-1120S		5.03
C0240-040-1250S		4.46
C0240-040-1380S		4.02
C0240-040-1500S		3.67
C0240-040-1750S		3.14
C0240-040-2000S		2.72
C0240-040-2250S		2.41
C0240-040-2500S		2.16
C0240-042-0380S		22.02
C0240-042-0440S		17.94
C0240-042-0500S		15.46
C0240-042-0560S		13.71
C0240-042-0620S		12.40
C0240-042-0690S		10.94
C0240-042-0750S	53.32	9.34
C0240-042-0810S		8.75
C0240-042-0880S		8.17
C0240-042-0940S		7.44
C0240-042-1000S		7.01
C0240-042-1120S		6.20
C0240-042-1250S		5.47

COMPRESSION SPRINGS - MUSIC WIRE

Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)
C0240-042-1380M			35.05	24.33	21.51		5.95
C0240-042-1500M			38.10	26.11	23.70		5.34
C0240-042-1750M			44.45	30.66	26.42		4.64
C0240-042-2000M		1.07	50.80	34.90	29.90	64.01	4.03
C0240-042-2250M			57.15	39.24	33.38		3.57
C0240-042-2500M			63.50	43.54	36.88		3.20
C0240-045-0440M			11.18	8.84	8.28		30.63
C0240-045-0500M			12.70	9.96	9.17		26.14
C0240-045-0560M			14.22	11.07	10.06		22.80
C0240-045-0620M	6.10		15.75	12.19	11.07		20.22
C0240-045-0690M			17.53	13.51	12.12		17.86
C0240-045-0750M			19.05	14.63	13.11		16.23
C0240-045-0810M			20.57	15.75	14.00		14.88
C0240-045-0880M		1.14	22.35	17.04	15.09	71.92	13.57
C0240-045-1000M			25.40	19.30	16.94		11.78
C0240-045-1250M			31.75	23.98	20.65		9.25
C0240-045-1500M			38.10	28.65	24.36		7.60
C0240-045-1750M			44.45	33.30	28.07		6.46
C0240-045-2000M			50.80	37.97	31.78		5.60
C0240-045-2250M			57.15	42.65	35.48		4.96
C0240-045-2500M			63.50	47.32	39.19		4.45
D11300			13.50	4.30	3.25		0.73
D11310			20.00	6.00	4.25		0.46
D11320	6.80	0.50	30.00	8.70	5.75	6.57	0.30
D11330			44.00	12.20	7.75		0.21
D11340			65.00	17.40	10.75		0.14
D11500			11.50	4.60	4.10		1.83
D11510			17.00	6.20	5.36		1.17
D11520	6.93	0.63	25.50	8.90	7.25	12.45	0.76
D11530			36.50	12.30	9.77		0.51
D11540			54.00	17.70	13.55		0.34
D11700			10.50	5.60	5.20		4.77
D11710			15.50	7.70	6.80		3.03
D11720	7.10	0.80	23.00	10.90	9.20	24.03	1.96
D11730			33.00	15.10	12.40		1.33
D11740			48.00	21.50	17.20		0.90
D11900			10.00	7.30	5.50		11.57
D11910			14.50	10.10	7.50		7.39
D11920	7.30	1.00	21.50	14.30	10.50	34.13	4.79
D11930			30.50	19.90	14.50		3.26
D11940			43.50	28.30	20.50		2.20
D12100			12.00	7.20	6.88		29.03
D12110			17.00	9.80	9.38		18.04
D12120	7.55	1.25	25.00	13.80	13.13	133.37	11.77
D12130			35.50	19.20	18.13		8.09
D12140			51.50	27.10	25.63		5.39
C0300-022-0380M			9.65	4.19	2.54		1.58
C0300-022-0440M			11.18	4.72	2.69		1.33
C0300-022-0500M			12.70	5.21	2.77		1.16
C0300-022-0560M			14.22	5.97	2.92		1.03
C0300-022-0620M			15.75	6.02	3.20		0.88
C0300-022-0690M			17.53	7.04	3.33		0.82
C0300-022-0750M			19.05	7.06	3.61		0.72
C0300-022-0810M		0.56	20.57	7.67	3.78	8.59	0.67
C0300-022-0880M			22.35	8.86	3.91		0.63
C0300-022-1000M			25.40	10.08	4.45		0.56
C0300-022-1250M			31.75	12.14	5.18		0.44
C0300-022-1500M			38.10	14.76	5.89		0.37
C0300-022-1750M	7.62		44.45	17.22	6.63		0.32
C0300-022-2000M			50.80	18.11	7.34		0.26
C0300-022-2250M			57.15	22.12	7.82		0.25
C0300-022-2500M			63.50	25.78	8.48		0.23
C0300-026-0440M			11.18	5.23	3.30		2.33
C0300-026-0500M			12.70	5.56	3.63		1.94
C0300-026-0560M			14.22	6.50	3.76		1.80
C0300-026-0620M			15.75	6.83	4.11		1.56
C0300-026-0690M		0.66	17.53	7.42	4.47	13.88	1.37
C0300-026-0750M			19.05	8.33	4.62		1.30
C0300-026-0810M			20.57	8.69	4.93		1.17
C0300-026-0880M			22.35	9.27	5.23		1.07
C0300-026-0940M			23.88	9.60	5.64		0.96

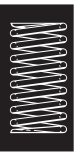
STAINLESS STEEL / INOX

Part Number	P_1 (N)	R (N/mm)
C0240-042-1380S		4.96
C0240-042-1500S		4.45
C0240-042-1750S		3.87
C0240-042-2000S	53.32	3.36
C0240-042-2250S		2.97
C0240-042-2500S		2.67
C0240-045-0440S		25.51
C0240-045-0500S		21.77
C0240-045-0560S		18.99
C0240-045-0620S		16.84
C0240-045-0690S		14.88
C0240-045-0750S		13.52
C0240-045-0810S		12.40
C0240-045-0880S	59.91	11.30
C0240-045-1000S		9.81
C0240-045-1250S		7.71
C0240-045-1500S		6.33
C0240-045-1750S		5.38
C0240-045-2000S		4.66
C0240-045-2250S		4.13
C0240-045-2500S		3.71
D21300		0.61
D21310		0.38
D21320	5.47	0.25
D21330		0.17
D21340		0.12
D21500		1.52
D21510		0.97
D21520	10.37	0.63
D21530		0.42
D21540		0.28
D21700		3.97
D21710		2.52
D21720	20.02	1.63
D21730		1.11
D21740		0.75
D21900		9.64
D21910		6.16
D21920	28.43	3.99
D21930		2.72
D21940		1.83
D22100		24.18
D22110		15.03
D22120	111.10	9.80
D22130		6.74
D22140		4.49
C0300-022-0380S		1.31
C0300-022-0440S		1.11
C0300-022-0500S		0.96
C0300-022-0560S		0.86
C0300-022-0620S		0.73
C0300-022-0690S		0.69
C0300-022-0750S		0.60
C0300-022-0810S	7.16	0.55
C0300-022-0880S		0.52
C0300-022-1000S		0.47
C0300-022-1250S		0.36
C0300-022-1500S		0.31
C0300-022-1750S		0.26
C0300-022-2000S		0.22
C0300-022-2250S		0.20
C0300-022-2500S		0.19
C0300-026-0440S		1.94
C0300-026-0500S		1.62
C0300-026-0560S		1.50
C0300-026-0620S		1.30
C0300-026-0690S	11.56	1.14
C0300-026-0750S		1.08
C0300-026-0810S		0.98
C0300-026-0880S		0.89
C0300-026-0940S		0.80



COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0300-026-1000M			25.40	9.93	5.94		0.89		C0300-026-1000S		0.74
C0300-026-1250M			31.75	13.31	6.91		0.75		C0300-026-1250S		0.63
C0300-026-1500M			38.10	15.47	7.95		0.61		C0300-026-1500S		0.51
C0300-026-1750M		0.66	44.45	18.03	8.99	13.88	0.53		C0300-026-1750S	11.56	0.44
C0300-026-2000M			50.80	20.32	10.01		0.46		C0300-026-2000S		0.38
C0300-026-2250M			57.15	25.45	10.57		0.44		C0300-026-2250S		0.36
C0300-026-2500M			63.50	27.56	11.56		0.39		C0300-026-2500S		0.32
C0300-030-0440M			11.18	5.97	4.37		3.77		C0300-030-0440S		3.14
C0300-030-0500M			12.70	6.65	4.70		3.26		C0300-030-0500S		2.72
C0300-030-0560M			14.22	7.37	5.03		2.87		C0300-030-0560S		2.39
C0300-030-0620M			15.75	8.05	5.38		2.56		C0300-030-0620S		2.13
C0300-030-0690M			17.53	8.89	5.77		2.28		C0300-030-0690S		1.90
C0300-030-0750M			19.05	9.58	6.10		2.08		C0300-030-0750S		1.73
C0300-030-0810M			20.57	10.29	6.43		1.91		C0300-030-0810S		1.59
C0300-030-0880M		0.76	22.35	11.10	6.81	19.66	1.75		C0300-030-0880S	16.38	1.46
C0300-030-0940M			23.88	11.81	7.14		1.63		C0300-030-0940S		1.36
C0300-030-1000M			25.40	12.50	7.47		1.52		C0300-030-1000S		1.27
C0300-030-1250M			31.75	15.42	8.84		1.21		C0300-030-1250S		1.01
C0300-030-1500M			38.10	18.34	10.21		1.00		C0300-030-1500S		0.83
C0300-030-1750M			44.45	21.26	11.61		0.84		C0300-030-1750S		0.70
C0300-030-2000M			50.80	24.18	12.98		0.74		C0300-030-2000S		0.61
C0300-030-2250M			57.15	27.10	14.35		0.65		C0300-030-2250S		0.54
C0300-030-2500M			63.50	30.48	15.72		0.60		C0300-030-2500S		0.50
C0300-032-0440M			11.18	5.97	4.45		4.78		C0300-032-0440S		3.98
C0300-032-0500M			12.70	6.68	4.83		4.13		C0300-032-0500S		3.44
C0300-032-0560M			14.22	7.26	5.28		3.57		C0300-032-0560S		2.97
C0300-032-0620M			15.75	7.92	5.66		3.19		C0300-032-0620S		2.66
C0300-032-0690M			17.53	8.84	6.10		2.85		C0300-032-0690S		2.37
C0300-032-0750M			19.05	9.50	6.48		2.61		C0300-032-0750S		2.17
C0300-032-0810M			20.57	10.16	6.91		2.38		C0300-032-0810S		1.98
C0300-032-0880M		0.81	22.35	11.05	7.29	27.87	2.21		C0300-032-0880S	20.72	1.84
C0300-032-0940M			23.88	11.28	7.90		1.98		C0300-032-0940S		1.65
C0300-032-1000M			25.40	11.94	8.28		1.86		C0300-032-1000S		1.55
C0300-032-1250M			31.75	15.24	9.86		1.51		C0300-032-1250S		1.25
C0300-032-1500M			38.10	18.11	11.43		1.24		C0300-032-1500S		1.04
C0300-032-1750M	7.62		44.45	20.78	12.98		1.05		C0300-032-1750S		0.88
C0300-032-2000M			50.80	24.00	14.55		0.93		C0300-032-2000S		0.77
C0300-032-2250M			57.15	28.27	15.44		0.86		C0300-032-2250S		0.71
C0300-032-2500M			63.50	31.32	16.66		0.77		C0300-032-2500S		0.64
C0300-035-0380M			9.65	5.69	4.90		8.06		C0300-035-0380S		6.71
C0300-035-0440M			11.18	6.45	5.33		6.74		C0300-035-0440S		5.61
C0300-035-0500M			12.70	7.21	5.77		5.81		C0300-035-0500S		4.84
C0300-035-0560M			14.22	7.98	6.20		5.10		C0300-035-0560S		4.25
C0300-035-0620M			15.75	8.74	6.65		4.54		C0300-035-0620S		3.78
C0300-035-0690M			17.53	9.63	7.14		4.03		C0300-035-0690S		3.36
C0300-035-0750M			19.05	10.36	7.57		3.68		C0300-035-0750S		3.07
C0300-035-0810M			20.57	11.13	8.03		3.38		C0300-035-0810S		2.82
C0300-035-0880M			22.35	12.01	8.51		3.08		C0300-035-0880S		2.57
C0300-035-0940M		0.89	23.88	12.78	8.97	31.85	2.87		C0300-035-0940S	26.53	2.39
C0300-035-1000M			25.40	13.54	9.40		2.68		C0300-035-1000S		2.23
C0300-035-1120M			28.45	15.06	10.26		2.38		C0300-035-1120S		1.98
C0300-035-1250M			31.75	16.69	11.20		2.12		C0300-035-1250S		1.77
C0300-035-1380M			35.05	18.34	12.14		1.91		C0300-035-1380S		1.59
C0300-035-1500M			38.10	19.86	13.00		1.75		C0300-035-1500S		1.46
C0300-035-1750M			44.45	23.01	14.81		1.49		C0300-035-1750S		1.24
C0300-035-2000M			50.80	26.16	16.61		1.30		C0300-035-2000S		1.08
C0300-035-2250M			57.15	29.34	18.42		1.14		C0300-035-2250S		0.95
C0300-035-2500M			63.50	32.49	20.22		1.03		C0300-035-2500S		0.86
C0300-038-0380M			9.65	6.10	5.00		11.29		C0300-038-0380S		9.40
C0300-038-0440M			11.18	6.88	5.54		9.37		C0300-038-0440S		7.81
C0300-038-0500M			12.70	7.75	6.02		8.13		C0300-038-0500S		6.77
C0300-038-0560M			14.22	8.31	6.73		6.79		C0300-038-0560S		5.66
C0300-038-0620M			15.75	9.17	7.21		6.11		C0300-038-0620S		5.09
C0300-038-0690M			17.53	9.96	7.95		5.31		C0300-038-0690S		4.42
C0300-038-0750M		0.97	19.05	10.82	8.41	40.21	4.89		C0300-038-0750S	33.49	4.07
C0300-038-0810M			20.57	11.68	8.92		4.52		C0300-038-0810S		3.77
C0300-038-0880M			22.35	12.47	9.63		4.06		C0300-038-0880S		3.38
C0300-038-0940M			23.88	13.34	10.11		3.82		C0300-038-0940S		3.18
C0300-038-1000M			25.40	14.20	10.59		3.59		C0300-038-1000S		2.99
C0300-038-1120M			28.45	15.93	11.58		3.20		C0300-038-1120S		2.67
C0300-038-1250M			31.75	17.91	12.52		2.91		C0300-038-1250S		2.42

COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0300-038-1380M			35.05	19.89	13.51		2.64		C0300-038-1380S		2.20
C0300-038-1500M			38.10	21.64	14.48		2.43		C0300-038-1500S		2.02
C0300-038-1750M		0.97	44.45	23.95	17.27	40.21	1.96		C0300-038-1750S	33.49	1.63
C0300-038-2000M			50.80	27.13	19.43		1.70		C0300-038-2000S		1.41
C0300-038-2250M			57.15	31.65	20.47		1.58		C0300-038-2250S		1.31
C0300-038-2500M			63.50	35.38	22.20		1.44		C0300-038-2500S		1.20
C0300-040-0380M			9.65	6.35	5.87		13.22		C0300-040-0380S		11.01
C0300-040-0440M			11.18	7.19	6.43		11.01		C0300-040-0440S		9.17
C0300-040-0500M			12.70	8.05	6.99		9.44		C0300-040-0500S		7.86
C0300-040-0560M			14.22	8.92	7.54		8.27		C0300-040-0560S		6.89
C0300-040-0620M			15.75	9.78	8.13		7.34		C0300-040-0620S		6.11
C0300-040-0690M			17.53	10.80	8.79		6.50		C0300-040-0690S		5.41
C0300-040-0750M			19.05	11.66	9.35		5.92		C0300-040-0750S		4.93
C0300-040-0810M			20.57	12.52	9.91		5.43		C0300-040-0810S		4.52
C0300-040-0880M			22.35	13.51	10.57		4.96		C0300-040-0880S		4.13
C0300-040-0940M		1.02	23.88	14.38	11.13	43.81	4.61		C0300-040-0940S	36.49	3.84
C0300-040-1000M			25.40	15.24	11.68		4.31		C0300-040-1000S		3.59
C0300-040-1120M			28.45	16.97	12.83		3.82		C0300-040-1120S		3.18
C0300-040-1250M			31.75	18.82	14.05		3.40		C0300-040-1250S		2.83
C0300-040-1380M			35.05	20.70	15.27		3.05		C0300-040-1380S		2.54
C0300-040-1500M			38.10	22.40	16.38		2.80		C0300-040-1500S		2.33
C0300-040-1750M			44.45	26.01	18.72		2.38		C0300-040-1750S		1.98
C0300-040-2000M			50.80	29.59	21.08		2.07		C0300-040-2000S		1.72
C0300-040-2250M			57.15	33.17	23.42		1.82		C0300-040-2250S		1.52
C0300-040-2500M			63.50	36.78	25.78		1.65		C0300-040-2500S		1.37
C0300-042-0380M			9.65	6.88	5.33		18.96		C0300-042-0380S		15.79
C0300-042-0440M			11.18	7.87	5.84		15.90		C0300-042-0440S		13.24
C0300-042-0500M			12.70	8.46	6.76		12.38		C0300-042-0500S		10.31
C0300-042-0560M			14.22	9.25	7.47		10.54		C0300-042-0560S		8.78
C0300-042-0620M			15.75	9.93	8.26		9.04		C0300-042-0620S		7.53
C0300-042-0690M			17.53	10.87	9.07		7.90		C0300-042-0690S		6.58
C0300-042-0750M			19.05	11.86	9.60		7.30		C0300-042-0750S		6.08
C0300-042-0810M			20.57	12.55	10.39		6.55		C0300-042-0810S		5.46
C0300-042-0880M			22.35	13.49	11.23		5.92		C0300-042-0880S		4.93
C0300-042-0940M		1.07	23.88	14.48	11.73	52.53	5.59		C0300-042-0940S	43.76	4.66
C0300-042-1000M	7.62		25.40	15.44	12.29		5.27		C0300-042-1000S		4.39
C0300-042-1120M			28.45	17.37	13.36		4.75		C0300-042-1120S		3.96
C0300-042-1250M			31.75	19.30	14.68		4.22		C0300-042-1250S		3.52
C0300-042-1380M			35.05	21.21	16.00		3.80		C0300-042-1380S		3.17
C0300-042-1500M			38.10	22.89	17.37		3.45		C0300-042-1500S		2.87
C0300-042-1750M			44.45	26.16	20.17		2.87		C0300-042-1750S		2.39
C0300-042-2000M			50.80	29.67	22.71		2.49		C0300-042-2000S		2.07
C0300-042-2250M			57.15	33.35	25.27		2.21		C0300-042-2250S		1.84
C0300-042-2500M			63.50	38.15	26.67		2.07		C0300-042-2500S		1.72
C0300-045-0380M			9.65	6.71	6.27		21.63		C0300-045-0380S		18.02
C0300-045-0440M			11.18	7.75	6.83		18.58		C0300-045-0440S		15.48
C0300-045-0500M			12.70	8.79	7.42		16.21		C0300-045-0500S		13.50
C0300-045-0560M			14.22	9.60	8.26		13.71		C0300-045-0560S		11.42
C0300-045-0620M			15.75	10.39	9.12		11.84		C0300-045-0620S		9.86
C0300-045-0690M			17.53	11.68	9.68		10.86		C0300-045-0690S		9.05
C0300-045-0750M			19.05	12.47	10.54		9.63		C0300-045-0750S		8.02
C0300-045-0810M			20.57	13.51	11.10		8.98		C0300-045-0810S		7.48
C0300-045-0880M			22.35	14.55	11.99		8.13		C0300-045-0880S		6.77
C0300-045-0940M		1.14	23.88	15.34	12.85	63.43	7.42		C0300-045-0940S	52.84	6.18
C0300-045-1000M			25.40	16.38	13.39		7.04		C0300-045-1000S		5.86
C0300-045-1120M			28.45	18.44	14.55		6.34		C0300-045-1120S		5.28
C0300-045-1250M			31.75	20.55	15.98		5.66		C0300-045-1250S		4.71
C0300-045-1380M			35.05	22.61	17.42		5.10		C0300-045-1380S		4.25
C0300-045-1500M			38.10	24.43	18.85		4.64		C0300-045-1500S		3.87
C0300-045-1750M			44.45	27.61	22.30		3.77		C0300-045-1750S		3.14
C0300-045-2000M			50.80	31.42	25.15		3.27		C0300-045-2000S		2.72
C0300-045-2250M			57.15	35.33	27.99		2.91		C0300-045-2250S		2.42
C0300-045-2500M			63.50	40.16	29.72		2.73		C0300-045-2500S		2.27
C0300-047-0380M			9.65	7.09	6.35		27.84		C0300-047-0380S		23.19
C0300-047-0440M			11.18	8.05	7.09		23.01		C0300-047-0440S		19.17
C0300-047-0500M			12.70	9.04	7.90		19.61		C0300-047-0500S		16.34
C0300-047-0560M			14.22	10.03	8.71		17.09		C0300-047-0560S		14.24
C0300-047-0620M		1.19	15.75	11.02	9.50	71.61	15.15		C0300-047-0620S	59.65	12.62
C0300-047-0690M			17.53	12.17	10.36		13.36		C0300-047-0690S		11.13
C0300-047-0750M			19.05	13.16	11.05		12.13		C0300-047-0750S		10.10
C0300-047-0810M			20.57	14.12	11.71		11.12		C0300-047-0810S		9.26



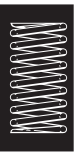
COMPRESSION SPRINGS - MUSIC WIRE

Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)
C0300-047-0880M			22.35	15.29	12.52		10.14
C0300-047-0940M			23.88	16.26	13.21		9.42
C0300-047-1000M			25.40	17.25	13.89		8.79
C0300-047-1120M			28.45	19.23	15.24		7.76
C0300-047-1250M			31.75	21.36	16.71		6.88
C0300-047-1380M			35.05	23.50	18.21		6.20
C0300-047-1500M		1.19	38.10	25.45	19.56	71.61	5.66
C0300-047-1750M			44.45	29.57	22.40		4.82
C0300-047-2000M			50.80	33.66	25.25		4.19
C0300-047-2250M			57.15	37.77	28.09		3.70
C0300-047-2500M			63.50	41.86	30.94		3.31
C0300-047-2750M			69.85	45.97	33.78		2.99
C0300-047-3000M			76.20	50.06	36.63		2.75
C0300-049-0380M			9.65	7.24	6.68		33.18
C0300-049-0440M			11.18	8.26	7.47		27.37
C0300-049-0500M			12.70	9.27	8.33		23.29
C0300-049-0560M			14.22	10.29	9.19		20.26
C0300-049-0620M			15.75	11.28	10.03		17.93
C0300-049-0690M			17.53	12.47	10.95		15.81
C0300-049-0750M			19.05	13.49	11.68		14.36
C0300-049-0810M			20.57	14.48	12.42		13.15
C0300-049-0880M			22.35	15.67	13.28		11.98
C0300-049-0940M			23.88	16.69	14.00		11.12
C0300-049-1000M		1.24	25.40	17.70	14.73	79.98	10.38
C0300-049-1120M			28.45	19.71	16.21		9.16
C0300-049-1250M			31.75	21.89	17.78		8.13
C0300-049-1380M			35.05	24.10	19.38		7.30
C0300-049-1500M	7.62		38.10	26.11	20.85		6.67
C0300-049-1750M			44.45	30.33	23.90		5.67
C0300-049-2000M			50.80	34.54	26.95		4.92
C0300-049-2250M			57.15	38.76	30.00		4.34
C0300-049-2500M			63.50	42.98	33.05		3.91
C0300-049-2750M			69.85	47.19	36.09		3.54
C0300-049-3000M			76.20	51.41	39.14		3.22
C0300-051-0380M			9.65	7.39	6.96		39.68
C0300-051-0440M			11.18	8.43	7.82		32.64
C0300-051-0500M			12.70	9.47	8.71		27.72
C0300-051-0560M			14.22	10.49	9.63		24.08
C0300-051-0620M			15.75	11.53	10.54		21.29
C0300-051-0690M			17.53	12.75	11.51		18.75
C0300-051-0750M			19.05	13.77	12.27		17.02
C0300-051-0810M			20.57	14.81	13.06		15.58
C0300-051-0880M			22.35	16.03	13.97		14.18
C0300-051-0940M			23.88	17.07	14.73		13.17
C0300-051-1000M		1.30	25.40	18.08	15.52	89.72	12.28
C0300-051-1120M			28.45	20.17	17.07		10.84
C0300-051-1250M			31.75	22.40	18.75		9.61
C0300-051-1380M			35.05	24.66	20.45		8.63
C0300-051-1500M			38.10	26.72	22.00		7.90
C0300-051-1750M			44.45	31.04	25.22		6.69
C0300-051-2000M			50.80	35.36	28.47		5.81
C0300-051-2250M			57.15	39.67	31.70		5.13
C0300-051-2500M			63.50	43.99	34.95		4.61
C0300-051-2750M			69.85	48.31	38.18		4.17
C0300-051-3000M			76.20	52.63	41.43		3.80
D11550			16.00	5.10	4.10		0.89
D11560			24.50	7.10	5.36		0.57
D11570	8.63	0.63	37.00	10.20	7.25	10.00	0.37
D11580			55.00	14.30	9.77		0.25
D11590			80.50	20.60	13.55		0.17
D11750			14.50	6.10	5.20		2.32
D11760			21.50	8.40	6.80		1.48
D11770	8.80	0.80	32.00	12.00	9.20	19.52	0.96
D11780			47.00	16.70	12.40		0.65
D11790			68.00	23.80	17.20		0.44
D11950			13.00	7.30	5.50		5.68
D11960			19.00	10.10	7.50		3.61
D11970	9.00	1.00	28.50	14.30	10.50	33.15	2.33
D11980			40.50	19.90	14.50		1.59
D11990			59.00	28.30	20.50		1.08
C0360-026-0500M	9.14	0.66	12.70	5.46	2.97	11.65	1.61

STAINLESS STEEL / INOX

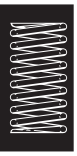
Part Number	P_1 (N)	R (N/mm)
C0300-047-0880S		8.45
C0300-047-0940S		7.85
C0300-047-1000S		7.32
C0300-047-1120S		6.46
C0300-047-1250S		5.73
C0300-047-1380S		5.16
C0300-047-1500S	59.65	4.71
C0300-047-1750S		4.02
C0300-047-2000S		3.49
C0300-047-2250S		3.08
C0300-047-2500S		2.76
C0300-047-2750S		2.49
C0300-047-3000S		2.29
C0300-049-0380S		27.64
C0300-049-0440S		22.80
C0300-049-0500S		19.40
C0300-049-0560S		16.88
C0300-049-0620S		14.94
C0300-049-0690S		13.17
C0300-049-0750S		11.96
C0300-049-0810S		10.95
C0300-049-0880S		9.98
C0300-049-0940S		9.26
C0300-049-1000S	66.62	8.65
C0300-049-1120S		7.63
C0300-049-1250S		6.77
C0300-049-1380S		6.08
C0300-049-1500S		5.56
C0300-049-1750S		4.72
C0300-049-2000S		4.10
C0300-049-2250S		3.62
C0300-049-2500S		3.26
C0300-049-2750S		2.95
C0300-049-3000S		2.68
C0300-051-0380S		33.05
C0300-051-0440S		27.19
C0300-051-0500S		23.09
C0300-051-0560S		20.06
C0300-051-0620S		17.73
C0300-051-0690S		15.62
C0300-051-0750S		14.18
C0300-051-0810S		12.98
C0300-051-0880S		11.81
C0300-051-0940S		10.97
C0300-051-1000S	74.74	10.23
C0300-051-1120S		9.03
C0300-051-1250S		8.01
C0300-051-1380S		7.19
C0300-051-1500S		6.58
C0300-051-1750S		5.57
C0300-051-2000S		4.84
C0300-051-2250S		4.27
C0300-051-2500S		3.84
C0300-051-2750S		3.47
C0300-051-3000S		3.17
D21550		0.74
D21560		0.47
D21570	8.33	0.31
D21580		0.21
D21590		0.14
D21750		1.93
D21760		1.23
D21770	16.26	0.80
D21780		0.54
D21790		0.37
D21950		4.73
D21960		3.01
D21970	27.61	1.94
D21980		1.32
D21990		0.90
C0360-026-0500S	9.70	1.34

COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0360-026-0560M			14.22	6.07	3.12		1.44		C0360-026-0560S		1.20
C0360-026-0620M			15.75	6.71	3.28		1.30		C0360-026-0620S		1.08
C0360-026-0690M			17.53	7.57	3.45		1.17		C0360-026-0690S		0.98
C0360-026-0750M			19.05	8.20	3.63		1.07		C0360-026-0750S		0.89
C0360-026-0810M			20.57	8.81	3.76		1.00		C0360-026-0810S		0.83
C0360-026-0880M			22.35	8.79	4.11		0.86		C0360-026-0880S		0.71
C0360-026-0940M		0.66	23.88	9.40	4.29	11.65	0.81		C0360-026-0940S	9.70	0.67
C0360-026-1000M			25.40	9.12	4.60		0.72		C0360-026-1000S		0.60
C0360-026-1120M			28.45	11.25	4.75		0.68		C0360-026-1120S		0.57
C0360-026-1250M			31.75	12.17	5.41		0.60		C0360-026-1250S		0.50
C0360-026-1500M			38.10	14.33	6.15		0.49		C0360-026-1500S		0.41
C0360-026-1750M			44.45	16.56	6.86		0.42		C0360-026-1750S		0.35
C0360-026-2000M			50.80	21.18	7.57		0.37		C0360-026-2000S		0.31
C0360-029-0500M			12.70	6.05	3.81		2.26		C0360-029-0500S		1.88
C0360-029-0560M			14.22	6.68	4.04		2.00		C0360-029-0560S		1.66
C0360-029-0620M			15.75	7.29	4.24		1.79		C0360-029-0620S		1.49
C0360-029-0690M			17.53	8.03	4.50		1.58		C0360-029-0690S		1.31
C0360-029-0750M			19.05	8.66	4.72		1.44		C0360-029-0750S		1.20
C0360-029-0810M			20.57	9.27	4.93		1.33		C0360-029-0810S		1.11
C0360-029-0880M		0.74	22.35	10.01	5.18	15.03	1.21		C0360-029-0880S	12.52	1.01
C0360-029-0940M			23.88	10.62	5.41		1.14		C0360-029-0940S		0.95
C0360-029-1000M			25.40	11.25	5.61		1.07		C0360-029-1000S		0.89
C0360-029-1120M			28.45	12.50	6.05		0.95		C0360-029-1120S		0.79
C0360-029-1250M			31.75	13.84	6.53		0.84		C0360-029-1250S		0.70
C0360-029-1380M			35.05	15.19	6.99		0.75		C0360-029-1380S		0.63
C0360-029-1500M			38.10	16.43	7.42		0.70		C0360-029-1500S		0.58
C0360-029-1750M			44.45	19.02	8.33		0.60		C0360-029-1750S		0.50
C0360-029-2000M			50.80	21.18	9.25		0.51		C0360-029-2000S		0.42
C0360-032-0380M			9.65	4.83	3.84		4.34		C0360-032-0380S		3.62
C0360-032-0440M			11.18	5.44	4.11		3.64		C0360-032-0440S		3.03
C0360-032-0500M			12.70	6.02	4.04		3.13		C0360-032-0500S		2.61
C0360-032-0560M			14.22	6.86	4.24		2.85		C0360-032-0560S		2.37
C0360-032-0620M			15.75	7.72	4.45		2.61		C0360-032-0620S		2.17
C0360-032-0690M			17.53	8.15	4.85		2.24		C0360-032-0690S		1.87
C0360-032-0750M			19.05	9.02	5.05		2.08		C0360-032-0750S		1.73
C0360-032-0810M	9.14		20.57	9.86	5.26		1.96		C0360-032-0810S		1.63
C0360-032-0880M			22.35	10.31	5.69		1.73		C0360-032-0880S		1.44
C0360-032-0940M		0.81	23.88	11.15	5.87	21.00	1.65		C0360-032-0940S	17.49	1.37
C0360-032-1000M			25.40	11.35	6.27		1.49		C0360-032-1000S		1.24
C0360-032-1120M			28.45	12.40	6.86		1.31		C0360-032-1120S		1.09
C0360-032-1250M			31.75	13.59	7.70		1.16		C0360-032-1250S		0.96
C0360-032-1380M			35.05	14.99	8.05		1.05		C0360-032-1380S		0.88
C0360-032-1500M			38.10	16.03	8.74		0.95		C0360-032-1500S		0.79
C0360-032-1750M			44.45	18.39	9.93		0.81		C0360-032-1750S		0.67
C0360-032-2000M			50.80	20.83	11.02		0.70		C0360-032-2000S		0.58
C0360-032-2250M			57.15	25.53	11.79		0.67		C0360-032-2250S		0.55
C0360-032-2500M			63.50	28.27	12.65		0.60		C0360-032-2500S		0.50
C0360-035-0440M		0.89	11.18	6.05	4.62	25.49	4.97		C0360-035-0440S	21.23	4.14
C0360-035-0500M			12.70	6.73	4.95		4.27		C0360-035-0500S		3.56
C0360-035-0560M			14.22	7.44	5.28		3.75		C0360-035-0560S		3.12
C0360-035-0620M			15.75	8.13	5.59		3.34		C0360-035-0620S		2.78
C0360-035-0690M			17.53	8.94	5.97		2.96		C0360-035-0690S		2.47
C0360-035-0750M			19.05	9.63	6.27		2.70		C0360-035-0750S		2.25
C0360-035-0810M			20.57	10.31	6.60		2.49		C0360-035-0810S		2.07
C0360-035-0880M			22.35	11.13	6.99		2.28		C0360-035-0880S		1.90
C0360-035-0940M			23.88	11.81	7.29		2.12		C0360-035-0940S		1.77
C0360-035-1000M			25.40	12.52	7.62		1.98		C0360-035-1000S		1.65
C0360-035-1120M			28.45	13.89	8.26		1.75		C0360-035-1120S		1.46
C0360-035-1250M			31.75	15.39	8.94		1.56		C0360-035-1250S		1.30
C0360-035-1380M			35.05	16.89	9.63		1.40		C0360-035-1380S		1.17
C0360-035-1500M			38.10	18.29	10.26		1.28		C0360-035-1500S		1.06
C0360-035-1750M			44.45	21.18	11.61		1.10		C0360-035-1750S		0.92
C0360-035-2000M			50.80	24.05	12.93		0.95		C0360-035-2000S		0.79
C0360-035-2250M			57.15	26.95	14.27		0.84		C0360-035-2250S		0.70
C0360-035-2500M			63.50	29.82	15.60		0.75		C0360-035-2500S		0.63
C0360-038-0440M		0.97	11.18	5.99	4.83	33.94	6.55		C0360-038-0440S	28.27	5.46
C0360-038-0500M			12.70	7.01	5.05		5.97		C0360-038-0500S		4.97
C0360-038-0560M			14.22	7.49	5.54		5.04		C0360-038-0560S		4.20
C0360-038-0620M			15.75	7.98	6.02		4.36		C0360-038-0620S		3.63
C0360-038-0690M			17.53	8.74	6.50		3.87		C0360-038-0690S		3.22
C0360-038-0750M			19.05	9.73	6.76		3.64		C0360-038-0750S		3.03



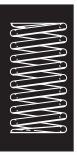
COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0360-038-0810M			20.57	10.24	7.24		3.27		C0360-038-0810S		2.72
C0360-038-0880M			22.35	10.97	7.72		2.98		C0360-038-0880S		2.48
C0360-038-0940M			23.88	11.46	8.20		2.73		C0360-038-0940S		2.27
C0360-038-1000M			25.40	12.47	8.43		2.63		C0360-038-1000S		2.19
C0360-038-1120M			28.45	13.44	9.40		2.26		C0360-038-1120S		1.88
C0360-038-1250M		0.97	31.75	15.19	10.13	33.94	2.05		C0360-038-1250S	28.27	1.71
C0360-038-1380M			35.05	16.43	11.10		1.82		C0360-038-1380S		1.52
C0360-038-1500M			38.10	17.91	11.81		1.68		C0360-038-1500S		1.40
C0360-038-1750M			44.45	21.11	13.36		1.45		C0360-038-1750S		1.21
C0360-038-2000M			50.80	23.88	14.91		1.26		C0360-038-2000S		1.05
C0360-038-2250M			57.15	26.87	16.48		1.12		C0360-038-2250S		0.93
C0360-038-2500M			63.50	29.49	18.06		1.00		C0360-038-2500S		0.83
C0360-040-0440M			11.18	6.58	5.54		8.06		C0360-040-0440S		6.71
C0360-040-0500M			12.70	7.34	5.94		6.90		C0360-040-0500S		5.75
C0360-040-0560M			14.22	8.10	6.35		6.04		C0360-040-0560S		5.03
C0360-040-0620M			15.75	8.86	6.78		5.38		C0360-040-0620S		4.48
C0360-040-0690M			17.53	9.73	7.26		4.75		C0360-040-0690S		3.96
C0360-040-0750M			19.05	10.49	7.67		4.33		C0360-040-0750S		3.61
C0360-040-0810M			20.57	11.25	8.08		3.98		C0360-040-0810S		3.32
C0360-040-0880M			22.35	12.14	8.56		3.63		C0360-040-0880S		3.02
C0360-040-0940M		1.02	23.88	12.90	8.97	37.01	3.36		C0360-040-0940S	30.83	2.80
C0360-040-1000M			25.40	13.64	9.40		3.15		C0360-040-1000S		2.62
C0360-040-1120M			28.45	15.16	10.21		2.78		C0360-040-1120S		2.32
C0360-040-1250M			31.75	16.81	11.13		2.47		C0360-040-1250S		2.06
C0360-040-1380M			35.05	18.44	12.01		2.22		C0360-040-1380S		1.85
C0360-040-1500M			38.10	19.96	12.83		2.05		C0360-040-1500S		1.71
C0360-040-1750M			44.45	23.11	14.55		1.73		C0360-040-1750S		1.44
C0360-040-2000M			50.80	26.29	16.28		1.51		C0360-040-2000S		1.25
C0360-040-2250M			57.15	29.44	18.01		1.33		C0360-040-2250S		1.11
C0360-040-2500M			63.50	32.59	19.74		1.19		C0360-040-2500S		0.99
C0360-042-0440M			11.18	6.81	5.31		10.17		C0360-042-0440S		8.47
C0360-042-0500M			12.70	7.44	5.87		8.46		C0360-042-0500S		7.05
C0360-042-0560M			14.22	8.08	6.40		7.23		C0360-042-0560S		6.02
C0360-042-0620M			15.75	9.17	6.65		6.76		C0360-042-0620S		5.63
C0360-042-0690M	9.14		17.53	10.06	7.21		5.95		C0360-042-0690S		4.96
C0360-042-0750M			19.05	10.82	7.65		5.41		C0360-042-0750S		4.51
C0360-042-0810M			20.57	11.35	8.28		4.82		C0360-042-0810S		4.02
C0360-042-0880M			22.35	12.27	8.79		4.42		C0360-042-0880S		3.68
C0360-042-0940M		1.07	23.88	12.90	9.35	44.48	4.04		C0360-042-0940S	37.05	3.37
C0360-042-1000M			25.40	13.56	9.86		3.77		C0360-042-1000S		3.14
C0360-042-1120M			28.45	14.86	10.92		3.27		C0360-042-1120S		2.72
C0360-042-1250M			31.75	16.84	11.76		2.98		C0360-042-1250S		2.48
C0360-042-1380M			35.05	18.82	12.57		2.73		C0360-042-1380S		2.27
C0360-042-1500M			38.10	20.55	13.34		2.54		C0360-042-1500S		2.12
C0360-042-1750M			44.45	22.94	15.77		2.07		C0360-042-1750S		1.72
C0360-042-2000M			50.80	26.14	17.65		1.80		C0360-042-2000S		1.50
C0360-042-2250M			57.15	29.24	19.56		1.59		C0360-042-2250S		1.33
C0360-042-2500M			63.50	32.13	21.44		1.42		C0360-042-2500S		1.18
C0360-045-0440M			11.18	7.29	5.69		13.83		C0360-045-0440S		11.52
C0360-045-0500M			12.70	8.03	6.27		11.50		C0360-045-0500S		9.58
C0360-045-0560M			14.22	8.76	6.86		9.84		C0360-045-0560S		8.20
C0360-045-0620M			15.75	9.50	7.42		8.60		C0360-045-0620S		7.16
C0360-045-0690M			17.53	10.52	7.98		7.67		C0360-045-0690S		6.39
C0360-045-0750M			19.05	11.25	8.56		6.90		C0360-045-0750S		5.75
C0360-045-0810M			20.57	11.99	9.12		6.27		C0360-045-0810S		5.22
C0360-045-0880M			22.35	13.00	9.70		5.74		C0360-045-0880S		4.78
C0360-045-0940M		1.14	23.88	13.74	10.26	53.78	5.31		C0360-045-0940S	44.80	4.42
C0360-045-1000M			25.40	14.48	10.85		4.92		C0360-045-1000S		4.10
C0360-045-1120M			28.45	15.98	11.99		4.31		C0360-045-1120S		3.59
C0360-045-1250M			31.75	17.73	13.11		3.84		C0360-045-1250S		3.20
C0360-045-1380M			35.05	19.46	14.27		3.45		C0360-045-1380S		2.87
C0360-045-1500M			38.10	20.96	15.42		3.13		C0360-045-1500S		2.61
C0360-045-1750M			44.45	24.26	17.63		2.66		C0360-045-1750S		2.22
C0360-045-2000M			50.80	27.53	19.76		2.31		C0360-045-2000S		1.92
C0360-045-2250M			57.15	30.91	21.89		2.05		C0360-045-2250S		1.71
C0360-045-2500M			63.50	34.26	24.03		1.84		C0360-045-2500S		1.53
C0360-045-2750M			69.85	38.91	25.15		1.73		C0360-045-2750S		1.44
C0360-047-0440M			11.18	7.59	6.53		16.21		C0360-047-0440S		13.50
C0360-047-0500M		1.19	12.70	8.51	7.04	57.87	13.82		C0360-047-0500S	48.21	11.51
C0360-047-0560M			14.22	9.42	7.54		12.03		C0360-047-0560S		10.02
C0360-047-0620M			15.75	10.31	8.08		10.66		C0360-047-0620S		8.88

COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0360-047-0690M			17.53	11.38	8.66		9.40		C0360-047-0690S		7.83
C0360-047-0750M			19.05	12.29	9.17		8.55		C0360-047-0750S		7.12
C0360-047-0810M			20.57	13.18	9.68		7.83		C0360-047-0810S		6.52
C0360-047-0880M			22.35	14.25	10.29		7.13		C0360-047-0880S		5.94
C0360-047-0940M			23.88	15.14	10.80		6.64		C0360-047-0940S		5.53
C0360-047-1000M			25.40	16.05	11.30		6.18		C0360-047-1000S		5.15
C0360-047-1120M			28.45	17.86	12.32		5.46		C0360-047-1120S		4.55
C0360-047-1250M			31.75	19.81	13.44		4.85		C0360-047-1250S		4.04
C0360-047-1380M		1.19	35.05	21.79	14.55	57.87	4.36		C0360-047-1380S	48.21	3.63
C0360-047-1500M			38.10	23.60	15.57		3.99		C0360-047-1500S		3.32
C0360-047-1750M			44.45	27.36	17.70		3.38		C0360-047-1750S		2.82
C0360-047-2000M			50.80	31.14	19.84		2.94		C0360-047-2000S		2.45
C0360-047-2250M			57.15	34.90	21.97		2.61		C0360-047-2250S		2.17
C0360-047-2500M			63.50	38.68	24.10		2.33		C0360-047-2500S		1.94
C0360-047-2750M			69.85	42.44	26.24		2.12		C0360-047-2750S		1.77
C0360-047-3000M			76.20	46.20	28.37		1.93		C0360-047-3000S		1.60
C0360-047-3250M			82.55	49.99	30.51		1.77		C0360-047-3250S		1.47
C0360-047-3500M			88.90	53.75	32.61		1.65		C0360-047-3500S		1.37
C0360-049-0440M			11.18	7.77	6.88		19.03		C0360-049-0440S		15.85
C0360-049-0500M			12.70	8.71	7.44		16.20		C0360-049-0500S		13.49
C0360-049-0560M			14.22	9.63	8.00		14.10		C0360-049-0560S		11.75
C0360-049-0620M			15.75	10.57	8.53		12.47		C0360-049-0620S		10.39
C0360-049-0690M			17.53	11.63	9.19		11.00		C0360-049-0690S		9.16
C0360-049-0750M			19.05	12.57	9.75		9.98		C0360-049-0750S		8.31
C0360-049-0810M			20.57	13.51	10.29		9.14		C0360-049-0810S		7.61
C0360-049-0880M			22.35	14.58	10.95		8.34		C0360-049-0880S		6.95
C0360-049-0940M			23.88	15.52	11.51		7.74		C0360-049-0940S		6.45
C0360-049-1000M			25.40	16.43	12.04		7.21		C0360-049-1000S		6.01
C0360-049-1120M		1.24	28.45	18.29	13.16	64.72	6.37		C0360-049-1120S	53.91	5.31
C0360-049-1250M			31.75	20.29	14.35		5.66		C0360-049-1250S		4.71
C0360-049-1380M			35.05	22.33	15.54		5.08		C0360-049-1380S		4.23
C0360-049-1500M			38.10	24.18	16.66		4.64		C0360-049-1500S		3.87
C0360-049-1750M			44.45	28.04	18.97		3.94		C0360-049-1750S		3.28
C0360-049-2000M			50.80	31.90	21.26		3.43		C0360-049-2000S		2.86
C0360-049-2250M	9.14		57.15	35.76	23.57		3.03		C0360-049-2250S		2.52
C0360-049-2500M			63.50	39.65	25.88		2.71		C0360-049-2500S		2.26
C0360-049-2750M			69.85	43.51	28.19		2.45		C0360-049-2750S		2.04
C0360-049-3000M			76.20	47.37	30.48		2.24		C0360-049-3000S		1.87
C0360-049-3250M			82.55	51.23	32.79		2.07		C0360-049-3250S		1.72
C0360-049-3500M			88.90	55.09	35.10		1.91		C0360-049-3500S		1.59
C0360-051-0440M			11.18	7.90	7.26		22.20		C0360-051-0440S		18.49
C0360-051-0500M			12.70	8.84	7.85		18.86		C0360-051-0500S		15.71
C0360-051-0560M			14.22	9.78	8.46		16.39		C0360-051-0560S		13.65
C0360-051-0620M			15.75	10.72	9.04		14.48		C0360-051-0620S		12.06
C0360-051-0690M			17.53	11.84	9.75		12.77		C0360-051-0690S		10.64
C0360-051-0750M			19.05	12.78	10.34		11.57		C0360-051-0750S		9.64
C0360-051-0810M			20.57	13.72	10.95		10.59		C0360-051-0810S		8.82
C0360-051-0880M			22.35	14.81	11.63		9.65		C0360-051-0880S		8.04
C0360-051-0940M			23.88	15.75	12.24		8.95		C0360-051-0940S		7.46
C0360-051-1000M			25.40	16.71	12.83		8.35		C0360-051-1000S		6.96
C0360-051-1120M		1.30	28.45	18.59	14.02	72.68	7.37		C0360-051-1120S	60.54	6.14
C0360-051-1250M			31.75	20.62	15.32		6.53		C0360-051-1250S		5.44
C0360-051-1380M			35.05	22.68	16.61		5.87		C0360-051-1380S		4.89
C0360-051-1500M			38.10	24.56	17.81		5.38		C0360-051-1500S		4.48
C0360-051-1750M			44.45	28.50	20.32		4.55		C0360-051-1750S		3.79
C0360-051-2000M			50.80	32.41	22.81		3.96		C0360-051-2000S		3.30
C0360-051-2250M			57.15	36.35	25.30		3.48		C0360-051-2250S		2.90
C0360-051-2500M			63.50	40.28	27.79		3.13		C0360-051-2500S		2.61
C0360-051-2750M			69.85	44.20	30.28		2.84		C0360-051-2750S		2.37
C0360-051-3000M			76.20	48.13	32.77		2.59		C0360-051-3000S		2.16
C0360-051-3250M			82.55	52.07	35.26		2.38		C0360-051-3250S		1.98
C0360-051-3500M			88.90	55.98	37.74		2.21		C0360-051-3500S		1.84
C0360-055-0440M			11.18	8.26	7.87		30.75		C0360-055-0440S		25.61
C0360-055-0500M			12.70	9.25	8.56		26.02		C0360-055-0500S		21.67
C0360-055-0560M			14.22	10.26	9.22		22.55		C0360-055-0560S		18.78
C0360-055-0620M			15.75	11.25	9.88		19.89		C0360-055-0620S		16.57
C0360-055-0690M		1.40	17.53	12.40	10.67	89.58	17.49		C0360-055-0690S	74.62	14.57
C0360-055-0750M			19.05	13.41	11.35		15.86		C0360-055-0750S		13.21
C0360-055-0810M			20.57	14.40	12.01		14.50		C0360-055-0810S		12.08
C0360-055-0880M			22.35	15.54	12.80		13.19		C0360-055-0880S		10.99
C0360-055-0940M			23.88	16.56	13.46		12.22		C0360-055-0940S		10.18



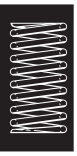
COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0360-055-1000M			25.40	17.55	14.15		11.40		C0360-055-1000S		9.50
C0360-055-1120M			28.45	19.53	15.47		10.05		C0360-055-1120S		8.37
C0360-055-1250M			31.75	21.69	16.94		8.90		C0360-055-1250S		7.41
C0360-055-1380M			35.05	23.85	18.39		7.99		C0360-055-1380S		6.66
C0360-055-1500M			38.10	25.83	19.74		7.30		C0360-055-1500S		6.08
C0360-055-1750M			44.45	29.97	22.53		6.18		C0360-055-1750S		5.15
C0360-055-2000M		1.40	50.80	34.11	25.32	89.58	5.38		C0360-055-2000S	74.62	4.48
C0360-055-2250M			57.15	38.25	28.12		4.75		C0360-055-2250S		3.96
C0360-055-2500M			63.50	42.42	30.91		4.24		C0360-055-2500S		3.53
C0360-055-2750M			69.85	46.56	33.71		3.85		C0360-055-2750S		3.21
C0360-055-3000M			76.20	50.70	36.50		3.52		C0360-055-3000S		2.93
C0360-055-3250M			82.55	54.84	39.29		3.24		C0360-055-3250S		2.70
C0360-055-3500M			88.90	58.98	42.09		2.99		C0360-055-3500S		2.49
C0360-059-0440M			11.18	8.59	8.15		41.67		C0360-059-0440S		34.71
C0360-059-0500M			12.70	9.63	9.04		35.13		C0360-059-0500S		29.26
C0360-059-0560M	9.14		14.22	10.67	9.86		30.36		C0360-059-0560S		25.29
C0360-059-0620M			15.75	11.71	10.69		26.74		C0360-059-0620S		22.27
C0360-059-0690M			17.53	12.90	11.63		23.46		C0360-059-0690S		19.54
C0360-059-0750M			19.05	13.94	12.40		21.24		C0360-059-0750S		17.69
C0360-059-0810M			20.57	14.99	13.13		19.40		C0360-059-0810S		16.16
C0360-059-0880M			22.35	16.21	14.02		17.62		C0360-059-0880S		14.68
C0360-059-0940M			23.88	17.25	14.76		16.32		C0360-059-0940S		13.59
C0360-059-1000M			25.40	18.29	15.52		15.22		C0360-059-1000S		12.68
C0360-059-1120M		1.50	28.45	20.37	17.02	108.22	13.40		C0360-059-1120S	90.15	11.16
C0360-059-1250M			31.75	22.63	18.64		11.85		C0360-059-1250S		9.87
C0360-059-1380M			35.05	24.87	20.24		10.63		C0360-059-1380S		8.85
C0360-059-1500M			38.10	26.95	21.74		9.72		C0360-059-1500S		8.10
C0360-059-1750M			44.45	31.29	24.87		8.23		C0360-059-1750S		6.86
C0360-059-2000M			50.80	35.64	27.99		7.13		C0360-059-2000S		5.94
C0360-059-2250M			57.15	39.95	31.12		6.30		C0360-059-2250S		5.25
C0360-059-2500M			63.50	44.30	34.24		5.64		C0360-059-2500S		4.70
C0360-059-2750M			69.85	48.64	37.36		5.10		C0360-059-2750S		4.25
C0360-059-3000M			76.20	52.96	40.49		4.66		C0360-059-3000S		3.88
C0360-059-3250M			82.55	57.30	43.61		4.29		C0360-059-3250S		3.57
C0360-059-3500M			88.90	61.65	46.74		3.98		C0360-059-3500S		3.32
D12150			15.00	7.40	6.88		14.32		D22150		11.93
D12160			22.00	10.50	9.38		8.92		D22160		7.43
D12170	9.25	1.25	33.00	14.90	13.13	104.93	5.83		D22170	87.41	4.86
D12180			47.50	21.00	18.13		3.96		D22180		3.30
D12190			69.00	30.00	25.63		2.69		D22190		2.24
D12350			14.50	9.00	8.80		37.27		D22350		31.05
D12360			21.50	12.60	12.00		23.73		D22360		19.77
D12370	9.60	1.60	31.50	17.90	16.80	211.82	15.40		D22370	176.45	12.83
D12380			45.00	24.80	23.20		10.40		D22380		8.66
D12390			65.50	35.20	32.80		7.05		D22390		5.87
C0390-043-0500M			12.70	7.39	6.12		7.93		C0390-043-0500S		6.61
C0390-043-0560M			14.22	8.15	6.53		6.93		C0390-043-0560S		5.77
C0390-043-0620M			15.75	8.92	6.93		6.15		C0390-043-0620S		5.12
C0390-043-0690M			17.53	9.80	7.42		5.43		C0390-043-0690S		4.52
C0390-043-0750M			19.05	10.54	7.82		4.94		C0390-043-0750S		4.12
C0390-043-0810M			20.57	11.30	8.23		4.54		C0390-043-0810S		3.78
C0390-043-0880M			22.35	12.19	8.71		4.13		C0390-043-0880S		3.44
C0390-043-0940M		1.09	23.88	13.03	9.12	42.04	3.87		C0390-043-0940S	35.02	3.22
C0390-043-1000M			25.40	13.69	9.55		3.59		C0390-043-1000S		2.99
C0390-043-1120M			28.45	15.21	10.36		3.17		C0390-043-1120S		2.64
C0390-043-1250M			31.75	16.87	11.25		2.82		C0390-043-1250S		2.35
C0390-043-1380M			35.05	18.49	12.14		2.54		C0390-043-1380S		2.12
C0390-043-1500M	9.91		38.10	20.02	12.95		2.33		C0390-043-1500S		1.94
C0390-043-1750M			44.45	23.16	14.68		1.98		C0390-043-1750S		1.65
C0390-043-2000M			50.80	26.31	16.38		1.72		C0390-043-2000S		1.43
C0390-047-0500M			12.70	7.85	6.86		11.08		C0390-047-0500S		9.23
C0390-047-0560M			14.22	8.66	7.34		9.67		C0390-047-0560S		8.06
C0390-047-0620M			15.75	9.45	7.82		8.56		C0390-047-0620S		7.13
C0390-047-0690M			17.53	10.39	8.38		7.55		C0390-047-0690S		6.29
C0390-047-0750M			19.05	11.20	8.89		6.86		C0390-047-0750S		5.71
C0390-047-0810M		1.19	20.57	12.01	9.37	53.82	6.29		C0390-047-0810S	44.83	5.24
C0390-047-0880M			22.35	12.95	9.93		5.73		C0390-047-0880S		4.77
C0390-047-0940M			23.88	13.77	10.41		5.32		C0390-047-0940S		4.43
C0390-047-1000M			25.40	14.58	10.90		4.97		C0390-047-1000S		4.14
C0390-047-1120M			28.45	16.18	11.86		4.40		C0390-047-1120S		3.67
C0390-047-1250M			31.75	17.93	12.90		3.89		C0390-047-1250S		3.24

COMPRESSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)	Part Number	P_1 (N)	R (N/mm)
C0390-047-1380M			35.05	19.69	13.97		3.50	C0390-047-1380S		2.92
C0390-047-1500M	9.91	1.19	38.10	21.29	14.94	53.82	3.20	C0390-047-1500S	44.83	2.67
C0390-047-1750M			44.45	24.66	16.94		2.71	C0390-047-1750S		2.26
C0390-047-2000M			50.80	28.02	18.97		2.36	C0390-047-2000S		1.97
C0420-035-0500M			12.70	6.35	4.37		3.45	C0420-035-0500S		2.87
C0420-035-0620M			15.75	7.62	4.85		2.70	C0420-035-0620S		2.25
C0420-035-0750M			19.05	8.99	5.36		2.19	C0420-035-0750S		1.82
C0420-035-0880M		0.89	22.35	10.36	5.87	22.02	1.84	C0420-035-0880S	18.34	1.53
C0420-035-1000M			25.40	11.63	6.35		1.59	C0420-035-1000S		1.33
C0420-035-1250M			31.75	14.30	7.34		1.26	C0420-035-1250S		1.05
C0420-035-1500M			38.10	16.94	8.33		1.03	C0420-035-1500S		0.86
C0420-035-1750M			44.45	19.58	9.32		0.89	C0420-035-1750S		0.74
C0420-038-0500M			12.70	5.08	4.37		3.85	C0420-038-0500S		3.21
C0420-038-0560M			14.22	5.84	4.72		3.50	C0420-038-0560S		2.92
C0420-038-0625M			15.75	6.43	4.93		3.15	C0420-038-0625S		2.62
C0420-038-0750M			19.05	7.49	5.66		2.54	C0420-038-0750S		2.12
C0420-038-0880M			22.35	8.94	6.25		2.19	C0420-038-0880S		1.82
C0420-038-1000M		0.97	25.40	10.16	6.83	29.36	1.93	C0420-038-1000S	24.46	1.60
C0420-038-1250M			31.75	12.07	8.28		1.49	C0420-038-1250S		1.24
C0420-038-1500M			38.10	14.73	9.45		1.26	C0420-038-1500S		1.05
C0420-038-1750M			44.45	19.05	10.74		1.16	C0420-038-1750S		0.96
C0420-038-2000M			50.80	23.29	11.58		1.07	C0420-038-2000S		0.89
C0420-038-2250M			57.15	26.09	12.55		0.95	C0420-038-2250S		0.79
C0420-038-2500M			63.50	28.85	13.51		0.84	C0420-038-2500S		0.70
C0420-042-0500M			12.70	6.05	4.83		5.95	C0420-042-0500S		4.96
C0420-042-0560M			14.22	6.91	5.11		5.43	C0420-042-0560S		4.52
C0420-042-0625M			15.75	7.67	5.41		4.90	C0420-042-0625S		4.08
C0420-042-0750M			19.05	8.76	6.30		3.85	C0420-042-0750S		3.21
C0420-042-0880M			22.35	10.03	7.11		3.24	C0420-042-0880S		2.70
C0420-042-1000M		1.07	25.40	11.30	7.87	39.59	2.80	C0420-042-1000S	32.98	2.33
C0420-042-1250M			31.75	14.35	9.22		2.28	C0420-042-1250S		1.90
C0420-042-1500M			38.10	16.51	10.90		1.84	C0420-042-1500S		1.53
C0420-042-1750M			44.45	20.14	12.73		1.63	C0420-042-1750S		1.36
C0420-042-2000M			50.80	22.89	14.17		1.42	C0420-042-2000S		1.18
C0420-042-2250M			57.15	27.74	15.04		1.35	C0420-042-2250S		1.12
C0420-042-2500M			63.50	30.71	16.00		1.21	C0420-042-2500S		1.01
C0420-045-0500M			12.70	6.35	5.44		7.35	C0420-045-0500S		6.12
C0420-045-0625M	10.67		15.75	7.90	6.20		5.95	C0420-045-0625S		4.96
C0420-045-0750M			19.05	9.14	7.21		4.73	C0420-045-0750S		3.94
C0420-045-0880M			22.35	10.67	8.08		4.03	C0420-045-0880S		3.36
C0420-045-1000M			25.40	12.07	8.94		3.50	C0420-045-1000S		2.92
C0420-045-1250M		1.14	31.75	15.11	10.62	46.71	2.80	C0420-045-1250S	38.91	2.33
C0420-045-1500M			38.10	17.53	12.52		2.28	C0420-045-1500S		1.90
C0420-045-1750M			44.45	21.84	14.30		2.07	C0420-045-1750S		1.72
C0420-045-2000M			50.80	24.66	15.93		1.79	C0420-045-2000S		1.49
C0420-045-2250M			57.15	27.51	17.55		1.58	C0420-045-2250S		1.31
C0420-045-2500M			63.50	30.58	19.20		1.42	C0420-045-2500S		1.18
C0420-048-0500M			12.70	7.67	6.63		10.61	C0420-048-0500S		8.84
C0420-048-0750M			19.05	10.92	8.48		6.55	C0420-048-0750S		5.46
C0420-048-1000M			25.40	14.17	10.34		4.75	C0420-048-1000S		3.96
C0420-048-1250M		1.22	31.75	17.40	12.19	53.25	3.71	C0420-048-1250S	44.36	3.09
C0420-048-1500M			38.10	20.65	14.02		3.05	C0420-048-1500S		2.54
C0420-048-1750M			44.45	23.90	15.88		2.59	C0420-048-1750S		2.16
C0420-048-2000M			50.80	27.13	17.73		2.26	C0420-048-2000S		1.88
C0420-051-0500M			12.70	8.00	7.16		13.38	C0420-051-0500S		11.15
C0420-051-0620M			15.75	9.63	8.15		10.28	C0420-051-0620S		8.56
C0420-051-0750M			19.05	11.38	9.22		8.21	C0420-051-0750S		6.84
C0420-051-0880M			22.35	13.13	10.31		6.85	C0420-051-0880S		5.71
C0420-051-1000M			25.40	14.78	11.30		5.94	C0420-051-1000S		4.95
C0420-051-1250M		1.30	31.75	18.16	13.36	63.03	4.64	C0420-051-1250S	52.50	3.87
C0420-051-1500M			38.10	21.56	15.42		3.80	C0420-051-1500S		3.17
C0420-051-1750M			44.45	24.94	17.48		3.22	C0420-051-1750S		2.68
C0420-051-2000M			50.80	28.35	19.53		2.80	C0420-051-2000S		2.33
C0420-051-2250M			57.15	31.72	21.59		2.49	C0420-051-2250S		2.07
C0420-051-2500M			63.50	35.13	23.67		2.22	C0420-051-2500S		1.85
C0420-055-0500M			12.70	7.87	6.93		16.64	C0420-055-0500S		13.86
C0420-055-0625M			15.75	9.65	8.03		13.13	C0420-055-0625S		10.94
C0420-055-0750M		1.40	19.05	11.68	9.14	80.07	10.86	C0420-055-0750S	6670	9.05
C0420-055-0880M			22.35	13.56	10.36		9.11	C0420-055-0880S		7.59
C0420-055-1000M			25.40	15.24	11.53		7.88	C0420-055-1000S		6.56
C0420-055-1250M			31.75	18.67	14.05		6.13	C0420-055-1250S		5.11



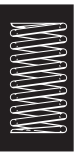
COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0420-055-1500M			38.10	22.35	16.38		5.08		C0420-055-1500S		4.23
C0420-055-1750M			44.45	25.78	19.61		4.29		C0420-055-1750S		3.57
C0420-055-2000M		1.40	50.80	29.34	21.97	80.07	3.73		C0420-055-2000S	66.70	3.11
C0420-055-2250M			57.15	32.77	24.31		3.29		C0420-055-2250S		2.74
C0420-055-2500M			63.50	36.32	26.67		2.94		C0420-055-2500S		2.45
C0420-059-0500M			12.70	8.76	8.18		23.94		C0420-059-0500S		19.94
C0420-059-0625M			15.75	10.52	9.65		18.04		C0420-059-0625S		15.03
C0420-059-0750M			19.05	12.52	11.15		14.46		C0420-059-0750S		12.05
C0420-059-0880M			22.35	14.50	12.60		11.99		C0420-059-0880S		9.99
C0420-059-1000M			25.40	16.31	13.87		10.37		C0420-059-1000S		8.64
C0420-059-1250M		1.50	31.75	20.07	16.54	94.30	8.07		C0420-059-1250S	78.55	6.72
C0420-059-1500M			38.10	23.85	19.18		6.62		C0420-059-1500S		5.51
C0420-059-1750M			44.45	27.61	21.84		5.60		C0420-059-1750S		4.66
C0420-059-2000M			50.80	31.39	24.51		4.85		C0420-059-2000S		4.04
C0420-059-2250M			57.15	35.15	27.15		4.29		C0420-059-2250S		3.57
C0420-059-2500M			63.50	20.96	29.82		3.84		C0420-059-2500S		3.20
C0420-063-0500M			12.70	9.17	8.76		31.89		C0420-063-0500S		26.56
C0420-063-0620M			15.75	11.07	10.57		24.15		C0420-063-0620S		20.12
C0420-063-0750M	10.67		19.05	13.16	12.09		19.12		C0420-063-0750S		15.93
C0420-063-0880M			22.35	15.21	13.61		15.81		C0420-063-0880S		13.17
C0420-063-1000M			25.40	17.15	15.01		13.64		C0420-063-1000S		11.36
C0420-063-1250M		1.60	31.75	21.11	17.93	112.85	10.61		C0420-063-1250S	94.00	8.84
C0420-063-1500M			38.10	25.10	20.85		8.69		C0420-063-1500S		7.24
C0420-063-1750M			44.45	29.08	23.80		7.34		C0420-063-1750S		6.11
C0420-063-2000M			50.80	33.07	26.72		6.36		C0420-063-2000S		5.30
C0420-063-2250M			57.15	37.06	29.64		5.62		C0420-063-2250S		4.68
C0420-063-2500M			63.50	41.05	32.56		5.03		C0420-063-2500S		4.19
C0420-067-0750M			19.05	13.77	12.88		25.27		C0420-067-0750S		21.05
C0420-067-1000M			25.40	17.98	16.03		17.98		C0420-067-1000S		14.98
C0420-067-1250M			31.75	22.17	19.18		13.96		C0420-067-1250S		11.63
C0420-067-1500M		1.70	38.10	26.39	22.33	133.53	11.40		C0420-067-1500S	111.23	9.50
C0420-067-1750M			44.45	30.58	25.48		9.63		C0420-067-1750S		8.02
C0420-067-2000M			50.80	34.80	28.63		8.34		C0420-067-2000S		6.95
C0420-067-2250M			57.15	39.01	31.78		7.35		C0420-067-2250S		6.12
C0420-067-2500M			63.50	43.21	34.93		6.58		C0420-067-2500S		5.48
C0420-072-1000M			25.40	18.75	17.53		24.37		C0420-072-1000S		20.30
C0420-072-1250M			31.75	23.14	21.06		18.86		C0420-072-1250S		15.71
C0420-072-1500M			38.10	27.53	24.56		15.39		C0420-072-1500S		12.82
C0420-072-1750M		1.83	44.45	31.95	28.07	162.49	12.99		C0420-072-1750S	135.35	10.82
C0420-072-2000M			50.80	36.35	31.60		11.24		C0420-072-2000S		9.36
C0420-072-2250M			57.15	40.74	35.10		9.91		C0420-072-2250S		8.26
C0420-072-2500M			63.50	45.16	38.63		8.86		C0420-072-2500S		7.38
D11800			20.00	6.90	5.20		1.20		D21800		1.00
D11810			30.00	9.80	6.80		0.76		D21810		0.63
D11820	10.80	0.80	45.50	14.30	9.20	15.40	0.49		D21820	12.83	0.41
D11830			66.00	19.90	12.40		0.33		D21830		0.27
D11840			96.50	28.50	17.20		0.23		D21840		0.19
D12000			17.50	8.00	5.50		2.90		D22000		2.42
D12010			26.00	11.20	7.50		1.85		D22010		1.54
D12020	11.00	1.00	39.00	16.00	10.50	27.36	1.20		D22020	22.79	1.00
D12030			56.00	22.40	14.50		0.81		D22030		0.67
D12040			81.50	32.00	20.50		0.55		D22040		0.46
D12200			20.00	7.70	6.88		7.09		D22200		5.91
D12210			29.50	10.80	9.38		4.51		D22210		3.76
D12220	11.25	1.25	44.50	15.20	13.13	85.42	2.92		D22220	71.15	2.43
D12230			64.00	21.10	18.13		1.99		D22230		1.66
D12240			93.50	30.00	25.63		1.34		D22240		1.12
D12850			16.20	12.90	12.10		100.03		D22850		83.32
D12860	11.00	2.20	23.00	17.70	16.50	337.35	63.55		D22860	281.01	52.94
D12870			36.50	27.40	25.30		36.87		D22870		30.71
D12880			56.80	41.90	38.50		22.56		D22880		18.79
C0455-039-0500M			12.70	6.53	4.75		4.48		C0455-039-0500S		3.73
C0455-039-0620M			15.75	7.82	5.26		3.48		C0455-039-0620S		2.90
C0455-039-0750M			19.05	9.25	5.82		2.82		C0455-039-0750S		2.35
C0455-039-0880M		0.99	22.35	10.64	6.38	27.62	2.36		C0455-039-0880S	23.01	1.97
C0455-039-1000M	11.56		25.40	11.94	6.88		2.05		C0455-039-1000S		1.71
C0455-039-1250M			31.75	14.63	7.92		1.61		C0455-039-1250S		1.34
C0455-039-1500M			38.10	17.32	8.99		1.33		C0455-039-1500S		1.11
C0455-039-1750M			44.45	20.04	10.06		1.14		C0455-039-1750S		0.95
C0455-046-0500M		1.17	12.70	7.21	5.92	43.86	7.99		C0455-046-0500S	36.54	6.66
C0455-046-0620M			15.75	8.64	6.63		6.18		C0455-046-0620S		5.15

COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0455-046-0750M			19.05	10.19	7.39		4.96		C0455-046-0750S		4.13
C0455-046-0880M			22.35	11.76	8.15		4.13		C0455-046-0880S		3.44
C0455-046-1000M	11.56	1.17	25.40	13.18	8.86	43.86	3.59		C0455-046-1000S	36.54	2.99
C0455-046-1250M			31.75	16.18	10.34		2.82		C0455-046-1250S		2.35
C0455-046-1500M			38.10	19.15	11.81		2.31		C0455-046-1500S		1.92
C0455-046-1750M			44.45	22.15	13.28		1.96		C0455-046-1750S		1.63
D12400			18.50	9.40	8.80		19.12		D22400		15.93
D12410			27.00	13.20	12.00		12.16		D22410		10.13
D12420	11.60	1.60	40.50	18.90	16.80	169.66	7.87		D22420	141.33	6.56
D12430			58.50	26.50	23.20		5.33		D22430		4.44
D12440			85.00	37.90	32.80		3.61		D22440		3.01
D12600			18.00	11.20	11.00		46.58		D22600		38.80
D12610			26.50	15.60	15.00		29.71		D22610		24.75
D12620	12.00	2.00	38.50	22.00	21.00	317.74	19.22		D22620	264.68	16.01
D12630			55.00	30.60	29.00		13.04		D22630		10.86
D12640			79.50	43.40	41.00		8.81		D22640		7.34
C0480-035-0500M			12.70	5.08	4.06		2.75		C0480-035-0500S		2.29
C0480-035-0620M			15.75	6.02	4.45		2.14		C0480-035-0620S		1.78
C0480-035-0750M			19.05	7.01	4.88		1.73		C0480-035-0750S		1.44
C0480-035-0880M			22.35	8.00	5.28		1.45		C0480-035-0880S		1.21
C0480-035-1000M			25.40	8.94	5.66		1.26		C0480-035-1000S		1.05
C0480-035-1250M		0.89	31.75	10.85	6.48	20.86	1.00		C0480-035-1250S	17.38	0.83
C0480-035-1500M			38.10	12.78	7.29		0.82		C0480-035-1500S		0.69
C0480-035-1750M			44.45	14.71	8.10		0.70		C0480-035-1750S		0.58
C0480-035-2000M			50.80	16.64	8.92		0.61		C0480-035-2000S		0.51
C0480-035-2500M			63.50	20.96	10.52		0.49		C0480-035-2500S		0.41
C0480-035-3000M			76.20	24.33	12.14		0.40		C0480-035-3000S		0.34
C0480-038-0500M			12.70	5.08	3.66		3.50		C0480-038-0500S		2.92
C0480-038-0625M			15.75	5.59	4.24		2.63		C0480-038-0625S		2.19
C0480-038-0750M			19.05	6.86	4.70		2.19		C0480-038-0750S		1.82
C0480-038-0880M			22.35	7.75	5.26		1.84		C0480-038-0880S		1.53
C0480-038-1000M			25.40	9.40	5.59		1.66		C0480-038-1000S		1.39
C0480-038-1250M			31.75	11.43	6.58		1.31		C0480-038-1250S		1.09
C0480-038-1500M		0.97	38.10	12.70	7.75	26.69	1.05		C0480-038-1500S	22.23	0.88
C0480-038-1750M			44.45	16.76	8.94		0.96		C0480-038-1750S		0.80
C0480-038-2000M			50.80	19.20	9.86		0.84		C0480-038-2000S		0.70
C0480-038-2250M			57.15	24.46	10.08		0.82		C0480-038-2250S		0.69
C0480-038-2500M			63.50	27.05	10.90		0.74		C0480-038-2500S		0.61
C0480-038-2750M			69.85	29.67	11.73		0.67		C0480-038-2750S		0.55
C0480-038-3000M			76.20	32.26	12.55		0.61		C0480-038-3000S		0.51
C0480-042-0500M			12.70	5.59	4.24		4.90		C0480-042-0500S		4.08
C0480-042-0625M			15.75	6.32	4.93		3.68		C0480-042-0625S		3.07
C0480-042-0750M			19.05	8.00	5.41		3.15		C0480-042-0750S		2.62
C0480-042-0880M	12.19		22.35	9.02	6.07		2.63		C0480-042-0880S		2.19
C0480-042-1000M			25.40	10.16	6.68		2.28		C0480-042-1000S		1.90
C0480-042-1250M			31.75	11.94	8.05		1.75		C0480-042-1250S		1.46
C0480-042-1500M		1.07	38.10	14.73	9.09	34.70	1.49		C0480-042-1500S	28.91	1.24
C0480-042-1750M			44.45	18.72	10.62		1.35		C0480-042-1750S		1.12
C0480-042-2000M			50.80	21.23	11.73		1.17		C0480-042-2000S		0.98
C0480-042-2250M			57.15	23.57	12.83		1.03		C0480-042-2250S		0.86
C0480-042-2500M			63.50	28.58	13.21		1.00		C0480-042-2500S		0.83
C0480-042-2750M			69.85	31.32	14.25		0.89		C0480-042-2750S		0.74
C0480-042-3000M			76.20	34.04	15.29		0.82		C0480-042-3000S		0.69
C0480-045-0500M			12.70	6.02	4.70		6.13		C0480-045-0500S		5.11
C0480-045-0625M			15.75	7.39	5.31		4.90		C0480-045-0625S		4.08
C0480-045-0750M			19.05	8.38	6.15		3.85		C0480-045-0750S		3.21
C0480-045-0880M			22.35	10.06	6.76		3.33		C0480-045-0880S		2.77
C0480-045-1000M			25.40	11.68	7.29		2.98		C0480-045-1000S		2.48
C0480-045-1250M			31.75	13.84	8.84		2.28		C0480-045-1250S		1.90
C0480-045-1500M		1.14	38.10	16.89	10.03	40.92	1.93		C0480-045-1500S	34.09	1.60
C0480-045-1750M			44.45	20.12	11.91		1.68		C0480-045-1750S		1.40
C0480-045-2000M			50.80	22.99	13.21		1.47		C0480-045-2000S		1.23
C0480-045-2250M			57.15	25.58	14.48		1.30		C0480-045-2250S		1.08
C0480-045-2500M			63.50	28.32	15.75		1.16		C0480-045-2500S		0.96
C0480-045-2750M			69.85	31.04	17.04		1.05		C0480-045-2750S		0.88
C0480-045-3000M			76.20	33.71	18.31		0.96		C0480-045-3000S		0.80
C0480-051-0500M			12.70	7.52	6.48		10.73		C0480-051-0500S		8.94
C0480-051-0620M			15.75	9.02	7.26		8.25		C0480-051-0620S		6.87
C0480-051-0750M		1.30	19.05	10.62	8.13	55.65	6.60		C0480-051-0750S	46.36	5.50
C0480-051-0880M			22.35	12.22	8.97		5.50		C0480-051-0880S		4.58
C0480-051-1000M			25.40	13.72	9.75		4.76		C0480-051-1000S		3.97



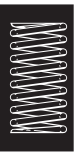
COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0480-051-1250M			31.75	16.81	11.38		3.73		C0480-051-1250S		3.11
C0480-051-1500M			38.10	19.91	13.03		3.06		C0480-051-1500S		2.55
C0480-051-1750M			44.45	23.01	14.66		2.59		C0480-051-1750S		2.16
C0480-051-2000M		1.30	50.80	26.09	16.28	55.65	2.26		C0480-051-2000S	46.36	1.88
C0480-051-2250M			57.15	29.18	17.93		2.00		C0480-051-2250S		1.66
C0480-051-2500M			63.50	32.28	19.56		1.79		C0480-051-2500S		1.49
C0480-051-2750M			69.85	35.38	21.18		1.61		C0480-051-2750S		1.34
C0480-051-3000M			76.20	38.48	22.83		1.47		C0480-051-3000S		1.23
C0480-055-0500M			12.70	6.99	6.25		12.61		C0480-055-0500S		10.50
C0480-055-0625M			15.75	8.41	7.24		9.81		C0480-055-0625S		8.17
C0480-055-0750M			19.05	10.26	8.10		8.23		C0480-055-0750S		6.86
C0480-055-0880M			22.35	11.43	9.35		6.65		C0480-055-0880S		5.54
C0480-055-1000M			25.40	13.59	9.93		6.13		C0480-055-1000S		5.11
C0480-055-1250M			31.75	16.51	12.04		4.73		C0480-055-1250S		3.94
C0480-055-1500M		1.40	38.10	19.43	14.15	72.06	3.85		C0480-055-1500S	60.03	3.21
C0480-055-1750M			44.45	23.24	16.54		3.40		C0480-055-1750S		2.83
C0480-055-2000M			50.80	26.31	18.42		2.94		C0480-055-2000S		2.45
C0480-055-2250M			57.15	29.54	20.29		2.61		C0480-055-2250S		2.17
C0480-055-2500M			63.50	32.56	22.20		2.33		C0480-055-2500S		1.94
C0480-055-2750M			69.85	37.29	23.14		2.21		C0480-055-2750S		1.84
C0480-055-3000M			76.20	40.56	24.92		2.01		C0480-055-3000S		1.67
C0480-059-0500M			12.70	8.26	7.75		18.77		C0480-059-0500S		15.64
C0480-059-0620M			15.75	9.91	8.79		14.29		C0480-059-0620S		11.90
C0480-059-0750M			19.05	11.71	9.91		11.35		C0480-059-0750S		9.45
C0480-059-1000M			25.40	15.14	12.04		8.13		C0480-059-1000S		6.77
C0480-059-1250M			31.75	18.59	14.17		6.34		C0480-059-1250S		5.28
C0480-059-1500M		1.50	38.10	22.02	16.31	83.40	5.18		C0480-059-1500S	69.49	4.31
C0480-059-1750M			44.45	25.48	18.44		4.40		C0480-059-1750S		3.67
C0480-059-2000M			50.80	28.91	20.57		3.82		C0480-059-2000S		3.18
C0480-059-2250M			57.15	32.36	22.71		3.36		C0480-059-2250S		2.80
C0480-059-2500M			63.50	35.79	24.84		3.01		C0480-059-2500S		2.51
C0480-059-2750M			69.85	39.24	26.97		2.73		C0480-059-2750S		2.27
C0480-059-3000M			76.20	42.67	29.11		2.49		C0480-059-3000S		2.07
C0480-063-0500M			12.70	7.82	7.52		21.01		C0480-063-0500S		17.50
C0480-063-0625M			15.75	9.60	8.69		16.64		C0480-063-0625S		13.86
C0480-063-0750M	12.19		19.05	11.56	9.86		13.66		C0480-063-0750S		11.38
C0480-063-0880M			22.35	13.51	11.07		11.56		C0480-063-0880S		9.63
C0480-063-1000M			25.40	15.11	12.32		9.98		C0480-063-1000S		8.31
C0480-063-1250M			31.75	18.80	14.78		7.88		C0480-063-1250S		6.56
C0480-063-1380M			35.05	21.36	16.64		7.48		C0480-063-1380S		6.23
C0480-063-1500M		1.60	38.10	22.73	16.89	102.31	6.65		C0480-063-1500S	85.22	5.54
C0480-063-1750M			44.45	26.31	20.35		5.64		C0480-063-1750S		4.70
C0480-063-2000M			50.80	29.87	22.73		4.89		C0480-063-2000S		4.07
C0480-063-2250M			57.15	33.40	25.12		4.31		C0480-063-2250S		3.59
C0480-063-2500M			63.50	36.96	27.51		3.85		C0480-063-2500S		3.21
C0480-063-2750M			69.85	40.56	29.90		3.48		C0480-063-2750S		2.90
C0480-063-3000M			76.20	44.12	32.28		3.19		C0480-063-3000S		2.66
C0480-067-0500M			12.70	8.97	8.53		31.64		C0480-067-0500S		26.36
C0480-067-0620M			15.75	10.77	10.24		23.83		C0480-067-0620S		19.85
C0480-067-0750M			19.05	12.75	11.63		18.81		C0480-067-0750S		15.67
C0480-067-0880M			22.35	14.73	13.00		15.53		C0480-067-0880S		12.94
C0480-067-1000M			25.40	16.54	14.27		13.38		C0480-067-1000S		11.15
C0480-067-1250M			31.75	20.35	16.92		10.38		C0480-067-1250S		8.65
C0480-067-1500M		1.70	38.10	24.13	19.56	118.46	8.48		C0480-067-1500S	98.67	7.06
C0480-067-1750M			44.45	27.91	22.20		7.16		C0480-067-1750S		5.96
C0480-067-2000M			50.80	31.72	24.84		6.20		C0480-067-2000S		5.16
C0480-067-2250M			57.15	35.51	27.48		5.48		C0480-067-2250S		4.56
C0480-067-2500M			63.50	39.29	30.15		4.90		C0480-067-2500S		4.08
C0480-067-2750M			69.85	43.10	32.79		4.43		C0480-067-2750S		3.69
C0480-067-3000M			76.20	46.89	35.43		4.05		C0480-067-3000S		3.37
C0480-072-0500M			12.70	9.47	9.09		44.76		C0480-072-0500S		37.29
C0480-072-0620M			15.75	11.43	10.64		33.48		C0480-072-0620S		27.89
C0480-072-0750M			19.05	13.56	12.32		26.30		C0480-072-0750S		21.91
C0480-072-0880M			22.35	15.67	13.89		21.66		C0480-072-0880S		18.04
C0480-072-1000M			25.40	17.65	15.27		18.61		C0480-072-1000S		15.50
C0480-072-1250M		1.83	31.75	21.72	18.14	144.47	14.41		C0480-072-1250S	120.34	12.00
C0480-072-1500M			38.10	25.81	20.98		11.75		C0480-072-1500S		9.79
C0480-072-1750M			44.45	29.90	23.85		9.93		C0480-072-1750S		8.27
C0480-072-2000M			50.80	33.99	26.70		8.58		C0480-072-2000S		7.15
C0480-072-2250M			57.15	38.05	29.57		7.56		C0480-072-2250S		6.30
C0480-072-2500M			63.50	42.14	32.41		6.76		C0480-072-2500S		5.63

COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0480-072-2750M			69.85	46.23	35.28		6.11		C0480-072-2750S		5.09
C0480-072-3000M		1.83	76.20	50.32	38.13	144.47	5.59		C0480-072-3000S	120.34	4.66
C0480-072-3250M			82.55	54.41	41.00		5.13		C0480-072-3250S		4.27
C0480-072-3500M			88.90	58.47	43.84		4.75		C0480-072-3500S		3.96
C0480-074-0500M			12.70	9.65	8.89		50.62		C0480-074-0500S		42.17
C0480-074-0620M			15.75	11.66	10.69		37.75		C0480-074-0620S		31.45
C0480-074-0750M			19.05	13.82	12.24		29.61		C0480-074-0750S		24.67
C0480-074-0880M			22.35	16.00	13.87		24.34		C0480-074-0880S		20.28
C0480-074-1000M			25.40	18.01	15.49		20.91		C0480-074-1000S		17.42
C0480-074-1250M			31.75	22.17	18.64		16.16		C0480-074-1250S		13.46
C0480-074-1500M		1.88	38.10	26.37	21.72	154.75	13.19		C0480-074-1500S	128.91	10.99
C0480-074-1750M			44.45	30.53	24.69		11.12		C0480-074-1750S		9.26
C0480-074-2000M			50.80	34.72	27.66		9.63		C0480-074-2000S		8.02
C0480-074-2250M			57.15	38.89	30.63		8.48		C0480-074-2250S		7.06
C0480-074-2500M	12.19		63.50	43.08	33.63		7.58		C0480-074-2500S		6.31
C0480-074-2750M			69.85	47.27	36.60		6.85		C0480-074-2750S		5.71
C0480-074-3000M			76.20	51.44	39.57		6.25		C0480-074-3000S		5.21
C0480-074-3250M			82.55	55.63	42.55		5.74		C0480-074-3250S		4.78
C0480-074-3500M			88.90	59.79	45.52		5.32		C0480-074-3500S		4.43
C0480-081-0500M			12.70	10.19	9.63		78.22		C0480-081-0500S		65.16
C0480-081-0620M			15.75	12.34	11.63		57.73		C0480-081-0620S		48.09
C0480-081-0750M			19.05	14.66	13.36		44.97		C0480-081-0750S		37.46
C0480-081-0880M			22.35	16.99	15.19		36.82		C0480-081-0880S		30.67
C0480-081-1000M			25.40	19.15	16.99		31.55		C0480-081-1000S		26.28
C0480-081-1250M			31.75	23.65	20.52		24.30		C0480-081-1250S		20.24
C0480-081-1500M		2.06	38.10	28.12	23.93	197.22	19.77		C0480-081-1500S	164.28	16.47
C0480-081-1750M			44.45	32.61	27.25		16.65		C0480-081-1750S		13.87
C0480-081-2000M			50.80	37.08	30.58		14.39		C0480-081-2000S		11.99
C0480-081-2250M			57.15	41.58	33.88		12.66		C0480-081-2250S		10.55
C0480-081-2500M			63.50	46.05	37.21		11.31		C0480-081-2500S		9.42
C0480-081-2750M			69.85	50.55	40.51		10.21		C0480-081-2750S		8.50
C0480-081-3000M			76.20	55.04	43.84		9.32		C0480-081-3000S		7.76
C0480-081-3250M			82.55	59.51	47.17		8.56		C0480-081-3250S		7.13
C0480-081-3500M			88.90	64.01	50.47		7.92		C0480-081-3500S		6.60
D12050			24.00	9.40	5.50		1.49		D22050		1.24
D12060			36.50	13.40	7.50		0.95		D22060		0.79
D12070	13.50	1.00	55.50	19.40	10.50	21.97	0.61		D22070	18.30	0.51
D12080			80.50	27.40	14.50		0.41		D22080		0.34
D12090			115.00	39.40	20.50		0.28		D22090		0.23
D12250			27.00	8.20	6.88		3.63		D22250		3.02
D12260			41.50	11.60	9.38		2.31		D22260		1.92
D12270	13.75	1.25	62.50	16.50	13.13	69.04	1.49		D22270	57.51	1.24
D12280			90.50	23.10	18.13		1.02		D22280		0.85
D12290			130.00	32.90	25.63		0.69		D22290		0.57
D13190			20.50	16.40	15.40		127.49		D23190		106.20
D13200	14.00	2.80	29.00	22.30	21.00	518.77	62.86		D23200	432.14	52.36
D13210			45.90	34.90	32.20		46.88		D23210		39.05
D13220			71.40	53.30	49.00		28.73		D23220		23.93
D12450			24.00	10.00	8.80		9.76		D22450		8.13
D12460			36.00	14.10	12.00		6.23		D22460		5.19
D12470	14.10	1.60	53.50	20.10	16.80	135.33	4.04		D22470	112.73	3.37
D12480			78.00	28.00	23.20		2.73		D22480		2.27
D12490			115.00	39.90	32.80		1.84		D22490		1.53
D12650			22.50	11.70	11.00		23.93		D22650		19.93
D12660			33.00	16.40	15.00		15.20		D22660		12.66
D12670	14.50	2.00	49.50	23.50	21.00	253.99	9.81		D22670	211.57	8.17
D12680			71.00	33.00	29.00		6.69		D22680		5.57
D12690			105.00	47.20	41.00		4.52		D22690		3.77
D12890			20.00	12.90	12.10		32.46		D22890		27.04
D12900		2.20	30.20	17.70	16.50	256.93	20.69		D22900	214.02	17.23
D12910			48.90	27.40	25.30		11.96		D22910		9.96
D12940	15.00		22.00	14.00	13.75		58.35		D22940		48.61
D12950			32.00	19.50	18.75		37.17		D22950		30.96
D12960		2.50	47.50	27.80	26.25	467.78	24.03		D22960	389.66	20.02
D12970			67.50	38.70	36.25		16.28		D22970		13.56
D12980			98.00	55.10	51.25		10.98		D22980		9.15
C0600-045-0500M			12.70	6.53	3.89		4.33		C0600-045-0500S		3.61
C0600-045-0625M			15.75	7.29	4.55		3.15		C0600-045-0625S		2.62
C0600-045-0750M	15.24	1.14	19.05	8.15	5.21	26.69	2.45		C0600-045-0750S	22.23	2.04
C0600-045-0880M			22.35	9.65	5.69		2.10		C0600-045-0880S		1.75
C0600-045-1000M			25.40	10.16	6.38		1.75		C0600-045-1000S		1.46



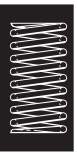
COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0600-045-1250M			31.75	12.70	7.42		1.40		C0600-045-1250S		1.17
C0600-045-1380M			35.05	13.72	7.77		1.24		C0600-045-1380S		1.04
C0600-045-1500M			38.10	14.61	8.59		1.14		C0600-045-1500S		0.95
C0600-045-1750M			44.45	21.69	9.30		1.17		C0600-045-1750S		0.98
C0600-045-2000M		1.14	50.80	24.54	10.19	26.69	1.02		C0600-045-2000S	22.23	0.85
C0600-045-2250M			57.15	27.84	11.07		0.91		C0600-045-2250S		0.76
C0600-045-2500M			63.50	30.38	11.96		0.81		C0600-045-2500S		0.67
C0600-045-2750M			69.85	29.72	13.72		0.67		C0600-045-2750S		0.55
C0600-045-3000M			76.20	32.31	14.86		0.61		C0600-045-3000S		0.51
C0600-045-3500M			88.90	38.10	16.74		0.53		C0600-045-3500S		0.44
C0600-049-0620M			15.75	8.13	5.94		4.90		C0600-049-0620S		4.08
C0600-049-0750M			19.05	9.53	6.48		3.92		C0600-049-0750S		3.27
C0600-049-1000M			25.40	12.22	7.54		2.84		C0600-049-1000S		2.37
C0600-049-1250M			31.75	14.91	8.59		2.22		C0600-049-1250S		1.85
C0600-049-1500M			38.10	17.60	9.65		1.82		C0600-049-1500S		1.52
C0600-049-1750M		1.24	44.45	20.32	10.72	37.37	1.54		C0600-049-1750S	31.13	1.28
C0600-049-2000M			50.80	23.01	11.76		1.35		C0600-049-2000S		1.12
C0600-049-2250M			57.15	25.70	12.83		1.19		C0600-049-2250S		0.99
C0600-049-2500M			63.50	28.40	13.87		1.07		C0600-049-2500S		0.89
C0600-049-2750M			69.85	31.09	14.94		0.96		C0600-049-2750S		0.80
C0600-049-3000M			76.20	33.78	15.98		0.88		C0600-049-3000S		0.73
C0600-055-0625M			15.75	8.13	5.74		7.00		C0600-055-0625S		5.83
C0600-055-0750M			19.05	9.78	6.38		5.78		C0600-055-0750S		4.81
C0600-055-0880M			22.35	11.43	7.01		4.90		C0600-055-0880S		4.08
C0600-055-1000M			25.40	12.70	7.72		4.20		C0600-055-1000S		3.50
C0600-055-1250M			31.75	14.73	9.37		3.15		C0600-055-1250S		2.62
C0600-055-1500M		1.40	38.10	17.78	10.67	53.38	2.63		C0600-055-1500S	44.47	2.19
C0600-055-1750M			44.45	21.01	12.93		2.28		C0600-055-1750S		1.90
C0600-055-2000M			50.80	23.83	14.27		1.98		C0600-055-2000S		1.65
C0600-055-2250M			57.15	26.67	15.60		1.75		C0600-055-2250S		1.46
C0600-055-2500M			63.50	29.26	16.94		1.56		C0600-055-2500S		1.30
C0600-055-2750M			69.85	33.30	17.81		1.45		C0600-055-2750S		1.21
C0600-055-3000M			76.20	36.17	19.10		1.33		C0600-055-3000S		1.11
C0600-059-0620M			15.75	9.07	7.57		9.40		C0600-059-0620S		7.83
C0600-059-0750M			19.05	10.64	8.36		7.48		C0600-059-0750S		6.23
C0600-059-0880M	15.24		22.35	12.22	9.14		6.20		C0600-059-0880S		5.16
C0600-059-1000M			25.40	13.67	9.88		5.36		C0600-059-1000S		4.46
C0600-059-1250M			31.75	16.69	11.40		4.17		C0600-059-1250S		3.47
C0600-059-1500M		1.50	38.10	19.71	12.95	62.85	3.41		C0600-059-1500S	52.35	2.84
C0600-059-1750M			44.45	22.73	14.48		2.89		C0600-059-1750S		2.41
C0600-059-2000M			50.80	25.76	16.00		2.50		C0600-059-2000S		2.08
C0600-059-2250M			57.15	28.78	17.53		2.21		C0600-059-2250S		1.84
C0600-059-2500M			63.50	31.80	19.05		1.98		C0600-059-2500S		1.65
C0600-059-2750M			69.85	34.82	20.60		1.79		C0600-059-2750S		1.49
C0600-059-3000M			76.20	37.85	22.12		1.65		C0600-059-3000S		1.37
C0600-063-0625M			15.75	8.38	7.11		10.86		C0600-063-0625S		9.05
C0600-063-0750M			19.05	10.16	7.98		8.93		C0600-063-0750S		7.44
C0600-063-0880M			22.35	11.96	8.71		7.70		C0600-063-0880S		6.41
C0600-063-1000M			25.40	13.34	9.60		6.65		C0600-063-1000S		5.54
C0600-063-1250M			31.75	17.02	11.05		5.43		C0600-063-1250S		4.52
C0600-063-1500M		1.60	38.10	19.05	13.36	80.07	4.20		C0600-063-1500S	66.70	3.50
C0600-063-1750M			44.45	22.48	16.05		3.64		C0600-063-1750S		3.03
C0600-063-2000M			50.80	25.40	17.78		3.15		C0600-063-2000S		2.62
C0600-063-2250M			57.15	28.40	19.51		2.78		C0600-063-2250S		2.32
C0600-063-2500M			63.50	31.29	21.23		2.49		C0600-063-2500S		2.07
C0600-063-2750M			69.85	36.40	21.92		2.40		C0600-063-2750S		2.00
C0600-063-3000M			76.20	39.57	23.55		2.19		C0600-063-3000S		1.82
C0600-063-3500M			88.90	45.90	26.80		1.86		C0600-063-3500S		1.55
C0600-067-0625M			15.75	9.14	7.62		14.01		C0600-067-0625S		11.67
C0600-067-0750M			19.05	10.92	8.53		11.56		C0600-067-0750S		9.63
C0600-067-0880M			22.35	11.68	10.19		8.76		C0600-067-0880S		7.30
C0600-067-1000M			25.40	13.46	10.92		7.88		C0600-067-1000S		6.56
C0600-067-1250M			31.75	16.89	12.83		6.30		C0600-067-1250S		5.25
C0600-067-1500M		1.70	38.10	19.81	15.09	93.41	5.08		C0600-067-1500S	77.81	4.23
C0600-067-1750M			44.45	21.08	18.16		4.03		C0600-067-1750S		3.36
C0600-067-2000M			50.80	27.10	19.58		3.94		C0600-067-2000S		3.28
C0600-067-2250M			57.15	30.20	21.51		3.47		C0600-067-2250S		2.89
C0600-067-2500M			63.50	33.38	23.44		3.10		C0600-067-2500S		2.58
C0600-067-2750M			69.85	38.00	24.54		2.92		C0600-067-2750S		2.43
C0600-067-3000M			76.20	41.30	26.42		2.68		C0600-067-3000S		2.23
C0600-072-0620M		1.83	15.75	10.41	9.68	106.76	20.05		C0600-072-0620S	88.93	16.70

COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0600-072-0750M			19.05	11.30	10.06		13.66		C0600-072-0750S		11.38
C0600-072-0880M			22.35	13.39	11.00		11.91		C0600-072-0880S		9.92
C0600-072-1000M			25.40	14.35	12.75		9.63		C0600-072-1000S		8.02
C0600-072-1250M			31.75	18.21	14.76		7.88		C0600-072-1250S		6.56
C0600-072-1500M			38.10	21.08	17.55		6.30		C0600-072-1500S		5.25
C0600-072-1750M		1.83	44.45	24.13	20.35	106.76	5.25		C0600-072-1750S	88.93	4.37
C0600-072-2000M			50.80	28.96	21.54		4.90		C0600-072-2000S		4.08
C0600-072-2250M			57.15	33.60	24.03		4.54		C0600-072-2250S		3.78
C0600-072-2500M			63.50	37.11	26.24		4.05		C0600-072-2500S		3.37
C0600-072-2750M			69.85	40.67	28.42		3.66		C0600-072-2750S		3.05
C0600-072-3000M			76.20	44.25	30.63		3.34		C0600-072-3000S		2.78
C0600-081-0620M			15.75	11.84	10.46		37.23		C0600-081-0620S		31.01
C0600-081-0750M			19.05	14.05	11.66		29.00		C0600-081-0750S		24.16
C0600-081-0880M			22.35	16.23	12.88		23.74		C0600-081-0880S		19.78
C0600-081-1000M			25.40	18.26	14.02		20.35		C0600-081-1000S		16.95
C0600-081-1250M			31.75	22.48	16.36		15.67		C0600-081-1250S		13.05
C0600-081-1500M			38.10	26.70	18.69		12.75		C0600-081-1500S		10.62
C0600-081-1750M		2.06	44.45	30.91	21.03	145.41	10.73		C0600-081-1750S	121.13	8.94
C0600-081-2000M			50.80	35.13	23.37		9.28		C0600-081-2000S		7.73
C0600-081-2250M			57.15	39.34	25.70		8.16		C0600-081-2250S		6.80
C0600-081-2500M			63.50	43.56	28.04		7.30		C0600-081-2500S		6.08
C0600-081-2750M			69.85	47.78	30.38		6.58		C0600-081-2750S		5.48
C0600-081-3000M			76.20	51.99	32.72		6.01		C0600-081-3000S		5.01
C0600-081-3250M			82.55	56.21	35.05		5.52		C0600-081-3250S		4.60
C0600-081-3500M			88.90	60.43	37.39		5.11		C0600-081-3500S		4.26
C0600-081-3750M			95.25	64.64	39.73		4.75		C0600-081-3750S		3.96
C0600-081-4000M			101.60	68.86	42.06		4.45		C0600-081-4000S		3.71
C0600-085-0620M			15.75	12.12	11.00		45.96		C0600-085-0620S		38.28
C0600-085-0750M			19.05	14.35	12.29		35.65		C0600-085-0750S		29.70
C0600-085-0880M			22.35	16.61	13.61		29.14		C0600-085-0880S		24.27
C0600-085-1000M			25.40	18.69	14.81		24.92		C0600-085-1000S		20.76
C0600-085-1250M			31.75	23.01	17.32		19.16		C0600-085-1250S		15.96
C0600-085-1500M			38.10	27.33	19.84		15.55		C0600-085-1500S		12.95
C0600-085-1750M		2.16	44.45	31.67	22.35	167.33	13.10		C0600-085-1750S	139.39	10.91
C0600-085-2000M			50.80	35.99	24.84		11.29		C0600-085-2000S		9.40
C0600-085-2250M	15.24		57.15	40.34	27.36		9.95		C0600-085-2250S		8.29
C0600-085-2500M			63.50	44.65	29.87		8.88		C0600-085-2500S		7.40
C0600-085-2750M			69.85	48.97	32.39		8.02		C0600-085-2750S		6.68
C0600-085-3000M			76.20	53.31	34.90		7.30		C0600-085-3000S		6.08
C0600-085-3250M			82.55	57.63	37.41		6.71		C0600-085-3250S		5.59
C0600-085-3500M			88.90	61.95	39.93		6.22		C0600-085-3500S		5.18
C0600-085-3750M			95.25	66.29	42.42		5.78		C0600-085-3750S		4.81
C0600-085-4000M			101.60	70.61	44.93		5.39		C0600-085-4000S		4.49
C0600-092-0750M			19.05	15.01	13.31		51.04		C0600-092-0750S		42.52
C0600-092-0880M			22.35	17.37	14.76		41.50		C0600-092-0880S		34.57
C0600-092-1000M			25.40	19.56	16.08		35.41		C0600-092-1000S		29.50
C0600-092-1250M			31.75	24.13	18.87		27.09		C0600-092-1250S		22.57
C0600-092-1500M			38.10	28.68	21.67		21.96		C0600-092-1500S		18.29
C0600-092-1750M			44.45	33.25	24.43		18.44		C0600-092-1750S		15.36
C0600-092-2000M			50.80	37.80	27.23		15.90		C0600-092-2000S		13.24
C0600-092-2250M		2.34	57.15	42.37	30.00	206.65	13.97		C0600-092-2250S	172.14	11.64
C0600-092-2500M			63.50	46.94	32.79		12.47		C0600-092-2500S		10.39
C0600-092-2750M			69.85	51.49	35.56		11.26		C0600-092-2750S		9.38
C0600-092-3000M			76.20	56.06	38.35		10.26		C0600-092-3000S		8.55
C0600-092-3250M			82.55	60.60	41.12		9.42		C0600-092-3250S		7.85
C0600-092-3500M			88.90	65.18	43.92		8.70		C0600-092-3500S		7.25
C0600-092-3750M			95.25	69.75	46.69		8.11		C0600-092-3750S		6.76
C0600-092-4000M			101.60	74.30	49.48		7.56		C0600-092-4000S		6.30
C0600-098-0750M			19.05	15.44	14.20		67.90		C0600-098-0750S		56.56
C0600-098-0880M			22.35	17.88	15.77		55.00		C0600-098-0880S		45.82
C0600-098-1000M			25.40	20.17	17.22		46.79		C0600-098-1000S		38.98
C0600-098-1250M			31.75	24.89	20.27		35.70		C0600-098-1250S		29.74
C0600-098-1500M			38.10	29.59	23.29		28.86		C0600-098-1500S		24.04
C0600-098-1750M			44.45	34.32	26.34		24.22		C0600-098-1750S		20.18
C0600-098-2000M		2.49	50.80	39.04	29.36	245.26	20.85		C0600-098-2000S	204.30	17.37
C0600-098-2250M			57.15	43.76	32.41		18.32		C0600-098-2250S		15.26
C0600-098-2500M			63.50	48.49	35.43		16.34		C0600-098-2500S		13.61
C0600-098-2750M			69.85	53.21	38.48		14.73		C0600-098-2750S		12.27
C0600-098-3000M			76.20	57.91	41.50		13.41		C0600-098-3000S		11.17
C0600-098-3250M			82.55	62.64	44.55		12.33		C0600-098-3250S		10.27
C0600-098-3500M			88.90	67.36	47.57		11.38		C0600-098-3500S		9.48



COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0600-098-3750M	15.24	2.49	95.25	72.09	50.62	245.26	10.59		C0600-098-3750S	204.30	8.82
C0600-098-4000M			101.60	76.81	53.64		9.89		C0600-098-4000S		8.24
D12300			40.50	9.10	6.88		1.73		D22300		1.44
D12310			62.00	12.90	9.38		1.10		D22310		0.92
D12320	17.25	1.25	94.00	18.50	13.13	54.23	0.72		D22320	45.17	0.60
D12330			140.00	26.00	18.13		0.48		D22330		0.40
D12340			205.00	37.30	25.63		0.32		D22340		0.27
D12500			34.00	11.00	8.80		4.65		D22500		3.87
D12510			51.50	15.50	12.00		2.96		D22510		2.47
D12520	17.60	1.60	77.50	22.20	16.80	105.91	1.92		D22520	88.92	1.60
D12530			110.00	31.20	23.20		1.30		D22530		1.08
D12540			165.00	44.60	32.80		0.88		D22540		0.73
D12700			30.00	12.50	11.00		11.38		D22700		9.48
D12710			45.00	17.70	15.00		7.24		D22710		6.03
D12720	18.00	2.00	68.00	25.50	21.00	198.09	4.69		D22720	165.01	3.91
D12730			98.00	35.90	29.00		3.19		D22730		2.66
D12740			145.00	51.40	41.00		2.16		D22740		1.80
C0720-055-0620M			15.75	8.13	6.12		5.69		C0720-055-0620S		4.74
C0720-055-0750M			19.05	8.28	5.61		4.03		C0720-055-0750S		3.36
C0720-055-0880M			22.35	9.98	6.05		3.50		C0720-055-0880S		2.92
C0720-055-1000M			25.40	12.01	6.30		3.24		C0720-055-1000S		2.70
C0720-055-1250M			31.75	15.24	7.14		2.63		C0720-055-1250S		2.19
C0720-055-1500M		1.40	38.10	16.56	8.46	43.37	2.01		C0720-055-1500S	36.13	1.67
C0720-055-1750M			44.45	17.53	9.86		1.61		C0720-055-1750S		1.34
C0720-055-2000M			50.80	21.67	10.44		1.49		C0720-055-2000S		1.24
C0720-055-2250M			57.15	25.20	12.24		1.37		C0720-055-2250S		1.14
C0720-055-2500M			63.50	27.81	13.18		1.21		C0720-055-2500S		1.01
C0720-055-2750M			69.85	30.43	14.12		1.10		C0720-055-2750S		0.92
C0720-055-3000M			76.20	33.07	15.06		1.00		C0720-055-3000S		0.83
C0720-059-0750M			19.05	9.88	7.24		5.76		C0720-059-0750S		4.80
C0720-059-0880M			22.35	11.28	7.82		4.78		C0720-059-0880S		3.98
C0720-059-1000M			25.40	12.60	8.33		4.12		C0720-059-1000S		3.43
C0720-059-1250M			31.75	15.32	9.42		3.20		C0720-059-1250S		2.67
C0720-059-1500M		1.50	38.10	18.03	10.52	52.84	2.63		C0720-059-1500S	44.02	2.19
C0720-059-1750M			44.45	20.75	11.61		2.22		C0720-059-1750S		1.85
C0720-059-2000M			50.80	23.47	12.67		1.93		C0720-059-2000S		1.60
C0720-059-2250M			57.15	26.19	13.77		1.70		C0720-059-2250S		1.41
C0720-059-2500M			63.50	28.91	14.86		1.52		C0720-059-2500S		1.27
C0720-063-0620M			15.75	8.92	7.26		9.11		C0720-063-0620S		7.59
C0720-063-0750M			19.05	8.26	7.21		5.78		C0720-063-0750S		4.81
C0720-063-0880M			22.35	9.65	7.95		4.90		C0720-063-0880S		4.08
C0720-063-1000M			25.40	10.67	8.74		4.20		C0720-063-1000S		3.50
C0720-063-1250M			31.75	12.45	10.39		3.24		C0720-063-1250S		2.70
C0720-063-1500M	18.29	1.60	38.10	14.48	12.07	62.28	2.63		C0720-063-1500S	51.88	2.19
C0720-063-1750M			44.45	17.27	13.44		2.28		C0720-063-1750S		1.90
C0720-063-2000M			50.80	18.54	15.29		1.93		C0720-063-2000S		1.60
C0720-063-2250M			57.15	27.76	15.37		2.12		C0720-063-2250S		1.77
C0720-063-2500M			63.50	30.58	16.61		1.89		C0720-063-2500S		1.58
C0720-063-2750M			69.85	33.55	17.83		1.72		C0720-063-2750S		1.43
C0720-063-3000M			76.20	36.25	19.08		1.56		C0720-063-3000S		1.30
C0720-065-0750M			19.05	10.44	8.23		8.06		C0720-065-0750S		6.71
C0720-065-0880M			22.35	11.94	8.92		6.65		C0720-065-0880S		5.54
C0720-065-1000M			25.40	13.34	9.55		5.74		C0720-065-1000S		4.78
C0720-065-1250M			31.75	16.21	10.87		4.45		C0720-065-1250S		3.71
C0720-065-1500M			38.10	19.10	12.19		3.64		C0720-065-1500S		3.03
C0720-065-1750M		1.65	44.45	21.97	13.51	69.26	3.08		C0720-065-1750S	57.69	2.57
C0720-065-2000M			50.80	24.84	14.83		2.66		C0720-065-2000S		2.22
C0720-065-2250M			57.15	27.74	16.15		2.35		C0720-065-2250S		1.96
C0720-065-2500M			63.50	30.61	17.50		2.10		C0720-065-2500S		1.75
C0720-065-2750M			69.85	33.50	18.14		1.91		C0720-065-2750S		1.59
C0720-065-3000M			76.20	36.37	20.14		1.73		C0720-065-3000S		1.44
C0720-067-0750M			19.05	9.91	7.09		8.76		C0720-067-0750S		7.30
C0720-067-0880M			22.35	10.92	8.00		7.00		C0720-067-0880S		5.83
C0720-067-1000M			25.40	11.43	8.99		5.78		C0720-067-1000S		4.81
C0720-067-1250M			31.75	14.73	10.24		4.73		C0720-067-1250S		3.94
C0720-067-1500M			38.10	17.27	11.79		3.85		C0720-067-1500S		3.21
C0720-067-1750M		1.70	44.45	19.05	13.67	80.07	3.15		C0720-067-1750S	66.70	2.62
C0720-067-2000M			50.80	21.59	15.32		2.71		C0720-067-2000S		2.26
C0720-067-2250M			57.15	26.47	16.99		2.61		C0720-067-2250S		2.17
C0720-067-2500M			63.50	29.13	18.39		2.33		C0720-067-2500S		1.94
C0720-067-3000M			76.20	34.65	21.21		1.93		C0720-067-3000S		1.60

COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0720-067-3250M		1.70	82.55	40.01	21.59	80.07	1.87		C0720-067-3250S	66.70	1.56
C0720-067-3500M			88.90	42.95	22.91		1.75		C0720-067-3500S		1.46
C0720-072-0750M			19.05	11.13	9.35		11.78		C0720-072-0750S		9.81
C0720-072-0880M			22.35	11.25	9.27		8.41		C0720-072-0880S		7.01
C0720-072-1000M			25.40	12.70	10.08		7.35		C0720-072-1000S		6.12
C0720-072-1250M			31.75	16.51	11.38		6.13		C0720-072-1250S		5.11
C0720-072-1500M			38.10	17.78	14.07		4.55		C0720-072-1500S		3.79
C0720-072-1750M			44.45	20.19	15.95		3.85		C0720-072-1750S		3.21
C0720-072-2000M		1.83	50.80	24.13	17.20	93.41	3.50		C0720-072-2000S	77.81	2.92
C0720-072-2250M			57.15	29.24	19.08		3.34		C0720-072-2250S		2.78
C0720-072-2500M			63.50	32.39	20.70		2.99		C0720-072-2500S		2.49
C0720-072-2750M			69.85	35.20	22.30		2.70		C0720-072-2750S		2.25
C0720-072-3000M			76.20	38.38	23.93		2.47		C0720-072-3000S		2.06
C0720-072-3250M			82.55	41.38	25.53		2.28		C0720-072-3250S		1.90
C0720-072-3500M			88.90	44.42	27.15		2.10		C0720-072-3500S		1.75
C0720-072-4000M			101.60	51.18	30.02		1.86		C0720-072-4000S		1.55
C0720-081-0750M			19.05	11.99	10.90		18.12		C0720-081-0750S		15.09
C0720-081-0880M			22.35	13.74	11.94		14.83		C0720-081-0880S		12.35
C0720-081-1000M			25.40	15.34	12.90		12.71		C0720-081-1000S		10.59
C0720-081-1250M			31.75	18.69	14.91		9.79		C0720-081-1250S		8.16
C0720-081-1500M			38.10	22.05	16.89		7.97		C0720-081-1500S		6.64
C0720-081-1750M			44.45	25.40	18.90		6.71		C0720-081-1750S		5.59
C0720-081-2000M		2.06	50.80	28.75	20.90	127.75	5.80		C0720-081-2000S	106.42	4.83
C0720-081-2250M			57.15	32.11	22.91		5.10		C0720-081-2250S		4.25
C0720-081-2500M			63.50	35.46	24.92		4.55		C0720-081-2500S		3.79
C0720-081-2750M			69.85	38.81	26.92		4.12		C0720-081-2750S		3.43
C0720-081-3000M			76.20	42.16	28.93		3.75		C0720-081-3000S		3.12
C0720-081-3500M			88.90	48.87	32.94		3.19		C0720-081-3500S		2.66
C0720-081-4000M			101.60	55.52	36.96		2.78		C0720-081-4000S		2.32
C0720-085-0750M			19.05	12.90	11.02		24.34		C0720-085-0750S		20.28
C0720-085-0880M			22.35	14.83	12.04		19.87		C0720-085-0880S		16.55
C0720-085-1000M			25.40	16.61	13.00		17.00		C0720-085-1000S		14.16
C0720-085-1250M			31.75	20.32	14.96		13.06		C0720-085-1250S		10.88
C0720-085-1500M			38.10	24.03	16.92		10.61		C0720-085-1500S		8.84
C0720-085-1750M			44.45	27.74	18.87		8.93		C0720-085-1750S		7.44
C0720-085-2000M	18.29	2.16	50.80	31.42	20.85	149.41	7.70		C0720-085-2000S	124.46	6.41
C0720-085-2250M			57.15	35.13	22.81		6.78		C0720-085-2250S		5.65
C0720-085-2500M			63.50	38.84	24.77		6.06		C0720-085-2500S		5.05
C0720-085-2750M			69.85	42.55	26.72		5.46		C0720-085-2750S		4.55
C0720-085-3000M			76.20	46.25	28.70		4.99		C0720-085-3000S		4.16
C0720-085-3500M			88.90	53.64	32.61		4.24		C0720-085-3500S		3.53
C0720-085-4000M			101.60	61.06	36.55		3.68		C0720-085-4000S		3.07
C0720-096-0750M			19.05	14.22	12.45		41.78		C0720-096-0750S		34.80
C0720-096-0880M			22.35	16.41	13.64		33.90		C0720-096-0880S		28.24
C0720-096-1000M			25.40	18.42	14.76		28.86		C0720-096-1000S		24.04
C0720-096-1250M			31.75	22.61	17.04		22.05		C0720-096-1250S		18.37
C0720-096-1500M			38.10	26.80	19.35		17.83		C0720-096-1500S		14.85
C0720-096-1750M			44.45	30.99	21.64		14.97		C0720-096-1750S		12.47
C0720-096-2000M		2.44	50.80	35.18	23.95	201.63	12.91		C0720-096-2000S	167.96	10.75
C0720-096-2250M			57.15	39.34	26.26		11.33		C0720-096-2250S		9.44
C0720-096-2500M			63.50	43.54	28.55		10.10		C0720-096-2500S		8.41
C0720-096-2750M			69.85	47.73	30.86		9.12		C0720-096-2750S		7.60
C0720-096-3000M			76.20	51.92	33.15		8.30		C0720-096-3000S		6.91
C0720-096-3500M			88.90	60.30	37.74		7.06		C0720-096-3500S		5.88
C0720-096-4000M			101.60	68.68	42.37		6.13		C0720-096-4000S		5.11
C0720-105-0750M			19.05	14.86	13.64		62.11		C0720-105-0750S		51.74
C0720-105-0880M			22.35	17.15	15.01		50.06		C0720-105-0880S		41.70
C0720-105-1000M			25.40	19.25	16.26		42.46		C0720-105-1000S		35.37
C0720-105-1250M			31.75	23.67	18.87		32.25		C0720-105-1250S		26.86
C0720-105-1500M			38.10	28.07	21.49		26.00		C0720-105-1500S		21.66
C0720-105-1750M			44.45	32.49	24.10		21.78		C0720-105-1750S		18.14
C0720-105-2000M		2.67	50.80	36.88	26.72	260.65	18.74		C0720-105-2000S	217.1	15.61
C0720-105-2250M			57.15	41.30	29.34		16.44		C0720-105-2250S		13.69
C0720-105-2500M			63.50	45.69	31.95		14.64		C0720-105-2500S		12.20
C0720-105-2750M			69.85	50.11	34.57		13.20		C0720-105-2750S		11.00
C0720-105-3000M			76.20	54.51	37.19		12.03		C0720-105-3000S		10.02
C0720-105-3500M			88.90	63.32	42.42		10.19		C0720-105-3500S		8.49
C0720-105-4000M			101.60	72.14	47.65		8.84		C0720-105-4000S		7.36
C0720-112-0750M			19.05	15.29	14.63		82.09		C0720-112-0750S		68.38
C0720-112-0880M		2.84	22.35	17.65	16.15	309.54	65.82		C0720-112-0880S	257.85	54.83
C0720-112-1000M			25.40	19.84	17.55		55.63		C0720-112-1000S		46.34



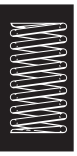
COMPRESSION SPRINGS - MUSIC WIRE

Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)
C0720-112-1250M			31.75	24.38	20.45		42.08
C0720-112-1500M			38.10	28.96	23.34		33.83
C0720-112-1750M			44.45	33.50	26.26		28.30
C0720-112-2000M			50.80	38.07	29.16		24.30
C0720-112-2250M	18.29	2.84	57.15	42.62	32.05	309.54	21.31
C0720-112-2500M			63.50	47.19	34.95		18.96
C0720-112-2750M			69.85	51.74	37.87		17.09
C0720-112-3000M			76.20	56.29	40.77		15.55
C0720-112-3500M			88.90	65.41	46.58		13.19
C0720-112-4000M			101.60	74.52	52.37		11.43
D12990			27.50	14.60	13.75		27.75
D13000			41.00	20.50	18.75		17.65
D13010	18.50	2.50	61.00	29.30	26.25	364.81	11.47
D13020			88.00	41.10	36.25		7.78
D13030			130.00	58.90	51.25		5.25
D13280			27.50	17.80	17.60		74.33
D13290			40.00	24.90	24.00		47.37
D13300	19.20	3.20	59.00	35.40	33.60	720.79	30.69
D13310			83.50	49.00	46.40		20.79
D13320			120.00	69.40	65.60		14.12
D13230			27.20	16.40	15.40		35.11
D13240	20.00	2.80	39.50	22.50	21.00	379.52	22.36
D13250			64.20	34.90	32.20		12.94
D12550			48.00	12.40	8.80		2.38
D12560			73.50	17.60	12.00		1.52
D12570	21.60	1.60	110.00	25.50	16.80	84.83	0.99
D12580			165.00	36.00	23.20		0.67
D12590			240.00	51.80	32.80		0.45
C0850-068-0750M			19.05	11.30	7.42		6.29
C0850-068-0875M			22.35	13.03	8.05		5.22
C0850-068-1000M			25.40	14.50	8.69		4.47
C0850-068-1250M			31.75	17.68	9.93		3.47
C0850-068-1500M			38.10	20.88	11.20		2.82
C0850-068-1750M		1.73	44.45	24.08	12.45	48.66	2.38
C0850-068-2000M			50.80	27.28	13.72		2.07
C0850-068-2250M			57.15	30.48	14.99		1.82
C0850-068-2500M			63.50	33.66	16.23		1.63
C0850-068-3000M			76.20	40.06	18.77		1.35
C0850-068-3500M			88.90	46.43	21.29		1.14
C0850-068-4000M			101.60	52.83	23.80		1.00
C0850-074-0875M			22.35	13.56	9.02		7.02
C0850-074-1000M			25.40	15.11	9.75		5.99
C0850-074-1250M			31.75	18.47	11.25		4.64
C0850-074-1500M		1.88	38.10	21.79	12.73	61.65	3.78
C0850-074-2000M			50.80	28.45	15.70		2.77
C0850-074-2500M			63.50	35.13	18.67		2.17
C0850-074-3000M			76.20	41.78	21.64		1.79
C0850-074-3500M			88.90	48.46	24.61		1.52
C0850-081-0750M			19.05	12.34	9.27		11.85
C0850-081-0875M	21.59		22.35	14.22	10.16		9.77
C0850-081-1000M			25.40	15.85	11.05		8.32
C0850-081-1250M			31.75	19.35	12.80		6.41
C0850-081-1500M			38.10	22.86	14.55		5.20
C0850-081-1750M		2.06	44.45	26.37	16.31	79.31	4.40
C0850-081-2000M			50.80	29.87	18.08		3.78
C0850-081-2250M			57.15	33.38	19.84		3.34
C0850-081-2500M			63.50	36.88	21.59		2.98
C0850-081-2750M			69.85	40.39	23.37		2.70
C0850-081-3000M			76.20	43.89	25.12		2.45
C0850-081-3500M			88.90	50.90	28.63		2.08
C0850-085-0750M			19.05	12.67	9.86		14.24
C0850-085-0875M			22.35	14.61	10.82		11.71
C0850-085-1000M			25.40	16.28	11.76		9.95
C0850-085-1250M			31.75	19.89	13.69		7.63
C0850-085-1500M			38.10	23.50	15.62		6.20
C0850-085-1750M		2.16	44.45	27.10	17.53	90.69	5.22
C0850-085-2000M			50.80	30.68	19.46		4.52
C0850-085-2250M			57.15	34.29	21.36		3.98
C0850-085-2500M			63.50	37.90	23.29		3.54
C0850-085-2750M			69.85	41.50	25.20		3.20
C0850-085-3000M			76.20	45.11	27.13		2.92

STAINLESS STEEL / INOX

Part Number	P_1 (N)	R (N/mm)
C0720-112-1250S		35.05
C0720-112-1500S		28.18
C0720-112-1750S		23.57
C0720-112-2000S		20.24
C0720-112-2250S	257.85	17.75
C0720-112-2500S		15.79
C0720-112-2750S		14.24
C0720-112-3000S		12.95
C0720-112-3500S		10.99
C0720-112-4000S		9.52
D22990		23.12
D23000		14.70
D23010	303.89	9.55
D23020		6.48
D23030		4.37
D23280		61.92
D23290		39.46
D23300	600.42	25.56
D23310		17.32
D23320		11.76
D23230		29.25
D23240	316.14	18.63
D23250		10.78
D22550		1.98
D22560		1.27
D22570	70.66	0.82
D22580		0.56
D22590		0.37
C0850-068-0750S		5.24
C0850-068-0875S		4.35
C0850-068-1000S		3.72
C0850-068-1250S		2.89
C0850-068-1500S		2.35
C0850-068-1750S	40.53	1.98
C0850-068-2000S		1.72
C0850-068-2250S		1.52
C0850-068-2500S		1.36
C0850-068-3000S		1.12
C0850-068-3500S		0.95
C0850-068-4000S		0.83
C0850-074-0875S		5.85
C0850-074-1000S		4.99
C0850-074-1250S		3.87
C0850-074-1500S	51.35	3.15
C0850-074-2000S		2.31
C0850-074-2500S		1.81
C0850-074-3000S		1.49
C0850-074-3500S		1.27
C0850-081-0750S		9.87
C0850-081-0875S		8.14
C0850-081-1000S		6.93
C0850-081-1250S		5.34
C0850-081-1500S		4.33
C0850-081-1750S	66.06	3.67
C0850-081-2000S		3.15
C0850-081-2250S		2.78
C0850-081-2500S		2.48
C0850-081-2750S		2.25
C0850-081-3000S		2.04
C0850-081-3500S		1.73
C0850-085-0750S		11.86
C0850-085-0875S		9.75
C0850-085-1000S		8.29
C0850-085-1250S		6.36
C0850-085-1500S		5.16
C0850-085-1750S	75.55	4.35
C0850-085-2000S		3.77
C0850-085-2250S		3.32
C0850-085-2500S		2.95
C0850-085-2750S		2.67
C0850-085-3000S		2.43

COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C0850-085-3250M			82.55	48.72	29.06		2.68		C0850-085-3250S		2.23
C0850-085-3500M		2.16	88.90	52.30	30.96	90.69	2.49		C0850-085-3500S	75.55	2.07
C0850-085-4000M			101.60	59.51	34.80		2.15		C0850-085-4000S		1.79
C0850-092-0880M			22.35	15.19	11.96		15.78		C0850-092-0880S		13.14
C0850-092-1000M			25.40	17.02	13.03		13.47		C0850-092-1000S		11.22
C0850-092-1250M			31.75	20.78	15.24		10.30		C0850-092-1250S		8.58
C0850-092-1500M			38.10	24.56	17.42		8.35		C0850-092-1500S		6.96
C0850-092-1750M			44.45	28.35	19.63		7.00		C0850-092-1750S		5.83
C0850-092-2000M		2.34	50.80	32.13	21.84	112.93	6.04		C0850-092-2000S	94.07	5.03
C0850-092-2250M			57.15	35.89	24.05		5.32		C0850-092-2250S		4.43
C0850-092-2500M	21.59		63.50	39.67	26.24		4.75		C0850-092-2500S		3.96
C0850-092-2750M			69.85	43.46	28.45		4.27		C0850-092-2750S		3.56
C0850-092-3000M			76.20	47.24	30.66		3.91		C0850-092-3000S		3.26
C0850-092-3500M			88.90	54.79	35.05		3.31		C0850-092-3500S		2.76
C0850-098-1000M			25.40	17.63	14.10		17.28		C0850-098-1000S		14.39
C0850-098-1250M			31.75	21.54	16.54		13.19		C0850-098-1250S		10.99
C0850-098-1500M			38.10	25.48	18.97		10.65		C0850-098-1500S		8.87
C0850-098-1750M			44.45	29.41	21.41		8.95		C0850-098-1750S		7.46
C0850-098-2000M		2.49	50.80	33.32	23.88	134.51	7.70		C0850-098-2000S	112.04	6.41
C0850-098-2250M			57.15	37.26	26.31		6.76		C0850-098-2250S		5.63
C0850-098-2500M			63.50	41.20	28.75		6.02		C0850-098-2500S		5.01
C0850-098-2750M			69.85	45.11	31.22		5.45		C0850-098-2750S		4.54
C0850-098-3000M			76.20	49.05	33.66		4.96		C0850-098-3000S		4.13
C0850-098-3500M			88.90	56.90	38.53		4.20		C0850-098-3500S		3.50
D12750			41.00	13.60	11.00		5.83		D22750		4.86
D12760			62.00	19.20	15.00		3.71		D22760		3.09
D12770			94.00	27.60	21.00	158.87	2.39		D22770	132.34	1.99
D12780			135.00	38.80	29.00		1.63		D22780		1.36
D12790	22.00	2.00	200.00	55.60	41.00		1.10		D22790		0.92
D13040			36.00	15.50	13.75		14.22		D23040		11.85
D13050			54.00	21.90	18.75		9.05		D23050		7.54
D13060			81.50	31.50	26.25	292.24	5.85		D23060	243.44	4.87
D13070			120.00	44.30	36.25		3.98		D23070		3.32
D13080			175.00	63.60	51.25		2.69		D23080		2.24
D13330			33.50	18.50	17.60		38.15		D23330		31.78
D13340			49.50	25.90	24.00		24.22		D23340		20.18
D13350	23.20	3.20	74.00	37.10	33.60	576.63	15.69		D23350	480.33	13.07
D13360			105.00	51.60	46.40		10.69		D23360		8.90
D13370			155.00	73.20	65.60		7.21		D23370		6.01
D12920		2.20	39.20	14.00	12.10	165.73	6.57		D22920	138.05	5.47
D12930			59.10	19.50	16.50		4.19		D22930		3.49
D13530			33.50	22.20	22.00		93.07		D23530		77.53
D13540	24.00		49.00	31.00	30.00		59.23		D23540		49.34
D13550		4.00	72.00	44.20	42.00	1068.92	38.34		D23550	890.41	31.94
D13560			105.00	61.70	58.00		26.09		D23560		21.73
D13570			150.00	87.70	82.00		17.55		D23570		14.62
C0975-074-0750M			19.05	11.30	7.49		6.97		C0975-074-0750S		5.81
C0975-074-0875M			22.35	13.00	8.05		5.78		C0975-074-0875S		4.81
C0975-074-1000M			25.40	14.43	8.64		4.92		C0975-074-1000S		4.10
C0975-074-1250M			31.75	17.55	9.80		3.80		C0975-074-1250S		3.17
C0975-074-1500M			38.10	20.68	10.95		3.10		C0975-074-1500S		2.58
C0975-074-2000M		1.88	50.80	26.95	13.26	54.04	2.26		C0975-074-2000S	45.02	1.88
C0975-074-2500M			63.50	33.20	15.57		1.79		C0975-074-2500S		1.49
C0975-074-3000M			76.20	39.47	17.88		1.47		C0975-074-3000S		1.23
C0975-074-3500M			88.90	45.72	20.19		1.24		C0975-074-3500S		1.04
C0975-074-4000M			101.60	51.99	22.50		1.09		C0975-074-4000S		0.90
C0975-085-0875M			22.35	13.89	9.68		9.42		C0975-085-0875S		7.85
C0975-085-1000M	24.77		25.40	15.44	10.44		8.00		C0975-085-1000S		6.66
C0975-085-1250M			31.75	18.80	11.94		6.15		C0975-085-1250S		5.12
C0975-085-1500M		2.16	38.10	22.15	13.46	79.62	4.99		C0975-085-1500S	66.32	4.16
C0975-085-2000M			50.80	28.85	16.48		3.63		C0975-085-2000S		3.02
C0975-085-2500M			63.50	35.56	19.53		2.85		C0975-085-2500S		2.37
C0975-085-3000M			76.20	42.27	22.56		2.35		C0975-085-3000S		1.96
C0975-085-3500M			88.90	48.97	25.58		2.00		C0975-085-3500S		1.66
C0975-092-0875M			22.35	14.48	10.69		12.61		C0975-092-0875S		10.50
C0975-092-1000M			25.40	16.10	11.58		10.68		C0975-092-1000S		8.90
C0975-092-1250M			31.75	19.61	13.34		8.18		C0975-092-1250S		6.81
C0975-092-1500M		2.34	38.10	23.11	15.09	99.23	6.62		C0975-092-1500S	82.66	5.51
C0975-092-2000M			50.80	30.12	18.59		4.80		C0975-092-2000S		4.00
C0975-092-2500M			63.50	37.11	22.12		3.77		C0975-092-2500S		3.14
C0975-092-3000M			76.20	44.12	25.63		3.10		C0975-092-3000S		2.58

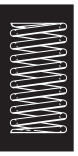


COMPRESSION SPRINGS - MUSIC WIRE

STAINLESS STEEL / INOX

Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)	Part Number	P_1 (N)	R (N/mm)
C0975-092-3500M		2.34	88.90	51.13	29.13	99.23	2.63	C0975-092-3500S	82.66	2.19
C0975-092-4000M			101.60	58.14	32.66		2.28	C0975-092-4000S		1.90
C0975-096-0875M			22.35	14.81	11.28		14.81	C0975-096-0875S		12.34
C0975-096-1000M			25.40	16.48	12.22		12.52	C0975-096-1000S		10.43
C0975-096-1250M			31.75	20.07	14.12		9.56	C0975-096-1250S		7.96
C0975-096-1500M		2.44	38.10	23.65	16.03	111.69	7.74	C0975-096-1500S	93.04	6.45
C0975-096-2000M			50.80	30.84	19.81		5.59	C0975-096-2000S		4.66
C0975-096-2500M			63.50	38.02	23.62		4.38	C0975-096-2500S		3.65
C0975-096-3000M			76.20	45.19	27.41		3.61	C0975-096-3000S		3.01
C0975-096-3500M			88.90	52.37	31.19		3.06	C0975-096-3500S		2.55
C0975-105-0880M			22.35	15.49	12.60		20.85	C0975-105-0880S		17.37
C0975-105-1000M			25.40	17.30	13.67		17.69	C0975-105-1000S		14.74
C0975-105-1250M			31.75	21.08	15.90		13.43	C0975-105-1250S		11.19
C0975-105-1500M			38.10	24.87	18.11		10.82	C0975-105-1500S		9.01
C0975-105-1750M			44.45	28.68	20.32		9.07	C0975-105-1750S		7.56
C0975-105-2000M		2.67	50.80	32.46	22.56	143.18	7.81	C0975-105-2000S	119.27	6.51
C0975-105-2250M			57.15	36.25	24.77		6.85	C0975-105-2250S		5.71
C0975-105-2500M			63.50	40.03	26.97		6.09	C0975-105-2500S		5.07
C0975-105-2750M			69.85	43.82	29.18		5.50	C0975-105-2750S		4.58
C0975-105-3000M			76.20	47.60	31.42		5.01	C0975-105-3000S		4.17
C0975-105-3500M			88.90	55.19	35.84		4.26	C0975-105-3500S		3.55
C0975-105-4000M			101.60	62.76	40.28		3.70	C0975-105-4000S		3.08
C0975-112-0880M			22.35	16.03	13.59		27.09	C0975-112-0880S		22.57
C0975-112-1000M			25.40	17.93	14.76		22.90	C0975-112-1000S		19.08
C0975-112-1250M			31.75	21.87	17.25		17.32	C0975-112-1250S		14.43
C0975-112-1500M		2.84	38.10	25.81	19.71	171.16	13.92	C0975-112-1500S	142.58	11.60
C0975-112-2000M			50.80	33.71	24.64		10.00	C0975-112-2000S		8.33
C0975-112-2500M			63.50	41.58	29.57		7.81	C0975-112-2500S		6.51
C0975-112-3000M			76.20	49.45	34.49		6.41	C0975-112-3000S		5.34
C0975-112-3500M			88.90	57.35	39.45		5.43	C0975-112-3500S		4.52
C0975-125-0880M			22.35	16.99	15.29		43.18	C0975-125-0880S		35.97
C0975-125-1000M			25.40	19.02	16.69		36.28	C0975-125-1000S		30.22
C0975-125-1250M	24.77		31.75	23.24	19.61		27.21	C0975-125-1250S		22.67
C0975-125-1500M			38.10	27.46	22.53		21.77	C0975-125-1500S		18.13
C0975-125-1750M			44.45	31.70	25.45		18.14	C0975-125-1750S		15.11
C0975-125-2000M		3.18	50.80	35.92	28.37	231.47	15.55	C0975-125-2000S	192.82	12.95
C0975-125-2250M			57.15	40.13	31.29		13.61	C0975-125-2250S		11.34
C0975-125-2500M			63.50	44.35	34.21		12.10	C0975-125-2500S		10.08
C0975-125-2750M			69.85	48.59	37.13		10.89	C0975-125-2750S		9.07
C0975-125-3000M			76.20	52.81	40.06		9.89	C0975-125-3000S		8.24
C0975-125-3500M			88.90	61.24	45.90		8.37	C0975-125-3500S		6.97
C0975-125-4000M			101.60	69.70	51.74		7.25	C0975-125-4000S		6.04
C0975-135-0880M			22.35	17.75	16.33		62.44	C0975-135-0880S		52.01
C0975-135-1000M			25.40	19.91	17.86		52.18	C0975-135-1000S		43.47
C0975-135-1500M			38.10	28.83	24.21		30.96	C0975-135-1500S		25.79
C0975-135-2000M		3.43	50.80	37.77	30.56	286.72	22.01	C0975-135-2000S	238.84	18.33
C0975-135-2500M			63.50	46.71	36.91		17.07	C0975-135-2500S		14.22
C0975-135-3000M			76.20	55.65	43.26		13.96	C0975-135-3000S		11.63
C0975-135-3500M			88.90	64.59	49.61		11.78	C0975-135-3500S		9.81
C0975-135-4000M			101.60	73.53	55.96		10.21	C0975-135-4000S		8.50
C0975-148-1000M			25.40	20.83	19.38		80.37	C0975-148-1000S		66.95
C0975-148-1500M			38.10	30.30	26.47		47.00	C0975-148-1500S		39.15
C0975-148-2000M			50.80	39.75	33.58		33.20	C0975-148-2000S		27.66
C0975-148-2500M		3.76	63.50	49.20	40.67	367.09	25.67	C0975-148-2500S	305.79	21.38
C0975-148-3000M			76.20	58.65	47.75		20.92	C0975-148-3000S		17.43
C0975-148-3500M			88.90	68.12	54.84		17.67	C0975-148-3500S		14.72
C0975-148-4000M			101.60	77.57	61.95		15.27	C0975-148-4000S		12.72
C0975-162-1500M			38.10	31.65	28.55		72.70	C0975-162-1500S		60.56
C0975-162-2000M			50.80	41.61	36.32		51.01	C0975-162-2000S		42.49
C0975-162-2500M		4.11	63.50	51.56	44.07	498.82	39.29	C0975-162-2500S	390.53	32.73
C0975-162-3000M			76.20	61.52	51.84		31.96	C0975-162-3000S		26.62
C0975-162-3500M			88.90	71.48	59.61		26.91	C0975-162-3500S		22.42
C0975-162-4000M			101.60	81.43	67.36		23.25	C0975-162-4000S		19.37
D12800			58.00	15.00	11.00		2.98	D22800		2.48
D12810			88.50	21.40	15.00		1.90	D22810		1.58
D12820	27.00	2.00	135.00	31.00	21.00	127.49	1.23	D22820	106.20	1.02
D12830			195.00	43.80	29.00		0.83	D22830		0.69
D12840			290.00	63.00	41.00		0.57	D22840		0.47
D13090			49.00	16.80	13.75		7.29	D23090		6.07
D13100	27.50	2.50	74.50	24.00	18.75	233.40	4.64	D23100	194.42	3.87
D13110			115.00	34.80	26.25		3.00	D23110		2.50

COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	**Do (mm)**	**d (mm)**	**Lo (mm)**	**L_1 (mm)**	**Sh (mm)**	**P_1 (N)**	**R (N/mm)**		**Part Number**	**P_1 (N)**	**R (N/mm)**
D13120	27.50	2.50	165.00	49.20	36.25	233.40	2.04		D23120	194.42	1.70
D13130			240.00	70.80	51.25		1.38		D23130		1.15
C1100-085-0875M			22.35	13.39	8.84		7.90		C1100-085-0875S		6.58
C1100-085-1000M			25.40	14.83	9.45		6.71		C1100-085-1000S		5.59
C1100-085-1250M			31.75	18.01	10.67		5.17		C1100-085-1250S		4.31
C1100-085-1500M			38.10	21.16	11.86		4.19		C1100-085-1500S		3.49
C1100-085-2000M			50.80	27.51	14.30		3.05		C1100-085-2000S		2.54
C1100-085-2500M		2.16	63.50	33.83	16.74	70.90	2.40		C1100-085-2500S	59.06	2.00
C1100-085-3000M			76.20	40.06	19.18		1.96		C1100-085-3000S		1.63
C1100-085-3500M			88.90	46.51	21.62		1.68		C1100-085-3500S		1.40
C1100-085-4000M			101.60	52.86	24.05		1.45		C1100-085-4000S		1.21
C1100-085-4500M			114.30	59.18	26.49		1.28		C1100-085-4500S		1.06
C1100-085-5000M			127.00	65.53	28.93		1.16		C1100-085-5000S		0.96
C1100-096-0875M			22.35	14.20	10.31		12.22		C1100-096-0875S		10.18
C1100-096-1000M			25.40	15.77	11.07		10.33		C1100-096-1000S		8.60
C1100-096-1250M			31.75	19.13	12.62		7.90		C1100-096-1250S		6.58
C1100-096-1500M			38.10	22.50	14.17		6.39		C1100-096-1500S		5.32
C1100-096-2000M		2.44	50.80	29.24	17.25	99.59	4.62		C1100-096-2000S	82.96	3.85
C1100-096-2500M			63.50	35.99	20.32		3.63		C1100-096-2500S		3.02
C1100-096-3000M			76.20	42.72	23.42		2.98		C1100-096-3000S		2.48
C1100-096-3500M			88.90	49.45	26.49		2.52		C1100-096-3500S		2.10
C1100-096-4000M			101.60	56.18	29.59		2.19		C1100-096-4000S		1.82
C1100-096-4500M			114.30	62.94	32.66		1.94		C1100-096-4500S		1.62
C1100-105-0875M			22.35	14.88	11.51		17.11		C1100-105-0875S		14.25
C1100-105-1000M			25.40	16.54	12.42		14.39		C1100-105-1000S		11.99
C1100-105-1250M			31.75	20.07	14.25		10.94		C1100-105-1250S		9.11
C1100-105-1500M		2.67	38.10	23.62	16.05	127.79	8.83		C1100-105-1500S	106.45	7.36
C1100-105-2000M			50.80	30.68	19.71		6.36		C1100-105-2000S		5.30
C1100-105-2500M			63.50	37.77	23.34		4.97		C1100-105-2500S		4.14
C1100-105-3000M			76.20	44.86	26.97		4.08		C1100-105-3000S		3.40
C1100-105-3500M			88.90	51.94	30.63		3.45		C1100-105-3500S		2.87
C1100-112-0875M			22.35	15.39	12.42		21.98		C1100-112-0875S		18.31
C1100-112-1000M	27.94		25.40	17.12	13.46		18.44		C1100-112-1000S		15.36
C1100-112-1250M			31.75	20.78	15.49		13.94		C1100-112-1250S		11.61
C1100-112-1500M			38.10	24.46	17.53		11.21		C1100-112-1500S		9.34
C1100-112-1750M			44.45	28.14	19.58		9.37		C1100-112-1750S		7.81
C1100-112-2000M		2.84	50.80	31.83	21.62	152.83	8.06		C1100-112-2000S	127.31	6.71
C1100-112-2250M			57.15	35.51	23.67		7.06		C1100-112-2250S		5.88
C1100-112-2500M			63.50	39.19	25.70		6.29		C1100-112-2500S		5.24
C1100-112-3000M			76.20	46.53	29.79		5.15		C1100-112-3000S		4.29
C1100-112-3500M			88.90	53.90	33.86		4.36		C1100-112-3500S		3.63
C1100-112-4000M			101.60	61.26	37.95		3.78		C1100-112-4000S		3.15
C1100-112-4500M			114.30	68.61	42.04		3.34		C1100-112-4500S		2.78
C1100-125-0880M			22.35	16.26	14.12		34.02		C1100-125-0880S		28.34
C1100-125-1000M			25.40	18.16	15.32		28.58		C1100-125-1000S		23.81
C1100-125-1250M			31.75	22.10	17.75		21.43		C1100-125-1250S		17.85
C1100-125-1500M			38.10	26.04	20.22		17.14		C1100-125-1500S		14.28
C1100-125-1750M			44.45	29.97	22.68		14.29		C1100-125-1750S		11.90
C1100-125-2000M		3.18	50.80	33.91	25.12	207.01	12.24		C1100-125-2000S	172.44	10.20
C1100-125-2250M			57.15	37.85	27.58		10.72		C1100-125-2250S		8.93
C1100-125-2500M			63.50	41.76	30.05		9.53		C1100-125-2500S		7.94
C1100-125-3000M			76.20	49.63	34.95		7.79		C1100-125-3000S		6.49
C1100-125-3500M			88.90	57.51	39.85		6.60		C1100-125-3500S		5.50
C1100-125-4000M			101.60	65.38	44.78		5.71		C1100-125-4000S		4.76
C1100-125-4500M			114.30	73.25	49.68		5.04		C1100-125-4500S		4.20
C1100-135-1500M			38.10	27.18	22.20		23.41		C1100-135-1500S		19.50
C1100-135-2000M			50.80	35.43	27.74		16.65		C1100-135-2000S		13.87
C1100-135-2500M			63.50	43.69	33.27		12.92		C1100-135-2500S		10.76
C1100-135-3000M		3.43	76.20	51.94	38.81	255.80	10.56		C1100-135-3000S	213.09	8.80
C1100-135-3500M			88.90	60.22	44.35		8.91		C1100-135-3500S		7.42
C1100-135-4000M			101.60	68.48	49.89		7.72		C1100-135-4000S		6.43
C1100-135-4500M			114.30	76.73	55.42		6.81		C1100-135-4500S		5.67
C1100-135-5000M			127.00	84.99	60.96		6.09		C1100-135-5000S		5.07
D13380			42.50	19.10	17.60		19.42		D23380		16.18
D13390			63.50	26.30	24.00		12.36		D23390		10.30
D13400	28.20	3.20	94.50	37.10	33.60	460.91	8.02		D23400	383.94	6.68
D13410			135.00	51.60	46.40		5.45		D23410		4.54
D13420			200.00	73.20	65.60		3.68		D23420		3.07
D13580			41.00	22.90	22.00		47.66		D23580		39.70
D13590	29.00	4.00	60.50	32.20	30.00	852.20	30.30		D23590	709.88	25.24
D13600			89.50	46.00	42.00		19.61		D23600		16.34



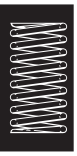
COMPRESSION SPRINGS - MUSIC WIRE

Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)
D13610		4.00	130.00	64.50	58.00	852.20	13.34
D13620			185.00	92.10	82.00		9.02
D13260		2.80	47.00	17.90	15.40	258.90	8.88
D13270			70.70	24.90	21.00		5.65
D13780			41.00	27.60	27.50		116.70
D13790	30.00		60.00	38.50	37.50		74.04
D13800		5.00	87.50	54.90	52.50	1569.06	47.86
D13810			125.00	76.70	72.50		32.59
D13820			180.00	109.00	102.50		21.97
C1225-085-0875M			22.35	12.37	8.38		6.41
C1225-085-1000M			25.40	13.64	8.92		5.45
C1225-085-1500M			38.10	19.28	11.02		3.40
C1225-085-2000M			50.80	24.89	13.16		2.47
C1225-085-2500M		2.16	63.50	30.51	15.27	64.05	1.94
C1225-085-3000M			76.20	36.14	17.37		1.59
C1225-085-3500M			88.90	41.76	19.51		1.37
C1225-085-4000M			101.60	47.37	21.62		1.17
C1225-085-4500M			114.30	53.01	23.72		1.05
C1225-085-5000M			127.00	58.62	25.86		0.93
C1225-096-0875M			22.35	13.74	9.58		10.44
C1225-096-1000M			25.40	15.21	10.21		8.83
C1225-096-1250M			31.75	18.42	11.48		6.74
C1225-096-1500M			38.10	21.62	12.75		5.45
C1225-096-1750M			44.45	24.82	14.02		4.57
C1225-096-2000M			50.80	28.02	15.29		3.94
C1225-096-2250M		2.44	57.15	31.22	16.56	89.85	3.47
C1225-096-2500M			63.50	34.42	17.83		3.08
C1225-096-2750M			69.85	37.62	19.10		2.78
C1225-096-3000M			76.20	40.82	20.37		2.54
C1225-096-3500M			88.90	47.22	22.91		2.15
C1225-096-4000M			101.60	53.62	25.45		1.87
C1225-096-4500M			114.30	60.02	27.99		1.66
C1225-096-5000M			127.00	66.42	30.53		1.49
C1225-105-0875M			22.35	14.38	10.69		14.45
C1225-105-1000M			25.40	15.93	11.43		12.17
C1225-105-1250M			31.75	19.28	12.95		9.25
C1225-105-1500M			38.10	22.63	14.45		7.44
C1225-105-2000M			50.80	29.31	17.48		5.38
C1225-105-2500M		2.67	63.50	36.02	20.50	115.34	4.20
C1225-105-3000M	31.12		76.20	42.72	23.52		3.45
C1225-105-3500M			88.90	49.43	26.54		2.92
C1225-105-4000M			101.60	56.11	29.57		2.54
C1225-105-4500M			114.30	62.81	32.59		2.24
C1225-105-5000M			127.00	69.52	35.61		2.01
C1225-112-0875M			22.35	14.86	11.56		18.40
C1225-112-1000M			25.40	16.46	12.40		15.44
C1225-112-1250M			31.75	19.94	14.12		11.68
C1225-112-1500M			38.10	23.39	15.82		9.39
C1225-112-2000M		2.84	50.80	30.35	19.23	138.02	6.74
C1225-112-2500M			63.50	37.29	22.63		5.27
C1225-112-3000M			76.20	44.22	26.06		4.31
C1225-112-3500M			88.90	51.16	29.46		3.66
C1225-112-4000M			101.60	58.12	32.87		3.17
C1225-125-0875M			22.35	15.72	13.13		28.24
C1225-125-1000M			25.40	17.45	14.17		23.53
C1225-125-1250M			31.75	21.16	16.23		17.65
C1225-125-1500M			38.10	24.84	18.31		14.11
C1225-125-1750M			44.45	28.55	20.40		11.77
C1225-125-2000M			50.80	32.26	22.48		10.09
C1225-125-2250M		3.18	57.15	35.94	24.54	187.13	8.83
C1225-125-2500M			63.50	39.65	26.62		7.84
C1225-125-2750M			69.85	43.36	28.70		7.06
C1225-125-3000M			76.20	47.04	30.78		6.43
C1225-125-3500M			88.90	54.46	34.93		5.43
C1225-125-4000M			101.60	61.85	39.09		4.71
C1225-125-4500M			114.30	69.24	43.23		4.15
C1225-125-5000M			127.00	76.66	47.37		3.71
C1225-135-0880M			22.35	16.33	14.35		38.38
C1225-135-1000M		3.43	25.40	18.19	15.47	231.43	32.06
C1225-135-1250M			31.75	22.07	17.83		23.88
C1225-135-1500M			38.10	25.93	20.19		19.03

STAINLESS STEEL / INOX

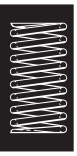
Part Number	P_1 (N)	R (N/mm)
D23610	709.88	11.11
D23620		7.51
D23260	215.66	7.40
D23270		4.71
D23780		97.21
D23790		61.68
D23800	1307.03	39.87
D23810		27.15
D23820		18.30
C1225-085-0875S		5.34
C1225-085-1000S		4.54
C1225-085-1500S		2.83
C1225-085-2000S		2.06
C1225-085-2500S	53.35	1.62
C1225-085-3000S		1.33
C1225-085-3500S		1.14
C1225-085-4000S		0.98
C1225-085-4500S		0.88
C1225-085-5000S		0.77
C1225-096-0875S		8.70
C1225-096-1000S		7.36
C1225-096-1250S		5.61
C1225-096-1500S		4.54
C1225-096-1750S		3.81
C1225-096-2000S		3.28
C1225-096-2250S	74.84	2.89
C1225-096-2500S		2.57
C1225-096-2750S		2.32
C1225-096-3000S		2.12
C1225-096-3500S		1.79
C1225-096-4000S		1.56
C1225-096-4500S		1.39
C1225-096-5000S		1.24
C1225-105-0875S		12.04
C1225-105-1000S		10.14
C1225-105-1250S		7.71
C1225-105-1500S		6.20
C1225-105-2000S		4.48
C1225-105-2500S	96.08	3.50
C1225-105-3000S		2.87
C1225-105-3500S		2.43
C1225-105-4000S		2.12
C1225-105-4500S		1.87
C1225-105-5000S		1.67
C1225-112-0875S		15.33
C1225-112-1000S		12.86
C1225-112-1250S		9.73
C1225-112-1500S		7.82
C1225-112-2000S	114.97	5.61
C1225-112-2500S		4.39
C1225-112-3000S		3.59
C1225-112-3500S		3.05
C1225-112-4000S		2.64
C1225-125-0875S		23.52
C1225-125-1000S		19.60
C1225-125-1250S		14.70
C1225-125-1500S		11.75
C1225-125-1750S		9.80
C1225-125-2000S		8.40
C1225-125-2250S	155.88	7.36
C1225-125-2500S		6.53
C1225-125-2750S		5.88
C1225-125-3000S		5.36
C1225-125-3500S		4.52
C1225-125-4000S		3.92
C1225-125-4500S		3.46
C1225-125-5000S		3.09
C1225-135-0880S		31.97
C1225-135-1000S	192.78	26.71
C1225-135-1250S		19.89
C1225-135-1500S		15.85

COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C1225-135-2000M			50.80	33.71	24.94		13.54		C1225-135-2000S		11.28
C1225-135-2500M		3.43	63.50	41.45	29.67	231.43	10.51		C1225-135-2500S	192.78	8.75
C1225-135-3000M			76.20	49.23	34.39		8.58		C1225-135-3000S		7.15
C1225-135-3500M			88.90	56.97	39.12		7.25		C1225-135-3500S		6.04
C1225-148-0880M			22.35	17.12	15.77		56.91		C1225-148-0880S		47.41
C1225-148-1000M			25.40	19.08	17.09		47.21		C1225-148-1000S		39.33
C1225-148-1250M			31.75	23.19	19.84		34.83		C1225-148-1250S		29.01
C1225-148-1500M			38.10	27.31	22.56		27.60		C1225-148-1500S		22.99
C1225-148-2000M			50.80	35.51	28.04		19.51		C1225-148-2000S		16.25
C1225-148-2500M		3.76	63.50	43.74	33.50	298.02	15.08		C1225-148-2500S	248.25	12.56
C1225-148-3000M			76.20	51.94	38.96		12.29		C1225-148-3000S		10.24
C1225-148-3500M			88.90	60.17	44.42		10.37		C1225-148-3500S		8.64
C1225-148-4000M			101.60	68.38	49.91		8.97		C1225-148-4000S		7.47
C1225-148-4500M			114.30	76.61	55.37		7.90		C1225-148-4500S		6.58
C1225-148-5000M			127.00	84.81	60.83		7.06		C1225-148-5000S		5.88
C1225-162-1000M			25.40	20.14	18.47		72.60		C1225-162-1000S		60.48
C1225-162-1500M			38.10	28.96	24.51		41.73		C1225-162-1500S		34.76
C1225-162-2000M			50.80	37.74	30.58		29.28		C1225-162-2000S		24.39
C1225-162-2500M			63.50	46.56	36.63		22.55		C1225-162-2500S		18.78
C1225-162-3000M		4.11	76.20	55.37	42.67	382.08	18.33		C1225-162-3000S	318.28	15.27
C1225-162-3500M			88.90	64.16	48.72		15.44		C1225-162-3500S		12.86
C1225-162-4000M			101.60	72.97	54.79		13.34		C1225-162-4000S		11.11
C1225-162-4500M			114.30	81.79	60.83		11.75		C1225-162-4500S		9.79
C1225-162-5000M	31.21		127.00	90.60	66.88		10.49		C1225-162-5000S		8.74
C1225-177-1500M			38.10	30.23	26.85		61.81		C1225-177-1500S		51.49
C1225-177-2000M			50.80	39.50	33.66		43.04		C1225-177-2000S		35.85
C1225-177-2500M			63.50	48.77	40.49		33.01		C1225-177-2500S		27.50
C1225-177-3000M			76.20	58.04	47.29		26.77		C1225-177-3000S		22.30
C1225-177-3500M		4.50	88.90	67.31	54.10	486.43	22.52		C1225-177-3500S	405.20	18.76
C1225-177-4000M			101.60	76.56	60.91		19.42		C1225-177-4000S		16.18
C1225-177-4500M			114.30	85.83	67.72		17.09		C1225-177-4500S		14.24
C1225-177-5000M			127.00	95.10	74.52		15.25		C1225-177-5000S		12.70
C1225-192-1500M			38.10	31.39	28.93		90.37		C1225-192-1500S		75.28
C1225-192-2000M			50.80	41.10	36.45		62.41		C1225-192-2000S		51.99
C1225-192-2500M			63.50	50.80	43.94		47.66		C1225-192-2500S		39.70
C1225-192-3000M		4.88	76.20	60.50	51.44	605.51	38.56		C1225-192-3000S	504.39	32.12
C1225-192-3500M			88.90	70.21	58.95		32.36		C1225-192-3500S		26.96
C1225-192-4000M			101.60	79.88	66.45		27.89		C1225-192-4000S		23.23
C1225-192-4500M			114.30	89.59	73.96		24.50		C1225-192-4500S		20.41
C1225-192-5000M			127.00	99.29	81.46		21.85		C1225-192-5000S		18.20
C1225-207-2000M			50.80	42.39	39.19		88.39		C1225-207-2000S		73.63
C1225-207-2500M			63.50	52.45	47.42		67.20		C1225-207-2500S		55.98
C1225-207-3000M			76.20	62.51	55.63		54.21		C1225-207-3000S		45.16
C1225-207-3500M		5.26	88.90	72.57	63.86	742.50	45.42		C1225-207-3500S	618.51	37.83
C1225-207-4000M			101.60	82.60	72.06		39.08		C1225-207-4000S		32.55
C1225-207-4500M			114.30	92.66	80.29		34.30		C1225-207-4500S		28.57
C1225-207-5000M			127.00	102.72	88.49		30.57		C1225-207-5000S		25.46
D13140			71.50	19.30	13.75		3.48		D23140		2.90
D13150			110.00	27.90	18.75		2.22		D23150		1.85
D13160	34.50	2.50	170.00	41.00	26.25	182.40	1.43		D23160	151.94	1.19
D13170			245.00	58.10	36.25		0.97		D23170		0.81
D13180			360.00	83.90	51.25		0.66		D23180		0.55
D13430			58.50	19.80	17.60		9.31		D23430		7.76
D13440			88.50	27.40	24.00		5.92		D23440		4.93
D13450	35.20	3.20	135.00	38.80	33.60	360.88	3.82		D23450	300.61	3.18
D13460			190.00	54.10	46.40		2.61		D23460		2.17
D13470			280.00	77.00	65.60		1.76		D23470		1.47
D13630			53.50	24.00	22.00		22.75		D23630		18.95
D13640			79.50	33.30	30.00		14.42		D23640		12.01
D13650	36.00	4.00	120.00	47.20	42.00	665.87	9.35		D23650	554.67	7.79
D13660			170.00	65.80	58.00		6.35		D23660		5.29
D13670			250.00	93.60	82.00		4.30		D23670		3.58
D13830			51.00	28.70	27.50		55.41		D23830		46.16
D13840			75.00	40.20	37.50		35.30		D23840		29.40
D13850	37.00	5.00	110.00	57.50	52.50	1225.83	22.85		D23850	1021.12	19.03
D13860			160.00	80.50	72.50		15.49		D23860		12.90
D13870			230.00	115.00	102.50		10.49		D23870		8.74
C1460-112-1500M			38.10	21.95	13.49		7.23		C1460-112-1500S		6.02
C1460-112-2000M	37.08	2.84	50.80	28.32	15.98	116.67	5.18		C1460-112-2000S	97.19	4.31
C1460-112-2500M			63.50	34.70	18.47		4.05		C1460-112-2500S		3.37
C1460-112-3000M			76.20	41.07	20.96		3.33		C1460-112-3000S		2.77



COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
C1460-112-3500M		2.84	88.90	47.45	23.47	116.67	2.82		C1460-112-3500S	97.19	2.35
C1460-112-4000M			101.60	53.82	25.96		2.43		C1460-112-4000S		2.02
C1460-125-1500M			38.10	23.19	15.65		10.63		C1460-125-1500S		8.85
C1460-125-2000M			50.80	29.95	18.75		7.60		C1460-125-2000S		6.33
C1460-125-2500M		3.18	63.50	36.68	21.82	158.39	5.90		C1460-125-2500S	131.94	4.91
C1460-125-3000M			76.20	43.41	24.92		4.83		C1460-125-3000S		4.02
C1460-125-3500M			88.90	50.17	27.99		4.08		C1460-125-3500S		3.40
C1460-125-4000M			101.60	56.90	31.09		3.54		C1460-125-4000S		2.95
C1460-135-1500M			38.10	24.16	17.32		14.06		C1460-135-1500S		11.71
C1460-135-2000M			50.80	31.19	20.90		10.00		C1460-135-2000S		8.33
C1460-135-2500M		3.43	63.50	38.23	24.46	196.11	7.76		C1460-135-2500S	163.36	6.46
C1460-135-3000M			76.20	45.26	28.02		6.34		C1460-135-3000S		5.28
C1460-135-3500M			88.90	52.30	31.57		5.36		C1460-135-3500S		4.46
C1460-135-4000M	37.08		101.60	59.33	35.38		4.64		C1460-135-4000S		3.87
C1460-148-1500M			38.10	25.40	19.51		19.91		C1460-148-1500S		16.59
C1460-148-2000M			50.80	32.82	23.70		14.06		C1460-148-2000S		11.71
C1460-148-2500M		3.76	63.50	40.26	27.89	252.91	10.87		C1460-148-2500S	210.68	9.05
C1460-148-3000M			76.20	47.68	32.08		8.86		C1460-148-3000S		7.38
C1460-148-3500M			88.90	55.09	36.27		7.48		C1460-148-3500S		6.23
C1460-148-4000M			101.60	62.53	40.46		6.48		C1460-148-4000S		5.40
C1460-162-1500M			38.10	26.70	21.77		28.44		C1460-162-1500S		23.69
C1460-162-2000M			50.80	34.54	26.64		19.96		C1460-162-2000S		16.63
C1460-162-2500M			63.50	42.39	31.52		15.37		C1460-162-2500S		12.80
C1460-162-3000M		4.11	76.20	50.24	36.40	324.44	12.50		C1460-162-3000S	270.26	10.41
C1460-162-3500M			88.90	58.09	41.28		10.52		C1460-162-3500S		8.76
C1460-162-4000M			101.60	65.94	46.15		9.11		C1460-162-4000S		7.59
C1460-162-4500M			114.30	73.79	51.03		8.00		C1460-162-4500S		6.66
C1460-162-5000M			127.00	81.64	55.91		7.14		C1460-162-5000S		5.95
C1687-135-1500M			38.10	22.94	15.37		11.28		C1687-135-1500S		9.40
C1687-135-2000M			50.80	29.49	18.14		8.02		C1687-135-2000S		6.68
C1687-135-2500M			63.50	36.02	20.90		6.22		C1687-135-2500S		5.18
C1687-135-3000M		3.43	76.20	42.57	23.67	170.80	5.08		C1687-135-3000S	142.28	4.23
C1687-135-3500M			88.90	49.10	26.44		4.29		C1687-135-3500S		3.57
C1687-135-4000M			101.60	55.65	29.21		3.71		C1687-135-4000S		3.09
C1687-135-4500M			114.30	62.20	31.98		3.27		C1687-135-4500S		2.72
C1687-135-5000M			127.00	68.73	34.75		2.92		C1687-135-5000S		2.43
C1687-148-1500M			38.10	24.05	17.32		15.71		C1687-148-1500S		13.09
C1687-148-2000M			50.80	30.94	20.62		11.10		C1687-148-2000S		9.25
C1687-148-2500M			63.50	37.80	23.93		8.58		C1687-148-2500S		7.15
C1687-148-3000M		3.76	76.20	44.65	27.20	220.49	6.99		C1687-148-3000S	183.67	5.82
C1687-148-3500M			88.90	51.54	30.51		5.90		C1687-148-3500S		4.91
C1687-148-4000M			101.60	58.39	33.81		5.10		C1687-148-4000S		4.25
C1687-148-4500M			114.30	65.28	37.11		4.50		C1687-148-4500S		3.75
C1687-148-5000M			127.00	72.14	40.39		4.01		C1687-148-5000S		3.34
C1687-162-1500M			38.10	25.25	19.43		22.03		C1687-162-1500S		18.35
C1687-162-2000M			50.80	32.49	23.32		15.44		C1687-162-2000S		12.86
C1687-162-2500M			63.50	39.70	27.18		11.91		C1687-162-2500S		9.92
C1687-162-3000M	42.85	4.11	76.20	46.94	31.06	283.12	9.68		C1687-162-3000S	235.83	8.06
C1687-162-3500M			88.90	54.18	34.95		8.16		C1687-162-3500S		6.80
C1687-162-4000M			101.60	61.42	38.84		7.04		C1687-162-4000S		5.86
C1687-162-4500M			114.30	68.66	42.72		6.20		C1687-162-4500S		5.16
C1687-162-5000M			127.00	75.87	46.61		5.53		C1687-162-5000S		4.61
C1687-177-1500M			38.10	26.49	21.62		31.12		C1687-177-1500S		25.92
C1687-177-2000M			50.80	34.11	26.14		21.66		C1687-177-2000S		18.04
C1687-177-2500M			63.50	41.76	30.66		16.62		C1687-177-2500S		13.84
C1687-177-3000M		4.50	76.20	49.38	35.18	361.44	13.47		C1687-177-3000S	301.08	11.22
C1687-177-3500M			88.90	57.00	39.70		11.33		C1687-177-3500S		9.44
C1687-177-4000M			101.60	64.64	44.22		9.77		C1687-177-4000S		8.14
C1687-177-4500M			114.30	72.26	48.77		8.60		C1687-177-4500S		7.16
C1687-177-5000M			127.00	79.91	53.29		7.67		C1687-177-5000S		6.39
C1687-192-1500M			38.10	27.66	23.72		43.32		C1687-192-1500S		36.09
C1687-192-2000M			50.80	35.69	28.88		29.93		C1687-192-2000S		24.93
C1687-192-2500M			63.50	43.71	34.04		22.85		C1687-192-2500S		19.03
C1687-192-3000M		4.88	76.20	51.74	39.19	451.92	18.49		C1687-192-3000S	376.45	15.40
C1687-192-3500M			88.90	59.77	44.37		15.51		C1687-192-3500S		12.92
C1687-192-4000M			101.60	67.79	49.53		13.38		C1687-192-4000S		11.15
C1687-192-4500M			114.30	75.82	54.69		11.75		C1687-192-4500S		9.79
C1687-192-5000M			127.00	83.87	59.84		10.47		C1687-192-5000S		8.72
D13480			82.00	21.20	17.60		4.76		D23480		3.97
D13490	43.20	3.20	125.00	29.70	24.00	288.32	3.03		D23490	240.17	2.52
D13500			190.00	42.30	33.60		1.96		D23500		1.63

COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
D13510	43.20	3.20	275.00	59.20	46.40	288.32	1.33		D23510	240.17	1.11
D13520			405.00	84.50	65.60		0.90		D23520		0.75
D13680			71.00	25.20	22.00		11.67		D23680		9.72
D13690			105.00	35.10	30.00		7.40		D23690		6.16
D13700		4.00	160.00	50.00	42.00	532.50	4.79		D23700	443.57	3.99
D13710			235.00	69.80	58.00		3.26		D23710		2.72
D13720	44.00		340.00	99.60	82.00		2.20		D23720		1.83
D13880			64.00	29.60	27.50		28.34		D23880		23.61
D13890		5.00	95.50	41.10	37.50	980.67	18.04		D23890	816.90	15.03
D13900			140.00	58.40	52.50		11.67		D23900		9.72
D13910			205.00	81.40	72.50		7.94		D23910		6.61
D13920	45	5	300	116	102.500	980.67	5.36		D23920	816.90	4.46
C1937-148-2000M			50.80	29.41	18.19		9.04		C1937-148-2000S		7.53
C1937-148-2500M			63.50	35.84	20.75		6.99		C1937-148-2500S		5.82
C1937-148-3000M			76.20	42.27	23.34		5.69		C1937-148-3000S		4.74
C1937-148-3500M		3.76	88.90	48.69	25.91	193.13	4.80		C1937-148-3500S	160.88	4.00
C1937-148-4000M			101.60	55.12	28.50		4.15		C1937-148-4000S		3.46
C1937-148-4500M			114.30	61.52	31.06		3.66		C1937-148-4500S		3.05
C1937-148-5000M			127.00	67.95	33.63		3.27		C1937-148-5000S		2.72
C1937-148-5500M			139.70	74.37	36.22		2.96		C1937-148-5500S		2.47
C1937-162-2000M			50.80	30.78	20.57		12.40		C1937-162-2000S		10.33
C1937-162-2500M			63.50	37.52	23.65		9.54		C1937-162-2500S		7.95
C1937-162-3000M			76.20	44.25	26.72		7.76		C1937-162-3000S		6.46
C1937-162-3500M		4.11	88.90	50.98	29.79	248.20	6.55		C1937-162-3500S	206.75	5.46
C1937-162-4000M			101.60	57.71	32.84		5.66		C1937-162-4000S		4.71
C1937-162-4500M			114.30	64.44	35.92		4.97		C1937-162-4500S		4.14
C1937-162-5000M			127.00	71.15	38.99		4.45		C1937-162-5000S		3.71
C1937-162-5500M			139.70	77.88	42.06		4.01		C1937-162-5500S		3.34
C1937-177-2500M			63.50	39.34	26.77		13.12		C1937-177-2500S		10.93
C1937-177-3000M			76.20	46.41	30.38		10.65		C1937-177-3000S		8.87
C1937-177-3500M			88.90	53.47	34.01		8.95		C1937-177-3500S		7.46
C1937-177-4000M	49.20	4.50	101.60	60.53	37.62	317.10	7.72		C1937-177-4000S	264.14	6.43
C1937-177-4500M			114.30	67.61	41.25		6.79		C1937-177-4500S		5.66
C1937-177-5000M			127.00	74.68	44.86		6.06		C1937-177-5000S		5.05
C1937-177-5500M			139.70	81.74	48.46		5.46		C1937-177-5500S		4.55
C1937-177-6000M			152.40	88.82	52.10		4.99		C1937-177-6000S		4.16
C1937-192-2500M			63.50	41.15	29.87		17.76		C1937-192-2500S		14.79
C1937-192-3000M			76.20	48.56	34.06		14.36		C1937-192-3000S		11.96
C1937-192-3500M			88.90	55.98	38.23		12.05		C1937-192-3500S		10.04
C1937-192-4000M		4.88	101.60	63.40	42.42	396.90	10.38		C1937-192-4000S	330.61	8.65
C1937-192-4500M			114.30	70.82	46.58		9.12		C1937-192-4500S		7.60
C1937-192-5000M			127.00	78.23	50.77		8.14		C1937-192-5000S		6.78
C1937-192-5500M			139.70	85.65	54.97		7.34		C1937-192-5500S		6.11
C1937-192-6000M			152.40	93.07	59.13		6.69		C1937-192-6000S		5.57
C1937-207-2500M			63.50	42.93	32.94		23.71		C1937-207-2500S		19.75
C1937-207-3000M			76.20	50.67	37.67		19.12		C1937-207-3000S		15.93
C1937-207-3500M			88.90	58.45	42.42		16.02		C1937-207-3500S		13.34
C1937-207-4000M		5.26	101.60	66.22	47.17	488.08	13.80		C1937-207-4000S	406.57	11.50
C1937-207-4500M			114.30	73.99	51.92		12.10		C1937-207-4500S		10.08
C1937-207-5000M			127.00	81.76	56.64		10.79		C1937-207-5000S		8.99
C1937-207-5500M			139.70	89.51	61.39		9.72		C1937-207-5500S		8.10
C1937-207-6000M			152.40	97.28	66.14		8.86		C1937-207-6000S		7.38
D13730			99.00	27.40	22.00		5.95		D23730		4.96
D13740			150.00	38.60	30.00		3.79		D23740		3.16
D13750	54.00	4.00	230.00	55.40	42.00	426.59	2.45		D23750	355.35	2.04
D13760			335.00	77.80	58.00		1.67		D23760		1.39
D13770			490.00	111.00	82.00		1.13		D23770		0.94
D13930			85.00	30.90	27.50		14.51		D23930		12.09
D13940			130.00	43.20	37.50		9.25		D23940		7.71
D13950	55.00		195.00	61.60	52.50	784.53	5.98		D23950	653.51	4.98
D13960			280.00	86.10	72.50		4.07		D23960		3.39
D13970		5.00	410.00	123.00	102.50		2.75		D23970		2.29
D13980			120.00	32.30	27.50		7.27		D23980		6.06
D13990			180.00	45.30	37.50		4.63		D23990		3.86
D14000	68.00		275.00	64.80	52.50	622.72	2.99		D24000	518.73	2.49
D14010			395.00	90.80	72.50		2.03		D24010		1.69
D14020			585.00	130.00	102.50		1.37		D24020		1.14
DH14030	34.50		100	78.50	71.00	1161.60	52.80				
DH14040		6.00	160	117.00	110.00	1427.10	33.19				
DH14050	37.00		380	215.00	180.00	2656.00	16.10				
DH14060	42.00		125	75.00	68.00	1370.00	27.40				



COMPRESSION SPRINGS - MUSIC WIRE									STAINLESS STEEL / INOX		
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)		Part Number	P_1 (N)	R (N/mm)
DH14070	42.50		120	75.00	68.00	1184.85	26.33				
DH14080			200	120.00	113.00	1228.80	15.36				
DH14090	47.50		110	63.00	56.00	1040.11	22.13				
DH14100			200	105.00	95.00	1153.30	12.14				
DH14110	52.50	6.00	120	63.00	56.00	896.61	15.73				
DH14120			250	164.00	110.00	676.82	7.87				
DH14130	57.50		110	51.00	44.00	893.20	15.14				
DH14140			250	102.00	95.00	970.88	6.56				
DH14150	62.50		120	48.00	41.00	894.96	12.43				
DH14160			250	90.00	83.00	916.80	5.73				
DH14170	39.50		200	147.00	138.00	2024.07	38.19				
DH14180	44.50		200	136.50	128.00	1713.87	26.99				
DH14190	49.50		200	122.50	114.50	1622.85	20.94				
DH14200	54.50		130	77.00	68.00	1368.99	25.83				
DH14210		7.00	250	136.50	126.00	1507.63	13.28				
DH14220	59.50		120	59.50	54.00	1401.03	24.59				
DH14230			250	112.00	103.00	1697.40	12.30				
DH14240	64.50		130	63.00	54.00	1254.81	18.73				
DH14250			250	112.00	103.00	1291.68	9.36				
DH14260	41.50		100	80.00	66.00	2825.80	141.29				
DH14270			160	128.00	117.00	2583.68	80.74				
DH14280	46.50		110	80.00	69.00	2790.00	93.00				
DH14290			200	144.00	134.00	2606.29	46.54				
DH14300	50.00		190	128.00	92.00	3385.20	54.60				
DH14310	51.50		120	80.00	69.00	2581.20	64.53				
DH14320	56.50	8.00	130	88.00	77.00	1738.38	41.39				
DH14330			250	152.00	142.00	2147.18	21.90				
DH14340	61.50		300	168.00	158.00	1927.20	14.60				
DH14350	66.50		300	152.00	141.00	1848.52	12.49				
DH14360	71.00		205	85.00	73.00	2400.00	20.00				
DH14370	76.50		300	128.00	117.00	1623.68	9.44				
DH14380	88.00		180	62.00	49.00	1781.80	15.10				
DH14390	44.00		120	92.50	84.00	4977.50	181.00				
DH14400	48.50		110	90.00	77.00	2761.20	138.06				
DH14410	53.50		120	90.00	78.00	2896.80	96.56				
DH14420	59.00	9.00	130	94.50	82.50	2274.40	64.07				
DH14430	64.00		160	108.00	96.00	2123.37	40.91				
DH14440	69.00		130	81.00	69.00	2205.98	45.02				
DH14450	79.00		160	85.50	73.50	1971.27	26.46				
DH14460	46.00		130	102.50	93.00	6985.00	254.00				
DH14470	51.00		110	90.00	76.00	4301.00	215.05				
DH14480	56.00		120	95.00	81.00	3553.00	142.12				
DH14490	60.00	10.00	110	75.00	61.00	5285.00	151.00				
DH14500	61.00		250	180.00	166.00	3421.60	48.88				
DH14510	73.00		135	79.50	61.00	4181.70	75.40				
DH14520	81.00		160	95.00	81.00	2521.25	38.65				
DH14530	91.00		150	80.00	66.00	2272.90	32.54				
DH14540	74.00	12.00	470	333.00	262.00	5891.00	43.00				

UK

HIGH PERFORMANCE COMPRESSION SPRINGS

These items offer high performance, in dimensions not available in our standard music wire or stainless steel lines.

MATERIALS
Either chrome vanadium or chrome silicon will be supplied, based on availability at time of shipment. Not recommended for application where the temperature exceeds 220ºC (425ºF).

COILED
Right hand or left hand, as per the following tables (to allow springs to be used in tandem if required).

ENDS
Part numbers starting with C00168, C00170, C00186, C00200, C00257, C00309, C00347, C00395 are squared only. All others are squared and ground.

ID & OD TOLERANCES
High performance springs are designed to fit in a hole and over a shaft as specified in the table.

LOADS & SPRING RATES
Rate is calculated and should be used as a reference only. Load (P) at L_1 is +/-10%

SURFACE FINISH
Standard finish is oil. Special finishes available upon request.

KEY TO MEASUREMENTS

Do = Outside Diameter
d = Wire diameter
Sh = Approx. Solid Height
Lo = Free Length
L_1 = Loaded length
P_1 = Load at L_1
R = Spring Rate
a = Hole Diameter
b = Shaft Diameter

F

RESSORTS DE COMPRESSION HAUTE PERFORMANCE

Ces ressorts offrent des performances élevées, dans des dimensions non disponibles dans nos gammes Corde à Piano et Inox.

MATERIAUX
Selon la disponibilité du stock, les matériaux fournis sont le chrome vanadium ou le chrome silicium. Pas recommandé pour les applications où la température excède 220°C (425°F).

ENROULEMENT
Enroulement à droite (RH) ou à gauche (LH), comme indiqué sur le tableau suivant, afin de permettre l'usage des ressorts en tandem.

EXTREMITES
Les références commençant par C00168, C00170, C00186, C00200, C00257, C00309, C00347, C00395 ont les extrémités rapprochées uniquement. Les autres les ont rapprochées et meulées.

TOLERANCES DES DIAMETRES INT. & EXT.
Cette gamme est conçue pour travailler dans un logement et autour d'un axe, comme spécifié dans le tableau.

CHARGES ET RAIDEURS
La raideur n'est donnée que pour référence. La charge (P) à L_1 est +/-10%.

ETAT DE SURFACE
Finition standard huilée. Finitions spéciales sur demande.

INDEX DES MESURES

Do = Diamètre extérieur
d = Diamètre du fil
Sh = Hauteur à bloc approx.
Lo = Longueur libre
L_1 = Longueur en charge
P_1 = Charge à L_1
R = Raideur
a = Diamètre de logement
b = Diamètre d'arbre

E

MUELLES/RESORTES DE ALTO RENDIMIENTO

Estos muelles/resortes proporcionan un alto rendimiento en aquellas dimensiones fuera del rango de nuestros muelles/resortes standard.

MATERIALES
Se suministran en cromo-vanadio o cromo-silicio, en función de disponibilidad de material. No se recomienda en aplicaciones las que se superen los 220ºC (425ºF).

ESPIRAS
A derechas o izquierdas como se muestra en las tablas (para pemitir uso en tándem).

EXTREMOS
Referencias comenzando con C00168, C00170, C00186, C00200, C00257, C00309, C00347 y C00395 sólo refrentadas. Resto refrentadas y rectificadas.

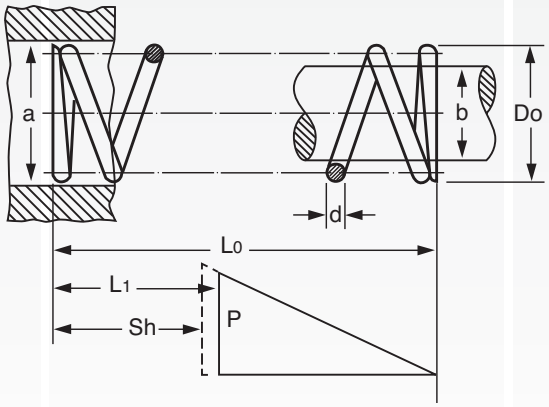
TOLERANCIAS DI Y DE
Los muelles/resortes de alto rendimiento están diseñados para entrar en el alojamiento y ejes de la tabla.

CARGAS Y COEFICIENTES COMPRESIÓN
Utilizar el coeficiente de compresión como referencia solamente. Fuerza (P) a L_1 +/-10%.

ACABADO SUPERFICIAL
Ligeramente lubricados. Acabados especiales bajo pedido.

CLAVES DE DIMENSIONES

Do = Diámetro Externo
d = Diámetro hilo
Sh = Longitud bloque
Lo = Longitud libre
L_1 = Longitud cargada
P_1 = Carga a L_1
R = Coeficiente carga
a = Diámetro alojamiento
b = Diámetro eje



D

HOCHLEISTUNG DRUCKFEDERN

Diese Druckfedern bieten eine Hochleistung bei Länge und Durchmesser, die bei unseren standard Federn nicht zur Verfügung stellen.

WERKSTOFFEN
Chrom Vanadium oder Chrom Silizium, abhängig von Verfügbarkeit. Nicht geignet für Arbeitstemperaturen höher als 220ºC (425ºF).

AUSFÜHRUNG
Rechts- oder Linksgewickelt, nach nächsten Tabellen (ermöglich Tandem Ausführung der Federn).

FEDERENDEN
Teilen anfangen mit C00168, C00170, C00186, C00200, C00257, C00309, C00347, C00395 nur angelegt. Andere, angelegt und geschliffen.

AD UND ID TOLERANZEN
Geignet für in Tabellen angegebenen Hülsen- und Dorndurchmessern.

FEDERKRAFT UND FEDERRATE
Federrate nur als Referenz berücksichtigen.. Federkraft (p) bei L_1 ist +/-10%.

OBERFLÄCHE
Standardmässig leicht eingeölt. Sondern Behandlungen verfügbar.

KENNZEICHNEN DER ABMESSUNGEN

Do = Äußerer Windungsdurchmesser
d = Drahtdurchmesser
Sh = Blocklänge der Feder
Lo = Länge der unbelasteten Feder
L_1 = Länge der belasteten Feder
P_1 = Federkraft bei Federlänge L_1
R = Federrate
a = Hülsendurchmesser
b = Dorndurchmesser

I

MOLLE A COMPRESSIONE HIGH PERFORMANCE

Questi articoli offrono alte prestazioni con dimensioni non disponibili nelle nostre molle standard in filo armonico o acciaio inossidabile.

MATERIALI
Sono fornibili sia in cromo vanadio che in cromo silicio, la scelta sarà basata a seconda della disponibilità al momento della spedizione. Si suggerisce di non utilizzarle per applicazioni che superano i 220°C (425°F).

AVVOLGIMENTO
Avvolgimento destro o sinistro secondo le seguenti tabelle (per permettere alle molle di essere utilizzate in tandem se richiesto)

ESTREMITA'
Codici che iniziano per C00168, C00170, C00186, C00200, C00257, C00309, C00347, C00395 sono solo squadrate. Tutti gli altri codici sono squadrati e rettificati.

TOLLERANZE DIAMETRI
Le molle high performance sono progettate per lavorare all'interno di una sede o all'esterno di un perno come specificato nella tabella.

CARICHI
Il carico flessionale unitario è calcolato e deve essere utilizzato solo come riferimento. Carico (P) a L_1 +/- 10%

FINITURE
Da standard la molla è oliata. Finiture speciali fornibili su richiesta.

LEGENDA

Do = Diametro Esterno
d = Diametro Filo
Sh = Lunghezza a blocco
(misura approssimativa)
Lo = Lunghezza Libera
L_1 = Lunghezza minima di lavoro
P_1 = Carico a L_1
R = Carico flessionale unitario
a = Diametro sede
b = Diametro perno

P

MOLAS DE COMPRESSÃO DE ALTA RENTABILIDADE

Esses itens oferecem alta rentabilidade em dimensões não oferecidas em fio corda de piano ou aço inox .

MATERIAL
Podemos fornecer em aço cromo vanádio ou silício, baseado na disponibilidade no embarque. Não recomendamos para temperaturas acima de 220 graus celcius (425 graus F).

SENTIDO DO ENROLAMENTO
Direito ou esquerdo, consultar tabela.(Permitir molas para serem usadas apertadas quando necessário)

EXTREMIDADES
Peças que começam com C00168, C00170, C00186, C00200, C00257, C00309, C00347, C00395 ,
São em esquadro. Todas as outras são em esquadro e retificadas.

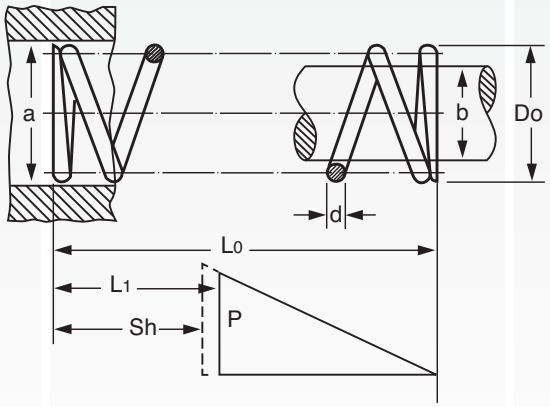
DIAMETROS INTERNOS E EXTERNOS (TOLERANCIAS)
Essa molas são projetadas para entrarem nos furos e hastes conforme tabela.

CARGAS E CONSTANTES
A constante é calculada e deverá ser usada como referencia: Carga (P) em L1 esta em + ou – 10%.

SUPERFICIE
Oleada ou sob consulta.

LEGENDA

Do = Diam externo
d = Diam do fio
Sh = Approx. Solido
Lo = Comprimento livre
L_1 = Comp min de trabalho
P_1 = Força em L_1
R = Constante
a = Hole Diameter
b = Shaft Diameter



HIGH PERFORMANCE COMPRESSION SPRINGS

Part Number		Do (mm)	d (mm)	L (mm)	a (mm)	b (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)
C00168003003				3.2			2.2	1.6		2.5
C00168003004				4.0			2.8	2.0		2.0
C00168003005				5.0			3.4	2.5		1.5
C00168003006				6.3			4.3	3.1		1.2
C00168003008	LH	1.68	0.25	8.0		1.1	5.5	4.0	2.45	1.0
C00168003010				10.0			6.8	5.0		0.8
C00168003013				12.5			8.5	6.2		0.6
C00168003016				16.0			11.0	8.0		0.5
C00168003020				20.0			13.7	10.0		0.4
C00168003025				25.0	1.8		17.0	12.5		0.3
C00170003003				3.2			2.5	2.1		6.4
C00170003004				4.0			3.1	2.6		5.0
C00170003005				5.0			3.9	3.2		3.9
C00170003006				6.3			4.9	4.1		3.2
C00170003008	RH	1.70	0.32	8.0			6.2	5.2	4.41	2.5
C00170003010				10.0			7.7	6.4		1.9
C00170003013				12.5		1.0	9.7	8.0		1.6
C00170003016				16.0			12.5	10.4		1.3
C00170003020				20.0			15.6	13.0		1.0
C00170003025				25.0			19.3	16.0		0.8
C00186004010				10.0			8.3	7.3		4.6
C00186004013	LH	1.86	0.4	12.5			10.5	9.3	7.85	3.9
C00186004016				16.0			13.5	12.0		3.1
C00186004020				20.0			16.9	15.0		2.5
C00188003003				3.2			2.2	1.6		3.1
C00188003004				4.0			2.8	2.0		2.5
C00188003005				5.0			3.4	2.5		2.0
C00188003006				6.3			4.3	3.1		1.6
C00188003008	RH	1.88	0.28	8.0		1.3	5.5	4.0	3.14	1.3
C00188003010				10.0	2.0		6.8	5.0		1.0
C00188003013				12.5			8.5	6.2		0.8
C00188003016				16.0			11.0	8.0		0.6
C00188003020				20.0			13.7	10.0		0.5
C00188003025				25.0			17.0	12.5		0.4
C00190004010				10.0			7.7	6.4		2.4
C00190004013				12.5			9.7	8.0		1.9
C00190004016				16.0			12.5	10.4		1.6
C00190004020		1.90	0.36	20.0		1.1	15.6	13.0	5.49	1.2
C00190004025				25.0			19.3	16.0		1.0
C00190004032				32.0			24.9	20.8		0.8
C00190004040				40.0			31.2	26.0		0.6
C00200003006				6.3			3.9	2.5		0.9
C00200003008				8.0			5.0	3.2		0.7
C00200003010				10.0			6.2	4.0		0.6
C00200003013		2.00	0.25	12.5	2.1	1.4	7.7	5.0	2.16	0.4
C00200003016	LH			16.0			10.0	6.4		0.4
C00200003020				20.0			12.5	8.0		0.3
C00200003025				25.0			15.4	10.0		0.2
C00200003032				32.0			20.0	13.0		0.2
C00208005003				3.2			2.7	2.4		19.5
C00208005004				4.0			3.4	3.0		15.6
C00208005005				5.0			4.2	3.8		12.5
C00208005006				6.3			5.3	4.7		9.7
C00208005008		2.08	0.45	8.0		1.1	6.7	6.0	9.81	7.8
C00208005010				10.0			8.3	7.3		5.8
C00208005013				12.5			10.5	9.3		4.9
C00208005016				16.0			13.5	12.0		3.9
C00208005020				20.0			16.9	15.0		3.1
C00212004004				4.0			3.1	2.6		7.8
C00212004005				5.0	2.3		3.9	3.2		6.1
C00212004006				6.3			4.9	4.1		5.0
C00212004008				8.0			6.2	5.2		3.9
C00212004010				10.0			7.7	6.4		3.0
C00212004013		2.12	0.4	12.5		1.3	9.7	8.0	6.86	2.4
C00212004016	RH			16.0			12.5	10.4		1.9
C00212004020				20.0			15.6	13.0		1.6
C00212004025				25.0			19.3	16.0		1.2
C00212004032				32.0			24.9	20.8		1.0
C00212004040				40.0			31.2	26.0		0.8
C00214003003		2.14	0.32	3.2		1.4	2.2	1.6	3.92	3.9
C00214003004				4.0			2.8	2.0		3.1

HIGH PERFORMANCE COMPRESSION SPRINGS

Part Number		Do (mm)	d (mm)	L (mm)	a (mm)	b (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)
C00214003005				5.0			3.4	2.5		2.5
C00214003006				6.3			4.3	3.1		2.0
C00214003008				8.0			5.5	4.0		1.6
C00214003010		2.14	0.32	10.0	2.3	1.4	6.8	5.0	3.92	1.2
C00214003013				12.5			8.5	6.2		1.0
C00214003016				16.0			11.0	8.0		0.8
C00214003020				20.0			13.7	10.0		0.6
C00214003025				25.0			17.0	12.5		0.5
C00232005004				4.0			3.4	3.0		19.5
C00232005005	RH			5.0			4.2	3.8		15.6
C00232005006				6.3			5.3	4.7		12.2
C00232005008				8.0			6.7	6.0		9.7
C00232005010		2.32	0.5	10.0		1.3	8.3	7.3	12.26	7.2
C00232005013				12.5			10.5	9.3		6.1
C00232005016				16.0			13.5	12.0		4.9
C00232005020				20.0			16.9	15.0		3.9
C00232005025				25.0			21.0	18.7		3.1
C00240003040				40.0			22.0	12.0		0.1
C00240003050			0.25	50.0	2.5	1.8	27.5	14.0	1.77	0.1
C00240003063				63.0			35.0	18.0		0.1
C00240005013				12.5			9.7	8.0		3.1
C00240005016		2.40		16.0			12.5	10.4		2.5
C00240005020	LH		0.45	20.0		1.4	15.6	13.0	8.83	2.0
C00240005025				25.0			19.3	16.0		1.6
C00240005032				32.0			24.9	20.8		1.3
C00240005040				40.0			31.2	26.0		1.0
C00242004003				3.2			2.2	1.6		4.9
C00242004004				4.0			2.8	2.0		3.9
C00242004005				5.0			3.4	2.5		3.1
C00242004006				6.3			4.3	3.1		2.5
C00242004008				8.0			5.5	4.0		2.0
C00242004010				10.0			6.8	5.0		1.5
C00242004013		2.42	0.36	12.5		1.6	8.5	6.2	4.90	1.2
C00242004016				16.0			11.0	8.0		1.0
C00242004020				20.0			13.7	10.0		0.8
C00242004025				25.0			17.0	12.5		0.6
C00242004032				32.0			22.0	16.0		0.5
C00242004040				40.0			27.5	20.0		0.4
C00242004050				50.0			34.0	25.0		0.3
C00257003008				8.0			5.0	3.2		1.2
C00257003010				10.0			6.2	4.0		0.9
C00257003013				12.5			7.7	5.0		0.7
C00257003016		2.57	0.32	16.0	2.7	1.8	10.0	6.4	3.53	0.6
C00257003020				20.0			12.5	8.0		0.5
C00257003025				25.0			15.4	10.0		0.4
C00257003032				32.0			20.0	13.0		0.3
C00257003040	RH			40.0			25.0	16.0		0.2
C00262005005				5.0			4.2	3.8		19.9
C00262005006				6.3			5.3	4.7		15.6
C00262005008				8.0			6.7	6.0		12.5
C00262005010		2.62	0.56	10.0	2.8	1.4	8.3	7.3	15.69	9.2
C00262005013				12.5			10.5	9.3		7.8
C00262005016				16.0			13.5	12.0		6.2
C00262005020				20.0			16.9	15.0		5.0
C00262005025				25.0			21.0	18.7		4.0
C00268003004				4.0			2.2	1.2		1.2
C00268003016				16.0			9.0	4.8		0.3
C00268003020				20.0			11.0	6.0		0.2
C00268003025		2.68	0.28	25.0		2.0	13.8	7.0	2.16	0.2
C00268003032				32.0			18.0	9.5		0.2
C00268003040				40.0			22.0	12.0		0.1
C00268003050				50.0			27.5	14.0		0.1
C00268003063				63.0			35.0	18.0		0.1
C00270004005				5.0			3.4	2.5		3.9
C00270004006				6.3			4.3	3.1		3.1
C00270004008				8.0			5.5	4.0		2.5
C00270004010		2.70	0.4	10.0		1.8	6.8	5.0	6.18	1.9
C00270004013				12.5			8.5	6.2		1.5
C00270004016				16.0			11.0	8.0		1.2
C00270004020				20.0			13.7	10.0		1.0
C00270004025				25.0			17.0	12.5		0.8

HIGH PERFORMANCE COMPRESSION SPRINGS

Part Number		Do (mm)	d (mm)	L (mm)	a (mm)	b (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)
C00270004032				32.0			22.0	16.0		0.6
C00270004040			0.4	40.0		1.8	27.5	20.0	6.18	0.5
C00270004050				50.0			34.0	25.0		0.4
C00270005005				5.0			3.9	3.2		9.5
C00270005006				6.3			4.9	4.1		7.8
C00270005008	RH	2.7		8.0	2.8		6.2	5.2		6.1
C00270005010				10.0			7.7	6.4		4.8
C00270005013			0.5	12.5		1.6	9.7	8.0	10.79	3.8
C00270005016				16.0			12.5	10.4		3.1
C00270005020				20.0			15.6	13.0		2.4
C00270005025				25.0			19.3	16.0		1.9
C00270005032				32.0			24.9	20.8		1.5
C00270005040				40.0			31.2	26.0		1.2
C00284004008		2.84	0.36	8.0	3.0	2.0	5.0	3.2	4.41	1.5
C00300003004				4.0			2.2	1.2		1.5
C00300003005				5.0			2.8	1.4		1.2
C00300003006				6.3			3.5	1.8		1.0
C00300003008				8.0			4.4	2.4		0.8
C00300003010				10.0			5.5	3.0		0.6
C00300003013				12.5			6.9	4.5		0.5
C00300003016			0.32	16.0		2.2	9.0	4.8	2.75	0.4
C00300003020				20.0			11.0	6.0		0.3
C00300003025				25.0			13.8	7.0		0.2
C00300003032				32.0			18.0	9.5		0.2
C00300003040				40.0			22.0	12.0		0.2
C00300003050				50.0			27.5	14.0		0.1
C00300003063				63.0			35.0	18.0		0.1
C00300005016		3.00		16.0	3.2		12.5	10.4		3.9
C00300005020				20.0			15.6	13.0		3.1
C00300005025			0.56	25.0		1.8	19.3	16.0	13.73	2.4
C00300005032				32.0			24.9	20.8		1.9
C00300005040	LH			40.0			31.2	26.0		1.6
C00300006005				5.0			4.2	3.8		24.9
C00300006006				6.3			5.3	4.7		19.5
C00300006008				8.0			6.7	6.0		15.6
C00300006010				10.0			8.3	7.3		11.5
C00300006013				12.5			10.5	9.3		9.7
C00300006016			0.63	16.0		1.6	13.5	12.0	19.61	7.8
C00300006020				20.0			16.9	15.0		6.2
C00300006025				25.0			21.0	18.7		4.9
C00300006032				32.0			27.0	24.0		3.9
C00300006040				40.0			33.7	30.0		3.1
C00300006050				50.0			42.1	37.5		2.5
C00300006063				63.0			52.9	47.0		1.9
C00309003010				10.0			5.0	2.0		0.2
C00309003013				12.5			6.2	2.5		0.2
C00309003016				16.0			8.0	3.2		0.2
C00309003020		3.09	0.25	20.0	3.3	2.5	10.0	4.0	1.23	0.1
C00309003025				25.0			12.5	5.0		0.1
C00309003032				32.0			16.0	6.4		0.1
C00309003040				40.0			20.0	8.0		0.1
C00320004010				10.0			6.2	4.0		1.4
C00320004013				12.5			7.7	5.0		1.1
C00320004016				16.0			10.0	6.4		0.9
C00320004020	RH	3.20	0.4	20.0	3.4	2.3	12.5	8.0	5.49	0.7
C00320004025				25.0			15.4	10.0		0.6
C00320004032				32.0			20.0	13.0		0.5
C00320004040				40.0			25.0	16.0		0.4
C00330007005				5.0			4.2	3.8		31.1
C00330007006				6.3			5.3	4.7		24.3
C00330007008				8.0			6.7	6.0		19.5
C00330007010				10.0			8.3	7.3		14.4
C00330007013				12.5			10.5	9.3		12.2
C00330007016		3.30	0.7	16.0	3.6	1.8	13.5	12.0	24.52	9.7
C00330007020	LH			20.0			16.9	15.0		7.8
C00330007025				25.0			21.0	18.7		6.2
C00330007032				32.0			27.0	24.0		4.9
C00330007040				40.0			33.7	30.0		3.9
C00330007050				50.0			42.1	37.5		3.1
C00330007063				63.0			52.9	47.0		2.4
C00332005006		3.32	0.5	6.3		2.3	4.3	3.1	9.81	4.9

HIGH PERFORMANCE COMPRESSION SPRINGS

Part Number		Do (mm)	d (mm)	L (mm)	a (mm)	b (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)
C00332005008				8.0			5.5	4.0		3.9
C00332005010				10.0			6.8	5.0		3.1
C00332005013				12.5			8.5	6.2		2.5
C00332005016				16.0			11.0	8.0		2.0
C00332005020	LH	3.32	0.5	20.0		2.3	13.7	10.0	9.81	1.6
C00332005025				25.0			17.0	12.5		1.2
C00332005032				32.0			22.0	16.0		1.0
C00332005040				40.0			27.5	20.0		0.8
C00332005050				50.0			34.0	25.0		0.6
C00336006006				6.3			4.9	4.1		12.7
C00336006008				8.0			6.2	5.2		10.0
C00336006010				10.0			7.7	6.4		7.8
C00336006013				12.5			9.7	8.0		6.2
C00336006016				16.0			12.5	10.4		5.0
C00336006020	RH	3.36	0.63	20.0	3.6	2.0	15.6	13.0	17.65	4.0
C00336006025				25.0			19.3	16.0		3.1
C00336006032				32.0			24.9	20.8		2.5
C00336006040				40.0			31.2	26.0		2.0
C00336006050				50.0			38.7	32.0		1.6
C00336006063				63.0			48.8	40.5		1.2
C00337004005				5.0			2.8	1.4		1.6
C00337004006				6.3			3.5	1.8		1.3
C00337004008				8.0			4.4	2.4		1.0
C00337004010				10.0			5.5	3.0		0.8
C00337004013				12.5			6.9	4.5		0.6
C00337004016	LH	3.37	0.36	16.0		2.5	9.0	4.8	3.53	0.5
C00337004020				20.0			11.0	6.0		0.4
C00337004025				25.0			13.8	7.0		0.3
C00337004032				32.0			18.0	9.5		0.3
C00337004040				40.0			22.0	12.0		0.2
C00337004050				50.0			27.5	14.0		0.2
C00337004063				63.0			35.0	18.0		0.1
C00347003010				10.0			5.0	2.0		0.3
C00347003013				12.5			6.2	2.5		0.2
C00347003016				16.0			8.0	3.2		0.2
C00347003020		3.47	0.3	20.0	3.7	2.8	10.0	4.0	1.57	0.2
C00347003025				25.0			12.5	5.0		0.1
C00347003032				32.0			16.0	6.4		0.1
C00347003040				40.0			20.0	8.0		0.1
C00347003050	RH			50.0			25.0	10.0		0.1
C00355005013				12.5			7.7	5.0		1.4
C00355005016				16.0			10.0	6.4		1.1
C00355005020				20.0			12.5	8.0		0.9
C00355005025		3.55	0.45	25.0	3.8	2.5	15.4	10.0	6.86	0.7
C00355005032				32.0			20.0	13.0		0.6
C00355005040				40.0			25.0	16.0		0.5
C00355005050				50.0			31.0	20.0		0.4
C00355005063				63.0			39.0	25.0		0.3
C00376007032				32.0			24.9	20.8		3.1
C00376007040		3.76	0.7	40.0		2.3	31.2	26.0	22.07	2.5
C00376007050				50.0			38.7	32.0		1.9
C00376007063				63.0			48.8	40.5		1.6
C00377005006				6.3			4.3	3.1		6.1
C00377005008				8.0			5.5	4.0		4.9
C00377005010				10.0			6.8	5.0		3.8
C00377005013				12.5			8.5	6.2		3.1
C00377005016				16.0			11.0	8.0		2.5
C00377005020		3.77	0.56	20.0		2.5	13.7	10.0	12.26	1.9
C00377005025				25.0			17.0	12.5		1.5
C00377005032	LH			32.0	4.0		22.0	16.0		1.2
C00377005040				40.0			27.5	20.0		1.0
C00377005050				50.0			34.0	25.0		0.8
C00377005063				63.0			43.0	31.0		0.6
C00377005080				80.0			55.0	40.0		0.5
C00380004005				5.0			2.8	1.4		2.0
C00380004006				6.3			3.5	1.8		1.6
C00380004008				8.0			4.4	2.4		1.2
C00380004010		3.80	0.4	10.0		2.8	5.5	3.0	4.41	1.0
C00380004013				12.5			6.9	4.5		0.8
C00380004016				16.0			9.0	4.8		0.6
C00380004020				20.0			11.0	6.0		0.5

HIGH PERFORMANCE COMPRESSION SPRINGS

Part Number		Do (mm)	d (mm)	L (mm)	a (mm)	b (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)
C00380004025				25.0			13.8	7.0		0.4
C00380004032				32.0			18.0	9.5		0.3
C00380004040	LH	3.80	0.4	40.0	4.0	2.8	22.0	12.0	4.41	0.2
C00380004050				50.0			27.5	14.0		0.2
C00380004063				63.0			35.0	18.0		0.2
C00380004080				80.0			44.0	24.0		0.1
C00395003010				10.0			5.0	2.0		0.4
C00395003013				12.5			6.2	2.5		0.3
C00395003016				16.0			8.0	3.2		0.2
C00395003020	RH	3.95	0.32	20.0	4.3	3.2	10.0	4.0	1.96	0.2
C00395003025				25.0			12.5	5.0		0.2
C00395003032				32.0			16.0	6.4		0.1
C00395003040				40.0			20.0	8.0		0.1
C00395003050				50.0			25.0	10.0		0.1
C00400005013				12.5			7.7	5.0		1.8
C00400005016				16.0			10.0	6.4		1.5
C00400005020				20.0			12.5	8.0		1.2
C00400005025	LH	4.00	0.5	25.0	4.2	2.8	15.4	10.0	8.83	0.9
C00400005032				32.0			20.0	13.0		0.7
C00400005040				40.0			25.0	16.0		0.6
C00400005050				50.0			31.0	20.0		0.5
C00400005063				63.0			39.0	25.0		0.4
C00416009006				6.3			5.3	4.7		38.9
C00416009008				8.0			6.7	6.0		31.1
C00416009010				10.0			8.3	7.3		23.1
C00416009013				12.5			10.5	9.3		19.5
C00416009016				16.0			13.5	12.0		15.6
C00416009020		4.16	0.9	20.0		2.3	16.9	15.0	39.23	12.5
C00416009025				25.0			21.0	18.7		9.9
C00416009032				32.0			27.0	24.0		7.8
C00416009040				40.0			33.7	30.0		6.2
C00416009050				50.0			42.1	37.5		5.0
C00416009063				63.0			52.9	47.0		3.9
C00420005006				6.3			3.5	1.8		2.0
C00420005008				8.0			4.4	2.4		1.5
C00420005010				10.0			5.5	3.0		1.2
C00420005013				12.5			6.9	4.5		1.0
C00420005016				16.0			9.0	4.8		0.8
C00420005020	RH	4.20	0.45	20.0		3.2	11.0	6.0	5.49	0.6
C00420005025				25.0			13.8	7.0		0.5
C00420005032				32.0	4.5		18.0	9.5		0.4
C00420005040				40.0			22.0	12.0		0.3
C00420005050				50.0			27.5	14.0		0.2
C00420005063				63.0			35.0	18.0		0.2
C00420005080				80.0			44.0	24.0		0.2
C00425008006				6.3			4.9	4.1		19.8
C00425008008				8.0			6.2	5.2		15.6
C00425008010				10.0			7.7	6.4		12.1
C00425008013				12.5			9.7	8.0		9.7
C00425008016				16.0			12.5	10.4		7.8
C00425008020		4.25	0.8	20.0		2.5	15.6	13.0	27.46	6.2
C00425008025				25.0			19.3	16.0		4.8
C00425008032				32.0			24.9	20.8		3.9
C00425008040				40.0			31.2	26.0		3.1
C00425008050				50.0			38.7	32.0		2.4
C00425008063				63.0			48.8	40.5		1.9
C00426006006				6.3			4.3	3.1		7.8
C00426006008				8.0			5.5	4.0		6.3
C00426006010				10.0			6.8	5.0		4.9
C00426006013				12.5			8.5	6.2		3.9
C00426006016				16.0			11.0	8.0		3.1
C00426006020		4.26	0.63	20.0		2.8	13.7	10.0	15.69	2.5
C00426006025				25.0			17.0	12.5		2.0
C00426006032	LH			32.0			22.0	16.0		1.6
C00426006040				40.0			27.5	20.0		1.3
C00426006050				50.0			34.0	25.0		1.0
C00426006063				63.0			43.0	31.0		0.8
C00426006080				80.0			55.0	40.0		0.6
C00465010020				20.0			16.9	15.0		15.6
C00465010025		4.65	1	25.0	5.0	2.5	21.0	18.7	49.04	12.4
C00465010032				32.0			27.0	24.0		9.7

HIGH PERFORMANCE COMPRESSION SPRINGS

Part Number		Do (mm)	d (mm)	L (mm)	a (mm)	b (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)
C00465010040				40.0			33.7	30.0		7.8
C00465010050	LH	4.65	1	50.0		2.5	42.1	37.5	49.04	6.2
C00465010063				63.0			52.9	47.0		4.9
C00470007008				8.0			5.5	4.0		7.8
C00470007010				10.0			6.8	5.0		6.1
C00470007013				12.5			8.5	6.2		4.9
C00470007016				16.0			11.0	8.0		3.9
C00470007020				20.0			13.7	10.0		3.1
C00470007025	RH	4.70	0.7	25.0		3.2	17.0	12.5	19.61	2.5
C00470007032				32.0			22.0	16.0		2.0
C00470007040				40.0	5.0		27.5	20.0		1.6
C00470007050				50.0			34.0	25.0		1.2
C00470007063				63.0			43.0	31.0		1.0
C00470007080				80.0			55.0	40.0		0.8
C00470007100				100.0			68.0	50.0		0.6
C00480009020				20.0			15.6	13.0		8.0
C00480009025				25.0			19.3	16.0		6.2
C00480009032				32.0			24.9	20.8		5.0
C00480009040		4.80	0.9	40.0		2.8	31.2	26.0	35.31	4.0
C00480009050				50.0			38.7	32.0		3.1
C00480009063				63.0			48.8	40.5		2.5
C00480009080				80.0			62.4	52.0		2.0
C00494004013				12.5			6.2	2.5		0.5
C00494004016				16.0			8.0	3.2		0.4
C00494004020				20.0			10.0	4.0		0.3
C00494004025		4.94	0.4	25.0	5.2	4.0	12.5	5.0	3.14	0.3
C00494004032				32.0			16.0	6.4		0.2
C00494004040				40.0			20.0	8.0		0.2
C00494004050	LH			50.0			25.0	10.0		0.1
C00494004063				63.0			31.0	12.6		0.1
C00510007016				16.0			10.0	6.4		2.3
C00510007020				20.0			12.5	8.0		1.8
C00510007025				25.0			15.4	10.0		1.4
C00510007032				32.0			20.0	13.0		1.1
C00510007040		5.10	0.65	40.0	5.4	3.6	25.0	16.0	13.73	0.9
C00510007050				50.0			31.0	20.0		0.7
C00510007063				63.0			39.0	25.0		0.6
C00510007080				80.0			50.0	32.0		0.5
C00510007100				100.0			62.0	40.0		0.4
C00512011006				6.3			5.3	4.7		61.3
C00512011008				8.0			6.7	6.0		49.0
C00512011010				10.0			8.3	7.3		36.3
C00512011013				12.5			10.5	9.3		30.7
C00512011016				16.0			13.5	12.0		24.5
C00512011020		5.12	1.12	20.0	5.6	2.8	16.9	15.0	61.78	19.6
C00512011025				25.0			21.0	18.7		15.6
C00512011032				32.0			27.0	24.0		12.3
C00512011040				40.0			33.7	30.0		9.8
C00512011050				50.0			42.1	37.5		7.8
C00512011063				63.0			52.9	47.0		6.1
C00512011080				80.0			67.4	60.0		4.9
C00640008025				25.0			15.4	10.0		2.2
C00640008032				32.0			20.0	13.0		1.8
C00640008040				40.0			25.0	16.0		1.4
C00640008050		6.40	0.8	50.0	6.8	4.5	31.0	20.0	21.58	1.1
C00640008063				63.0			39.0	25.0		0.9
C00640008080				80.0			50.0	32.0		0.7
C00640008100				100.0			62.0	40.0		0.6
C00640008125				125.0			77.0	50.0		0.4
C00660014008				8.0			6.7	6.0		77.8
C00660014010	RH			10.0			8.3	7.3		57.7
C00660014013				12.5			10.5	9.3		48.7
C00660014016				16.0			13.5	12.0		38.9
C00660014020				20.0			16.9	15.0		31.1
C00660014025		6.60	1.4	25.0	7.0	3.6	21.0	18.7	98.07	24.7
C00660014032				32.0			27.0	24.0		19.5
C00660014040				40.0			33.7	30.0		15.6
C00660014050				50.0			42.1	37.5		12.5
C00660014063				63.0			52.9	47.0		9.7
C00660014080				80.0			67.4	60.0		7.8
C00670007010	LH	6.70	0.7	10.0		5.0	5.5	3.0	13.73	3.1

HIGH PERFORMANCE COMPRESSION SPRINGS

Part Number		Do (mm)	d (mm)	L (mm)	a (mm)	b (mm)	L_1 (mm)	Sh (mm)	P_1 (N)	R (N/mm)
C00670007013				12.5			6.9	4.5		2.5
C00670007016				16.0			9.0	4.8		2.0
C00670007020				20.0			11.0	6.0		1.5
C00670007025				25.0			13.8	7.0		1.2
C00670007032				32.0			18.0	9.5		1.0
C00670007040	LH	6.7	0.7	40.0	7.0	5.0	22.0	12.0	13.73	0.8
C00670007050				50.0			27.5	14.0		0.6
C00670007063				63.0			35.0	18.0		0.5
C00670007080				80.0			44.0	24.0		0.4
C00670007100				100.0			55.0	30.0		0.3
C00670007125				125.0			69.0	35.0		0.2
C00670007160				160.0			90.0	48.0		0.2
C00800010025				25.0			15.4	10.0		3.7
C00800010032				32.0			20.0	13.0		2.9
C00800010040				40.0			25.0	16.0		2.4
C00800010050	RH	8.00	1	50.0	8.4	5.6	31.0	20.0	35.31	1.9
C00800010063				63.0			39.0	25.0		1.5
C00800010080				80.0			50.0	32.0		1.2
C00800010100				100.0			62.0	40.0		0.9
C00800010125				125.0			77.0	50.0		0.7
C00850016016				16.0			12.5	10.4		31.1
C00850016020				20.0			15.6	13.0		24.9
C00850016025				25.0			19.3	16.0		19.4
C00850016032				32.0			24.9	20.8		15.6
C00850016040	LH	8.50	1.6	40.0	9.0	5.0	31.2	26.0	109.84	12.5
C00850016050				50.0			38.7	32.0		9.7
C00850016063				63.0			48.8	40.5		7.8
C00850016080				80.0			62.4	52.0		6.2
C00850016100				100.0			77.3	64.0		4.8
C00850016125				125.0			96.7	80.0		3.9
C00860009010				10.0			5.5	3.0		4.8
C00860009013				12.5			6.9	4.5		3.9
C00860009016				16.0			9.0	4.8		3.1
C00860009020				20.0			11.0	6.0		2.4
C00860009025				25.0			13.8	7.0		1.9
C00860009032				32.0			18.0	9.5		1.5
C00860009040		8.60	0.9	40.0		6.3	22.0	12.0	21.58	1.2
C00860009050				50.0			27.5	14.0		1.0
C00860009063				63.0			35.0	18.0		0.8
C00860009080				80.0			44.0	24.0		0.6
C00860009100				100.0			55.0	30.0		0.5
C00860009125	RH			125.0			69.0	35.0		0.4
C00860009160				160.0			90.0	48.0		0.3
C00860009200				200.0			110.0	60.0		0.2
C00860009250				250.0			138.0	70.0		0.2
C00865007025				25.0			12.5	5.0		0.8
C00865007032				32.0			16.0	6.4		0.6
C00865007040				40.0			20.0	8.0		0.5
C00865007050		8.65	0.7	50.0	9.1	7.0	25.0	10.0	9.81	0.4
C00865007063				63.0			31.0	12.6		0.3
C00865007080				80.0			40.0	16.0		0.2
C00865007100				100.0			50.0	20.0		0.2
C00865007125				125.0			62.0	25.0		0.2
C00990008025				25.0			12.5	5.0		1.0
C00990008032				32.0			16.0	6.4		0.8
C00990008040				40.0			20.0	8.0		0.6
C00990008050		9.90	0.8	50.0		8.0	25.0	10.0	12.26	0.5
C00990008063				63.0			31.0	12.6		0.4
C00990008080				80.0			40.0	16.0		0.3
C00990008100				100.0			50.0	20.0		0.2
C00990008125				125.0	10.5		62.0	25.0		0.2
C01000013032				32.0			20.0	13.0		4.6
C01000013040	LH			40.0			25.0	16.0		3.7
C01000013050				50.0			31.0	20.0		2.9
C01000013063		10.00	1.25	63.0		7.0	39.0	25.0		2.3
C01000013080				80.0			50.0	32.0	54.92	1.8
C01000013100				100.0			62.0	40.0		1.4
C01000013125				125.0			77.0	50.0		1.1
C01000013160				160.0			100.0	64.0		0.9
C01340014016		13.40	1.4	16.0	14.0	10.0	9.0	4.8		7.8
C01340014020				20.0			11.0	6.0		6.1

HIGH PERFORMANCE COMPRESSION SPRINGS										
Part Number		**Do (mm)**	**d (mm)**	**L (mm)**	**a (mm)**	**b (mm)**	**L_1 (mm)**	**Sh (mm)**	**P_1 (N)**	**R (N/mm)**
C01340014025				25.0			13.8	7.0		4.9
C01340014032				32.0			18.0	9.5		3.9
C01340014040				40.0			22.0	12.0		3.1
C01340014050				50.0			27.5	14.0		2.4
C01340014063				63.0			35.0	18.0		2.0
C01340014080	LH	13.40	1.4	80.0	14.0	10.0	44.0	24.0	54.92	1.5
C01340014100				100.0			55.0	30.0		1.2
C01340014125				125.0			69.0	35.0		1.0
C01340014160				160.0			90.0	48.0		0.8
C01340014200				200.0			110.0	60.0		0.6
C01340014250				250.0			138.0	70.0		0.5
C01340014320				320.0			180.0	95.0		0.4
C01380011040				40.0			20.0	8.0		1.2
C01380011050				50.0			25.0	10.0		1.0
C01380011063				63.0			31.0	12.6		0.8
C01380011080	RH	13.80	1.1	80.0	14.6	11.2	40.0	16.0	24.52	0.6
C01380011100				100.0			50.0	20.0		0.5
C01380011125				125.0			62.0	25.0		0.4
C01380011160				160.0			80.0	32.0		0.3
C01380011200				200.0			100.0	40.0		0.2

UK

EXTENSION SPRINGS

SPEC extension springs have a wide application for experimental, development, prototype and maintenance work and have been specified and designed to high precision standards.

MATERIALS

'E' part numbers

Music wire: ASTM A228 or AMS 5112

Stainless steel: Type 302 as per ASTM A313or AMS 5688 spring temper (Chemical and Physical only)

'T' part numbers

Music wire: DIN 17223 or JIS G4314 A313 SWP-A/B or AMS 5112

Stainless steel: Type 301, 302 or 304 as per DIN 17224 or JIS G4314 SUS 302/304 or AMS 5688 spring temper (chemical and physical only)

TOLERANCES

'E' part numbers

Outside Diameter	
1.45 to 3.02mm	+/-0.08mm
3.05 to 6.10mm	+/-0.13mm
6.12 to 12.70mm	+/-0.20mm
12.73 to 25.40mm	+/-0.38mm
25.43 to 31.12mm	+/-0.51mm
31.14 to 37.08mm	+/-0.76mm
37.11 to 50.08mm	+/-1.02mm
Load P	+/- 10%
Spring Rate R	+/- 10%

'T' part numbers

All dimension and forces to DIN 2097 (Grade 2)

KEY TO MEASUREMENTS

Do = Outside diameter
d = Wire diameter
Lo = Free length (reference use only inside hooks)
L_1 = Maximum extended length
P = Load at L_1
T = Initial tension
R = Spring rate

Initial tension is for reference only and may vary.

F

RESSORTS DE TRACTION

Les ressorts de traction SPEC offrent de larges possibilités d'application pour les travaux expérimentaux, l'étude de prototypes et les travaux de maintenance. Ils ont été étudiés selon des critères de haute précision.

MATÉRIAUX

Références commençant par 'E'

Corde à piano conforme à la norme DIN 17223, Classe C. No. 1,1200. - BS5216 ND3 ou HD3 - AMS 5112.

Fil en acier inoxydable suivant le norme DIN 17224. No. 1,4310, BS2056 EN58A. Commercial 302 AMS 5688 acier trempé pour ressorts.

Références commençant par 'T'

Corde à Piano suivant DIN 17223 ou JIS G4314 SWP-A/B ou AMS 5112.

Fil en acier inoxydable type 301, 302 ou 304 suivant DIN 17224 ou JIS G4314 SUS 302/304 ou AMS 5688 acier trempé pour ressorts.

TOLÉRANCES

Références commençant par 'E'

Do=Diamètre extérieur	
1.45 à 3.02 mm	+/-0.08mm
3.05 à 6.10 mm	+/-0.13mm
6.12 à 12.70 mm	+/-0.20mm
12.73 à 25.40 mm	+/-0.38mm
25.43 à 31.12 mm	+/-0.51mm
31.14 à 37.08 mm	+/-0.76mm
37.11 à 50.08 mm	+/-1.02mm
Charge P	+/-10%
Raideur H/mm, R	+/-10%

Références commençant par 'T'

Toutes les dimensions et charges sont conformes à la norme DIN 2097 (catégorie 2).

INDEX DES MESURES

Do = Diamètre extérieur
d = Diamètre du fil
Lo = Longueur libre
L_1 = Longueur de l'extension maximum
P_1 = Charge à L_1
T = Tension initiale
R = Raideur

La tension initiale est donnée à titre indicatif et peut varier.

E

MUELLES/RESORTES DE TRACCION

Los muelles/resortes de tracción de SPEC tienen un amplio número de aplicaciones en trabajos experimentales, de desarrollo, prototipos y de mantenimiento y han sido concebidos y diseñados según los más altos niveles de precisión.

MATERIALES

Referencia "E"

Alambre de piano: ASTM A228 ó AMS 5112

Acero inoxidable: Tipo 302 según ASTM A313 ó AMS 5688 templado (químico y mecánico solamente).

Referencia "T"

Alambre de piano: DIN 17223 ó JIS G4314 A313 SWP-A/B ó AMS 5112

Acero inoxidable : Tipo 301, 302 ó 304 según DIN 17224 ó JIS G4314 SUS 302/304 ó templado de resorte AMS 5688 (químico y mecánico solamente).

TOLERANCIAS

Referencia "E"

Diámetro externo	
1.45 a 3.02mm	+/-0.08mm
3.05 a 6.10mm	+/-0.13mm
6.12 a 12.70mm	+/-0.20mm
12.73 a 25.40mm	+/-0.38mm
25.43 a 31.12mm	+/-0.51mm
31.14 a 37.08mm	+/-0.76mm
37.11 a 50.08mm	+/-1.02mm
Carga P	+/- 10%
Coeficiente tracción R	+/- 10%

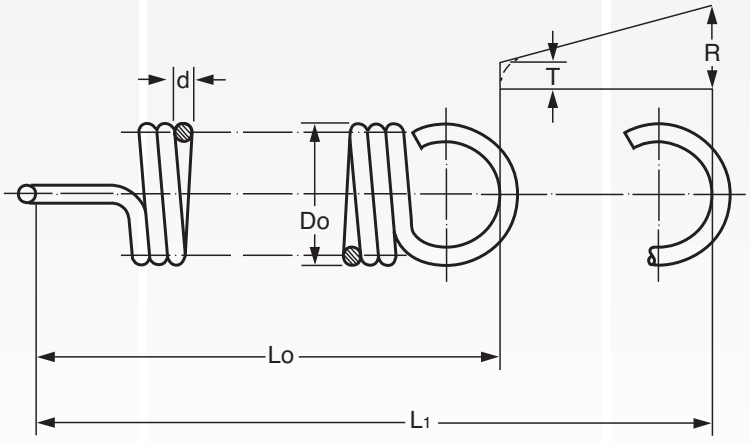
Referencia "T"

Todas las dimensiones y fuerzas según DIN 2097 (Grado 2).

CLAVES DE CARACTERÍSTICAS

Do = Diámetro exterior
d = Diámetro del alambre
Lo = Longitud libre
L_1 = Longitud máxima extendida
P_1 = Carga a L_1
T = Tensión inicial
R = Coeficiente de tracción

La tension inicial es solamente referencial y puede variar.



D

ZUGFEDERN

SPEC Zugfedern versehen Konstrukteure, Zeichner, Produktion und Wartung Abteilungen mit Präzision ausgeführten Federn in einer ökonomischen und zeitsparenden Weise.

WERKSTOFFE
'E' Teilen
Gezogener Federstahldraht: ASTM A228 oder AMS 5112

Rostfreier Federstahldraht: 302 nach ASTM A313 oder AMS 5688 gehärte Feder. (Chemisch und mechanisch ausschliesslich).

'T' Teilen
Gezogener Federstahldraht: DIN 17223 oder JIS G4314 A313 SWP-A/B oder AMS 5112

Rostfreier Federstahldraht: 301, 302 oder 304 nach DIN 17224 oder JIS G4314 SUS 302/304 oder AMS 5688 gehärte feder. (Chemisch und mechanisch ausschliesslich).

TOLERANZEN
'E' Teilen

Äußerer Durchmesser	
1.45 bis 3.02 mm	±0.08m
3.05 bis 6.10 mm	±0.13m
6.12 bis 12.70 mm	±0.20mm
12.73 bis 25.40 mm	±0.38mm
25.43 bis 31.12 mm	±0.51mm
31.14 bis 37.08 mm	±0.76mm
37.11 bis 50.08 mm	±1.02mm
Federkraft, P	±10%
Federrate, R	±10%

'T' Teilen
Massangaben und Kräften nach DIN 2097 (Klasse 2).

KENNZEICHNEN DER ABMESSUNGEN
Do = Äußerer Durchmesser
d = Drahtdurchmesser
Lo = Länge der unbelasteten Feder
L_1 = Maximale Länge der belasteten Feder
P = Federkraft bei Federlänge L_1
T = Innere Vorspannkraft
R = Federrate

Vorspannung ist nur zur Referenz aufgeführt und kann unterschiedlich sein.

I

MOLLE A TRAZIONE

Le molle a trazione SPEC offrono una vasta gamma di applicazioni per sperimentazione, sviluppo, prototipi, manutenzione e vengono progettate e fabbricate secondo i migliori standard di precisione.

MATERIALE
Codici 'E' iniziale
Filo Armonico: ASTM A228 o AMS 5112

Acciaio Inossidabile: Tipo 302 secondo ASTM A313 o AMS 5688 molla temprata (solo chimico o fisico)

Codici 'T' iniziale
Filo Armonico: DIN 17223 o JIS G4314 A313 SWP-A/B o AMS 5112

Acciaio inossidabile: Tipo 301, 302 o 304 secondo DIN 17224 o JIS G4314 SUS 302/304 o AMS 5688 molla temprata (solo chimico o fisico)

TOLLERANZE
Codici 'E' iniziale

Do = Diametro esterno	
da 1.45 a 3.02 mm	±0.08mm
da 3.05 a 6.10 mm	±0.13mm
da 6.12 a 12.70 mm	±0.20mm
da 12.73 a 25.40 mm	±0.38mm
da 25.43 a 31.12 mm	±0.51mm
da 31.14 a 37.08 mm	±0.76mm
da 37.11 a 50.08 mm	±1.02mm
Carico P	±10%
Compressione R	±10%

Codici 'T' iniziale
Dimensioni e forze secondo DIN 2097 (grado 2).

LEGENDA
Do = Diametro esterno
d = Diametro filo
Lo = Lunghezza libera
L_1 = Massima lung. estensione
P = Carico a L_1 Newtons
T = Tensione iniziale
R = Carico di trazione unit

La tensione iniziale è solo una misura di riferimento e può variare.

P

MOLAS DE TRACÇÃO

As molas de tracção SPEC têm um vasto campo de aplicações em projectos experimentais, de desenvolvimento, protótipos e de manutenção, sendo especificadas e concebidas em função dos mais elevados padrões de precisão.

MATERIAIS
PEÇAS " E "
Arame de aço conforme à norma DIN 17223 Classe C. Nº 1,1200, BS5216 ND3 ou HD3 – AMS 5112.

Arame de aço inoxidável conforme à norma DIN 17224 Nº 1,4310 BS 2056 EN58A. Têmpera de mola comercial 302 MAS 5688.

PEÇAS " T "
Fio de corda de piano: Din 17233 ou JIS G4314 A313 SWP-A/B AMS 5112

Aço inox: Tipo 301, 302 ou 304 , DIN 17224 ou JIS G4314 SUS 302/304 ou AMS 5688 (tempera de mola comercial)

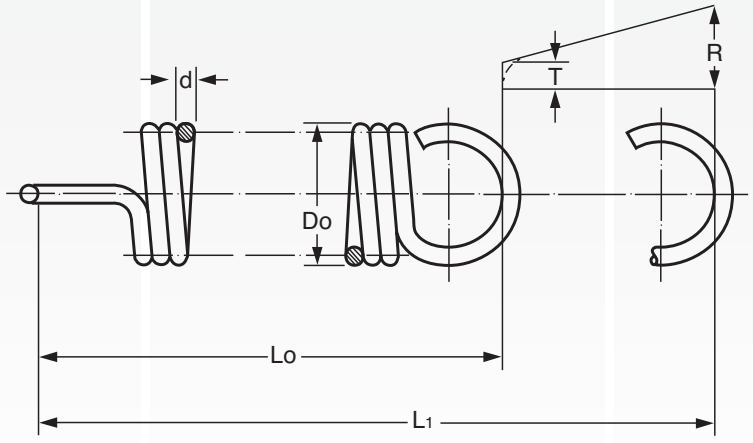
TOLERÂNCIAS
PEÇAS QUE COMEÇAM COM "T"

Do = Diâmetro exterior	
1.45 a 3.02 mm	± 0.08mm
3.05 a 6.10 mm	± 0.13mm
6.12 a 12.70 mm	± 0.20mm
12.73 a 25.40 mm	± 0.38mm
25.43 a 31.12 mm	± 0.51mm
31.14 a 37.08 mm	± 0.76mm
37.11 a 50.08 mm	± 1.02mm
Carga P	±10%
Coeficiente de compressão de mola, R	±10%

PEÇAS "T"
Todas as dimensões e forças conformes à especificação DIN 2097 (Graduação 2)

LEGENDA
Do Diâmetro exterior
D Diâmetro do arame
Lo Comprimento livre
(só para efeitos de referência entre ganchos)
L_1 Comprimento máximo em extensão
P Carga a L_1
T Tensão inicial
R Coeficiente de tracção

A tensão inicial é para a referência somente e pode variar.



UK

ADDITIONAL TECHNICAL DATA

EXTENSION SPRINGS

All SPEC extension springs have uniform body diameter and are produced with full twist loops the same diameter as the body. They are wound with initial tension, therefore some force is required before the coils are initially separated.

ENDS
German style closed loop. End position may vary. Special ends are available on request.

LOADS
Initial tension T is for reference only and will vary. To determine the load at any working length use the formula:
P = (rate x deflection) + Initial Tension
1lb = 4.448 Newtons
1 Newton = 0.225 lb

SURFACE FINISH
Music wire - oiled.
Stainless steel - plain wire.
Shot-peened and plated finishes supplied on request.
Allow sufficient additional time for special finishes.

F

DONNEES TECHNIQUES ADDITIONNELLES

RESSORTS DE TRACTION

Tous les ressorts de traction SPEC possèdent un diamètre de corps uniforme et sont produits avec des boucles d'accrochage fermées et de même diamètre que le corps du ressort.

Ils sont enroulés avec une tension initiale, donc un certain effort est nécessaire avant que les spires ne se séparent.

EXTREMITES
Boucles fermées allemandes. La position angulaire peut varier.

CHARGES
La tension initiale T est donnée pour référence uniquement et peut varier. Pour déterminer la charge à toute longueur de fonctionnement utiliser la formule:
P = (raideur x déflexion) + tension initiale.
1 kg = 9,80665N
1 N = 0,10197 kg.

ETAT DE SURFACE
Fil standard huilé. Finition par grenaillage et finition plaquée fournies à la demande. Prévoyez suffisamment de temps de livraison supplémentaire pour des états de surface spéciaux.

E

INFORMACIÓN TÉCNICA ADICIONAL

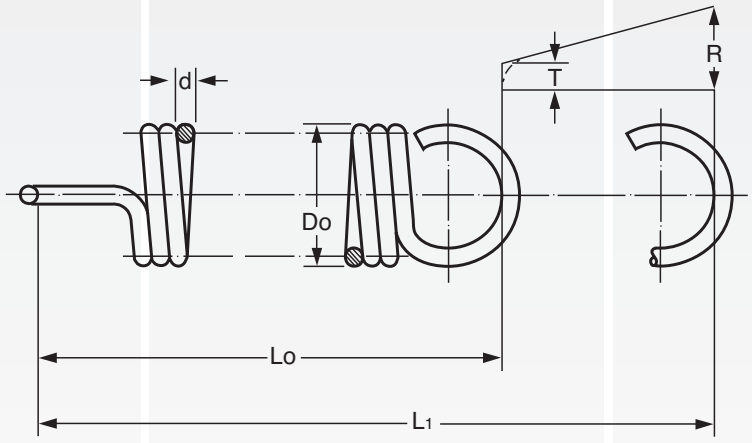
MUELLES/RESORTES DE TRACCION

Todos los muelles/resortes de tracción de SPEC tienen un diámetro uniforme de cuerpo y se fabrican con espiras enteras, cuyo diámetro es igual que el cuerpo. Se enrollan con una tensión inicial. Por lo tanto, es preciso aplicar un poco de fuerza antes de que se puedan separar las espiras.

EXTREMOS
Espiras alemanas cerradas. La posición del extremo puede variar.

CARGAS
La tension inicial T es solamente referencial y puede variar. Con el fin de determinar la carga a cualquier longitud de trabajo, utilice P = (L_Lx) x R donde Lx es la longitud de trabajo + tensión inicial.
1 lb = 4,448 Newtons
1 Newton = 0,225 lb

ACABADO SUPERFICIAL
Alambre de piano lubricado.
Acero inoxidable – alambre normal.
Bajo pedido granallado y con acabados especiales.
Requieren de un plazo superior.



D

ZUSÄTZLICHE TECHNISCHEN ANGABEN

ZUGFEDERN

Alle SPEC Zugfedern haben einen gleichmessigen äuseren Windungsdurchmesser. Die Ösenhöhe ist gleich wie die äusere Windungsdurchmesser. Die Zugfedern sind mit einer inneren Vorspannkraft hergestellt, die überwunden sein muss die Zugfedern zu öffenen.

FERDERENDEN
Deutsche Ösenform. Össenstellung kann abwandlen. Sondernösen verfugbar.

KRAFTWERTE
Die innere Vorspannkraft als Referenz nur berücksichtigen, da sie abwandeln könnte. Um die Kraft bei einer bestimmten Federlänge auszurechnen,
P = (Lo-Lx) x P/f + T, wo Lx die neue Belastetenlänge ist.
1 lb. = 4.448 Newtons
1 Newton = 0,225 lb.

OBERFLÄCHE
Gezogener Federstahldraht: Leicht eingeölt.
Rostfreier Federstahldraht: Nicht weiterbehandelt.
Kügelgestrahlt und andere sondern Behandlungen verfügbar.

I

ULTERIORI INFORMAZIONI TECNICHE

MOLLE A TRAZIONE

Tutte le molle a trazione SPEC hanno un diametro uniforme e vengono prodotte con ganci completamente avvolti, aventi lo stesso diametro del corpo molla.

Le molle sono avvolte con una tensione iniziale in modo che si debba esercitare una certa quantità di forza per separarne le spire.

ESTREMITA
Occhielli chiusi. Posizione estremità variabile.

CARICHI
La tensione iniziale riportata in tabella è indicativa e può variare. Per calcolare il carico di ogni lunghezza utilizzata moltiplicare: (carico traz. unit x deflessione) + tensione iniziale.
1 lb = 4.448 Newtons
1 Newtons = 0.225 lb.

FINITURA SUPERFICI
Acciaio armonico : Filo normale oliato.
Acciaio inossidabile : Filo liscio
Pallinatura e placcatura a richiesta.
Per finiture speciali la consegna è da concordare.

P

INFORMAÇÕES TECNICAS ADICIONAIS

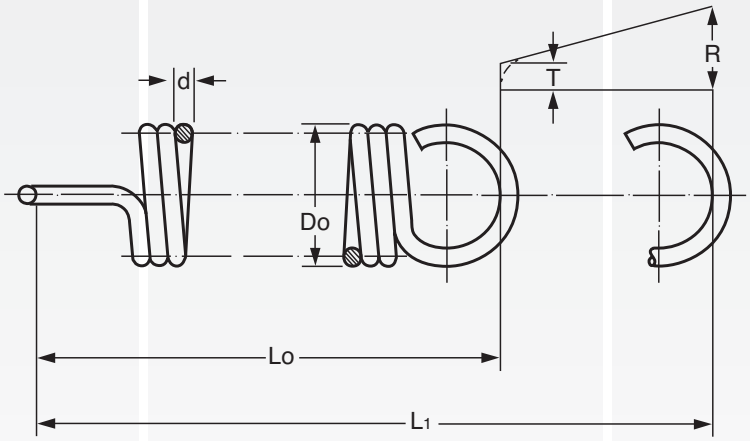
MOLAS DE TRACÇÃO

Todas as molas de tracção SPEC têm um diâmetro uniforme do corpo e são fabricadas com espiras torcidas inteiras, cujo diâmetro é igual ao do corpo.
O enrolamento é sujeito a uma tensão inicial. Para tanto, é necessária a aplicação de um pouco de força antes de se poder separar inicialmente as espiras.

EXTREMIDADES
Espiras alemãs fechadas. A posição da extremidade pode variar.

CARGAS
A tensão inicial é indicada apenas a título de referência e pode variar.
Para determinar a carga com qualquer comprimento de trabalho, utilize a seguinte fórmula (coeficiente de tracção x deflexão) + tensão inicial.
1 lb = 4,448 Newton
1 Newton = 0,225 lb

ACABAMENTO DE SUPERFICIE
Arame normal lubrificado. A pedido, podem ser fornecidas com acabamento granulado, e com acabamentos galvanizados. Deve ser tido em conta um período adicional para entrega de produtos com acabamento especial.



EXTENSION SPRINGS - MUSIC WIRE

Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)
E0063-007-0250-M			6.35	13.72			0.18
E0063-007-0310-M			7.87	18.54			0.12
E0063-007-0380-M		0.18	9.65	23.62	1.423	0.13	0.09
E0063-007-0440-M			11.18	28.45			0.07
E0063-007-0500-M			12.70	33.27			0.07
E0063-008-0250-M			6.35	11.68			0.35
E0063-008-0310-M			7.87	15.24			0.25
E0063-008-0380-M			9.65	19.05			0.19
E0063-008-0440-M		0.20	11.18	23.11	2.00	0.18	0.16
E0063-008-0500-M			12.70	26.67			0.12
E0063-008-0620-M			15.75	34.04			0.11
E0063-008-0750-M			19.05	41.66			0.09
E0063-009-0250-M	1.60		6.35	10.16			0.65
E0063-009-0310-M			7.87	13.21			0.47
E0063-009-0380-M			9.65	16.51			0.37
E0063-009-0440-M		0.23	11.18	19.56	2.76	0.27	0.30
E0063-009-0500-M			12.70	22.86			0.25
E0063-009-0620-M			15.75	28.70			0.19
E0063-009-0750-M			19.05	35.56			0.16
E0063-011-0250-M			6.35	8.64			1.94
E0063-011-0310-M			7.87	11.18			1.38
E0063-011-0380-M			9.65	13.97			1.03
E0063-011-0440-M		0.28	11.18	16.51	4.85	0.44	0.84
E0063-011-0500-M			12.70	18.80			0.72
E0063-011-0620-M			15.75	23.62			0.56
E0063-011-0750-M			19.05	28.96			0.44
E0094-010-0380-M			9.65	21.34			0.21
E0094-010-0440-M			11.18	26.16			0.16
E0094-010-0500-M			12.70	31.24			0.14
E0094-010-0620-M		0.25	15.75	40.64	2.67	0.22	0.11
E0094-010-0750-M			19.05	50.80			0.07
E0094-010-0880-M			22.35	59.18			0.05
E0094-010-1000-M			25.40	68.33			0.05
E0094-011-0380-M			9.65	18.29			0.33
E0094-011-0440-M			11.18	22.10			0.26
E0094-011-0500-M			12.70	26.16			0.21
E0094-011-0620-M		0.28	15.75	34.04	3.11	0.27	0.16
E0094-011-0750-M			19.05	42.67			0.12
E0094-011-0880-M			22.35	51.31			0.11
E0094-011-1000-M			25.40	59.18			0.09
E0094-012-0380-M			9.65	16.76			0.56
E0094-012-0440-M			11.18	20.83			0.42
E0094-012-0500-M			12.70	24.13			0.35
E0094-012-0620-M		0.30	15.75	30.99	4.45		0.26
E0094-012-0750-M			19.05	38.10			0.21
E0094-012-0880-M			22.35	46.23			0.18
E0094-012-1000-M	2.39		25.40	53.34		0.44	0.14
E0094-013-0380-M			9.65	15.24			0.81
E0094-013-0440-M			11.18	18.54			0.63
E0094-013-0500-M			12.70	21.59			0.53
E0094-013-0620-M		0.33	15.75	27.69	5.12		0.39
E0094-013-0750-M			19.05	34.29			0.30
E0094-013-0880-M			22.35	41.15			0.25
E0094-013-1000-M			25.40	47.24			0.21
E0094-014-0380-M			9.65	14.48			1.24
E0094-014-0440-M			11.18	17.27			0.96
E0094-014-0500-M			12.70	20.07			0.81
E0094-014-0620-M		0.36	15.75	25.65	6.67	0.76	0.60
E0094-014-0750-M			19.05	31.24			0.47
E0094-014-0880-M			22.35	37.85			0.39
E0094-014-1000-M			25.40	43.18			0.33
E0094-016-0380-M			9.65	13.21			2.49
E0094-016-0440-M			11.18	15.75			1.93
E0094-016-0500-M			12.70	18.03			1.61
E0094-016-0620-M		0.41	15.75	23.11	9.56	0.85	1.19
E0094-016-0750-M			19.05	28.45			0.93
E0094-016-0880-M			22.35	33.78			0.77
E0094-016-1000-M			25.40	38.61			0.65
T30800			7.90	9.61			7.98
T30810	2.50	0.50	10.90	13.64	16.10	2.45	4.98
T30820			15.40	19.68			3.19

STAINLESS STEEL / INOX

Part Number	P (N)	T (N)	R (N/mm)
E0063-007-0250S			0.15
E0063-007-0310S			0.10
E0063-007-0380S	1.18	0.11	0.07
E0063-007-0440S			0.06
E0063-007-0500S			0.06
E0063-008-0250S			0.29
E0063-008-0310S			0.20
E0063-008-0380S			0.16
E0063-008-0440S	1.67	0.15	0.13
E0063-008-0500S			0.10
E0063-008-0620S			0.09
E0063-008-0750S			0.07
E0063-009-0250S			0.54
E0063-009-0310S			0.39
E0063-009-0380S			0.31
E0063-009-0440S	2.30	0.22	0.25
E0063-009-0500S			0.20
E0063-009-0620S			0.16
E0063-009-0750S			0.13
E0063-011-0250S			1.62
E0063-011-0310S			1.15
E0063-011-0380S			0.86
E0063-011-0440S	4.04	0.37	0.70
E0063-011-0500S			0.60
E0063-011-0620S			0.47
E0063-011-0750S			0.37
E0094-010-0380S			0.18
E0094-010-0440S			0.13
E0094-010-0500S			0.12
E0094-010-0620S	2.22	0.18	0.09
E0094-010-0750S			0.06
E0094-010-0880S			0.04
E0094-010-1000S			0.04
E0094-011-0380S			0.28
E0094-011-0440S			0.22
E0094-011-0500S			0.18
E0094-011-0620S	2.59	0.22	0.13
E0094-011-0750S			0.10
E0094-011-0880S			0.09
E0094-011-1000S			0.07
E0094-012-0380S			0.47
E0094-012-0440S			0.35
E0094-012-0500S			0.29
E0094-012-0620S	3.71		0.22
E0094-012-0750S			0.18
E0094-012-0880S			0.15
E0094-012-1000S		0.37	0.12
E0094-013-0380S			0.67
E0094-013-0440S			0.53
E0094-013-0500S			0.44
E0094-013-0620S	4.26		0.32
E0094-013-0750S			0.25
E0094-013-0880S			0.20
E0094-013-1000S			0.18
E0094-014-0380S			1.04
E0094-014-0440S			0.80
E0094-014-0500S			0.67
E0094-014-0620S	5.56	0.63	0.50
E0094-014-0750S			0.39
E0094-014-0880S			0.32
E0094-014-1000S			0.28
E0094-016-0380S			2.07
E0094-016-0440S			1.60
E0094-016-0500S			1.34
E0094-016-0620S	7.96	0.71	0.99
E0094-016-0750S			0.77
E0094-016-0880S			0.64
E0094-016-1000S			0.54
T40800			6.65
T40810	13.41	2.04	4.15
T40820			2.66

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
T30930			8.80	10.78			8.18	T40930			6.81
T30940	2.80	0.55	12.10	15.27	19.00	2.79	5.11	T40940	15.83	2.33	4.26
T30950			17.00	21.96			3.27	T40950			2.72
T31050			9.70	11.55			12.10	T41050			10.08
T31060	3.00	0.63	13.50	16.46	26.20	3.92	7.51	T41060	21.82	3.27	6.26
T31070			19.20	23.82			4.81	T41070			4.01
E0120-014-0620-M			15.75	31.75			0.28	E0120-014-0620S			0.23
E0120-014-0750-M			19.05	40.13			0.21	E0120-014-0750S			0.18
E0120-014-0880-M			22.35	48.77			0.18	E0120-014-0880S			0.15
E0120-014-1000-M		0.36	25.40	56.64	4.98	0.44	0.14	E0120-014-1000S	4.15	0.37	0.12
E0120-014-1120-M			28.45	64.26			0.12	E0120-014-1120S			0.10
E0120-014-1250-M			31.75	72.90			0.11	E0120-014-1250S			0.09
E0120-014-1370-M			34.80	80.52			0.11	E0120-014-1370S			0.09
E0120-014-1500-M			38.10	89.15			0.09	E0120-014-1500S			0.07
E0120-016-0380-M			9.65	14.48			1.38	E0120-016-0380S			1.15
E0120-016-0500-M			12.70	20.83			0.81	E0120-016-0500S			0.67
E0120-016-0620-M			15.75	27.18			0.58	E0120-016-0620S			0.48
E0120-016-0750-M			19.05	34.04			0.44	E0120-016-0750S			0.37
E0120-016-0880-M			22.35	41.15			0.35	E0120-016-0880S			0.29
E0120-016-1000-M		0.41	25.40	45.97	7.12		0.30	E0120-016-1000S	5.93		0.25
E0120-016-1120-M			28.45	52.58			0.25	E0120-016-1120S			0.20
E0120-016-1250-M			31.75	58.67			0.23	E0120-016-1250S			0.19
E0120-016-1370-M			34.80	65.28			0.19	E0120-016-1370S			0.16
E0120-016-1500-M			38.10	71.63			0.18	E0120-016-1500S			0.15
E0120-016-1750-M			44.45	87.63			0.16	E0120-016-1750S			0.13
E0120-016-2000-M			50.80	100.84		0.89	0.12	E0120-016-2000S		0.74	0.10
E0120-018-0380-M			9.65	13.21			2.52	E0120-018-0380S			2.10
E0120-018-0500-M			12.70	18.80			1.51	E0120-018-0500S			1.25
E0120-018-0620-M			15.75	24.13			1.07	E0120-018-0620S			0.89
E0120-018-0750-M			19.05	30.23			0.82	E0120-018-0750S			0.69
E0120-018-0880-M			22.35	36.07			0.67	E0120-018-0880S			0.55
E0120-018-1000-M		0.46	25.40	40.64	9.79		0.58	E0120-018-1000S	8.16		0.48
E0120-018-1120-M			28.45	45.97			0.49	E0120-018-1120S			0.41
E0120-018-1250-M			31.75	51.56			0.44	E0120-018-1250S			0.37
E0120-018-1370-M	3.05		34.80	57.15			0.39	E0120-018-1370S			0.32
E0120-018-1500-M			38.10	62.74			0.35	E0120-018-1500S			0.29
E0120-018-1750-M			44.45	73.66			0.30	E0120-018-1750S			0.25
E0120-018-2000-M			50.80	84.84			0.25	E0120-018-2000S			0.20
E0120-018-2250-M			57.15	98.81			0.23	E0120-018-2250S			0.19
E0120-020-0500-M			12.70	17.27			2.64	E0120-020-0500S			2.20
E0120-020-0620-M			15.75	22.10			1.89	E0120-020-0620S			1.58
E0120-020-0750-M			19.05	27.43			1.45	E0120-020-0750S			1.21
E0120-020-0880-M			22.35	32.77			1.17	E0120-020-0880S			0.98
E0120-020-1000-M			25.40	36.83			1.05	E0120-020-1000S			0.88
E0120-020-1120-M		0.51	28.45	41.66	13.34	1.33	0.91	E0120-020-1120S	11.11	1.11	0.76
E0120-020-1250-M			31.75	46.74			0.79	E0120-020-1250S			0.66
E0120-020-1370-M			34.80	51.82			0.70	E0120-020-1370S			0.58
E0120-020-1500-M			38.10	56.64			0.65	E0120-020-1500S			0.54
E0120-020-1750-M			44.45	66.55			0.54	E0120-020-1750S			0.45
E0120-020-2000-M			50.80	76.45			0.46	E0120-020-2000S			0.38
E0120-020-2250-M			57.15	88.14			0.39	E0120-020-2250S			0.32
E0120-022-0620-M			15.75	20.57			3.20	E0120-022-0620S			2.67
E0120-022-0750-M			19.05	25.40			2.45	E0120-022-0750S			2.04
E0120-022-0880-M			22.35	30.23			2.00	E0120-022-0880S			1.66
E0120-022-1000-M			25.40	34.54			1.70	E0120-022-1000S			1.42
E0120-022-1120-M			28.45	39.12			1.49	E0120-022-1120S			1.24
E0120-022-1250-M		0.56	31.75	43.94	17.30	1.56	1.30	E0120-022-1250S	14.41	1.30	1.08
E0120-022-1370-M			34.80	48.26			1.17	E0120-022-1370S			0.98
E0120-022-1500-M			38.10	53.09			1.05	E0120-022-1500S			0.88
E0120-022-1750-M			44.45	62.23			0.88	E0120-022-1750S			0.73
E0120-022-2000-M			50.80	71.63			0.75	E0120-022-2000S			0.63
E0120-022-2250-M			57.15	80.77			0.67	E0120-022-2250S			0.55
E0120-022-2500-M			63.50	89.92			0.60	E0120-022-2500S			0.50
T30830			9.50	13.82			2.35	T40830			1.96
T30840			12.50	19.41			1.47	T40840			1.23
T30850		0.50	17.00	27.80	12.00	1.77	0.94	T40850	10.00	1.47	0.78
T30860	3.50		24.50	41.80			0.59	T40860			0.49
T30870			290.00	500.00			0.05	T40870			0.04
T30960			9.90	13.58			3.63	T40960			3.02
T30970		0.55	13.20	19.09	15.70	2.38	2.27	T40970	13.08	1.98	1.89
T30980			18.10	27.30			1.45	T40980			1.21

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
T30990		0.55	26.40	41.10	15.70	2.38	0.90	T40990	13.08	1.98	0.75
T31170	3.50		11.10	13.46			11.10	T41170			9.25
T31180		0.70	15.30	19.08	30.70	4.48	6.95	T41180	25.57	3.73	5.79
T31190			21.60	27.50			4.44	T41190			3.70
T31290			12.60	15.26			12.70	T41290			10.58
T31300	4.00	0.80	17.40	21.66	39.90	5.96	8.00	T41300	33.24	4.96	6.66
T31310			24.60	31.26			5.10	T41310			4.25
T31080			12.10	17.75			2.77	T41080			2.31
T31090		0.63	15.90	24.94	18.30	2.61	1.73	T41090	15.24	2.17	1.44
T31100	4.50		21.60	35.70			1.11	T41100			0.93
T31110			31.00	53.60			0.70	T41110			0.58
T31420			14.20	17.15			14.30	T41420			11.91
T31430		0.90	19.60	24.32	49.70	7.45	8.96	T41430	41.40	6.20	7.46
T31440			27.70	35.08			5.73	T41440			4.77
E0180-014-0620-M			15.75	44.45			0.11	E0180-014-0620S			0.09
E0180-014-0750-M			19.05	60.96			0.07	E0180-014-0750S			0.06
E0180-014-1000-M		0.36	25.40	93.73	3.42	0.31	0.05	E0180-014-1000S	2.85	0.26	0.04
E0180-014-1250-M			31.75	126.75			0.04	E0180-014-1250S			0.03
E0180-014-1500-M			38.10	159.51			0.02	E0180-014-1500S			0.02
E0180-018-0620-M			15.75	31.75			0.39	E0180-018-0620S			0.32
E0180-018-0750-M			19.05	42.16			0.26	E0180-018-0750S			0.22
E0180-018-0880-M			22.35	52.83			0.21	E0180-018-0880S			0.18
E0180-018-1000-M			25.40	62.48			0.18	E0180-018-1000S			0.15
E0180-018-1120-M			28.45	72.39			0.14	E0180-018-1120S			0.12
E0180-018-1250-M		0.46	31.75	82.80	6.89	0.62	0.12	E0180-018-1250S	5.74	0.52	0.10
E0180-018-1370-M			34.80	92.71			0.11	E0180-018-1370S			0.09
E0180-018-1500-M			38.10	103.12			0.09	E0180-018-1500S			0.07
E0180-018-1750-M			44.45	123.44			0.09	E0180-018-1750S			0.07
E0180-018-2000-M			50.80	143.76			0.07	E0180-018-2000S			0.06
E0180-018-2250-M			57.15	164.08			0.05	E0180-018-2250S			0.04
E0180-018-2500-M			63.50	184.66			0.05	E0180-018-2500S			0.04
E0180-020-0620-M			15.75	28.19			0.67	E0180-020-0620S			0.55
E0180-020-0750-M			19.05	37.08			0.47	E0180-020-0750S			0.39
E0180-020-0880-M			22.35	45.97			0.35	E0180-020-0880S			0.29
E0180-020-1000-M			25.40	54.10			0.30	E0180-020-1000S			0.25
E0180-020-1120-M			28.45	62.23			0.25	E0180-020-1120S			0.20
E0180-020-1250-M		0.51	31.75	71.12	9.25	0.85	0.21	E0180-020-1250S	7.71	0.71	0.18
E0180-020-1370-M			34.80	79.25			0.19	E0180-020-1370S			0.16
E0180-020-1500-M			38.10	88.14			0.18	E0180-020-1500S			0.15
E0180-020-1750-M			44.45	105.16			0.14	E0180-020-1750S			0.12
E0180-020-2000-M			50.80	122.17			0.12	E0180-020-2000S			0.10
E0180-020-2250-M			57.15	139.19			0.11	E0180-020-2250S			0.09
E0180-020-2500-M	4.57		63.50	156.46			0.09	E0180-020-2500S			0.07
E0180-022-0500-M			12.70	18.54			1.84	E0180-022-0500S			1.53
E0180-022-0620-M			15.75	25.65			1.10	E0180-022-0620S			0.92
E0180-022-0750-M			19.05	33.27			0.77	E0180-022-0750S			0.64
E0180-022-0880-M			22.35	40.89			0.60	E0180-022-0880S			0.50
E0180-022-1000-M			25.40	47.24			0.49	E0180-022-1000S			0.41
E0180-022-1120-M		0.56	28.45	54.10	11.56	0.89	0.42	E0180-022-1120S	9.63	0.74	0.35
E0180-022-1250-M			31.75	61.72			0.35	E0180-022-1250S			0.29
E0180-022-1370-M			34.80	68.58			0.32	E0180-022-1370S			0.26
E0180-022-1500-M			38.10	75.95			0.28	E0180-022-1500S			0.23
E0180-022-1750-M			44.45	90.17			0.23	E0180-022-1750S			0.19
E0180-022-2000-M			50.80	103.38			0.21	E0180-022-2000S			0.18
E0180-022-2250-M			57.15	121.41			0.18	E0180-022-2250S			0.15
E0180-022-2500-M			63.50	136.14			0.16	E0180-022-2500S			0.13
E0180-024-0620-M			15.75	23.88			1.73	E0180-024-0620S			1.44
E0180-024-0750-M			19.05	30.48			1.21	E0180-024-0750S			1.01
E0180-024-0880-M			22.35	37.34			0.93	E0180-024-0880S			0.77
E0180-024-1000-M			25.40	43.43			0.77	E0180-024-1000S			0.64
E0180-024-1120-M			28.45	49.78			0.65	E0180-024-1120S			0.54
E0180-024-1250-M		0.61	31.75	56.64	15.35	1.38	0.56	E0180-024-1250S	12.79	1.15	0.47
E0180-024-1370-M			34.80	62.74			0.51	E0180-024-1370S			0.42
E0180-024-1500-M			38.10	69.60			0.44	E0180-024-1500S			0.37
E0180-024-1750-M			44.45	82.55			0.37	E0180-024-1750S			0.31
E0180-024-2000-M			50.80	95.50			0.32	E0180-024-2000S			0.26
E0180-024-2250-M			57.15	108.46			0.28	E0180-024-2250S			0.23
E0180-024-2500-M			63.50	121.41			0.25	E0180-024-2500S			0.20
E0180-026-0500-M			12.70	16.76			4.26	E0180-026-0500S			3.55
E0180-026-0620-M		0.66	15.75	22.35	18.68	1.78	2.63	E0180-026-0620S	15.56	1.48	2.19
E0180-026-0750-M			19.05	28.45			1.86	E0180-026-0750S			1.55

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
E0180-026-0880-M			22.35	34.54			1.44	E0180-026-0880S			1.20
E0180-026-1000-M			25.40	39.88			1.19	E0180-026-1000S			0.99
E0180-026-1120-M			28.45	45.21			1.03	E0180-026-1120S			0.86
E0180-026-1250-M			31.75	51.05			0.89	E0180-026-1250S			0.74
E0180-026-1370-M		0.66	34.80	56.90	18.68	1.78	0.79	E0180-026-1370S	15.36	1.48	0.66
E0180-026-1500-M			38.10	62.74			0.70	E0180-026-1500S			0.58
E0180-026-1750-M			44.45	73.91			0.58	E0180-026-1750S			0.48
E0180-026-2000-M			50.80	85.34			0.49	E0180-026-2000S			0.41
E0180-026-2250-M			57.15	98.55			0.42	E0180-026-2250S			0.35
E0180-026-2500-M			63.50	110.24			0.37	E0180-026-2500S			0.31
E0180-029-0620-M			15.75	20.83			4.64	E0180-029-0620S			3.87
E0180-029-0750-M			19.05	26.16			3.31	E0180-029-0750S			2.76
E0180-029-0880-M			22.35	31.50			2.57	E0180-029-0880S			2.14
E0180-029-1000-M			25.40	36.32			2.14	E0180-029-1000S			1.78
E0180-029-1120-M			28.45	41.40			1.82	E0180-029-1120S			1.52
E0180-029-1250-M		0.74	31.75	46.74	25.89	2.31	1.58	E0180-029-1250S	21.57	1.92	1.31
E0180-029-1370-M			34.80	51.56			1.40	E0180-029-1370S			1.17
E0180-029-1500-M			38.10	56.90			1.24	E0180-029-1500S			1.04
E0180-029-1750-M			44.45	67.31			1.03	E0180-029-1750S			0.86
E0180-029-2000-M			50.80	77.47			0.88	E0180-029-2000S			0.73
E0180-029-2250-M			57.15	87.88			0.77	E0180-029-2250S			0.64
E0180-029-2500-M	4.57		63.50	98.04			0.68	E0180-029-2500S			0.57
E0180-031-0500-M			12.70	15.49			10.40	E0180-031-0500S			8.66
E0180-031-0620-M			15.75	20.07			6.62	E0180-031-0620S			5.51
E0180-031-0750-M			19.05	24.89			4.75	E0180-031-0750S			3.96
E0180-031-0880-M			22.35	29.97			3.70	E0180-031-0880S			3.08
E0180-031-1000-M		0.79	25.40	34.29	30.25	2.67	3.12	E0180-031-1000S	25.20	2.22	2.60
E0180-031-1120-M			28.45	38.86			2.66	E0180-031-1120S			2.22
E0180-031-1250-M			31.75	43.69			2.29	E0180-031-1250S			1.91
E0180-031-1370-M			34.80	48.51			2.03	E0180-031-1370S			1.69
E0180-031-1500-M			38.10	53.09			1.84	E0180-031-1500S			1.53
E0180-031-1750-M			44.45	62.48			1.52	E0180-031-1750S			1.27
E0180-031-2000-M			50.80	71.88			1.31	E0180-031-2000S			1.09
E0180-031-2250-M		0.79	57.15	81.28	30.25	2.67	1.14	E0180-031-2250S	25.20	2.22	0.95
E0180-031-2500-M			63.50	92.20			0.98	E0180-031-2500S			0.82
E0180-031-2750-M			69.85	101.85			0.89	E0180-031-2750S			0.74
E0180-034-0620-M			15.75	19.05			10.82	E0180-034-0620S			9.01
E0180-034-0750-M			19.05	23.62			7.83	E0180-034-0750S			6.52
E0180-034-0880-M			22.35	28.19			6.13	E0180-034-0880S			5.11
E0180-034-1000-M			25.40	32.51			5.11	E0180-034-1000S			4.26
E0180-034-1120-M			28.45	36.83			4.38	E0180-034-1120S			3.65
E0180-034-1250-M		0.86	31.75	41.40	39.90	3.60	3.78	E0180-034-1250S	33.24	3.00	3.15
E0180-034-1370-M			34.80	45.47			3.38	E0180-034-1370S			2.82
E0180-034-1500-M			38.10	50.04			3.01	E0180-034-1500S			2.51
E0180-034-1750-M			44.45	58.93			2.50	E0180-034-1750S			2.08
E0180-034-2000-M			50.80	67.82			2.14	E0180-034-2000S			1.78
E0180-034-2250-M			57.15	76.71			1.87	E0180-034-2250S			1.56
E0180-034-2500-M			63.50	85.34			1.66	E0180-034-2500S			1.39
E0180-034-2750-M			69.85	94.23			1.49	E0180-034-2750S			1.24
T31200			13.50	19.75			3.07	T41200			2.56
T31210		0.70	17.70	27.70	22.60	3.39	1.92	T41210	18.83	2.83	1.60
T31220			24.00	39.60			1.23	T41220			1.03
T31230	5.00		34.50	59.50			0.77	T41230			0.64
T31540			15.80	19.05			15.90	T41540			13.25
T31550		1.00	21.80	27.00	60.80	9.17	9.90	T41550	50.65	7.64	8.25
T31560			30.80	38.92			6.37	T41560			5.31
T30880			12.70	25.80			0.51	T40880			0.43
T30890			15.70	36.60			0.31	T40890			0.26
T30900		0.50	20.20	52.90	7.80	1.02	0.21	T40900	6.50	0.85	0.18
T30910			27.70	80.00			0.13	T40910			0.11
T30920			37.70	116.10			0.09	T40920			0.08
T31320	5.50		15.00	21.40			4.00	T41320			3.33
T31330			19.80	30.00			2.50	T41330			2.08
T31340		0.80	27.00	43.00	30.20	4.79	1.60	T41340	25.16	3.99	1.33
T31350			39.00	64.60			1.00	T41350			0.83
T31360			290.00	515.00			0.11	T41360			0.09
T31670			17.40	20.94			17.50	T41670			14.58
T31680		1.10	24.00	29.66	72.80	10.77	11.00	T41680	60.64	8.97	9.16
T31690			33.90	42.74			7.00	T41690			5.83
T31000	6.00	0.55	13.90	28.00	9.50	1.09	0.58	T41000	7.91	0.91	0.48
T31010			17.20	39.70			0.36	T41010			0.30

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
T31020			22.10	57.20			0.23	T41020			0.19
T31030			30.40	86.60			0.15	T41030			0.13
T31040	6.00	1.20	41.40	125.70	85.30	12.63	0.11	T41040	71.05	10.52	0.09
T31790			19.00	22.80			19.10	T41790			15.91
T31800			26.20	32.28			12.00	T41800			10.00
T31810			37.00	46.50			7.63	T41810			6.36
E0240-018-0620-M			15.75	32.51			0.28	E0240-018-0620S			0.23
E0240-018-0750-M			19.05	49.78			0.16	E0240-018-0750S			0.13
E0240-018-0880-M			22.35	68.07			0.11	E0240-018-0880S			0.09
E0240-018-1000-M			25.40	83.82			0.09	E0240-018-1000S			0.07
E0240-018-1250-M		0.46	31.75	118.11	5.25	0.49	0.05	E0240-018-1250S	4.37	0.41	0.04
E0240-018-1500-M			38.10	152.15			0.04	E0240-018-1500S			0.03
E0240-018-2000-M			50.80	219.46			0.04	E0240-018-2000S			0.03
E0240-018-2500-M			63.50	287.78			0.02	E0240-018-2500S			0.02
E0240-018-2750-M			69.85	321.82			0.02	E0240-018-2750S			0.02
E0240-022-0620-M			15.75	26.92			0.75	E0240-022-0620S			0.63
E0240-022-0750-M			19.05	38.86			0.42	E0240-022-0750S			0.35
E0240-022-0880-M			22.35	50.80			0.30	E0240-022-0880S			0.25
E0240-022-1000-M			25.40	61.98			0.23	E0240-022-1000S			0.19
E0240-022-1120-M			28.45	73.15			0.19	E0240-022-1120S			0.16
E0240-022-1250-M			31.75	85.09			0.16	E0240-022-1250S			0.13
E0240-022-1370-M		0.56	34.80	96.01	9.21	0.85	0.14	E0240-022-1370S	7.67	0.71	0.12
E0240-022-1500-M			38.10	108.20			0.12	E0240-022-1500S			0.10
E0240-022-1750-M			44.45	131.06			0.11	E0240-022-1750S			0.09
E0240-022-2000-M			50.80	154.18			0.09	E0240-022-2000S			0.07
E0240-022-2250-M			57.15	177.29			0.07	E0240-022-2250S			0.06
E0240-022-2500-M			63.50	200.41			0.05	E0240-022-2500S			0.04
E0240-022-2750-M			69.85	223.52			0.05	E0240-022-2750S			0.04
E0240-026-0500-M			12.70	15.24			5.06	E0240-026-0500S			4.22
E0240-026-0620-M			15.75	23.62			1.70	E0240-026-0620S			1.42
E0240-026-0750-M			19.05	32.77			0.98	E0240-026-0750S			0.82
E0240-026-0880-M			22.35	41.66			0.70	E0240-026-0880S			0.58
E0240-026-1000-M			25.40	50.04			0.53	E0240-026-1000S			0.44
E0240-026-1120-M			28.45	58.67			0.44	E0240-026-1120S			0.37
E0240-026-1250-M			31.75	67.06			0.37	E0240-026-1250S			0.31
E0240-026-1370-M			34.80	75.18			0.32	E0240-026-1370S			0.26
E0240-026-1500-M			38.10	83.31			0.28	E0240-026-1500S			0.23
E0240-026-1750-M		0.66	44.45	100.33	14.68	1.33	0.23	E0240-026-1750S	12.23	1.11	0.19
E0240-026-2000-M	6.10		50.80	116.84			0.19	E0240-026-2000S			0.16
E0240-026-2250-M			57.15	136.65			0.18	E0240-026-2250S			0.15
E0240-026-2500-M			63.50	153.92			0.14	E0240-026-2500S			0.12
E0240-026-2750-M			69.85	171.20			0.14	E0240-026-2750S			0.12
E0240-026-3000-M			76.20	188.47			0.12	E0240-026-3000S			0.10
E0240-026-3500-M			88.90	222.50			0.11	E0240-026-3500S			0.09
E0240-026-4000-M			101.60	257.56			0.09	E0240-026-4000S			0.07
E0240-026-4500-M			114.30	291.85			0.07	E0240-026-4500S			0.06
E0240-026-5000-M			127.00	326.64			0.07	E0240-026-5000S			0.06
E0240-029-0620-M			15.75	22.10			2.89	E0240-029-0620S			2.41
E0240-029-0750-M			19.05	29.72			1.72	E0240-029-0750S			1.43
E0240-029-0880-M			22.35	37.34			1.23	E0240-029-0880S			1.02
E0240-029-1000-M			25.40	44.20			0.96	E0240-029-1000S			0.80
E0240-029-1120-M			28.45	51.31			0.79	E0240-029-1120S			0.66
E0240-029-1250-M			31.75	58.93			0.67	E0240-029-1250S			0.55
E0240-029-1370-M			34.80	65.79			0.58	E0240-029-1370S			0.48
E0240-029-1500-M			38.10	73.41			0.51	E0240-029-1500S			0.42
E0240-029-1750-M		0.74	44.45	88.14	20.02	1.78	0.42	E0240-029-1750S	16.68	1.48	0.35
E0240-029-2000-M			50.80	102.62			0.35	E0240-029-2000S			0.29
E0240-029-2250-M			57.15	117.35			0.30	E0240-029-2250S			0.25
E0240-029-2500-M			63.50	131.83			0.26	E0240-029-2500S			0.22
E0240-029-2750-M			69.85	146.56			0.25	E0240-029-2750S			0.20
E0240-029-3000-M			76.20	161.04			0.21	E0240-029-3000S			0.18
E0240-029-3500-M			88.90	190.75			0.18	E0240-029-3500S			0.15
E0240-029-4000-M			101.60	219.71			0.16	E0240-029-4000S			0.13
E0240-029-4500-M			114.30	249.43			0.14	E0240-029-4500S			0.12
E0240-029-5000-M			127.00	278.38			0.12	E0240-029-5000S			0.10
E0240-031-0620-M			15.75	21.34			3.99	E0240-031-0620S			3.32
E0240-031-0750-M			19.05	28.19			2.42	E0240-031-0750S			2.02
E0240-031-0880-M		0.79	22.35	35.05	23.58	2.22	1.73	E0240-031-0880S	19.64	1.85	1.44
E0240-031-1000-M			25.40	41.66			1.31	E0240-031-1000S			1.09
E0240-031-1120-M			28.45	48.01			1.14	E0240-031-1120S			0.95
E0240-031-1250-M			31.75	54.36			0.93	E0240-031-1250S			0.77

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
E0240-031-1370-M			34.80	59.94			0.84	E0240-031-1370S			0.70
E0240-031-1500-M			38.10	67.06			0.74	E0240-031-1500S			0.61
E0240-031-1750-M			44.45	80.01			0.60	E0240-031-1750S			0.50
E0240-031-2000-M			50.80	92.71			0.51	E0240-031-2000S			0.42
E0240-031-2250-M			57.15	105.66			0.44	E0240-031-2250S			0.37
E0240-031-2500-M		0.79	63.50	118.36	23.58	2.22	0.39	E0240-031-2500S	19.64	1.85	0.32
E0240-031-2750-M			69.85	134.37			0.33	E0240-031-2750S			0.28
E0240-031-3000-M			76.20	147.57			0.30	E0240-031-3000S			0.25
E0240-031-3500-M			88.90	172.21			0.26	E0240-031-3500S			0.22
E0240-031-4000-M			101.60	198.37			0.23	E0240-031-4000S			0.19
E0240-031-4500-M			114.30	224.54			0.19	E0240-031-4500S			0.16
E0240-031-5000-M			127.00	250.70			0.18	E0240-031-5000S			0.15
E0240-034-0620-M			15.75	20.32			6.30	E0240-034-0620S			5.25
E0240-034-0750-M			19.05	26.42			3.87	E0240-034-0750S			3.22
E0240-034-0880-M			22.35	32.00			2.80	E0240-034-0880S			2.33
E0240-034-1000-M			25.40	38.10			2.22	E0240-034-1000S			1.85
E0240-034-1120-M			28.45	43.69			1.86	E0240-034-1120S			1.55
E0240-034-1250-M			31.75	49.78			1.56	E0240-034-1250S			1.30
E0240-034-1370-M			34.80	55.37			1.37	E0240-034-1370S			1.14
E0240-034-1500-M			38.10	61.47			1.21	E0240-034-1500S			1.01
E0240-034-1750-M		0.86	44.45	73.41	31.14	2.89	0.98	E0240-034-1750S	25.94	2.41	0.82
E0240-034-2000-M			50.80	85.09			0.82	E0240-034-2000S			0.69
E0240-034-2250-M			57.15	96.77			0.72	E0240-034-2250S			0.60
E0240-034-2500-M			63.50	108.46			0.63	E0240-034-2500S			0.53
E0240-034-2750-M			69.85	120.40			0.56	E0240-034-2750S			0.47
E0240-034-3000-M			76.20	132.08			0.51	E0240-034-3000S			0.42
E0240-034-3500-M			88.90	155.70			0.42	E0240-034-3500S			0.35
E0240-034-4000-M			101.60	179.07			0.37	E0240-034-4000S			0.31
E0240-034-4500-M			114.30	202.44			0.32	E0240-034-4500S			0.26
E0240-034-5000-M			127.00	226.06			0.28	E0240-034-5000S			0.23
E0240-037-0620-M			15.75	19.56			9.58	E0240-037-0620S			7.98
E0240-037-0750-M	6.10		19.05	24.89			6.01	E0240-037-0750S			5.01
E0240-037-1000-M			25.40	35.56			3.47	E0240-037-1000S			2.89
E0240-037-1120-M			28.45	40.89			2.87	E0240-037-1120S			2.39
E0240-037-1250-M			31.75	45.97			2.45	E0240-037-1250S			2.04
E0240-037-1370-M			34.80	51.05			2.17	E0240-037-1370S			1.81
E0240-037-1500-M			38.10	55.88			1.96	E0240-037-1500S			1.63
E0240-037-1750-M			44.45	66.80			1.56	E0240-037-1750S			1.30
E0240-037-2000-M		0.94	50.80	77.22	38.70	3.56	1.33	E0240-037-2000S	32.24	2.97	1.11
E0240-037-2250-M			57.15	87.63			1.14	E0240-037-2250S			0.95
E0240-037-2500-M			63.50	97.79			1.02	E0240-037-2500S			0.85
E0240-037-2750-M			69.85	108.46			0.91	E0240-037-2750S			0.76
E0240-037-3000-M			76.20	118.62			0.82	E0240-037-3000S			0.69
E0240-037-3250-M			82.55	131.06			0.74	E0240-037-3250S			0.61
E0240-037-3500-M			88.90	141.73			0.67	E0240-037-3500S			0.55
E0240-037-4000-M			101.60	162.05			0.58	E0240-037-4000S			0.48
E0240-037-4500-M			114.30	183.39			0.51	E0240-037-4500S			0.42
E0240-037-5000-M			127.00	204.47			0.46	E0240-037-5000S			0.38
E0240-041-0750-M			19.05	23.62			10.24	E0240-041-0750S			8.53
E0240-041-1000-M			25.40	33.27			6.06	E0240-041-1000S			5.05
E0240-041-1120-M			28.45	37.85			5.06	E0240-041-1120S			4.22
E0240-041-1250-M			31.75	42.67			4.29	E0240-041-1250S			3.57
E0240-041-1370-M			34.80	47.24			3.77	E0240-041-1370S			3.14
E0240-041-1500-M			38.10	52.32			3.33	E0240-041-1500S			2.77
E0240-041-1750-M			44.45	61.72			2.71	E0240-041-1750S			2.26
E0240-041-2000-M		1.04	50.80	71.37	51.82	4.67	2.29	E0240-041-2000S	43.17	3.89	1.91
E0240-041-2250-M			57.15	80.77			2.00	E0240-041-2250S			1.66
E0240-041-2500-M			63.50	90.42			1.75	E0240-041-2500S			1.46
E0240-041-2750-M			69.85	100.08			1.56	E0240-041-2750S			1.30
E0240-041-3000-M			76.20	109.47			1.42	E0240-041-3000S			1.18
E0240-041-3500-M			88.90	128.52			1.19	E0240-041-3500S			0.99
E0240-041-4000-M			101.60	147.57			1.03	E0240-041-4000S			0.86
E0240-041-4500-M			114.30	166.88			0.89	E0240-041-4500S			0.74
E0240-041-5000-M			127.00	185.67			0.81	E0240-041-5000S			0.67
T31450			17.10	24.53			4.23	T41450			3.52
T31460	6.30	0.90	22.50	34.40	37.10	5.58	2.65	T41460	30.90	4.65	2.21
T31470			30.60	49.20			1.70	T41470			1.42
T31480			44.10	73.80			1.06	T41480			0.88
T31120			16.10	32.70			0.62	T41120			0.52
T31130	7.00	0.63	19.90	46.50	12.20	1.67	0.39	T41130	10.16	1.39	0.33
T31140			25.60	67.20			0.25	T41140			0.21

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
T31150		0.63	35.00	101.50	12.20	1.67	0.16	T41150	10.16	1.39	0.13
T31160			47.60	147.30			0.11	T41160			0.09
T31570			19.00	27.17			4.71	T41570			3.92
T31580			25.00	38.10			2.94	T41580			2.45
T31590	7.00	1.00	34.00	54.40	45.30	6.78	1.83	T41590	37.73	5.66	1.52
T31600			49.00	81.70			1.18	T41600			0.98
T31610			290.00	510.00			0.18	T41610			0.15
T31920			22.10	26.46			22.30	T41920			18.58
T31930		1.40	30.50	37.48	114.00	16.88	13.90	T41930	95.96	14.06	11.58
T31940			43.10	54.00			8.91	T41940			7.42
T31240			17.50	34.40			0.78	T41240			0.65
T31250			21.70	48.70			0.49	T41250			0.41
T31260		0.70	28.00	70.20	15.40	2.18	0.31	T41260	12.83	1.81	0.26
T31270			38.50	106.00			0.20	T41270			0.17
T31280	7.50		52.50	153.50			0.13	T41280			0.11
T31700			20.60	28.90			5.69	T41700			4.74
T31710		1.10	27.20	40.50	55.50	8.25	3.55	T41710	46.23	6.87	2.96
T31720			37.10	57.90			2.28	T41720			1.90
T31730			53.60	86.80			1.42	T41730			1.18
E0300-031-1000-M			25.40	46.74			0.82	E0300-031-1000S			0.69
E0300-031-1120-M			28.45	55.63			0.65	E0300-031-1120S			0.54
E0300-031-1250-M			31.75	65.02			0.53	E0300-031-1250S			0.44
E0300-031-1370-M			34.80	73.91			0.46	E0300-031-1370S			0.38
E0300-031-1500-M			38.10	83.57			0.39	E0300-031-1500S			0.32
E0300-031-1750-M		0.79	44.45	101.85	19.53	1.73	0.32	E0300-031-1750S	16.27	1.44	0.26
E0300-031-2000-M			50.80	120.14			0.26	E0300-031-2000S			0.22
E0300-031-2250-M			57.15	138.43			0.21	E0300-031-2250S			0.18
E0300-031-2500-M			63.50	156.72			0.19	E0300-031-2500S			0.16
E0300-031-2750-M			69.85	175.26			0.18	E0300-031-2750S			0.15
E0300-031-3000-M			76.20	193.55			0.16	E0300-031-3000S			0.13
E0300-037-0750-M			19.05	25.65			4.45	E0300-037-0750S			3.71
E0300-037-1000-M			25.40	39.62			2.07	E0300-037-1000S			1.72
E0300-037-1120-M			28.45	46.23			1.65	E0300-037-1120S			1.37
E0300-037-1250-M			31.75	53.34			1.35	E0300-037-1250S			1.12
E0300-037-1370-M			34.80	60.20			1.16	E0300-037-1370S			0.96
E0300-037-1500-M		0.94	38.10	67.31	32.03	2.89	1.00	E0300-037-1500S	26.68	2.41	0.83
E0300-037-1750-M			44.45	81.28			0.79	E0300-037-1750S			0.66
E0300-037-2000-M			50.80	95.25			0.65	E0300-037-2000S			0.54
E0300-037-2250-M			57.15	109.22			0.56	E0300-037-2250S			0.47
E0300-037-2500-M			63.50	123.19			0.49	E0300-037-2500S			0.41
E0300-037-2750-M			69.85	137.16			0.44	E0300-037-2750S			0.37
E0300-037-3000-M	7.62		76.20	150.88			0.39	E0300-037-3000S			0.32
E0300-049-1000-M			25.40	32.51			8.88	E0300-049-1000S			7.40
E0300-049-1120-M			28.45	37.34			7.18	E0300-049-1120S			5.98
E0300-049-1250-M			31.75	42.42			5.94	E0300-049-1250S			4.95
E0300-049-1370-M			34.80	46.99			5.13	E0300-049-1370S			4.27
E0300-049-1500-M			38.10	52.32			4.47	E0300-049-1500S			3.72
E0300-049-1750-M		1.24	44.45	61.98	69.39	6.23	3.57	E0300-049-1750S	57.80	5.19	2.97
E0300-049-2000-M			50.80	71.88			2.98	E0300-049-2000S			2.48
E0300-049-2250-M			57.15	81.79			2.56	E0300-049-2250S			2.13
E0300-049-2500-M			63.50	91.69			2.24	E0300-049-2500S			1.87
E0300-049-2750-M			69.85	101.60			2.00	E0300-049-2750S			1.66
E0300-049-3000-M			76.20	111.25			1.79	E0300-049-3000S			1.49
E0300-055-1000-M			25.40	30.73			16.34	E0300-055-1000S			13.61
E0300-055-1120-M			28.45	35.05			13.31	E0300-055-1120S			11.09
E0300-055-1250-M			31.75	39.62			11.09	E0300-055-1250S			9.24
E0300-055-1370-M			34.80	43.69			9.60	E0300-055-1370S			8.00
E0300-055-1500-M			38.10	48.26			8.39	E0300-055-1500S			6.99
E0300-055-1750-M		1.40	44.45	57.15	94.97	8.54	6.74	E0300-055-1750S	78.96	7.11	5.61
E0300-055-2000-M			50.80	66.04			5.64	E0300-055-2000S			4.70
E0300-055-2250-M			57.15	74.93			4.85	E0300-055-2250S			4.04
E0300-055-2500-M			63.50	83.82			4.26	E0300-055-2500S			3.55
E0300-055-2750-M			69.85	92.71			3.78	E0300-055-2750S			3.15
E0300-055-3000-M			76.20	101.60			3.41	E0300-055-3000S			2.84
T32050			25.30	30.18			25.40	T42050			21.16
T32060	8.00	1.60	34.90	42.71	146.00	21.81	15.90	T42060	121.62	18.17	13.25
T32070			49.30	61.50			10.20	T42070			8.50
T31820			23.00	32.85			5.43	T41820			4.52
T31830	8.50	1.20	30.20	46.00	62.80	9.22	3.39	T41830	52.31	7.68	2.82
T31840			41.00	65.60			2.17	T41840			1.81
T31850			59.00	98.60			1.35	T41850			1.13

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
T31860	8.50	1.20	290.00	515.00	62.80	9.22	0.24	T41860	52.31	7.68	0.20
T31370			20.60	42.00			0.76	T41370			0.63
T31380			25.40	59.70			0.47	T41380			0.39
T31390		0.80	32.60	86.10	19.00	2.72	0.30	T41390	15.83	2.27	0.25
T31400	9.00		44.60	130.20			0.19	T41400			0.16
T31410			60.60	188.60			0.13	T41410			0.11
T32170			28.40	33.77			28.60	T42170			23.82
T32180		1.80	39.20	47.79	180.00	26.47	17.80	T42180	149.94	22.05	14.83
T32190			55.40	68.80			11.50	T42190			9.58
E0360-026-1000-M			25.40	58.93			0.26	E0360-026-1000S			0.22
E0360-026-1120-M			28.45	75.69			0.19	E0360-026-1120S			0.16
E0360-026-1250-M		0.66	31.75	93.73	10.01	0.89	0.14	E0360-026-1250S	8.34	0.74	0.12
E0360-026-1370-M			34.80	110.24			0.12	E0360-026-1370S			0.10
E0360-026-1500-M			38.10	128.27			0.11	E0360-026-1500S			0.09
E0360-026-1750-M			44.45	163.07			0.07	E0360-026-1750S			0.06
E0360-031-0880-M			22.10	35.56			1.10	E0360-031-0880S			0.92
E0360-031-1000-M			25.40	51.31			0.56	E0360-031-1000S			0.47
E0360-031-1120-M			28.45	62.99			0.42	E0360-031-1120S			0.35
E0360-031-1250-M			31.75	74.93			0.33	E0360-031-1250S			0.28
E0360-031-1370-M			34.80	86.61			0.28	E0360-031-1370S			0.23
E0360-031-1500-M		0.79	38.10	96.77	16.41	1.47	0.25	E0360-031-1500S	13.67	1.22	0.20
E0360-031-1750-M			44.45	122.94			0.19	E0360-031-1750S			0.16
E0360-031-2000-M			50.80	147.83			0.16	E0360-031-2000S			0.13
E0360-031-2250-M			57.15	172.47			0.12	E0360-031-2250S			0.10
E0360-031-2500-M			63.50	197.36			0.11	E0360-031-2500S			0.09
E0360-031-2750-M			69.85	222.25			0.11	E0360-031-2750S			0.09
E0360-031-3000-M			76.20	246.89			0.09	E0360-031-3000S			0.07
E0360-034-1000-M			25.40	44.45			1.02	E0360-034-1000S			0.85
E0360-034-1120-M			28.45	54.36			0.74	E0360-034-1120S			0.61
E0360-034-1250-M			31.75	65.28			0.58	E0360-034-1250S			0.48
E0360-034-1370-M			34.80	75.44			0.47	E0360-034-1370S			0.39
E0360-034-1500-M			38.10	86.36			0.40	E0360-034-1500S			0.34
E0360-034-1750-M			44.45	107.44			0.32	E0360-034-1750S			0.26
E0360-034-2000-M			50.80	128.52			0.25	E0360-034-2000S			0.20
E0360-034-2250-M		0.86	57.15	149.86	21.26	1.91	0.21	E0360-034-2250S	17.71	1.59	0.18
E0360-034-2500-M			63.50	170.18			0.18	E0360-034-2500S			0.15
E0360-034-2750-M			69.85	191.52			0.16	E0360-034-2750S			0.13
E0360-034-3000-M			76.20	212.60			0.14	E0360-034-3000S			0.12
E0360-034-3500-M			88.90	254.25			0.12	E0360-034-3500S			0.10
E0360-034-4000-M	9.14		101.60	296.93			0.11	E0360-034-4000S			0.09
E0360-034-4500-M			114.30	338.58			0.09	E0360-034-4500S			0.07
E0360-034-5000-M			127.00	379.98			0.07	E0360-034-5000S			0.06
E0360-037-0750-M			19.05	23.11			6.18	E0360-037-0750S			5.15
E0360-037-1000-M			25.40	42.67			1.38	E0360-037-1000S			1.15
E0360-037-1120-M			28.45	51.82			1.03	E0360-037-1120S			0.86
E0360-037-1250-M			31.75	60.71			0.82	E0360-037-1250S			0.69
E0360-037-1370-M			34.80	68.83			0.70	E0360-037-1370S			0.58
E0360-037-1500-M			38.10	77.72			0.60	E0360-037-1500S			0.50
E0360-037-1750-M			44.45	95.76			0.46	E0360-037-1750S			0.38
E0360-037-2000-M		0.94	50.80	112.78	26.24	2.22	0.39	E0360-037-2000S	21.86	1.85	0.32
E0360-037-2250-M			57.15	130.56			0.32	E0360-037-2250S			0.26
E0360-037-2500-M			63.50	147.57			0.28	E0360-037-2500S			0.23
E0360-037-2750-M			69.85	168.66			0.25	E0360-037-2750S			0.20
E0360-037-3000-M			76.20	186.69			0.23	E0360-037-3000S			0.19
E0360-037-3500-M			88.90	220.22			0.18	E0360-037-3500S			0.15
E0360-037-4000-M			101.60	256.03			0.16	E0360-037-4000S			0.13
E0360-037-4500-M			114.30	291.85			0.14	E0360-037-4500S			0.12
E0360-037-5000-M			127.00	327.66			0.12	E0360-037-5000S			0.10
E0360-039-1000-M			25.40	39.62			2.01	E0360-039-1000S			1.67
E0360-039-1120-M			28.45	47.50			1.49	E0360-039-1120S			1.24
E0360-039-1250-M			31.75	56.13			1.16	E0360-039-1250S			0.96
E0360-039-1370-M			34.80	64.26			0.96	E0360-039-1370S			0.80
E0360-039-1500-M			38.10	72.90			0.82	E0360-039-1500S			0.69
E0360-039-1750-M		0.99	44.45	89.66	31.23	2.80	0.63	E0360-039-1750S	26.01	2.33	0.53
E0360-039-2000-M			50.80	106.43			0.51	E0360-039-2000S			0.42
E0360-039-2250-M			57.15	122.94			0.44	E0360-039-2250S			0.37
E0360-039-2500-M			63.50	139.70			0.37	E0360-039-2500S			0.31
E0360-039-2750-M			69.85	156.46			0.33	E0360-039-2750S			0.28
E0360-039-3000-M			76.20	173.23			0.30	E0360-039-3000S			0.25
E0360-041-0750-M		1.04	19.05	22.61	35.14	3.11	9.23	E0360-041-0750S	29.27	2.59	7.69
E0360-041-1000-M			25.40	39.37			2.26	E0360-041-1000S			1.88

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
E0360-041-1120-M			28.45	46.99			1.73	E0360-041-1120S			1.44
E0360-041-1250-M			31.75	54.36			1.42	E0360-041-1250S			1.18
E0360-041-1370-M			34.80	61.72			1.19	E0360-041-1370S			0.99
E0360-041-1500-M			38.10	69.09			1.03	E0360-041-1500S			0.86
E0360-041-1750-M			44.45	83.82			0.81	E0360-041-1750S			0.67
E0360-041-2000-M			50.80	98.81			0.67	E0360-041-2000S			0.55
E0360-041-2250-M		1.04	57.15	114.30	35.14	3.11	0.56	E0360-041-2250S	29.87	2.59	0.47
E0360-041-2500-M			63.50	129.03			0.47	E0360-041-2500S			0.39
E0360-041-2750-M			69.85	146.05			0.42	E0360-041-2750S			0.35
E0360-041-3000-M			76.20	161.54			0.39	E0360-041-3000S			0.32
E0360-041-3500-M			88.90	192.53			0.32	E0360-041-3500S			0.26
E0360-041-4000-M			101.60	220.73			0.26	E0360-041-4000S			0.22
E0360-041-4500-M			114.30	251.71			0.23	E0360-041-4500S			0.19
E0360-041-5000-M			127.00	281.94			0.21	E0360-041-5000S			0.18
E0360-045-0750-M			19.05	22.10			13.40	E0360-045-0750S			11.16
E0360-045-1000-M			25.40	36.32			3.82	E0360-045-1000S			3.18
E0360-045-1120-M			28.45	42.93			2.87	E0360-045-1120S			2.39
E0360-045-1250-M			31.75	49.02			2.38	E0360-045-1250S			1.98
E0360-045-1370-M			34.80	55.88			1.96	E0360-045-1370S			1.63
E0360-045-1500-M			38.10	62.74			1.68	E0360-045-1500S			1.40
E0360-045-1750-M			44.45	75.69			1.31	E0360-045-1750S			1.09
E0360-045-2000-M			50.80	88.65			1.09	E0360-045-2000S			0.91
E0360-045-2250-M		1.14	57.15	101.60	45.37	4.00	0.93	E0360-045-2250S	37.79	3.33	0.77
E0360-045-2500-M			63.50	114.55			0.81	E0360-045-2500S			0.67
E0360-045-2750-M			69.85	127.51			0.72	E0360-045-2750S			0.60
E0360-045-3000-M			76.20	140.46			0.63	E0360-045-3000S			0.53
E0360-045-3500-M			88.90	170.43			0.53	E0360-045-3500S			0.44
E0360-045-4000-M			101.60	197.36			0.44	E0360-045-4000S			0.37
E0360-045-4500-M			114.30	224.28			0.39	E0360-045-4500S			0.32
E0360-045-5000-M			127.00	248.41			0.33	E0360-045-5000S			0.28
E0360-045-5500-M			139.70	275.08			0.30	E0360-045-5500S			0.25
E0360-045-6000-M			152.40	301.50			0.28	E0360-045-6000S			0.23
E0360-049-1000-M			25.40	33.78			6.30	E0360-049-1000S			5.25
E0360-049-1120-M			28.45	39.62			4.78	E0360-049-1120S			3.98
E0360-049-1250-M			31.75	45.97			3.78	E0360-049-1250S			3.15
E0360-049-1370-M	9.14		34.80	51.56			3.17	E0360-049-1370S			2.64
E0360-049-1500-M			38.10	57.91			2.70	E0360-049-1500S			2.25
E0360-049-1750-M			44.45	69.85			2.10	E0360-049-1750S			1.75
E0360-049-2000-M			50.80	82.04			1.72	E0360-049-2000S			1.43
E0360-049-2250-M		1.24	57.15	93.98	58.72	5.34	1.45	E0360-049-2250S	48.91	4.45	1.21
E0360-049-2500-M			63.50	105.92			1.26	E0360-049-2500S			1.05
E0360-049-2750-M			69.85	118.11			1.12	E0360-049-2750S			0.93
E0360-049-3000-M			76.20	130.05			1.00	E0360-049-3000S			0.83
E0360-049-3500-M			88.90	154.18			0.82	E0360-049-3500S			0.69
E0360-049-4000-M			101.60	178.05			0.70	E0360-049-4000S			0.58
E0360-049-4500-M			114.30	202.18			0.61	E0360-049-4500S			0.51
E0360-049-5000-M			127.00	226.06			0.54	E0360-049-5000S			0.45
E0360-049-5500-M			139.70	249.68			0.49	E0360-049-5500S			0.41
E0360-049-6000-M			152.40	273.56			0.44	E0360-049-6000S			0.37
E0360-055-1000-M			25.40	32.00			11.31	E0360-055-1000S			9.42
E0360-055-1120-M			28.45	37.85			8.04	E0360-055-1120S			6.70
E0360-055-1250-M			31.75	42.16			6.76	E0360-055-1250S			5.63
E0360-055-1370-M			34.80	47.50			5.62	E0360-055-1370S			4.68
E0360-055-1500-M			38.10	52.32			4.97	E0360-055-1500S			4.14
E0360-055-1750-M			44.45	62.48			3.92	E0360-055-1750S			3.27
E0360-055-2000-M			50.80	72.90			3.19	E0360-055-2000S			2.66
E0360-055-2250-M		1.40	57.15	83.31	78.29	7.12	2.71	E0360-055-2250S	65.22	5.93	2.26
E0360-055-2500-M			63.50	93.47			2.38	E0360-055-2500S			1.98
E0360-055-2750-M			69.85	103.38			2.10	E0360-055-2750S			1.75
E0360-055-3000-M			76.20	113.54			1.89	E0360-055-3000S			1.58
E0360-055-3500-M			88.90	133.86			1.58	E0360-055-3500S			1.31
E0360-055-4000-M			101.60	154.94			1.35	E0360-055-4000S			1.12
E0360-055-4500-M			114.30	172.97			1.17	E0360-055-4500S			0.98
E0360-055-5000-M			127.00	199.39			1.02	E0360-055-5000S			0.85
E0360-055-5500-M			139.70	220.47			0.91	E0360-055-5500S			0.76
E0360-055-6000-M			152.40	241.30			0.82	E0360-055-6000S			0.69
E0360-058-1000-M			25.40	31.24			14.80	E0360-058-1000S			12.33
E0360-058-1120-M			28.45	35.81			11.42	E0360-058-1120S			9.51
E0360-058-1250-M		1.47	31.75	41.15	93.50	8.41	9.16	E0360-058-1250S	77.89	7.01	7.63
E0360-058-1370-M			34.80	45.72			7.74	E0360-058-1370S			6.45
E0360-058-1500-M			38.10	51.05			6.62	E0360-058-1500S			5.51

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
E0360-058-1750-M			44.45	60.96			5.20	E0360-058-1750S			4.33
E0360-058-2000-M			50.80	70.61			4.27	E0360-058-2000S			3.56
E0360-058-2250-M			57.15	80.52			3.63	E0360-058-2250S			3.02
E0360-058-2500-M			63.50	90.42			3.15	E0360-058-2500S			2.62
E0360-058-2750-M			69.85	100.33			2.78	E0360-058-2750S			2.32
E0360-058-3000-M	9.14	1.47	76.20	110.24	93.50	8.41	2.49	E0360-058-3000S	77.89	7.01	2.07
E0360-058-3500-M			88.90	130.05			2.07	E0360-058-3500S			1.72
E0360-058-4000-M			101.60	149.61			1.77	E0360-058-4000S			1.47
E0360-058-4500-M			114.30	169.93			1.52	E0360-058-4500S			1.27
E0360-058-5000-M			127.00	189.48			1.37	E0360-058-5000S			1.14
E0360-058-5500-M			139.70	209.30			1.23	E0360-058-5500S			1.02
E0360-058-6000-M			152.40	228.85			1.12	E0360-058-6000S			0.93
T31490			23.00	46.10			0.88	T41490			0.73
T31500			28.40	65.30			0.55	T41500			0.46
T31510		0.90	36.50	94.10	24.00	3.46	0.35	T41510	19.99	2.88	0.29
T31520			50.00	142.20			0.23	T41520			0.19
T31530			68.00	206.00			0.15	T41530			0.13
T31950	10.00		26.90	38.50			6.14	T41950			5.12
T31960			35.30	53.80			3.83	T41960			3.19
T31970		1.40	47.90	76.80	83.60	12.66	2.46	T41970	69.64	10.54	2.05
T31980			68.90	115.10			1.54	T41980			1.28
T31990			290.00	510.00			0.32	T41990			0.27
T32300			31.60	37.46			31.80	T42300			26.49
T32310		2.00	43.60	52.98	220.00	32.94	19.90	T42310	183.26	27.44	16.58
T32320			61.60	76.30			12.80	T42320			10.66
E0420-037-1000-M			25.40	39.12			1.54	E0420-037-1000S			1.28
E0420-037-1120-M			28.45	50.29			0.96	E0420-037-1120S			0.80
E0420-037-1250-M			31.75	62.48			0.68	E0420-037-1250S			0.57
E0420-037-1370-M			34.80	73.91			0.54	E0420-037-1370S			0.45
E0420-037-1500-M			38.10	86.11			0.44	E0420-037-1500S			0.37
E0420-037-1750-M		0.94	44.45	109.47	23.13	2.22	0.33	E0420-037-1750S	19.27	1.85	0.28
E0420-037-2000-M			50.80	132.84			0.26	E0420-037-2000S			0.22
E0420-037-2250-M			57.15	156.21			0.21	E0420-037-2250S			0.18
E0420-037-2500-M			63.50	179.58			0.18	E0420-037-2500S			0.15
E0420-037-2750-M			69.85	202.95			0.16	E0420-037-2750S			0.13
E0420-037-3000-M			76.20	226.57			0.14	E0420-037-3000S			0.12
E0420-045-1000-M			25.40	35.05			3.85	E0420-045-1000S			3.21
E0420-045-1120-M			28.45	42.93			2.52	E0420-045-1120S			2.10
E0420-045-1250-M			31.75	51.82			1.84	E0420-045-1250S			1.53
E0420-045-1370-M			34.80	59.69			1.47	E0420-045-1370S			1.23
E0420-045-1500-M			38.10	68.33			1.21	E0420-045-1500S			1.01
E0420-045-1750-M	10.67	1.14	44.45	85.09	40.30	3.65	0.89	E0420-045-1750S	33.57	3.04	0.74
E0420-045-2000-M			50.80	101.85			0.72	E0420-045-2000S			0.60
E0420-045-2250-M			57.15	118.62			0.60	E0420-045-2250S			0.50
E0420-045-2500-M			63.50	135.38			0.51	E0420-045-2500S			0.42
E0420-045-2750-M			69.85	152.15			0.44	E0420-045-2750S			0.37
E0420-045-3000-M			76.20	168.91			0.40	E0420-045-3000S			0.34
E0420-055-1000-M			25.40	31.75			9.91	E0420-055-1000S			8.26
E0420-055-1120-M			28.45	37.85			6.79	E0420-055-1120S			5.66
E0420-055-1250-M			31.75	44.45			5.08	E0420-055-1250S			4.23
E0420-055-1370-M			34.80	50.29			4.12	E0420-055-1370S			3.43
E0420-055-1500-M			38.10	56.90			3.41	E0420-055-1500S			2.84
E0420-055-1750-M		1.40	44.45	69.34	70.28	6.23	2.57	E0420-055-1750S	58.54	5.19	2.14
E0420-055-2000-M			50.80	81.79			2.07	E0420-055-2000S			1.72
E0420-055-2250-M			57.15	94.23			1.72	E0420-055-2250S			1.43
E0420-055-2500-M			63.50	106.93			1.47	E0420-055-2500S			1.23
E0420-055-2750-M			69.85	119.38			1.30	E0420-055-2750S			1.08
E0420-055-3000-M			76.20	131.83			1.16	E0420-055-3000S			0.96
T31620			25.40	50.20			1.02	T41620			0.85
T31630			31.40	71.00			0.64	T41630			0.53
T31640		1.00	40.40	102.30	29.60	4.18	0.41	T41640	24.66	3.48	0.34
T31650			55.40	154.40			0.26	T41650			0.22
T31660			75.40	224.40			0.17	T41660			0.14
T32080	11.00		30.10	41.80			8.04	T42080			6.70
T32090		1.60	39.70	58.40	111.00	16.91	5.02	T42090	92.46	14.09	4.18
T32100			54.10	83.40			3.22	T42100			2.68
T32110			78.10	124.90			2.01	T42110			1.67
T32420			34.80	41.10			35.00	T42420			29.16
T32430		2.20	48.00	58.10	259.00	38.04	21.90	T42430	215.75	31.69	18.24
T32440			67.80	83.60			14.00	T42440			11.66
T31740	12.00	1.10	27.80	54.20	35.80	5.26	1.15	T41740	29.82	4.38	0.96

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
T31750			34.40	76.70			0.72	T41750			0.60
T31760		1.10	44.30	110.40	35.80	5.26	0.46	T41760	29.82	4.38	0.38
T31770			60.80	166.80			0.28	T41770			0.23
T31780			82.80	241.80			0.20	T41780			0.17
T32200	12.00		33.20	45.10			10.10	T42200			8.41
T32210			44.00	63.00			6.28	T42210			5.23
T32220		1.80	60.20	89.90	141.00	21.43	4.02	T42220	117.45	17.85	3.35
T32230			87.20	134.80			2.52	T42230			2.10
T32240			290.00	465.00			0.68	T42240			0.57
E0500-034-1250-M			31.75	65.02			0.42	E0500-034-1250S			0.35
E0500-034-1370-M			34.80	83.06			0.30	E0500-034-1370S			0.25
E0500-034-1500-M		0.86	38.10	102.62	15.52	1.38	0.23	E0500-034-1500S	12.93	1.15	0.19
E0500-034-1750-M			44.45	140.21			0.14	E0500-034-1750S			0.12
E0500-034-2000-M			50.80	177.80			0.11	E0500-034-2000S			0.09
E0500-034-2250-M			57.15	215.39			0.09	E0500-034-2250S			0.07
E0500-037-1250-M			31.75	67.31			0.49	E0500-037-1250S			0.41
E0500-037-1370-M			34.80	81.28			0.37	E0500-037-1370S			0.31
E0500-037-1500-M			38.10	96.77			0.30	E0500-037-1500S			0.25
E0500-037-1750-M			44.45	126.49			0.21	E0500-037-1750S			0.18
E0500-037-2000-M			50.80	155.45			0.18	E0500-037-2000S			0.15
E0500-037-2250-M			57.15	187.20			0.14	E0500-037-2250S			0.12
E0500-037-2500-M		0.94	63.50	216.92	19.57	1.78	0.12	E0500-037-2500S	16.30	1.48	0.10
E0500-037-2750-M			69.85	249.43			0.11	E0500-037-2750S			0.09
E0500-037-3000-M			76.20	281.94			0.09	E0500-037-3000S			0.07
E0500-037-3500-M			88.90	345.19			0.07	E0500-037-3500S			0.06
E0500-037-4000-M			101.60	408.43			0.05	E0500-037-4000S			0.04
E0500-037-4500-M			114.30	471.68			0.05	E0500-037-4500S			0.04
E0500-037-5000-M			127.00	534.92			0.04	E0500-037-5000S			0.03
E0500-041-1250-M			31.75	59.44			0.84	E0500-041-1250S			0.70
E0500-041-1370-M			34.80	71.88			0.63	E0500-041-1370S			0.53
E0500-041-1500-M			38.10	84.33			0.51	E0500-041-1500S			0.42
E0500-041-1750-M			44.45	108.97			0.35	E0500-041-1750S			0.29
E0500-041-2000-M			50.80	135.38			0.26	E0500-041-2000S			0.22
E0500-041-2250-M			57.15	160.02			0.23	E0500-041-2250S			0.19
E0500-041-2500-M		1.04	63.50	185.67	25.80	2.22	0.19	E0500-041-2500S	21.49	1.85	0.16
E0500-041-2750-M			69.85	211.84			0.18	E0500-041-2750S			0.15
E0500-041-3000-M			76.20	238.25			0.14	E0500-041-3000S			0.12
E0500-041-3500-M			88.90	287.53			0.12	E0500-041-3500S			0.10
E0500-041-4000-M			101.60	338.84			0.11	E0500-041-4000S			0.09
E0500-041-4500-M			114.30	391.41			0.09	E0500-041-4500S			0.07
E0500-041-5000-M	12.70		127.00	442.72			0.07	E0500-041-5000S			0.06
E0500-045-1250-M			31.75	50.80			1.63	E0500-045-1250S			1.36
E0500-045-1370-M			34.80	65.53			0.98	E0500-045-1370S			0.82
E0500-045-1500-M			38.10	74.68			0.81	E0500-045-1500S			0.67
E0500-045-1750-M			44.45	96.27			0.58	E0500-045-1750S			0.48
E0500-045-2000-M			50.80	117.09			0.46	E0500-045-2000S			0.38
E0500-045-2250-M			57.15	139.45			0.37	E0500-045-2250S			0.31
E0500-045-2500-M		1.14	63.50	161.54	33.36	3.11	0.32	E0500-045-2500S	27.79	2.59	0.26
E0500-045-2750-M			69.85	183.64			0.28	E0500-045-2750S			0.23
E0500-045-3000-M			76.20	205.74			0.25	E0500-045-3000S			0.20
E0500-045-3500-M			88.90	244.86			0.19	E0500-045-3500S			0.16
E0500-045-4000-M			101.60	289.31			0.16	E0500-045-4000S			0.13
E0500-045-4500-M			114.30	332.23			0.14	E0500-045-4500S			0.12
E0500-045-5000-M			127.00	375.41			0.12	E0500-045-5000S			0.10
E0500-049-1250-M			31.75	47.75			2.45	E0500-049-1250S			2.04
E0500-049-1370-M			34.80	57.15			1.77	E0500-049-1370S			1.47
E0500-049-1500-M			38.10	67.06			1.37	E0500-049-1500S			1.14
E0500-049-1750-M			44.45	86.11			0.95	E0500-049-1750S			0.79
E0500-049-2000-M			50.80	105.16			0.74	E0500-049-2000S			0.61
E0500-049-2250-M			57.15	124.21			0.60	E0500-049-2250S			0.50
E0500-049-2500-M		1.24	63.50	143.26	43.37	3.91	0.49	E0500-049-2500S	36.13	3.26	0.41
E0500-049-2750-M			69.85	162.31			0.42	E0500-049-2750S			0.35
E0500-049-3000-M			76.20	181.36			0.37	E0500-049-3000S			0.31
E0500-049-3500-M			88.90	219.46			0.30	E0500-049-3500S			0.25
E0500-049-4000-M			101.60	257.81			0.25	E0500-049-4000S			0.20
E0500-049-4500-M			114.30	296.42			0.21	E0500-049-4500S			0.18
E0500-049-5000-M			127.00	334.01			0.19	E0500-049-5000S			0.16
E0500-055-1250-M			31.75	44.45			4.27	E0500-055-1250S			3.56
E0500-055-1370-M		1.40	34.80	54.36	58.27	5.34	2.73	E0500-055-1370S	48.54	4.45	2.27
E0500-055-1500-M			38.10	61.21			2.28	E0500-055-1500S			1.90
E0500-055-1750-M			44.45	76.45			1.58	E0500-055-1750S			1.31

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
E0500-055-2000-M			50.80	91.44			1.30	E0500-055-2000S			1.08
E0500-055-2250-M			57.15	108.97			1.07	E0500-055-2250S			0.89
E0500-055-2500-M			63.50	122.43			0.89	E0500-055-2500S			0.74
E0500-055-2750-M			69.85	137.41			0.77	E0500-055-2750S			0.64
E0500-055-3000-M		1.40	76.20	152.65	58.27	5.34	0.68	E0500-055-3000S	48.54	4.45	0.57
E0500-055-3500-M			88.90	182.63			0.56	E0500-055-3500S			0.47
E0500-055-4000-M			101.60	212.85			0.47	E0500-055-4000S			0.39
E0500-055-4500-M			114.30	242.82			0.40	E0500-055-4500S			0.34
E0500-055-5000-M			127.00	281.94			0.35	E0500-055-5000S			0.29
E0500-063-1250-M			31.75	41.40			8.21	E0500-063-1250S			6.84
E0500-063-1370-M			34.80	48.77			5.46	E0500-063-1370S			4.55
E0500-063-1500-M			38.10	55.12			4.47	E0500-063-1500S			3.72
E0500-063-1750-M			44.45	67.56			3.27	E0500-063-1750S			2.72
E0500-063-2000-M			50.80	80.26			2.59	E0500-063-2000S			2.16
E0500-063-2250-M			57.15	92.71			2.14	E0500-063-2250S			1.78
E0500-063-2500-M		1.60	63.50	104.65	83.63	7.56	1.82	E0500-063-2500S	69.66	6.30	1.52
E0500-063-2750-M			69.85	116.84			1.61	E0500-063-2750S			1.34
E0500-063-3000-M			76.20	129.54			1.42	E0500-063-3000S			1.18
E0500-063-3500-M			88.90	154.43			1.16	E0500-063-3500S			0.96
E0500-063-4000-M			101.60	179.58			0.96	E0500-063-4000S			0.80
E0500-063-4500-M			114.30	204.72			0.84	E0500-063-4500S			0.70
E0500-063-5000-M			127.00	229.62			0.74	E0500-063-5000S			0.61
E0500-069-1250-M			31.75	39.37			12.96	E0500-069-1250S			10.80
E0500-069-1370-M	12.70		34.80	45.21			9.51	E0500-069-1370S			7.92
E0500-069-1500-M			38.10	50.55			7.92	E0500-069-1500S			6.60
E0500-069-1750-M			44.45	62.23			5.48	E0500-069-1750S			4.57
E0500-069-2000-M			50.80	73.41			4.33	E0500-069-2000S			3.61
E0500-069-2250-M			57.15	84.58			3.56	E0500-069-2250S			2.97
E0500-069-2500-M		1.75	63.50	95.76	107.69	9.70	3.03	E0500-069-2500S	89.71	8.08	2.52
E0500-069-2750-M			69.85	107.70			2.59	E0500-069-2750S			2.16
E0500-069-3000-M			76.20	118.87			2.29	E0500-069-3000S			1.91
E0500-069-3500-M			88.90	141.22			1.87	E0500-069-3500S			1.56
E0500-069-4000-M			101.60	164.08			1.56	E0500-069-4000S			1.30
E0500-069-4500-M			114.30	186.44			1.37	E0500-069-4500S			1.14
E0500-069-5000-M			127.00	209.55			1.19	E0500-069-5000S			0.99
E0500-075-1250-M			31.75	38.35			18.86	E0500-075-1250S			15.71
E0500-075-1370-M			34.80	43.18			14.81	E0500-075-1370S			12.34
E0500-075-1500-M			38.10	48.26			12.20	E0500-075-1500S			10.16
E0500-075-1750-M			44.45	58.67			8.65	E0500-075-1750S			7.21
E0500-075-2000-M			50.80	69.34			6.69	E0500-075-2000S			5.57
E0500-075-2250-M			57.15	79.25			5.60	E0500-075-2250S			4.67
E0500-075-2500-M		1.91	63.50	89.66	135.71	12.23	4.71	E0500-075-2500S	113.05	10.19	3.92
E0500-075-2750-M			69.85	100.33			4.06	E0500-075-2750S			3.38
E0500-075-3000-M			76.20	110.24			3.64	E0500-075-3000S			3.03
E0500-075-3500-M			88.90	131.06			2.92	E0500-075-3500S			2.43
E0500-075-4000-M			101.60	151.64			2.47	E0500-075-4000S			2.06
E0500-075-4500-M			114.30	171.96			2.14	E0500-075-4500S			1.78
E0500-075-5000-M			127.00	193.04			1.87	E0500-075-5000S			1.56
T31870			30.20	58.10			1.28	T41870			1.07
T31880			37.40	82.10			0.80	T41880			0.67
T31890		1.20	48.20	118.00	42.20	6.56	0.51	T41890	35.15	5.47	0.43
T31900	13.00		66.20	178.20			0.32	T41900			0.27
T31910			90.20	258.20			0.21	T41910			0.18
T32540			40.30	48.14			34.30	T42540			28.57
T32550		2.50	55.30	67.80	317.00	48.27	21.50	T42550	264.06	40.21	17.91
T32560			77.80	97.40			13.70	T42560			11.41
T32330			38.00	52.70			9.42	T42330			7.85
T32340		2.00	50.00	73.60	164.00	25.25	5.88	T42340	136.61	21.03	4.90
T32350			68.00	104.90			3.77	T42350			3.14
T32360	14.00		98.00	157.00			2.35	T42360			1.96
T32660			44.20	51.85			44.60	T42660			37.15
T32670		2.80	61.00	73.20	400.00	58.85	27.90	T42670	333.20	49.02	23.24
T32680			86.20	105.30			17.90	T42680			14.91
T32000			34.90	66.10			1.55	T42000			1.29
T32010			43.30	93.30			0.97	T42010			0.81
T32020		1.40	55.90	134.00	57.10	8.57	0.62	T42020	47.56	7.14	0.52
T32030	15.00		76.90	201.90			0.39	T42030			0.33
T32040			105.00	292.00			0.26	T42040			0.22
T32450			41.20	56.00			11.40	T42450			9.50
T32460		2.20	54.40	78.10	198.00	29.63	7.10	T42460	164.93	24.68	5.91
T32470			74.20	111.20			4.55	T42470			3.79

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
T32480	15.00	1.4	107.00	166.20	57.10	8.57	2.84	T42480	47.56	7.14	2.37
T32780			50.60	59.12			50.90	T42780			42.40
T32790	16.00	3.20	69.80	83.40	510.00	76.44	31.80	T42790	424.83	63.68	26.49
T32800			98.60	119.90			20.40	T42800			16.99
E0650-055-1500-M			38.10	56.13			2.35	E0650-055-1500S			1.96
E0650-055-1750-M			44.45	80.26			1.19	E0650-055-1750S			0.99
E0650-055-2000-M			50.80	106.68			0.72	E0650-055-2000S			0.60
E0650-055-2250-M			57.15	130.30			0.56	E0650-055-2250S			0.47
E0650-055-2500-M		1.40	63.50	151.89	44.93	4.00	0.46	E0650-055-2500S	37.43	3.33	0.38
E0650-055-2750-M			69.85	176.28			0.39	E0650-055-2750S			0.32
E0650-055-3000-M			76.20	198.88			0.33	E0650-055-3000S			0.28
E0650-055-3500-M			88.90	244.09			0.26	E0650-055-3500S			0.22
E0650-055-4000-M			101.60	289.05			0.21	E0650-055-4000S			0.18
E0650-063-1500-M			38.10	52.32			4.34	E0650-063-1500S			3.62
E0650-063-1750-M			44.45	71.37			2.31	E0650-063-1750S			1.92
E0650-063-2000-M			50.80	91.69			1.45	E0650-063-2000S			1.21
E0650-063-2250-M			57.15	109.73			1.12	E0650-063-2250S			0.93
E0650-063-2500-M			63.50	127.76			0.93	E0650-063-2500S			0.77
E0650-063-2750-M	16.51	1.60	69.85	145.80	65.83	6.23	0.77	E0650-063-2750S	54.84	5.19	0.64
E0650-063-3000-M			76.20	163.83			0.67	E0650-063-3000S			0.55
E0650-063-3500-M			88.90	199.90			0.53	E0650-063-3500S			0.44
E0650-063-4000-M			101.60	235.97			0.44	E0650-063-4000S			0.37
E0650-063-4500-M			114.30	272.03			0.37	E0650-063-4500S			0.31
E0650-063-5000-M			127.00	317.25			0.33	E0650-063-5000S			0.28
E0650-069-1750-M			44.45	66.55			3.63	E0650-069-1750S			3.02
E0650-069-2000-M			50.80	82.80			2.49	E0650-069-2000S			2.07
E0650-069-2250-M			57.15	99.06			1.91	E0650-069-2250S			1.59
E0650-069-2500-M			63.50	115.57			1.54	E0650-069-2500S			1.28
E0650-069-2750-M		1.75	69.85	131.83	88.07	8.45	1.30	E0650-069-2750S	73.36	7.04	1.08
E0650-069-3000-M			76.20	148.08			1.12	E0650-069-3000S			0.93
E0650-069-3500-M			88.90	180.85			0.88	E0650-069-3500S			0.73
E0650-069-4000-M			101.60	213.36			0.72	E0650-069-4000S			0.60
E0650-069-4500-M			114.30	245.87			0.61	E0650-069-4500S			0.51
E0650-069-5000-M			127.00	278.64			0.53	E0650-069-5000S			0.44
T32120			39.70	74.00			1.82	T42120			1.52
T32130			49.30	104.10			1.14	T42130			0.95
T32140	17.00	1.60	63.70	149.30	74.00	11.62	0.73	T42140	61.64	9.68	0.61
T32150			87.70	224.70			0.46	T42150			0.38
T32160			120.00	325.00			0.30	T42160			0.25
T32570			48.30	67.20			10.70	T42570			8.91
T32580		2.50	63.30	93.60	237.00	34.90	6.67	T42580	197.42	29.07	5.56
T32590			85.80	133.10			4.27	T42590			3.56
T32600	18.00		123.00	198.70			2.67	T42600			2.22
T32900			56.90	66.25			57.20	T42900			47.65
T32910		3.60	78.50	93.50	630.00	94.11	35.80	T42910	524.79	78.39	29.82
T32920			111.00	134.40			22.90	T42920			19.08
E0750-049-2000-M			50.80	117.86			0.40	E0750-049-2000S			0.34
E0750-049-2250-M			57.15	156.46			0.26	E0750-049-2250S			0.22
E0750-049-2500-M			63.50	195.33			0.21	E0750-049-2500S			0.18
E0750-049-2750-M		1.24	69.85	233.93	29.40	2.62	0.16	E0750-049-2750S	24.49	2.18	0.13
E0750-049-3000-M			76.20	272.80			0.14	E0750-049-3000S			0.12
E0750-049-3250-M			82.55	311.40			0.12	E0750-049-3250S			0.10
E0750-049-3500-M			88.90	350.27			0.11	E0750-049-3500S			0.09
E0750-055-2000-M			50.80	110.74			0.58	E0750-055-2000S			0.48
E0750-055-2250-M			57.15	139.70			0.42	E0750-055-2250S			0.35
E0750-055-2500-M		1.40	63.50	168.66	39.14	3.56	0.33	E0750-055-2500S	32.60	2.97	0.28
E0750-055-2750-M			69.85	197.36			0.26	E0750-055-2750S			0.22
E0750-055-3000-M			76.20	226.31			0.23	E0750-055-3000S			0.19
E0750-055-3500-M	19.05		88.90	286.51			0.18	E0750-055-3500S			0.15
E0750-063-2000-M			50.80	95.76			1.14	E0750-063-2000S			0.95
E0750-063-2250-M			57.15	118.62			0.84	E0750-063-2250S			0.70
E0750-063-2500-M			63.50	141.22			0.65	E0750-063-2500S			0.54
E0750-063-2750-M			69.85	159.77			0.56	E0750-063-2750S			0.47
E0750-063-3000-M		1.60	76.20	186.69	56.94	5.34	0.46	E0750-063-3000S	47.43	4.45	0.38
E0750-063-3500-M			88.90	229.87			0.35	E0750-063-3500S			0.29
E0750-063-4000-M			101.60	275.34			0.30	E0750-063-4000S			0.25
E0750-063-4500-M			114.30	320.80			0.25	E0750-063-4500S			0.20
E0750-063-5000-M			127.00	366.27			0.21	E0750-063-5000S			0.18
E0750-063-5500-M			139.70	425.45			0.19	E0750-063-5500S			0.16
E0750-069-2000-M		1.75	50.80	83.57	76.78	6.89	2.14	E0750-069-2000S	63.96	5.74	1.78
E0750-069-2250-M			57.15	104.14			1.49	E0750-069-2250S			1.24

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
E0750-069-2500-M			63.50	124.21			1.16	E0750-069-2500S			0.96
E0750-069-2750-M			69.85	144.53			0.93	E0750-069-2750S			0.77
E0750-069-3000-M			76.20	165.10			0.79	E0750-069-3000S			0.66
E0750-069-3500-M		1.75	88.90	205.74	76.78	6.89	0.60	E0750-069-3500S	63.96	5.74	0.50
E0750-069-4000-M			101.60	246.38			0.49	E0750-069-4000S			0.41
E0750-069-4500-M			114.30	287.27			0.40	E0750-069-4500S			0.34
E0750-069-5000-M			127.00	327.91			0.35	E0750-069-5000S			0.29
E0750-075-2000-M			50.80	80.26			2.84	E0750-075-2000S			2.37
E0750-075-2250-M			57.15	97.28			2.07	E0750-075-2250S			1.72
E0750-075-2500-M			63.50	114.55			1.63	E0750-075-2500S			1.36
E0750-075-2750-M			69.85	130.30			1.38	E0750-075-2750S			1.15
E0750-075-3000-M			76.20	147.32			1.17	E0750-075-3000S			0.98
E0750-075-3500-M		1.91	88.90	180.09	92.08	8.45	0.91	E0750-075-3500S	76.70	7.04	0.76
E0750-075-4000-M			101.60	214.63			0.74	E0750-075-4000S			0.61
E0750-075-4500-M			114.30	247.40			0.61	E0750-075-4500S			0.51
E0750-075-5000-M			127.00	280.16			0.54	E0750-075-5000S			0.45
E0750-075-5500-M			139.70	325.88			0.47	E0750-075-5500S			0.39
E0750-075-6000-M			152.40	361.44			0.42	E0750-075-6000S			0.35
E0750-085-2000-M			50.80	71.88			5.94	E0750-085-2000S			4.95
E0750-085-2250-M			57.15	86.36			4.27	E0750-085-2250S			3.56
E0750-085-2500-M			63.50	100.84			3.33	E0750-085-2500S			2.77
E0750-085-2750-M			69.85	115.57			2.73	E0750-085-2750S			2.27
E0750-085-3000-M		2.16	76.20	130.05	137.09	12.32	2.31	E0750-085-3000S	114.20	10.26	1.92
E0750-085-3500-M			88.90	159.26			1.77	E0750-085-3500S			1.47
E0750-085-4000-M			101.60	188.21			1.44	E0750-085-4000S			1.20
E0750-085-4500-M			114.30	217.42			1.21	E0750-085-4500S			1.01
E0750-085-5000-M			127.00	246.63			1.05	E0750-085-5000S			0.88
E0750-095-2000-M			50.80	66.80			10.42	E0750-095-2000S			8.68
E0750-095-2250-M			57.15	78.74			7.69	E0750-095-2250S			6.41
E0750-095-2500-M			63.50	91.95			5.83	E0750-095-2500S			4.86
E0750-095-2750-M			69.85	104.14			4.87	E0750-095-2750S			4.06
E0750-095-3000-M			76.20	116.08			4.17	E0750-095-3000S			3.47
E0750-095-3500-M	19.05	2.41	88.90	141.48	183.30	16.50	3.17	E0750-095-3500S	152.69	13.74	2.64
E0750-095-4000-M			101.60	165.61			2.61	E0750-095-4000S			2.17
E0750-095-4500-M			114.30	190.75			2.17	E0750-095-4500S			1.81
E0750-095-5000-M			127.00	214.88			1.89	E0750-095-5000S			1.58
E0750-095-5500-M			139.70	240.28			1.66	E0750-095-5500S			1.39
E0750-095-6000-M			152.40	264.41			1.49	E0750-095-6000S			1.24
E0750-105-2000-M			50.80	63.50			17.55	E0750-105-2000S			14.62
E0750-105-2250-M			57.15	74.68			12.68	E0750-105-2250S			10.56
E0750-105-2500-M			63.50	85.85			9.91	E0750-105-2500S			8.26
E0750-105-2750-M			69.85	97.28			8.14	E0750-105-2750S			6.78
E0750-105-3000-M		2.67	76.20	108.46	244.46	22.02	6.92	E0750-105-3000S	203.64	18.34	5.76
E0750-105-3500-M			88.90	129.90			5.43	E0750-105-3500S			4.52
E0750-105-4000-M			101.60	152.40			4.38	E0750-105-4000S			3.65
E0750-105-4500-M			114.30	173.74			3.73	E0750-105-4500S			3.11
E0750-105-5000-M			127.00	196.34			3.20	E0750-105-5000S			2.67
E0750-115-2000-M			50.80	61.47			26.46	E0750-115-2000S			22.04
E0750-115-2250-M			57.15	71.12			20.22	E0750-115-2250S			16.84
E0750-115-2500-M			63.50	81.53			15.64	E0750-115-2500S			13.03
E0750-115-2750-M			69.85	91.19			13.22	E0750-115-2750S			11.01
E0750-115-3000-M			76.20	100.84			11.47	E0750-115-3000S			9.56
E0750-115-3500-M		2.92	88.90	120.90	309.98	27.89	8.83	E0750-115-3500S	258.21	23.23	7.36
E0750-115-4000-M			101.60	140.97			7.16	E0750-115-4000S			5.96
E0750-115-4500-M			114.30	160.27			6.15	E0750-115-4500S			5.12
E0750-115-5000-M			127.00	180.34			5.29	E0750-115-5000S			4.41
E0750-115-5500-M			139.70	200.41			4.64	E0750-115-5500S			3.87
E0750-115-6000-M			152.40	219.71			4.19	E0750-115-6000S			3.49
E0750-125-2000-M			50.80	59.18			41.95	E0750-125-2000S			34.94
E0750-125-2250-M			57.15	68.58			31.47	E0750-125-2250S			26.22
E0750-125-2500-M			63.50	77.72			25.18	E0750-125-2500S			20.98
E0750-125-2750-M			69.85	86.87			20.98	E0750-125-2750S			17.48
E0750-125-3000-M		3.18	76.20	96.01	391.16	35.18	17.98	E0750-125-3000S	325.84	29.30	14.98
E0750-125-3500-M			88.90	114.30			13.99	E0750-125-3500S			11.65
E0750-125-4000-M			101.60	132.59			11.43	E0750-125-4000S			9.52
E0750-125-4500-M			114.30	151.13			9.68	E0750-125-4500S			8.06
E0750-125-5000-M			127.00	169.42			8.39	E0750-125-5000S			6.99
T32250			46.00	87.90			1.78	T42250			1.48
T32260	20.00	1.80	56.80	123.80	87.00	13.05	1.11	T42260	72.47	10.87	0.93
T32270			73.00	178.00			0.71	T42270			0.59
T32280			100.00	267.00			0.44	T42280			0.37

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
T32290		1.80	136.00	387.00	87.00	13.05	0.29	T42290	72.47	10.87	0.24
T32690			53.80	74.10			12.30	T42690			10.25
T32700		2.80	70.60	103.00	293.00	44.09	7.68	T42700	244.07	36.73	6.40
T32710	20.00		95.80	146.40			4.91	T42710			4.09
T32720			138.00	219.00			3.07	T42720			2.56
T33020			63.20	73.30			63.60	T43020			52.98
T33030		4.00	87.20	103.40	757.00	114.29	39.70	T43030	630.58	95.21	33.07
T33040			123.00	148.30			25.40	T43040			21.16
E0850-055-2000-M			50.80	107.19			0.56	E0850-055-2000S			0.47
E0850-055-2250-M		1.40	57.15	143.51	34.70	3.11	0.37	E0850-055-2250S	28.91	2.59	0.31
E0850-055-2500-M			63.50	179.58			0.28	E0850-055-2500S			0.23
E0850-055-2750-M			69.85	215.90			0.21	E0850-055-2750S			0.18
E0850-063-2250-M			57.15	123.95			0.68	E0850-063-2250S			0.57
E0850-063-2500-M			63.50	153.42			0.51	E0850-063-2500S			0.42
E0850-063-2750-M		1.60	69.85	183.13	50.26	4.45	0.40	E0850-063-2750S	41.87	3.71	0.34
E0850-063-3000-M			76.20	212.60			0.33	E0850-063-3000S			0.28
E0850-063-3500-M			88.90	271.78			0.25	E0850-063-3500S			0.20
E0850-075-2250-M			57.15	100.84			1.70	E0850-075-2250S			1.42
E0850-075-2500-M			63.50	119.63			1.31	E0850-075-2500S			1.09
E0850-075-2750-M			69.85	140.72			1.05	E0850-075-2750S			0.88
E0850-075-3000-M	21.59	1.91	76.20	161.54	81.85	7.56	0.88	E0850-075-3000S	68.18	6.30	0.73
E0850-075-3500-M			88.90	201.42			0.67	E0850-075-3500S			0.55
E0850-075-4000-M			101.60	241.05			0.53	E0850-075-4000S			0.44
E0850-075-4500-M			114.30	282.96			0.44	E0850-075-4500S			0.37
E0850-075-5000-M			127.00	322.83			0.39	E0850-075-5000S			0.32
E0850-085-2000-M			50.80	69.34			5.95	E0850-085-2000S			4.96
E0850-085-2250-M			57.15	89.41			3.36	E0850-085-2250S			2.80
E0850-085-2500-M			63.50	106.17			2.45	E0850-085-2500S			2.04
E0850-085-2750-M			69.85	122.68			1.98	E0850-085-2750S			1.65
E0850-085-3000-M			76.20	139.45			1.66	E0850-085-3000S			1.39
E0850-085-3500-M		2.16	88.90	170.94	115.21	10.68	1.28	E0850-085-3500S	95.97	8.90	1.07
E0850-085-4000-M			101.60	203.96			1.02	E0850-085-4000S			0.85
E0850-085-4500-M			114.30	237.24			0.86	E0850-085-4500S			0.72
E0850-085-4750-M			120.65	253.75			0.79	E0850-085-4750S			0.66
E0850-085-5000-M			127.00	270.26			0.74	E0850-085-5000S			0.61
E0850-085-5500-M			139.70	313.94			0.63	E0850-085-5500S			0.53
E0850-085-6000-M			152.40	348.74			0.56	E0850-085-6000S			0.47
T32370			50.80	95.50			2.03	T42370			1.69
T32380			62.80	134.30			1.27	T42380			1.06
T32390		2.00	80.80	192.80	107.00	16.07	0.81	T42390	89.13	13.38	0.68
T32400			111.00	290.00			0.51	T42400			0.43
T32410			151.00	419.00			0.34	T42410			0.28
T32810	22.00		60.20	80.70			16.10	T42810			13.41
T32820		3.20	79.40	112.10	386.00	56.75	10.00	T42820	321.54	47.27	8.33
T32830			108.00	159.10			6.48	T42830			5.40
T32840			156.00	237.80			4.02	T42840			3.35
T33140			70.30	80.70			77.90	T43140			64.89
T33150		4.50	97.30	113.90	951.00	142.11	48.70	T43150	792.18	118.38	40.57
T33160			138.00	163.90			31.20	T43160			25.99
T32490			55.60	102.70			2.31	T42490			1.92
T32500			68.80	144.10			1.44	T42500			1.20
T32510	24.00	2.20	88.60	206.60	127.00	18.60	0.92	T42510	105.79	15.50	0.77
T32520			122.00	310.00			0.58	T42520			0.48
T32530			166.00	448.00			0.38	T42530			0.32
T32930			68.10	91.10			17.50	T42930			14.58
T32940		3.60	89.70	126.50	473.00	70.96	10.90	T42940	394.01	59.11	9.08
T32950			122.00	179.60			6.98	T42950			5.81
T32960	25.00		176.00	268.10			4.37	T42960			3.64
T33260			79.00	90.90			79.50	T43260			66.22
T33270		5.00	109.00	128.00	1110.00	165.06	49.70	T43270	924.63	137.50	41.40
T33280			154.00	183.70			31.80	T43280			26.49
E1000-063-2500-M			63.50	150.11			0.46	E1000-063-2500S			0.38
E1000-063-2750-M		1.60	69.85	187.96	43.15	4.00	0.33	E1000-063-2750S	35.94	3.33	0.28
E1000-063-3000-M			76.20	225.81			0.26	E1000-063-3000S			0.22
E1000-063-3250-M			82.55	263.65			0.21	E1000-063-3250S			0.18
E1000-075-2500-M	25.40		63.50	121.16			1.10	E1000-075-2500S			0.92
E1000-075-2750-M			69.85	148.59			0.81	E1000-075-2750S			0.67
E1000-075-3000-M		1.91	76.20	176.28	69.84	6.23	0.63	E1000-075-3000S	58.18	5.19	0.53
E1000-075-3500-M			88.90	228.35			0.46	E1000-075-3500S			0.38
E1000-075-4000-M			101.60	280.42			0.35	E1000-075-4000S			0.29
E1000-075-4500-M			114.30	335.53			0.30	E1000-075-4500S			0.25

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
E1000-075-5000-M		1.91	127.00	387.60	69.84	6.23	0.25	E1000-075-5000S	58.18	5.19	0.20
E1000-085-2500-M			63.50	101.85			2.47	E1000-085-2500S			2.06
E1000-085-2750-M			69.85	130.05			1.49	E1000-085-2750S			1.24
E1000-085-3000-M			76.20	151.38			1.19	E1000-085-3000S			0.99
E1000-085-3500-M		2.16	88.90	191.77	98.75	8.90	0.88	E1000-085-3500S	82.26	7.41	0.73
E1000-085-4000-M			101.60	234.44			0.68	E1000-085-4000S			0.57
E1000-085-4500-M			114.30	277.37			0.56	E1000-085-4500S			0.47
E1000-085-5000-M			127.00	320.04			0.47	E1000-085-5000S			0.39
E1000-095-2500-M			63.50	94.23			4.22	E1000-095-2500S			3.52
E1000-095-2750-M			69.85	116.08			2.63	E1000-095-2750S			2.19
E1000-095-3000-M			76.20	133.10			2.14	E1000-095-3000S			1.78
E1000-095-3500-M			88.90	168.91			1.52	E1000-095-3500S			1.27
E1000-095-4000-M			101.60	202.69			1.21	E1000-095-4000S			1.01
E1000-095-4500-M		2.41	114.30	238.51	133.45	12.01	0.98	E1000-095-4500S	111.16	10.00	0.82
E1000-095-5000-M			127.00	272.29			0.84	E1000-095-5000S			0.70
E1000-095-5500-M			139.70	318.26			0.72	E1000-095-5500S			0.60
E1000-095-6000-M			152.40	355.60			0.63	E1000-095-6000S			0.53
E1000-095-6500-M			165.10	377.95			0.58	E1000-095-6500S			0.48
E1000-095-7000-M			177.80	414.78			0.51	E1000-095-7000S			0.42
E1000-095-8000-M			203.20	486.41			0.42	E1000-095-8000S			0.35
E1000-095-9000-M			228.60	557.78			0.37	E1000-095-9000S			0.31
E1000-105-2500-M			63.50	88.65			6.83	E1000-105-2500S			5.69
E1000-105-2750-M			69.85	104.39			4.94	E1000-105-2750S			4.12
E1000-105-3000-M			76.20	120.40			3.87	E1000-105-3000S			3.22
E1000-105-3500-M			88.90	152.15			2.70	E1000-105-3500S			2.25
E1000-105-4000-M			101.60	183.90			2.08	E1000-105-4000S			1.73
E1000-105-4500-M		2.67	114.30	215.65	187.94	16.90	1.68	E1000-105-4500S	156.55	14.08	1.40
E1000-105-5000-M			127.00	247.40			1.42	E1000-105-5000S			1.18
E1000-105-5500-M			139.70	279.15			1.23	E1000-105-5500S			1.02
E1000-105-6000-M			152.40	311.15			1.09	E1000-105-6000S			0.91
E1000-105-6500-M			165.10	343.41			0.96	E1000-105-6500S			0.80
E1000-105-7000-M			177.80	374.14			0.88	E1000-105-7000S			0.73
E1000-105-8000-M			203.20	437.64			0.74	E1000-105-8000S			0.61
E1000-105-9000-M			228.60	501.14			0.63	E1000-105-9000S			0.53
E1000-115-2500-M			63.50	84.33			10.58	E1000-115-2500S			8.81
E1000-115-2750-M	25.40		69.85	98.30			7.76	E1000-115-2750S			6.46
E1000-115-3000-M			76.20	112.01			6.13	E1000-115-3000S			5.11
E1000-115-3500-M			88.90	139.70			4.33	E1000-115-3500S			3.61
E1000-115-4000-M			101.60	167.64			3.33	E1000-115-4000S			2.77
E1000-115-4500-M			114.30	195.33			2.71	E1000-115-4500S			2.26
E1000-115-5000-M		2.92	127.00	223.01	241.54	21.80	2.29	E1000-115-5000S	201.20	18.16	1.91
E1000-115-5500-M			139.70	250.70			1.98	E1000-115-5500S			1.65
E1000-115-6000-M			152.40	278.64			1.75	E1000-115-6000S			1.46
E1000-115-6500-M			165.10	306.83			1.54	E1000-115-6500S			1.28
E1000-115-7000-M			177.80	333.50			1.42	E1000-115-7000S			1.18
E1000-115-8000-M			203.20	389.89			1.17	E1000-115-8000S			0.98
E1000-115-9000-M			228.60	444.75			1.02	E1000-115-9000S			0.85
E1000-125-2500-M			63.50	81.53			15.29	E1000-125-2500S			12.74
E1000-125-2750-M			69.85	93.73			11.47	E1000-125-2750S			9.56
E1000-125-3000-M			76.20	106.17			9.18	E1000-125-3000S			7.65
E1000-125-3500-M			88.90	130.81			6.55	E1000-125-3500S			5.46
E1000-125-4000-M			101.60	155.45			5.10	E1000-125-4000S			4.25
E1000-125-4500-M			114.30	180.09			4.17	E1000-125-4500S			3.47
E1000-125-5000-M		3.18	127.00	204.98	301.89	27.18	3.52	E1000-125-5000S	251.47	22.64	2.93
E1000-125-5500-M			139.70	229.62			3.06	E1000-125-5500S			2.55
E1000-125-6000-M			152.40	254.25			2.70	E1000-125-6000S			2.25
E1000-125-6500-M			165.10	278.89			2.42	E1000-125-6500S			2.02
E1000-125-7000-M			177.80	303.53			2.19	E1000-125-7000S			1.82
E1000-125-8000-M			203.20	352.81			1.84	E1000-125-8000S			1.53
E1000-125-9000-M			228.60	402.34			1.58	E1000-125-9000S			1.31
E1000-135-2500-M			63.50	77.98			23.48	E1000-135-2500S			19.56
E1000-135-2750-M			69.85	89.66			17.23	E1000-135-2750S			14.35
E1000-135-3000-M			76.20	101.09			13.61	E1000-135-3000S			11.34
E1000-135-3500-M			88.90	123.19			9.93	E1000-135-3500S			8.27
E1000-135-4000-M			101.60	145.03			7.83	E1000-135-4000S			6.52
E1000-135-4500-M		3.43	114.30	168.15	373.54	33.63	6.30	E1000-135-4500S	311.16	28.01	5.25
E1000-135-5000-M			127.00	190.25			5.38	E1000-135-5000S			4.48
E1000-135-5500-M			139.70	213.36			4.61	E1000-135-5500S			3.84
E1000-135-6000-M			152.40	235.20			4.10	E1000-135-6000S			3.42
E1000-135-6500-M			165.10	258.57			3.64	E1000-135-6500S			3.03
E1000-135-7000-M			177.80	280.42			3.31	E1000-135-7000S			2.76

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
E1000-135-8000-M		3.43	203.20	325.63	373.54	33.63	2.78	E1000-135-8000S	311.16	28.01	2.32
E1000-135-9000-M			228.60	370.59			2.40	E1000-135-9000S			2.00
E1000-148-2500-M			63.50	75.69			35.51	E1000-148-2500S			29.58
E1000-148-2750-M			69.85	85.34			27.89	E1000-148-2750S			23.23
E1000-148-3000-M			76.20	96.27			21.70	E1000-148-3000S			18.08
E1000-148-3500-M			88.90	115.57			16.27	E1000-148-3500S			13.55
E1000-148-4000-M			101.60	136.14			12.59	E1000-148-4000S			10.49
E1000-148-4500-M	25.40		114.30	156.72			10.28	E1000-148-4500S			8.56
E1000-148-5000-M		3.76	127.00	177.29	478.47	43.06	8.69	E1000-148-5000S	398.57	35.87	7.24
E1000-148-5500-M			139.70	196.60			7.65	E1000-148-5500S			6.37
E1000-148-6000-M			152.40	217.17			6.74	E1000-148-6000S			5.61
E1000-148-6500-M			165.10	237.49			6.01	E1000-148-6500S			5.01
E1000-148-7000-M			177.80	258.06			5.43	E1000-148-7000S			4.52
E1000-148-8000-M			203.20	297.94			4.59	E1000-148-8000S			3.82
E1000-148-9000-M			228.60	339.09			3.94	E1000-148-9000S			3.28
T32610			64.30	119.90			2.39	T42610			1.99
T32620			79.30	168.20			1.50	T42620			1.25
T32630		2.50	102.00	241.00	157.00	23.79	0.96	T42630	130.78	19.81	0.80
T32640			139.00	361.00			0.60	T42640			0.50
T32650	28.00		189.00	522.00			0.40	T42650			0.33
T33050			76.00	101.40			18.80	T43050			15.66
T33060		4.00	100.00	140.70	564.00	84.56	11.80	T43060	469.81	70.44	9.83
T33070			136.00	199.60			7.54	T43070			6.28
T33080			196.00	298.00			4.71	T43080			3.92
E1125-085-3000-M			76.20	145.80			1.23	E1125-085-3000S			1.02
E1125-085-3500-M			88.90	201.17			0.75	E1125-085-3500S			0.63
E1125-085-4000-M			101.60	256.79			0.54	E1125-085-4000S			0.45
E1125-085-4500-M			114.30	312.17			0.44	E1125-085-4500S			0.37
E1125-085-5000-M		2.16	127.00	367.54	93.28	8.41	0.35	E1125-085-5000S	77.70	7.01	0.29
E1125-085-5500-M			139.70	422.91			0.30	E1125-085-5500S			0.25
E1125-085-6000-M			152.40	478.54			0.26	E1125-085-6000S			0.22
E1125-085-6500-M			165.10	533.91			0.23	E1125-085-6500S			0.19
E1125-085-7000-M			177.80	589.28			0.21	E1125-085-7000S			0.18
E1125-105-3000-M			76.20	120.65			3.43	E1125-105-3000S			2.86
E1125-105-3500-M			88.90	158.75			2.19	E1125-105-3500S			1.82
E1125-105-4000-M			101.60	196.60			1.61	E1125-105-4000S			1.34
E1125-105-4500-M			114.30	234.70			1.28	E1125-105-4500S			1.07
E1125-105-5000-M	28.58	2.67	127.00	272.54	168.14	15.12	1.05	E1125-105-5000S	140.06	12.59	0.88
E1125-105-5500-M			139.70	310.64			0.89	E1125-105-5500S			0.74
E1125-105-6000-M			152.40	348.49			0.79	E1125-105-6000S			0.66
E1125-105-6500-M			165.10	386.59			0.68	E1125-105-6500S			0.57
E1125-105-7000-M			177.80	424.43			0.61	E1125-105-7000S			0.51
E1125-125-3000-M			76.20	106.93			8.09	E1125-125-3000S			6.74
E1125-125-3500-M			88.90	135.64			5.31	E1125-125-3500S			4.42
E1125-125-4000-M			101.60	164.59			3.94	E1125-125-4000S			3.28
E1125-125-4500-M			114.30	193.29			3.13	E1125-125-4500S			2.61
E1125-125-5000-M		3.18	127.00	222.25	272.45	24.51	2.61	E1125-125-5000S	226.95	20.42	2.17
E1125-125-5500-M			139.70	250.95			2.22	E1125-125-5500S			1.85
E1125-125-6000-M			152.40	279.91			1.94	E1125-125-6000S			1.62
E1125-125-6500-M			165.10	308.61			1.73	E1125-125-6500S			1.44
E1125-125-7000-M			177.80	337.57			1.56	E1125-125-7000S			1.30
T32730			69.80	124.50			3.11	T42730			2.59
T32740	30.00	2.80	86.60	174.20	200.00	29.47	1.94	T42740	166.60	25.55	1.62
T32750			112.00	249.00			1.25	T42750			1.04
T32760			154.00	373.00			0.78	T42760			0.65
E1250-095-3500-M			88.90	177.80			1.17	E1250-095-3500S			0.98
E1250-095-4000-M			101.60	231.90			0.81	E1250-095-4000S			0.67
E1250-095-4500-M			114.30	286.00			0.61	E1250-095-4500S			0.51
E1250-095-5000-M		2.41	127.00	340.11	115.03	10.36	0.49	E1250-095-5000S	95.82	8.63	0.41
E1250-095-5500-M			139.70	394.21			0.40	E1250-095-5500S			0.34
E1250-095-6000-M			152.40	448.31			0.35	E1250-095-6000S			0.29
E1250-095-6500-M			165.10	502.41			0.32	E1250-095-6500S			0.26
E1250-095-7500-M	31.75		190.50	610.62			0.25	E1250-095-7500S			0.20
E1250-115-3500-M			88.90	147.57			3.03	E1250-115-3500S			2.52
E1250-115-4000-M			101.60	185.93			2.12	E1250-115-4000S			1.77
E1250-115-4500-M			114.30	224.54			1.61	E1250-115-4500S			1.34
E1250-115-5000-M		2.92	127.00	262.89	195.86	17.61	1.31	E1250-115-5000S	163.15	14.67	1.09
E1250-115-5500-M			139.70	301.24			1.10	E1250-115-5500S			0.92
E1250-115-6000-M			152.40	339.85			0.95	E1250-115-6000S			0.79
E1250-115-6500-M			165.10	378.21			0.84	E1250-115-6500S			0.70
E1250-115-7000-M			177.80	416.56			0.75	E1250-115-7000S			0.63

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
E1250-115-7500-M		2.92	190.50	455.17	195.86	17.61	0.67	E1250-115-7500S	163.15	14.67	0.55
E1250-135-3500-M			88.90	130.05			6.74	E1250-135-3500S			5.61
E1250-135-4000-M			101.60	160.02			4.76	E1250-135-4000S			3.97
E1250-135-4500-M			114.30	189.74			3.70	E1250-135-4500S			3.08
E1250-135-5000-M			127.00	219.46			3.01	E1250-135-5000S			2.51
E1250-135-5500-M		3.43	139.70	249.17	305.24	27.49	2.54	E1250-135-5500S	254.26	22.90	2.12
E1250-135-6000-M			152.40	278.89			2.19	E1250-135-6000S			1.82
E1250-135-6500-M			165.10	308.61			1.93	E1250-135-6500S			1.60
E1250-135-7000-M	31.75		177.80	338.33			1.73	E1250-135-7000S			1.44
E1250-135-7500-M			190.50	368.30			1.56	E1250-135-7500S			1.30
E1250-148-3500-M			88.90	122.43			10.67	E1250-148-3500S			8.89
E1250-148-4000-M			101.60	148.59			7.62	E1250-148-4000S			6.35
E1250-148-4500-M			114.30	174.75			5.94	E1250-148-4500S			4.95
E1250-148-5000-M			127.00	200.66			4.85	E1250-148-5000S			4.04
E1250-148-5500-M		3.76	139.70	226.82	393.13	35.36	4.10	E1250-148-5500S	327.48	29.45	3.42
E1250-148-6000-M			152.40	252.98			3.56	E1250-148-6000S			2.97
E1250-148-6500-M			165.10	279.15			3.13	E1250-148-6500S			2.61
E1250-148-7000-M			177.80	305.05			2.80	E1250-148-7000S			2.33
E1250-148-7500-M			190.50	331.22			2.54	E1250-148-7500S			2.12
T33170			86.30	115.30			20.10	T43170			16.74
T33180	32.00	4.50	113.00	159.40	685.00	102.08	12.60	T43180	570.61	85.03	10.50
T33190			154.00	226.60			8.03	T43190			6.69
T33200			221.00	337.00			5.01	T43200			4.17
T32850			82.60	151.00			3.02	T42850			2.52
T32860			102.00	211.00			1.89	T42860			1.57
T32870		3.20	131.00	302.00	243.00	36.45	1.21	T42870	202.42	30.37	1.01
T32880			179.00	453.00			0.76	T42880			0.63
T32890	36.00		243.00	653.00			0.50	T42890			0.42
T33290			96.60	128.80			21.40	T43290			17.83
T33300		5.00	127.00	178.50	808.00	120.62	13.30	T43300	673.06	100.48	11.08
T33310			172.00	252.40			8.54	T43310			7.11
T33320			247.00	376.00			5.34	T43320			4.45
E1500-125-4500-M			114.30	218.19			1.82	E1500-125-4500S			1.52
E1500-125-5000-M			127.00	262.64			1.38	E1500-125-5000S			1.15
E1500-125-5500-M			139.70	307.34			1.12	E1500-125-5500S			0.93
E1500-125-6000-M		3.18	152.40	352.04	207.47	18.68	0.95	E1500-125-6000S	172.82	15.56	0.79
E1500-125-6500-M			165.10	396.75			0.82	E1500-125-6500S			0.69
E1500-125-7000-M			177.80	441.20			0.72	E1500-125-7000S			0.60
E1500-125-7500-M			190.50	485.90			0.63	E1500-125-7500S			0.53
E1500-125-8000-M			203.20	530.61			0.58	E1500-125-8000S			0.48
E1500-148-4500-M			114.30	185.42			4.26	E1500-148-4500S			3.55
E1500-148-5000-M			127.00	218.95			3.27	E1500-148-5000S			2.72
E1500-148-5500-M			139.70	252.48			2.68	E1500-148-5500S			2.23
E1500-148-6000-M	38.10	3.76	152.40	286.00	331.35	29.80	2.26	E1500-148-6000S	276.01	24.82	1.88
E1500-148-6500-M			165.10	319.53			1.96	E1500-148-6500S			1.63
E1500-148-7000-M			177.80	353.06			1.72	E1500-148-7000S			1.43
E1500-148-7500-M			190.50	386.59			1.54	E1500-148-7500S			1.28
E1500-148-8000-M			203.20	420.12			1.38	E1500-148-8000S			1.15
E1500-177-4500-M			114.30	161.29			10.49	E1500-177-4500S			8.74
E1500-177-5000-M			127.00	187.20			8.21	E1500-177-5000S			6.84
E1500-177-5500-M			139.70	212.85			6.74	E1500-177-5500S			5.61
E1500-177-6000-M		4.50	152.40	238.76	542.24	48.79	5.73	E1500-177-6000S	451.69	40.64	4.77
E1500-177-6500-M			165.10	264.41			4.97	E1500-177-6500S			4.14
E1500-177-7000-M			177.80	290.07			4.40	E1500-177-7000S			3.67
E1500-177-7500-M			190.50	315.98			3.94	E1500-177-7500S			3.28
E1500-177-8000-M			203.20	341.63			3.56	E1500-177-8000S			2.97
T32970			92.10	165.00			3.54	T42970			2.95
T32980			114.00	231.00			2.22	T42980			1.85
T32990	40.00	3.60	146.00	328.00	304.00	45.79	1.42	T42990	253.23	38.15	1.18
T33000			200.00	492.00			0.88	T43000			0.73
T33010			272.00	709.00			0.59	T43010			0.49
E1750-148-5000-M			127.00	226.06			2.63	E1750-148-5000S			2.19
E1750-148-5500-M			139.70	268.73			2.01	E1750-148-5500S			1.67
E1750-148-6000-M			152.40	311.40			1.65	E1750-148-6000S			1.37
E1750-148-6500-M		3.76	165.10	353.82	286.15	25.75	1.38	E1750-148-6500S	238.36	21.45	1.15
E1750-148-7000-M	44.45		177.80	396.49			1.19	E1750-148-7000S			0.99
E1750-148-7500-M			190.50	439.17			1.05	E1750-148-7500S			0.88
E1750-148-8000-M			203.20	481.84			0.93	E1750-148-8000S			0.77
E1750-148-9000-M			228.60	567.18			0.77	E1750-148-9000S			0.64
E1750-177-5000-M		4.50	127.00	193.55	469.33	42.26	6.41	E1750-177-5000S	390.95	35.20	5.34
E1750-177-5500-M			139.70	225.30			4.99	E1750-177-5500S			4.16

EXTENSION SPRINGS - MUSIC WIRE								STAINLESS STEEL / INOX			
Part Number	Do (mm)	d (mm)	Lo (mm)	L_1 (mm)	P (N)	T (N)	R (N/mm)	Part Number	P (N)	T (N)	R (N/mm)
E1750-177-6000-M			152.40	257.05			4.08	E1750-177-6000S			3.40
E1750-177-6500-M			165.10	288.80			3.45	E1750-177-6500S			2.87
E1750-177-7000-M		4.50	177.80	320.29	469.33	42.26	2.99	E1750-177-7000S	390.95	35.20	2.49
E1750-177-7500-M			190.50	352.04			2.64	E1750-177-7500S			2.20
E1750-177-8000-M			203.20	383.79			2.36	E1750-177-8000S			1.97
E1750-177-9000-M			228.60	447.29			1.96	E1750-177-9000S			1.63
E1750-207-5000-M	44.45		127.00	173.74			14.05	E1750-207-5000S			11.70
E1750-207-5500-M			139.70	199.14			11.07	E1750-207-5500S			9.22
E1750-207-6000-M			152.40	224.28			9.12	E1750-207-6000S			7.60
E1750-207-6500-M		5.26	165.10	249.68	721.37	64.90	7.76	E1750-207-6500S	600.90	54.06	6.46
E1750-207-7000-M			177.80	274.83			6.76	E1750-207-7000S			5.63
E1750-207-7500-M			190.50	300.23			5.99	E1750-207-7500S			4.99
E1750-207-8000-M			203.20	325.63			5.36	E1750-207-8000S			4.47
E1750-207-9000-M			228.60	376.17			4.45	E1750-207-9000S			3.71
T33090			103.00	184.20			3.78	T43090			3.15
T33100			127.00	257.00			2.36	T43100			1.97
T33110	45.00	4.00	163.00	366.00	361.00	54.49	1.51	T43110	300.71	45.39	1.26
T33120			223.00	548.00			0.94	T43120			0.78
T33130			303.00	790.00			0.63	T43130			0.53
T33210			115.00	201.40			4.43	T43210			3.69
T33220			142.00	280.00			2.77	T43220			2.31
T33230	50.00		183.00	399.00	451.00	67.63	1.78	T43230	375.68	56.33	1.48
T33240			250.00	596.00			1.11	T43240			0.93
T33250			340.00	858.00			0.74	T43250			0.62
E2000-177-5500-M			139.70	228.35			4.24	E2000-177-5500S			3.53
E2000-177-6000-M		4.50	152.40	267.21			3.27	E2000-177-6000S			2.72
E2000-177-6500-M			165.10	305.82			2.68	E2000-177-6500S			2.23
E2000-177-7000-M			177.80	344.68	413.46	37.23	2.26	E2000-177-7000S	344.41	31.01	1.88
E2000-177-7500-M			190.50	383.54			1.94	E2000-177-7500S			1.62
E2000-177-8000-M			203.20	422.15			1.72	E2000-177-8000S			1.43
E2000-177-9000-M			228.60	499.62			1.38	E2000-177-9000S			1.15
E2000-177-10000-M	50.80		254.00	577.34			1.16	E2000-177-10000S			0.96
E2000-207-5500-M			139.70	202.69			9.19	E2000-207-5500S			7.66
E2000-207-6000-M			152.40	232.92			7.20	E2000-207-6000S			6.00
E2000-207-6500-M			165.10	262.89			5.92	E2000-207-6500S			4.93
E2000-207-7000-M		5.26	177.80	293.12	636.63	57.29	5.03	E2000-207-7000S	530.31	47.72	4.19
E2000-207-7500-M			190.50	323.34			4.36	E2000-207-7500S			3.63
E2000-207-8000-M			203.20	353.31			3.85	E2000-207-8000S			3.21
E2000-207-9000-M			228.60	413.77			3.13	E2000-207-9000S			2.61
E2000-207-10000-M			254.00	473.96			2.63	E2000-207-10000S			2.19
T33330			127.00	217.60			5.09	T43330			4.24
T33340			157.00	302.00			3.18	T43340			2.65
T33350	55.00	5.00	202.00	428.00	543.00	82.28	2.04	T43350	452.32	68.54	1.70
T33360			227.00	589.00			1.28	T43360			1.07
T33370			377.00	921.00			0.84	T43370			0.70

UK

CONTINUOUS LENGTH SPRINGS

SPEC meter lengths can be used as a stock item or cut to length, where length requirement of spring can vary.

MATERIALS

Music wire to DIN 17223 Class C. No 1,1200

Stainless steel wire to DIN 17224 No. 1,4310

KEY TO MEASUREMENTS

Do = Outside diameter
d = Wire diameter
Lo = Free Length
S = Pitch (+/-10%)

When enquiring or ordering, use letter 'M' or 'S' as suffix on catalogue numbers to designate music wire or stainless steel wire respectively. If not specified we will supply music wire.

F

COMPRESSION / TRACTION AU METRE

Les ressorts à couper SPEC, en longueur d'un mètre, peuvent être gardés en stock et coupés à la demande.

MATERIAUX

Corde à piano conforme à la norme DIN 17223 Classe C. No. 1 1200.

Fil en acier inoxydable conforme à la norme DIN 17224 No. 1 4310.

INDEX DES MESURES

Do = Diamètre extérieur
d = Diamètre du fil
Lo = Longueur à vide
S =

Pour se renseigner ou commander, utiliser la lettre 'M' pour la corde à piano ou 'S' pour le fil en acier inoxydable (comme suffixes aux numéros du catalogue), en l'absence de précision, nous fournirons la corde à piano.

E

COMPRESION / TRACCION AL METRO

Los muelles/resortes de SPEC, suministrados en longitudes de un metro, se pueden utilizar como artículo de stock y cortarlos a medida en el caso de variaciones de longitud.

MATERIAL

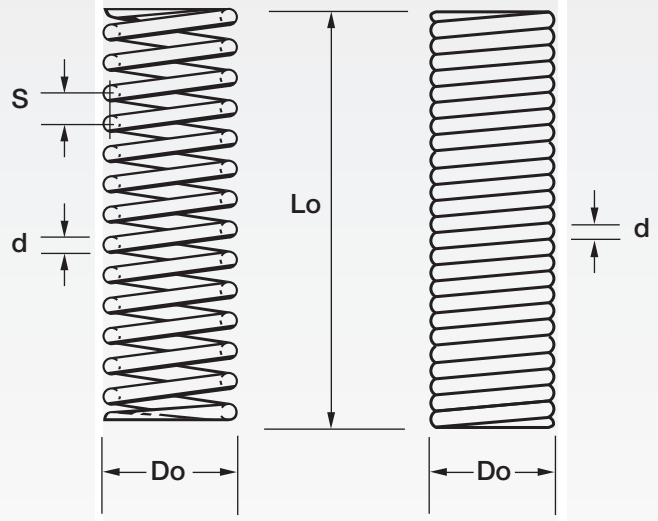
Alambre de piano según DIN 17223 Clase C. No. 1, 1200.

Alambre de acero inoxidable según DIN 17224 No. 1,4310.

CLAVES DE CARACTERÍSTICAS

Do = Diámetro exterior
d = Diámetro del alambre
Lo = Longitud libre
S = Paso (+/-10%)

Al hacer una consulta o un pedido, utilice la letra ''M'' o ''S'' como sufijo en los números de catálogo para designar alambre de piano o alambre de acero inoxidable, respectivamente. Por defecto, suministraremos en alambre de piano).



D

METERLANGE FEDERN

SPEC Federn mit Meterlänge werden zur gewunschte Länge abgeschnitten, wo Längebedürfnisse ändern.

WERKSTOFFE

Federstahldraht nach DIN 17223 Sorte C No 1,1200

Nichtrostender Federstahldraht nach DIN 17224 No 1,4310

KENNZEICHNEN DER ABMESSUNGEN

Do = Äußerer Windungsdurchmesser
d = Drahtdurchmesser
Lo = Länge der unbelasteten Feder
S = Steigung (+/-10%)

Bei Anfragen oder Bestellungen, fügen Sie "M" für Federstahldraht oder "S" für nichtrostender Federstahldraht Nachbuchstabe am Ende der Katalog-Bestell-Nummer zu. Falls keine zugefügt wird, werden wir Federstahldraht ausliefern.

I

MOLLE A COMPRESSIONE/TRAZIONE

Le molle SPEC vengono fornite anche con lunghezza libera di 1 metro e possono venire utilizzate come scorta a magazzino e venire tagliate con diverse lunghezze secondo le necessità.

MATERIALE

Filo armonico secondo DIN 17223 Classe C. No. 1. 1200.

Filo in acciaio inossidabile secondo DIN 17224 No. 1.4310

LEGENDA

Do = Diametro esterno
d = Diametro filo
Lo = Lunghezza libera
S = Passo (+/-10%)

Nelle vostre richieste od ordini specificate sempre il prefisso 'M' o 'S' rispettivamente per designare il filo armonico o l'acciaio inossidabile (se non specificato verrà fornito il filo armonico).

P

COMPRESSÃO / TRACÇÃO

As molas SPEC, fornecidas em comprimentos de um metro, podem utilizar-se como artigo de stock, podendo ser cortadas para suprir diferentes requisitos de comprimento.

MATERIAL

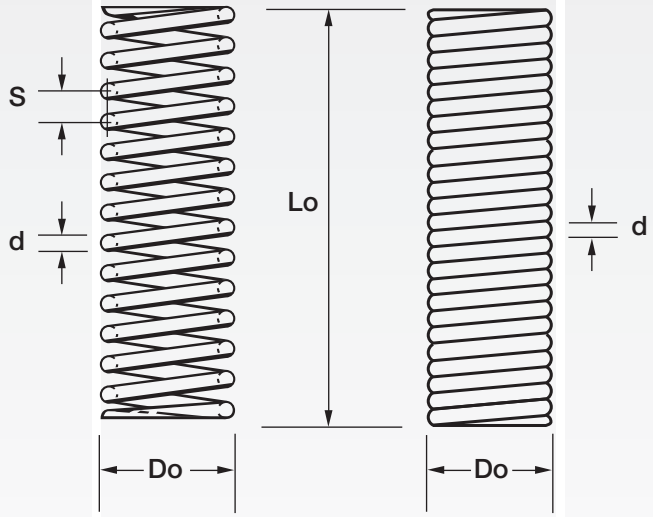
Arame de aço conforme à especificação DIN 17223 Classe C.

No. 1, 1200 Arame de aço inoxidável conforme à especificação DIN 17554 No. 1,4310.

TABELA DE MEDIDAS

Do = Diâmetro exterior
d = Diâmetro do arame
Lo = Comprimento livre
S = Passo (+/- 10mm)

Ao efectuar uma consulta ou um pedido, utilize a letra "M" ou "S" como sufixo nos números de catálogo, para designar arame de aço ou arame em aço inoxidável (caso não especifique, forneceremos arame de aço).



COMPRESSION (1 metre length)						EXTENSION (1 metre length)			
Part Number	Do (mm)	d (mm)	Lo(mm)	S (mm)		Part Number	Do (mm)	d (mm)	Lo (mm)
D19000	2.4	0.4	1000	1.0		T39000	2.4	0.4	1000
D19010	3.6		1000	1.6		T39010	3.4		1000
D19020	3.7	0.5	1000	1.6		T39020	3.5	0.5	1000
D19030	4.5		1000	4.0		T39030	5.5		1000
D19040	4.63	0.63	1000	2.0		T39040	4.5	0.63	1000
D19050	5.63		1000	2.5		T39050	7.0		1000
D19060	5.8	0.8	1000	2.5		T39060	5.5	0.8	1000
D19070	7.1		1000	3.15		T39070	9.0		1000
D19080	7.3	1.0	1000	3.15		T39080	7.0	1.0	1000
D19090	9.0		1000	4.0		T39090	11.0		1000
D19100	9.25	1.25	1000	4.0		T39100	8.5	1.2	1000
D19110	11.25		1000	5.0		T39110	13.0		1000
D19120	11.6	1.6	1000	5.0		T39120	11.0	1.6	1000
D19130	14.1		1000	6.25		T39130	17.0		1000
D19140	14.5	2.0	1000	6.25		T39140	14.0	2.0	1000
D19150	18.0		1000	8.0		T39150	22.0		1000
D19160	15.0	2.2	1000	6.41		T39160	15.0	2.2	1000
D19170	24.0		1000	10.91		T39170	24.0		1000
D19180	18.5	2.5	1000	8.0		T39180	18.0	2.5	1000
D19190	22.5		1000	10.0		T39190	28.0		1000
D19200	20.0	2.8	1000	8.62		T39200	20.0	2.8	1000
D19210	30.0		1000	13.61		T39210	30.0		1000
D19220	28.2	3.2	1000	12.5		T39220	22.0	3.2	1000
D19230	35.2		1000	17.54		T39230	36.0		1000

UK

DIE SPRINGS – NAMMS

Die springs are specially for use where high load is required in a confined space, eg, Die sets.

Can be used as heavy duty compression springs in non die applications.

The high demands placed upon these springs are a result of the high frequencies with which dies are charged.

Each group of spring is divided into a rising load range and can be identified by a colour coding system thus;

Middle = Blue
Middle Heavy = Red
Heavy = Copper
Extra Heavy = Green

FREE LENGTH TOLERANCES

Length (mm)	Tolerance (mm)
0-60	+2.5
61-105	+3.5
106-200	+5.0
201-250	+6.5
251-305	+10

KEY TO DIMENSIONS

Lo = Free length
L_1 = Recommended working length
P_1 = Load at L_1
P/f = Spring rate
H = Hole diameter (min)
R = Rod diameter (max)

F

RESSORTS DE COMPRESSION EXTRA-RAIDES – NORME US NAMMS

Les Ressorts de compression extra raide sont spécialement étudiés pour une utilisation demandant des efforts très élevés dans un encombrement réduit, l'outillage de presse par exemple .

Peuvent être utilisés comme des ressorts de compression de forte puissance dans des applications classiques.

Les exigences importantes imposées sur ces ressorts résultent de la fréquence de fonctionnement très élevée des outils de presse.

Chaque groupe de ressorts est divisé en plages croissantes de charge et peut être identifié par un système de code couleurs soit:

Moyen = Bleu
Moyen raide = Rouge
Raide = Cuivre
Extra raide = Vert

TOLÉRANCES SUR LES LONGUEURS LIBRES

Longueur (mm)	Tolérance (mm)
0-60	+2.5
61-105	+3.5
106-200	+5.0
201-250	+6.5
251-305	+10

INDEX DES DIMENSIONS

Lo = Longueur libre
L_1 = Longueur en charge recommandée
P_1 = Charge à L_1
P/f = Raideur du ressort
H = Diamètre de logement (min)
R = Diamètre d'axe (max)

E

MUELLES/RESORTES DE COMPRESION/ TROQUEL DE GRAN RESISTENCIA – NAMMS

Los muelles/resortes de troquel se usan especialmente en aplicaciones en las que se requiere una carga alta en un espacio reducido. p. ej. portamatrices.

Pueden ser usados como muelles/resortes de comprensión super fuertes en aplicaciones diferentes a la troquelería

Las grandes exigencias pedidas a estos muelles/resortes son el resultado de las altas frecuencias a las que son sometidos los troqueles.

Cada grupo de muelles/resortes se divide en una gama de carga creciente y pueden identificarse por medio de un sistema de códigos de colores:

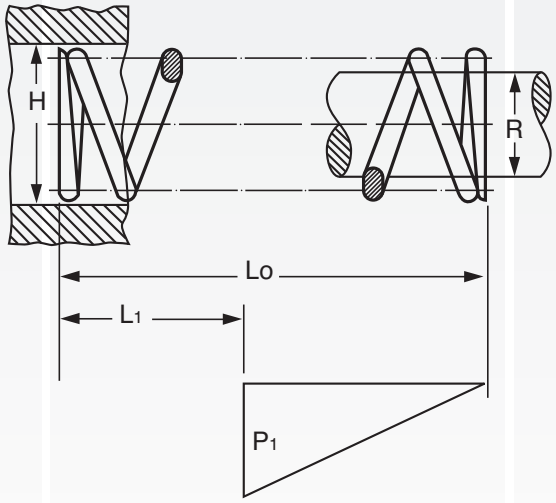
Medio = Azul
Medio pesado = Rojo
Pesado = Cobre
Extra-pesado = Verde

TOLERANCIAS ALTURA LIBRE

Longitud (mm)	Tol. (mm)
0-60	+2.5
61-105	+3.5
106-200	+5.0
201-250	+6.5
251-305	+10

CLAVES DE CARACTERÍSTICAS

Lo = Altura libre
L_1 = Altura trabajo recomendada
P_1 = Carga a L_1
P/f = Ratio de fuerza
H = Diámetro agujero (min)
R = Diámetro eje (max)



D

WERKZEUGFEDERN – NAMMS

Werkzeugfedern sind konstruiert für Fälle, wo hohe Belastungen auf engstem Raum auftreten, z.B., Formenbau.

Können als Druckfedern für hohe Belastungen bei Nicht-Werkzeug-Anwendungen verwendet werden

Wegen der hohen Frequenzen bei Formen, die Anforderungen erwartet von diesen Werkzeugfedern sind entsprechend.

Jede Gruppe der Werkzeugfedern ist laststeigend aufgebaut nach Farbcodesystem:

Mittlere Belastung = Blau
Mittel schwere Belastung = Rot
Schwere Belastung = Gold
Extra schwere Belastung = Grün

TOLERANZ BEI UNBELASTETEN LÄNGE

Länge Lo in (mm)	Toleranz in (mm)
0-60	+2.5
61-105	+3.5
106-200	+5.0
201-250	+6.5
251-305	+10

KENNZEICHNEN DER ABMESSUNGEN

Lo = Unbelastete Länge
L_1 = Belastete Länge
P_1 = Federkraft bei Federlänge
P/f = Federkonstante
H = Hülsen/Bohrungsdurchmesser (min)
R = Dorndurchmesser (max)

I

MOLLE A COMPRESSIONE PER CARICHI FORTI/MOLLE PER STAMPI – NAMMS

Le molle per stampi vengono utilizzate in casi in cui siano necessari dei carichi forti in spazi limitati.

Possono essere utilizzate anche in altre applicazioni oltre a quelle di stampaggio.

Queste molle per stampi sono calcolate per poter rispondere alle alte frequenze nello stampaggio

Ogni gruppo di molle è a sua volta suddiviso secondo le caratteristiche di carico in quattro codici di colori.

Carichi medi = Blu
Carichi medio/forti = Rosso
Carichi forti = Bronzo
Carichi extra forti = Verde

TOLLERANZE LUNGHEZZE LIBERE

Lung. (mm)	Toll. (mm)
0-60	+2.5
61-105	+3.5
106-200	+5.0
201-250	+6.5
251-305	+10

LEGENDA

Lo = Lunghezza libera
L_1 = Lunghezza di lavoro
P_1 = Carico a L_1 Newtons
P/f = Carico N/mm
H = Diametro foro (min)
R = Diametro perno (max)

P

MOLAS DE MATRIZ DE ALTA RESISTÊNCIA

As molas de matriz utilizam-se em especial em aplicações que carecem de uma carga elevada num espaço reduzido. Por exemplo, porta matrizes.

Podem ser usadas em aplicações pesadas sem ser em matrizes

As elevadas solicitações a que estas molas são sujeitas, resultam das elevadas frequências que as matrizes suportam.

Cada um dos grupos de molas divide-se numa gama de carga crescente, podendo identificar-se por intermédio de um sistema de código de cores:

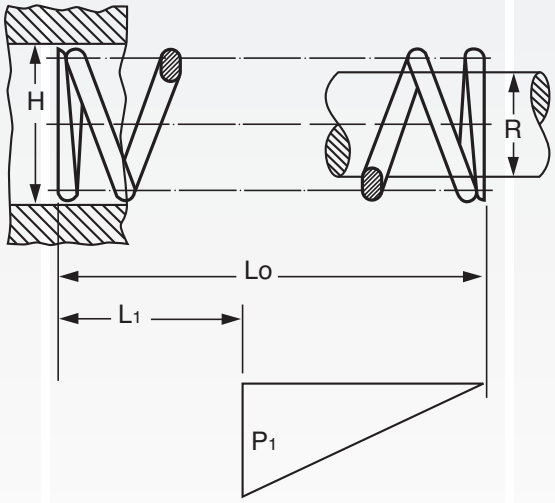
Médio = Azul
Médio pesado = Vermelho
Pesado = Cobre
Extra-pesado = Verde

TOLERANCIAS DE ALTURA LIVRE

Comprimento (mm)	Tolerancia (mm)
0-60	+2.5
61-105	+3.5
106-200	+5.0
201-250	+6.5
251-305	+10

LEGENDA

Lo = Comprimento livre
L_1 = Comprimento em carga (comprimento mínimo e trabalho)
P_1 = Carga em L_1
P/f = Carga em Newtons
H = Diâmetro do Furo
R = Diâmetro da Haste



WerkzeugfedernNAMMSWerkzeugfedernNAMMSWe
MolleACompressionePerCarichiForti/MollePerStamp
MolasDeMatrizDeAltaResistênciaMolasDeMatrizDeA

UK

ADDITIONAL TECHNICAL DATA

DIE SPRINGS – NAMMS

The use of high quality chrome alloy steels combines maximum load with long life. The SPEC range of die springs is composed of 8 groups by diameter. In this way it is possible to select springs of different loads characteristics for the same tooling already adapted for pressed parts, resulting in a longer operating lifetime for your dies and die sets.

The length in column L_1 can be used with a frequency of 1000 compressions per hour maximum.

In case of higher frequencies the efficient operating range will be:
Blue = 25-30% of the free length
Red = 20-25% of the free length
Copper = 15-20% of the free length
Green = 15% of the free length

To determine the load at any working length, use rate x proposed deflection ($Lo-L_1$)

F

DONNEES TECHNIQUES ADDITIONNELLES

RESSORTS DE COMPRESSION EXTRA-RAIDES – NORME US NAMMS

L'utilisation de l'acier au chrome vanadium de haute qualité (SAE6150) permet de combiner un maximum d'effort et de longévité.
La gamme de ressorts de compression extra raide SPEC est composée de 8 groupes par diamètre. De cette façon il est possible de sélectionner des ressorts à caractéristiques de forces différentes pour le même outillage adapté préalablement pour des pièces embouties, le résultat étant une longévité d'outillage augmentée.

La hauteur en charge donnée en colonne L_1 peut être utilisée avec une fréquence maximum de 1000 compressions par heure.

Dans le cas de fréquences plus importantes, la plage d'utilisation efficace sera:
Bleu = 25-30% de la longueur libre
Rouge = 20-25% de la longueur libre
Cuivre = 15-20% de la longueur libre
Vert = 15% de la longueur libre

Pour déterminer la charge à une longueur d'utilisation donnée utilisez la formule: taux x déflexion proposée ($Lo - L_1$)

E

INFORMACIÓN TÉCNICA ADICIONAL

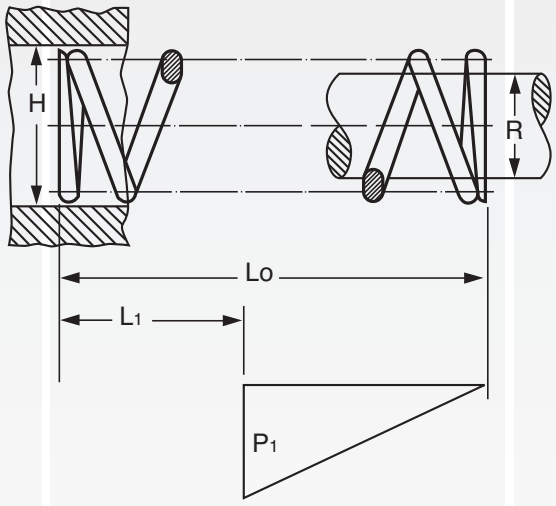
MUELLES/RESORTES DE COMPRESION/ TROQUEL DE GRAN RESISTENCIA – NAMMS

El uso del acero al cromo vanadio de alta calidad combina carga máxima con una larga vida útil.La gama de muelles/resortes de troquel de SPEC consiste en 8 grupos clasificados por diámetro. De esta manera se pueden seleccionar muelles/resortes de distintas características de carga para los mismos troqueles ya adaptados para piezas prensadas, resultando en una vida útil mayor para sus troqueles y portamatrices.

La longitud en la columna L_1 se puede utilizar con una frecuencia máxima de 1000 compresiones por hora.

En caso de frecuencias más altas, la gama de funcionamiento eficaz será:
Azul = 25-30% de la longitud libre
Rojo = 20-25% de la longitud libre
Cobre = 15-20% de la longitud libre
Verde = 15% de la longitud libre

Para determinar la carga a cualquier longitud de trabajo, utilice el ratio de fuerza multiplicada por la deflexión propuesta ($Lo - L_1$).



D

ZUSÄTZLICHE TECHNISCHEN ANGABEN

WERKZEUGFEDERN – NAMMS

Der Einsatz von Chrom-Vanadium-Stählen ermöglicht Kombinationen von maximalen Lasten mit hohen Lebensdauern. Die Werkzeugfedern sind in Gruppen nach Durchmessern geordnet. Nach diesem System können Werkzeugfedern bei gleichen Einbaumaßen jedoch verschiedenen Belastungen ausgewählt werden. Dies erhöht die Lebensdauer von Stanz- Biege- und sonstigen Werkzeugen.

Die Länge in Spalte L_1 kann bis zu einer Frequenz von 1.000/Stunde verwendet werden.

Bei höheren Frequenzen sollten folgende Werte eingehalten werden:
Blau = 25-30% Einfederung
Rot = 20-25% Einfederung
Gold = 15-20% Einfederung
Grün = max. 15% Einfederung

Um die Kraft bei einer bestimmten Federlänge auszurechnen, verwenden Sie Federkonstante x weg ($Lo-L_1$)

I

ULTERIORI INFORMAZIONI TECNICHE

MOLLE A COMPRESSIONE PER CARICHI FORTI/MOLLE PER STAMPI – NAMMS

L'impiego di acciaio al cromo/vanadio di altissima qualità (SAE 6150) combina la possibilità di sopportare carichi estremi e un lungo ciclo di vita della molla. Il programma SPEC comprende otto gruppi di molle divisi per diametri. In questo modo è possibile selezionare molle con differenti caratteristiche di carico per le stesse attrezzature in modo da incrementare la durata dei vostri stampi.

Le lunghezze indicate nella colonna L_1 possono essere utilizzate con una frequenza massima di 1,000 colpi/ora.

In caso di frequenze maggiori, l'utilizzo consigliato è il seguente:
Blu = 25-30% della lunghezza libera
Rosso = 20-25% della lunghezza libera
Bronzo = 15-20% della lunghezza libera
Verde = 15% della lunghezza libera

Per determinare il carico ad ogni altezza di lavoro moltiplicate il carico unitario x deflessione necessaria ($Lo - L_1$).

P

INFORMAÇÕES TECNICAS ADICIONAIS

MOLAS DE MATRIZ DE ALTA RESISTÊNCIA

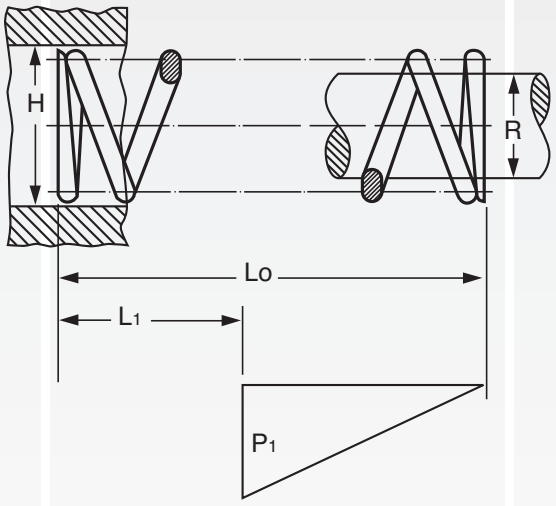
A utilização de aço cromo vanádio de alta qualidade (SAE 6150) permite conjugar a carga máxima e uma vida útil em serviço prolongada.

A gama de molas de matriz SPEC integra 8 grupos classificados em função do diâmetro. Desta forma, é possível seleccionar molas de diferentes características de carga para as mesmas matrizes, já adaptadas para peças estampadas, proporcionando uma vida útil alargada às matrizes e porta matrizes.

La longitud en la columna L_1 se puede utilizar con una frecuencia máxima de 1000 compresiones por hora.

En caso de frecuencias más altas, la gama de funcionamiento eficaz será:
Azul = 25-30% de la longitud libre
Rojo = 20-25% de la longitud libre
Cobre = 15-20% de la longitud libre
Verde = 15% de la longitud libre

Para determinar a carga a qualquer comprimento de trabalho, multiplique a cadência pela deflexão proposta ($Lo-L_1$).



DIE SPRINGS – NAMMS

Lo (mm)	L_1 (mm)	P_1 (N)	P/f (N/mm)	Part No.
	H min. 9.53mm	R max. 4.75mm		
	19.05	66.70	10.5	St50300
25.4	19.05	100.08	15.8	St50310
	21.59	73.42	19.3	St50320
	21.59	146.69	38.5	St50330
	23.83	74.93	9.5	St50340
31.75	23.83	101.29	12.8	St50350
	27.00	81.70	17.2	St50360
	27.00	133.14	28.0	St50370
	28.58	66.64	7.0	St50380
38.1	28.58	111.74	11.7	St50390
	32.39	80.03	14.0	St50400
	32.39	125.04	21.9	St50410
	33.35	66.12	6.0	St50420
44.45	33.35	112.89	10.2	St50430
	37.80	97.86	14.7	St50440
	37.80	133.98	20.1	St50450
	38.10	62.30	4.9	St50460
50.8	38.10	111.25	8.8	St50470
	43.18	96.11	12.6	St50480
	43.18	120.15	15.8	St50490
	47.63	66.72	4.2	St50500
63.5	47.63	116.77	7.4	St50510
	53.98	91.73	9.7	St50520
	53.98	116.75	12.3	St50530
	57.15	70.00	3.7	St50540
76.2	57.15	100.12	5.3	St50550
	64.77	84.10	7.4	St50560
	64.77	130.10	11.4	St50570
	228.6	80.10	1.0	St50580
304.8	228.6	120.15	1.6	St50590
	259.08	96.11	2.1	St50600
	259.08	120.15	2.6	St50610
	H min. 12.7mm	R max. 7.14mm		
	19.05	122.37	19.3	St50620
	19.05	186.90	29.4	St50630
25.4	21.59	157.52	41.3	St50640
	21.59	213.60	56.0	St50650
	23.83	113.78	14.4	St50660
	23.83	180.37	22.8	St50670
31.75	26.97	155.76	32.6	St50680
	26.97	200.98	42.0	St50690
	28.58	113.41	11.9	St50700
38.1	28.58	158.44	16.6	St50710
	32.39	155.05	27.1	St50720
	32.39	200.06	35.0	St50730
	33.35	116.67	10.5	St50740
44.45	33.35	165.29	14.9	St50750
	37.77	161.50	24.2	St50760
	37.77	198.95	29.8	St50770
	38.10	122.37	9.6	St50780
50.8	38.10	166.87	13.1	St50790
	43.18	146.84	19.3	St50800
	43.18	186.89	24.5	St50810
	47.63	125.11	7.9	St50820
63.5	47.63	166.82	10.5	St50830
	53.98	140.10	14.7	St50840
	53.98	191.80	20.1	St50850
	57.15	116.81	6.1	St50860
76.2	57.15	190.23	10.0	St50870
	64.77	148.18	13.0	St50880
	64.77	180.22	15.8	St50890
	66.68	116.78	5.3	St50900
88.9	66.68	155.71	7.0	St50910
	75.57	140.12	10.5	St50920
	75.57	186.82	14.0	St50930
	228.6	93.45	1.2	St50940
304.8	228.6	160.19	2.1	St50950
	259.08	128.15	2.8	St50960
	259.08	200.24	4.4	St50970
114.3	85.73	125.12	4.4	St50901

DIE SPRINGS – NAMMS

Lo (mm)	L_1 (mm)	P_1 (N)	P/f (N/mm)	Part No.
	H min. 12.7mm	R max. 7.14mm		
139.7	104.78	128.46	3.7	St50902
165.1	123.83	115.66	2.8	St50903
190.5	142.88	91.76	1.9	St50904
	H min. 15.88mm	R max. 8.71mm		
	19.05	182.44	28.7	St50980
25.4	19.05	333.74	52.5	St50990
	21.59	283.00	74.3	St51000
	21.59	420.51	110.4	St51010
	23.8	178.27	22.4	St51020
31.75	23.8	299.44	37.7	St51030
	26.97	247.87	51.8	St51040
	26.97	393.58	82.3	St51050
	28.58	180.12	18.9	St51060
38.1	28.58	316.88	33.3	St51070
	32.39	272.10	47.6	St51080
	32.39	380.13	66.6	St51090
	33.32	187.19	16.8	St51100
44.45	33.32	327.58	29.4	St51110
	37.77	280.86	42	St51120
	37.77	374.48	56	St51130
	38.1	195.79	15.4	St51140
50.8	38.1	329.28	25.9	St51150
	43.18	277.67	36.4	St51160
	43.18	387.13	50.8	St51170
	47.63	166.81	10.5	St51180
63.5	47.63	319.73	20.1	St51190
	53.98	283.53	29.8	St51200
	53.98	366.92	38.5	St51210
	57.15	186.89	9.8	St51220
76.2	57.15	333.74	17.5	St51230
	64.77	288.35	25.2	St51240
	64.77	380.46	33.3	St51250
	66.68	186.85	8.4	St51260
88.9	66.68	330.88	14.9	St51270
	75.57	284.90	21.4	St51280
	75.57	373.64	28	St51290
	76.2	195.79	7.7	St51300
101.6	76.2	338.18	13.3	St51310
	86.38	287.97	18.9	St51320
	86.38	359.96	23.6	St51330
	228.6	213.59	2.8	St51340
304.8	228.6	360.43	4.7	St51350
	259.08	240.29	5.3	St51360
	259.08	360.43	7.9	St51370
	H min. 19.05mm	R max. 9.53mm		
	19.05	347.08	54.7	St51380
25.4	19.05	556.23	87.6	St51390
	21.59	720.87	189.2	St51400
	21.59	934.46	245.3	St51410
	23.8	356.55	44.8	St51420
31.75	23.8	529.47	66.6	St51430
	26.97	736.92	154	St51440
	26.97	921.15	192.7	St51450
	28.58	333.56	35.0	St51460
38.1	28.58	534.00	56.1	St51470
	32.39	656.22	114.9	St51480
	32.39	890.30	155.9	St51490
	33.32	343.17	30.8	St51500
44.45	33.32	561.56	50.4	St51510
	37.77	702.16	105.1	St51520
	37.77	877.70	131.4	St51530
	38.1	320.39	25.2	St51540
50.8	38.1	551.78	43.4	St51550
	43.18	662.13	86.9	St51560
	43.18	907.76	119.1	St51570
	47.63	333.63	21.0	St51580
63.5	47.63	533.81	33.6	St51590
	53.98	667.12	70.0	St51600
	53.98	833.90	87.6	St51610
76.2	57.15	320.38	16.8	St51620

DIE SPRINGS – NAMMS

Lo (mm)	L_1 (mm)	P_1 (N)	P/f (N/mm)	Part No.
	H 19.05mm	R max. 9.53mm		
76.2	57.15	480.58	25.2	St51630
	64.77	680.82	59.6	St51640
	64.77	810.98	70.9	St51650
	66.68	311.42	14	St51660
88.9	66.68	498.27	22.4	St51670
	75.57	653.88	49	St51680
	75.57	805.67	60.4	St51690
	76.2	320.38	12.6	St51700
101.6	76.2	533.98	21	St51710
	86.36	667.47	43.8	St51720
	86.36	800.97	52.5	St51730
	85.73	320.26	11.2	St51740
114.3	85.73	560.58	19.6	St51750
	97.16	660.61	38.5	St51760
	97.16	795.73	46.4	St51770
	95.25	333.74	10.5	St51780
127	95.25	500.61	15.8	St51790
	107.95	650.79	34.2	St51800
	107.95	784.28	41.2	St51810
	104.78	336.47	9.6	St51820
139.7	104.78	489.41	14	St51830
	118.75	623.94	29.8	St51840
	118.75	789.10	37.6	St51850
	114.3	333.75	8.8	St51860
152.4	114.3	500.61	13.1	St51870
	129.54	640.77	28	St51880
	129.54	780.94	34.2	St51890
	228.6	320.39	4.2	St51900
304.8	228.6	480.38	6.3	St51910
	259.08	640.77	14	St51920
	259.08	760.92	16.6	St51930
165.1	123.83	281.91	6.8	St51861
190.5	142.88	275.24	5.8	St51862
	H min. 25.4mm	R max.12.7mm		
	19.05	611.85	96.4	St51940
25.4	19.05	845.47	133.1	St51950
	21.59	1388.35	364.4	St51960
	23.8	626.74	78.8	St51970
31.75	23.8	869.08	109.3	St51980
	26.97	1433.64	299.9	St51990
	28.58	583.73	61.3	St52000
38.1	28.58	827.23	86.9	St52010
	32.39	1184.40	207.4	St52020
	32.39	1600.54	280.3	St52030
	33.32	584.96	52.6	St52040
44.45	33.32	857.94	77.1	St52050
	37.77	1217.08	182.2	St52060
	38.1	578.48	45.5	St52070
50.8	38.1	889.97	70.1	St52080
	43.18	1201.45	157.7	St52090
	43.18	1548.54	203.2	St52100
	47.63	556.00	35	St52110
	47.63	861.88	54.3	St52120
63.5	53.98	1134.11	119.1	St52130
	53.98	1494.36	157	St52140
	57.15	550.67	28.9	St52150
	57.16	833.90	43.8	St52160
76.2	64.77	1089.32	95.3	St52170
	64.77	1473.78	128.9	St52180
	66.68	583.91	26.3	St52190
88.9	66.68	840.83	37.8	St52200
	75.57	1064.89	79.9	St52210
	75.57	1457.22	109.3	St52220
	76.2	533.98	21	St52230
101.6	76.2	818.77	32.2	St52240
	86.36	1067.96	70	St52250
	86.36	1473.78	96.7	St52260
	86.73	502.32	18.2	St52270
114.3	85.73	850.88	29.8	St52280
	97.14	1058.20	61.7	St52290

DIE SPRINGS – NAMMS

Lo (mm)	L_1 (mm)	P_1 (N)	P/f (N/mm)	Part No.
	H min. 25.4mm	R max.12.7mm		
114.3	97.16	1465.35	85.5	St52300
	95.25	533.98	16.8	St52310
127.0	95.25	800.97	25.2	St52320
	107.95	1041.26	54.7	St52330
	107.95	1441.74	75.7	St52340
	104.78	538.35	15.4	St52350
139.7	104.78	783.06	22.4	St52360
	118.75	1057.03	50.5	St52370
	114.3	533.98	14.0	St52380
152.4	114.3	800.97	21.0	St52390
	129.54	1025.24	44.8	St52400
	129.54	1441.74	63.1	St52410
	133.35	560.68	12.6	St52420
177.8	133.35	778.72	17.5	St52430
	151.13	1046.60	39.2	St52440
	152.4	533.98	10.5	St52450
203.2	152.4	783.17	15.4	St52460
	172.72	1025.34	33.6	St52470
	228.6	533.98	7.0	St52480
304.8	228.6	830.58	10.9	St52490
	259.08	961.16	21.0	St52500
	259.08	1409.70	30.8	St52510
	H min. 31.75mm	R max. 15.88mm		
	28.58	827.23	86.9	St52520
38.1	28.58	1907.97	200.4	St52530
	32.39	2120.71	371.4	St52540
	33.32	826.74	74.3	St52550
44.45	33.32	1965.46	176.6	St52560
	37.77	2125.21	318.1	St52570
	38.1	783.17	61.7	St52580
50.8	38.1	1922.32	151.4	St52590
	43.18	1997.08	262.1	St52600
	43.18	2563.10	336.4	St52610
	47.63	800.72	50.5	St52620
63.5	47.63	1734.89	109.3	St52630
	53.98	1961.34	206	St52640
	53.98	2401.64	252.3	St52650
	57.15	800.97	42	St52660
76.2	57.15	1708.73	89.7	St52670
	64.77	1906.31	166.8	St52680
	64.77	2370.87	207.4	St52690
	66.68	778.54	35	St52700
88.9	66.68	1712.80	77.1	St52710
	75.57	1756.13	131.7	St52720
	75.57	2353.96	176.6	St52730
	76.2	783.17	30.8	St52740
101.6	76.2	1637.54	64.5	St52750
	86.36	1772.81	116.3	St52760
	86.36	2242.71	147.2	St52770
	85.73	800.83	28	St52780
114.3	85.73	1601.66	56.1	St52790
	97.16	1753.61	102.3	St52800
	97.16	2354.16	137.3	St52810
	95.25	756.47	23.8	St52820
127	95.25	1613.06	50.8	St52830
	107.95	1768.81	92.9	St52840
	107.95	2269.41	119.1	St52850
	104.78	783.10	22.4	St52860
139.7	104.78	1615.06	46.3	St52870
	118.75	1732.35	82.7	St52880
	114.3	800.97	21	St52890
152.4	114.3	1668.68	43.8	St52900
	129.54	1698.05	74.3	St52910
	129.54	2242.71	98.1	St52920
	133.35	809.87	18.2	St52930
177.8	133.35	1557.44	35	St52940
	151.13	1719.41	64.5	St52950
	152.4	783.17	15.4	St52960
203.2	152.4	1637.54	32.2	St52970
	172.72	1751.45	57.5	St52980

DIE SPRINGS – NAMMS

Lo (mm)	L_1 (mm)	P_1 (N)	P/f (N/mm)	Part No.
Hole Dia. min. 31.75mm		Rod Dia. max. 15.88mm		
	172.72	2221.35	72.9	St52990
	190.5	800.97	12.6	St53000
254	190.5	1613.06	25.4	St53010
	215.9	1708.73	44.8	St53020
	215.9	2242.71	58.9	St53030
	228.6	800.97	10.5	St53040
304.8	228.6	1655.34	21.7	St53050
	259.08	1666.01	36.4	St53060
	259.08	2114.55	46.3	St53070
Hole Dia. min. 38.1mm		Rod Dia. max. 19.05mm		
	38.1	1179.20	92.9	St53080
50.8	38.1	2402.91	189.2	St53090
	43.18	2541.74	333.6	St53100
	43.18	5019.40	658.7	St53110
	47.63	1251.12	78.8	St53120
63.5	47.63	2379.91	149.9	St53130
	53.98	2585.10	271.5	St53140
	53.98	4910.03	515.8	St53150
	57.15	1201.45	63.1	St53160
76.2	57.15	2082.52	109.3	St53170
	64.77	2603.15	227.7	St53180
	64.77	4629.60	405	St53190
	66.68	1168.00	52.6	St53200
88.9	66.68	2055.85	92.5	St53210
	75.57	2484.74	186.4	St53220
	75.57	4577.15	343.3	St53230
	76.2	1201.45	47.3	St53240
101.6	76.2	2135.92	84.1	St53250
	86.36	2434.94	159.8	St53260
	86.36	4570.86	299.9	St53270
	85.73	1151.20	40.3	St53280
114.3	85.73	2162.24	75.7	St53290
	97.16	2354.16	137.3	St53300
	97.16	4444.08	259.3	St53310
	95.25	1168.08	36.8	St53320
127	95.25	2046.92	64.5	St53330
	107.95	2376.20	124.7	St53340
	107.95	4538.82	238.3	St53350
	104.78	1131.76	32.4	St53360
139.7	104.78	2104.47	60.3	St53370
	118.75	2348.95	112.1	St53380
	114.3	1134.71	29.8	St53390
152.4	114.3	2029.12	53.3	St53400
	129.54	2338.83	102.3	St53410
	129.54	4421.35	193.4	St53420
	133.35	1129.14	25.4	St53430
177.8	133.35	2055.82	46.3	St53440
	151.13	2317.47	86.9	St53450
	152.4	1139.16	22.4	St53460
203.2	152.4	1957.92	38.5	St53470
	172.72	2306.79	75.7	St53480
	172.72	4314.55	141.6	St53490
	190.5	1112.46	17.5	St53500
254	190.5	1957.92	30.8	St53510
	215.9	2296.11	60.3	St53520
	215.9	4485.42	117.7	St53530
	228.6	1067.96	14	St53540
304.8	228.6	1922.32	25.2	St53550
	259.08	2306.79	50.5	St53560
	259.08	4357.27	95.3	St53570
Hole Dia. min. 50.8mm		Rod Dia. max. 25.4mm		
	47.63	2780.27	175.19	St53580
63.5	47.63	3291.83	207.4	St53590
	53.98	4336.30	455.5	St53600
	53.98	6364.36	668.5	St53610
	57.15	2770.02	145.4	St53620
76.2	57.15	3203.87	168.2	St53630
	64.77	4004.84	350.4	St53640
	64.77	6247.56	546.6	St53650
88.9	66.68	2522.48	113.5	St53660

DIE SPRINGS – NAMMS

Lo (mm)	L_1 (mm)	P_1 (N)	P/f (N/mm)	Part No.
Hole Dia. min. 50.8mm		Rod Dia. max. 25.4mm		
88.9	66.68	3114.18	140.2	St53670
	75.57	3969.98	297.8	St53680
	75.57	5940.96	445.7	St53690
	76.2	2669.90	105.1	St53700
101.6	76.2	2954.68	116.3	St53710
	86.36	4004.84	262.8	St53720
	86.36	5873.77	385.4	St53730
	85.73	2652.74	92.9	St53740
114.3	85.73	3003.11	105.1	St53750
	97.16	3603.31	210.2	St53760
	97.16	5669.20	330.8	St53770
	95.25	2614.27	82.3	St53780
127	95.25	3114.88	98.1	St53790
	107.95	3671.11	192.7	St53800
	107.95	5766.73	302.7	St53810
	104.78	2398.11	68.7	St53820
139.7	104.78	3083.29	88.3	St53830
	118.75	3670.23	175.2	St53840
	114.3	2603.15	68.3	St53850
152.4	114.3	3150.48	82.7	St53860
	129.54	3764.55	164.7	St53870
	129.54	5670.96	248.07	St53880
	133.35	2429.60	54.7	St53890
177.8	133.35	3114.88	70	St53900
	151.13	3831.30	143.7	St53910
	152.4	2536.40	49.9	St53920
203.2	152.4	3132.68	61.7	St53930
	172.72	3898.05	127.6	St53940
	172.72	5339.79	175.2	St53950
	190.5	2313.90	36.4	St53960
254	190.5	2892.39	45.5	St53970
	215.9	3671.11	96.4	St53980
	215.9	5606.78	147.2	St53990
	228.6	2336.16	30.7	St54000
304.8	228.6	2990.28	39.2	St54010
	259.08	3365.00	73.6	St54020
	259.08	5702.90	124.7	St54030

UK

DIE SPRINGS – ISO

Associated Spring Raymond Die Springs are manufactured using a wire cross section developed to provide optimum balance between load carrying characteristics and cycle life.

Produced under carefully controlled processes with special equipment developed by Barnes Group, Inc's research and development facilities.

All of the manufacturing steps are closely monitored by rigid quality controls, inspection and testing to ensure that the long service life engineered into every die spring is constant.

Full technical specifications available on request from Associated Spring.

Springs manufactured in accordance with ISO 10243.

Green = Light Duty
Blue = Medium Duty
Red = Heavy Duty
Yellow = Extra Heavy Duty

Die Spring Features

Superior Materials & Wire Profile
- All Raymond die springs are made from high tensile strength chromium alloy steels.
- Optimal wire cross section.
- Spring ends are ground square.
- Other raw materials are available for special conditions and environments.

Dimensional Consistency
- Dimensional requirements remain consistent and measurably the same from one batch of springs to the next.

Longer Spring Life
- Engineered to better withstand shock loading.
- Designed to endure constant high-speed deflections.
- Shot-peened to increase fatigue life.
- Less downtime.

Excellent Deflection
- Springs provide greater available travel to solid.
- More travel in each spring.

KEY TO DIMENSIONS

H = Hole Diameter (mm)
R = Rod Diameter (mm)
Lo = Free Length (mm)
P/f = Spring Rate (N/mm)
L_1 = Optimum operating deflection (mm)
L_2 = Mid operating deflection (mm)
L_3 = Maximum operating deflection (mm)
L_4 = Maximum deflection (mm)
N = Force (N)
D = Deflection (mm)

F

RESSORTS DE COMPRESSION EXTRA-RAIDES - NORME ISO

Les ressorts extra raides de RESSORTS SPEC sont fabriqués à partir d'un fil à section trapézoidale, afin de garantir un niveau de contrainte minimum pendant le travail du ressort et une longévité maximale.

Fabriqués sur des équipements spéciaux, sous contrôle rigoureux par l'équipe de Recherche du Groupe BARNES, bénéficiant d'une longue expérience.

Toutes les étapes de fabrication sont effectuées sous un contrôle qualité strict (inspection, mesures, tests, . . .) afin d'assurer une longévité et des performances optimales.

Détails techniques fournis sur simple demande.

Ressorts construits selon ISO 10243

Verte = Charge Légère
Bleu = Charge Moyenne
Rouge = Charge Forte
Jaune = Charge Extra Forte

Caractéristiques

Matériaux Supérieurs et type de fil
- Tous nos ressorts sont fabriqués à partir d'acier au Chrome Vanadium.
- Fil trapézoïdal.
- Extrémités rapprochées, meulées.
- Autres matériaux disponibles pour des conditions et des environnements particuliers.

Consistance Dimensionnelle
- Les exigences dimensionnelles restent constantes d'une fabrication à l'autre.

Vie du Ressort
- Fabriqués pour mieux supporter les chocs.
- Conçus pour endurer des accoups.
- Grenaillés pour augmenter la durée de vie.
- Moins d'arrêt de machines.

Déflexion Excellente
- Les ressorts offrent une plus grande facilité pour atteindre la hauteur solide.
- Course plus performante pour chaque ressort.

INDEX DES DIMENSIONS

H = Diamètre de Logement (mm)
R = Diamètre d'Axe (mm)
Lo = Longueur Libre (mm)
P/f = Raideur du Ressort (N/mm)
L_1 = Déflexion minimum de fonctionnement (mm)
L_2 = Déflexion moyenne de fonctionnement (mm)
L_3 = Déflexion maximum de fonctionnement (mm)
L_4 = Déflexion maximum
N = Force / Charge (N)
D = qqDéflexion (mm)

E

MUELLES/RESORTES DE TROQUEL – NORMA ISO

Los muelles/resortes de troquel de Associated Spring Raymond se fabrican a partir de un hilo metálico de sección transversal desarrollado para garantizar un equilibrio óptimo entre la capacidad de carga y su duración máxima.

Nuestro proceso de producción se realiza mediante cuidadosos controles y con un equipo especial desarrollado por el equipo de investigación del Grupo Barnes.

Todas las etapas de la fabricación se efectúan bajo un estricto control de calidad, inspección y exámenes del producto para así garantizar una larga vida útil de cada uno de los muelles de troquel.

Detalles técnicos facilitados sobre demanda.

Muelles/resortes fabricados de acuerdo con la norma ISO 10243.

Verde = Carga Ligera
Azul = Carga Media
Rojo = Carga Fuerte
Amarillo = Carga Extra Fuerte

Caractéristiques

Materiales de calidad superior y tipo de hilo
- Todos los muelles/resortes de troquel Raymond están fabricados a partir de aceros al cromo aleados de alta ductilidad.
- Hilo metálico de sección transversal óptimo.
- Los extremos del muelle se rectifican para dar una sección cuadrada.
- Disponibles otros materiales para condiciones y ambientes especiales.

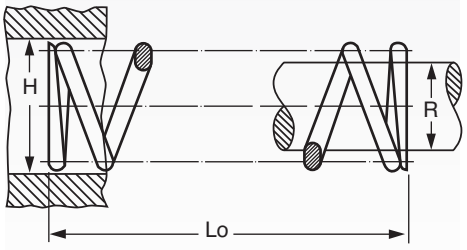
Consistencia Dimensional
- Las exigencias dimensionales se mantienen constantes de una fabricación a otra.

Vida útil más larga
- Diseñados para soportar mejor los impactos de la carga.
- Concebidos para resistir las continuas deflexiones.
- Granallado para prolongar la vida útil del muelle.
- Menor período de paralización del trabajo.

Deflexión excelente
- Los muelles/resortes proporcionan una mayor carrera para alcanzar la altura sólida.
- Mayor carrera en cada muelle.

CLAVES DE CARACTERÍSTICAS

H = Diámetro agujero (mm)
R = Diámetro eje (mm)
Lo = Altura libre (mm)
P/f = Ratio de fuerza (N/mm)
L_1 = Deflección operativa óptima (mm)
L_2 = Deflección operativa media (mm)
L_3 = Deflección operativa máxima (mm)
L_4 = Deflección máxima (mm)
N = Fuerza (N)
D = Deflexión (mm)



D

WERKZEUGFEDERN – ISO

Die Werkzeugfedern von Associated Spring Raymond werden mit einem Drahtquerschnitt hergestellt, der ein optimales Gleichgewicht zwischen Tragfähigkeit und Lebensdauer gewährleistet.

Die Federn werden in sorgfältig kontrollierten Prozessen unter Verwendung von Spezialausrüstung hergestellt, die von der Forschungs- und Entwicklungseinrichtung der Barnes Group entwickelt wurde.

Alle Fertigungsschritte werden streng überwacht und unterliegen rigorosen Qualitätskontrollen, Prüfungen und Testverfahren, um sicherzustellen, dass für jede Feder eine lange Nutzungsdauer garantiert werden kann.

Vollständige technische Spezifikationen sind auf Anfrage von Associated Spring erhältlich.

Federn werden in Übereinstimmung mit ISO 10243 hergestellt.

Grün = Geringe Beanspruchung
Blau = Mittlere Beanspruchung
Rot = Starke Beanspruchung
Gelb = Extra starke Beanspruchung

Werkzeugfedern - Merkmale

Überlegene Materialien und Drahtprofil
- Alle Raymond Werkzeugfedern werden aus höherfesten chromlegierten Stählen hergestellt.
- Optimaler Drahtquerschnitt.
- Federenden werden quadratisch geschliffen.
- Für besondere Bedingungen und Umgebungen sind weitere Rohmaterialien erhältlich.

Maßhaltigkeit
- Die Maßanforderungen bleiben von einer Charge zur nächsten konsistent und messbar unverändert.

Längere Lebensdauer
- Besserer Widerstand gegen Stoßbeanspruchungen.
- Widerstehen konstanten Belastungen bei hohen Geschwindigkeiten.
- Für längere Lebensdauer kugelgestrahlt.
- Geringere Ausfallzeiten.

Hervorragender Federweg
- Federn bieten mehr verfügbaren Federweg zur Blocklänge.
- Mehr Federweg in jeder Feder.

ABMESSUNGEN
H = Hülsendurchmesser (mm)
R = Dorndurchmesser (mm)
Lo = Ungespannte Länge (mm)
P/f = Federrate (N/mm)
L_1 = Optimaler Betriebsfederweg (mm)
L_2 = Mittlerer Federweg (mm)
L_3 = Maximaler Betriebsfederweg (mm)
L_4 = Maximaler Federweg (mm)
N = Kraft (N)
D = Federweg (mm)

I

MOLLE PER STAMPI – ISO

Le molle per stampi sono costruite utilizzando un filo di sezione speciale per ottenere un ottimo rapporto fra i carichi di lavoro e la durata.

Le molle sono prodotte con attrezzature speciali e con processi accuratamente controllati dai laboratori di ricerca e sviluppo del Gruppo Barnes.

Tutte le fasi di produzione sono monitorate da rigidi controlli di qualità, ispezioni e test, al fine di garantire l'uniformità della durata delle molle nel tempo.

Ulteriori dettagli tecnici sono disponibili su richiesta.

Le molle sono costruite secondo le norme ISO 10243.

Verde = carico leggero
Blu = carico medio
Rosso = carico forte
Giallo = carico extra-forte

Caratteristiche

Materiali e Filo
- Le molle per stampi Raymond sono fabbricate in acciaio al cromo vanadio
- Filo a sezione trapezoidale di tipo ottimale
- Le estremità della molla sono chiuse e molate
- Sono disponibili altri materiali per ambienti e condizioni speciali

Consistenza dimensionale
- Le esigenze dimensionali rimangono costanti da una produzione all'altra.

Ciclo di vita della molla
- Progettate per sopportare meglio l'impatto del carico
- Concepite per resistere alle continue deflessioni
- Trattamento di pallinatura per incrementarne la durata del ciclo di vita
- Minor tempo di fermo macchina (tempo passivo)

Deflessione eccellente
- Le molle permettono di raggiungere più facilmente l'altezza a blocco
- Maggior efficienza per ogni singola molla

LEGENDA
H = Diametro sede (mm)
R = Diametro perno (mm)
Lo = Lunghezza libera (mm)
P/f = Carico flessionale unitario (N/mm)
L_1 = Deflessione ottimale di lavoro (mm)
L_2 = Deflessione media di lavoro (mm)
L_3 = Deflessione massimo di lavoro (mm)
L_4 = Massima deflessione (mm)
N = Forza (N)
D = Deflessione (mm)

P

MOLAS DE MATRIZ – ISO

As Molas de Matriz da Associated Spring Raymond são fabricadas com usando arame de seção transversal projetada para proporcionar um equilíbrio ideal entre as características de condução de carga e vida útil.

São produzidas sob processos cuidadosamente controlados, com equipamentos especiais elaborados pelo departamento de pesquisa e desenvolvimento do Barnes Group, Inc.

Todas as etapas de fabricação acompanhadas de perto por rígidos controles de qualidade, inspeções e testes para garantir que a vida útil seja um fator importante e constante na fabricação de cada mola de matriz

Especificações técnicas completas estão disponíveis, podendo ser solicitadas a Associated Spring.

Molas fabricadas em conformidade com ISSO 10243.

Verde = Carga Leve
Azul = Carga Media
Vermelha = Carga Pesada
Amarela = Carga Extra Pesada

Características das Molas de Matriz

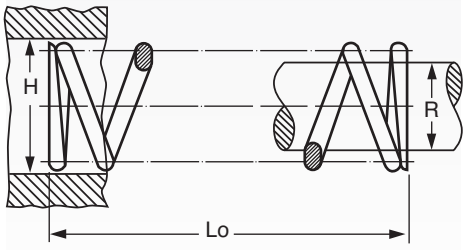
Material e Perfis de Arame Superiores
- Todas as Molas de Matriz Raymond com liga de aço cromo de alta resistência
- Seção transversal do arame otimizada.
- Pontas das molas com usinagem arredondadas.
- Outras matérias primas disponíveis para ambientes especiais.

Consistência Dimensional
- As dimensões permanecem constantes de um lote ao outro.

Maior Vida Útil
- Projetadas para suportar cargas de choque.
- Projetadas para suportar constantes deflexões.
- Tratadas por jato percussão para maior vida útil e contra fadiga.
- Tempo inoperante reduzido.

Excelente Deflexão
- As molas proporcionam maior percurso disponível ao solido.

LEGENDA
H = Diâmetro do furo
R = Diâmetro da haste
Lo = Comprimento livre
P/f = Taxa de compressão da mola
L_1 = Ponto de deflexão para vida longa
L_2 = Ponto de deflexão media
L_3 = Ponto de deflexão Máxima
L_4 = Maximo de deflexão
N = Força (N)
D = Deflexão (mm)



UK

ADDITIONAL TECHNICAL DATA

COMMON DIE SPRING TERMINOLOGY

HOLE DIAMETER This identifies the outside diameter (Do) of the die spring. Raymond die springs are available in eight different hole sizes matched to standard drill sizes. Each spring is made to fit in the hole, so the Do of the spring is actually less than the hole diameter.

ROD DIAMETER This is a nominal identification of the inside diameter (Di) of the die spring. Raymond die springs are available in eight different hole sizes matched to standard stripper bolts. Each spring is made to fit over the rod, so the Di of the springs is actually greater than the rod diameter.

FREE LENGTH The length of a die spring before it is subject to any operating force or load.

PRELOAD The distance the free length of the die spring is reduced by the pressure of assembled tool.

OPERATING TRAVEL The distance which is subtracted from the spring length after operating force has been applied.

DEFLECTION The amount of change in spring length after operating force has been applied. The compressed length is computed by subtracting the initial compression and the operating travel form the free length.

SOLID HEIGHT The length of a spring when it is compressed by enough load to bring all the coils into contact with each other.

LOAD This is the force built up by compressing the spring. Load is expressed in terms of total Newtons, which is the load on the spring per a specific unit of deflection. Load is generated and stress on the coils increases.

Selecting Die Springs
A general rule to observe in spring selection is to always use as many springs as the die will accommodate which will produce the required load with the least amount of deflection. This will increase the useful life of the spring, reduce the chances of spring failure and the resulting downtime, loss of production and increased maintenance cost.

Die spring costs are a very small percentage of the total cost of the die. An effort to save a few cents on die springs is a misguided act that can cost many dollars in lost time and labour.

The more rapidly a spring works, the more attention must be paid to its fatigue limits. In slow moving dies or fixtures, it is possible to get good performance with springs operating near maximum deflection. As the working speed increases, the life expectancy of the spring at that deflection decreases.

Springs for strippers, pressure pads, and other die components can be selected from the following pages. When selecting a die spring it is necessary to determine the type of performance required of the springs: short, normal, or long run. For short or normal run applications use the deflections tabulated in the long life columns. For long run applications use deflections based on optimum life. The recommended deflections for each spring based on the performance required are shown on the following pages.

Another approach when selecting a spring is to work back from the amount of operating travel the springs will be subjected to as indicated by the die layout. Select springs in the appropriate duty range which will operate efficiently at the required travel. Calculate the number of springs needed by dividing the load supplied by one spring into the total load required. Round the total number of springs to the next higher even number for balanced performance.

F

DONNEES TECHNIQUES ADDITIONNELLES

TERMINOLOGIE COMMUNE DES RESSORTS

LOGEMENT Permet d'identifier le diamêtre extérieur (Do) du ressort d'outil de presse. Les ressorts en provenance de Raymond (USA) sont disponibles dans huit diamêtres de logement différents qui s'adaptent aux dimensions standards des forêts. Chaque ressort est fabriqué pour rentrer dans le logement, par conséquent son Do est plus petit que le diamêtre de logement.

AXE Dimension nominale du diamêtre intérieur (Di) du ressort. Les ressorts en provenance de Raymond (USA) sont disponibles dans huit diamêtres de logement différents qui s'adaptent aux dimensions standards des écrous. Chaque ressort est fabriqué pour s'adapter sur l'axe, par conséquent son Di est plus grand que le diamêtre de l'axe.

LONGUEUR LIBRE Longueur du ressort à l'état libre, avant toute compression.

PRECONTRAINTE La longueur libre du ressort est réduite par la pression au montage.

COURSE DE TRAVAIL Distance otée à la longueur libre après application de la charge.

DEFLEXION Variation de la longueur du ressort après application de la charge de travail. La longueur comprimée est obtenue en soustrayant la compression initiale et la course de travail à la longueur libre.

HAUTEUR SOLIDE Longueur du ressort une fois comprimé par une charge suffisante permettant aux spires d'être en contact l'une avec l'autre (hauteur à spires jointives).

CHARGE Force obtenue en comprimant le ressort. La charge est exprimée en Newtons, ce qui correspond à la charge obtenue par le ressort à une certaine déflexion. La charge est générée et la pression augmente.

Sélectionner un Ressort d'Outil de Presse
Une règle générale à observer dans le choix d'un ressort, est de toujours utiliser autant de ressorts que la matrice peut en adapter, ce qui fournira la charge recherchée avec une déflexion minimum. En découlera une augmentation de durée de vie du ressort et réduira les chances de rupture et d'arrêt de machines, de perte de production et d'augmentation de frais de maintenance.

Le coût d'un ressort d'outil de presse est un très petit pourcentage du coût total d'une matrice. Une économie de quelques centimes sur un ressort peut engendrer des coûts faramineux de temps et de main d'oeuvre.

Plus un ressort travaille vite et plus il faut surveiller son taux de fatigue. Pour des cycles lents, il est possible d'obtenir une excellente performance avec des ressorts travaillant sur leur course maximale. Plus la vitesse de travail s'accroit, plus la durée de vie du ressort diminue.

Des ressorts pouvant aller sur des presses ou d'autres composants peuvent être sélectionnés dans les pages suivantes. Pour choisir un ressort d'outil de presse, il est nécessaire de déterminer le type de performance requise: court, moyen ou long terme. Pour des applications à court et moyen terme, utiliser les déflexions énoncées dans les colonnes longue vie. Pour des applications à long terme, utiliser les déflexions fondées sur la vie optimale. Les déflexions recommandées pour chaque ressort par rapport aux performances souhaitées se montré aux pages suivantes.

Une autre approche pour choisir un ressort, est de prendre en considération le nombre de cycles que le ressort doit subir, comme précisé sur le tracé de la matrice. Sélectionner les ressorts dans la catégorie de charge appropriée pour un travail efficace à la course demandée. Calculer le nombre de ressorts nécessaire en divisant la charge totale voulue, par la charge fournie par un ressort. Arrondir le nombre total de ressorts au chiffre supérieur pour une performance idéale.

E

INFORMACIÓN TÉCNICA ADICIONAL

TERMINOLGÍA PROPIA DE LOS MUELLES DE TROQUEL

DIÁMETRO DEL ORIFICIO Permite identificar el diámetro exterior del muelle. Los muelles de troquel Raymond están disponibles en 8 tamaños de orificio diferentes que coinciden con los tamaños estándar de las brocas. Cada muelle está fabricado para encajar perfectamente en el orificio, por lo que el diámetro exterior del muelle es menor que el del orificio.

DIÁMETRO DE LA VARILLA Identificación nominal del diámetro interior del muelle de troquel. Los muelles de troquel Raymond están disponibles en 8 tamaños de orificio diferentes que coinciden con los pernos eyectores estándares. Cada muelle está fabricado para que la varilla encaje perfectamente, por lo que el diámetro interior de los muelles es mayor que el de la varilla.

LONGITUD LIBRE Longitud del muelle de troquel antes de ser sometido a ninguna operación de fuerza o carga.

CARGA PREVIA La distancia en la que se reduce la longitud libre del muelle por la presión de una herramienta ensamblada.

CARRERA DE TRABAJO La distancia sustraída de la longitud del muelle tras aplicar la carga.

DEFLEXIÓN Variación de la longitud del muelle tras la aplicación de la carga de trabajo. La longitud comprimida se obtiene sustrayendo la compresión inicial y la carrera de trabajo a la longitud libre.

ALTURA SÓLIDA Longitud del muelle una vez comprimido por una carga suficiente que permita que las espiras estén en contacto entre sí

CARGA Fuerza que se obtiene al comprimir el muelle. La carga se expresa en newtones, que corresponden a la carga obtenida por el muelle a una deflexión específica. Se genera la carga y aumenta la tensión.

Seleccionar un muelle de troquel
Una regla general que hay que tener en cuenta a la hora de elegir un muelle es la de utilizar siempre tantos muelles como vaya a albergar el troquel que producirá la carga requerida con la menor cantidad de deflexión. Esto aumentará la vida útil del muelle, reducirá las posibilidades de fallo del muelle y el tiempo perdido que resulta de esto, así como las pérdidas productivas y los costes elevados de mantenimiento.

El muelle de troquel supone un porcentaje muy pequeño del coste del troquel. Ahorrar algo de dinero en los muelles resulta una elección equivocada que puede traer a largo plazo importantes costes en tiempo perdido y mano de obra.

Cuanto más rápido trabaja un muelle, más atención hay que prestar a sus límites de fatiga. En ciclos lentos, es posible obtener buenos resultados con los muelles trabajando cerca de la deflexión máxima. A medida que aumenta la velocidad, la vida útil del muelle disminuye.

Se pueden seleccionar los muelles para desmoldadoras, prensas y otros componentes de troquel de las páginas siguientes. Cuando se selecciona un muelle de troquel hay que determinar el tipo de resultados requeridos de los muelles: recorrido corto, normal o largo. Para aplicaciones de recorridos cortos o normales, se deben utilizar las deflexiones señaladas en la columna de larga vida. Para aplicaciones de recorrido largo, se deben utilizar las de la columna de vida óptima. Las deflexiones recomendadas para cada muelle basadas en los resultados requeridos se demostrado en las páginas siguientes.

Otro punto que se debe tener en cuenta a la hora de seleccionar un muelle es el de considerar el número de ciclos que el troquel requiere que realice el muelle. Hay que seleccionar los muelles en función de la labor que vayan a desempeñar para que funcionen de acuerdo con la carrera requerida. Hay que calcular el número de muelles necesarios dividiendo la carga total suministrada por un muelle entre la carga total requerida. Redondear el número resultante de muelles hacia el mayor para obtener los resultados requeridos.

D

ZUSÄTZLICHE TECHNISCHEN ANGABEN

ERKZEUGFEDERN – TERMINOLOGIE

HÜLSENDURCHMESSER Dieser Begriff bezeichnet den Außendurchmesser (Do) der Feder. Raymond Werkzeugfedern sind in acht verschiedenen Hülsendurchmessern erhältlich, welche Standard-Bohrergrößen entsprechen. Jede Feder wird so hergestellt, dass sie in die entsprechende Öffnung passt, so dass der Außendurchmesser der Feder tatsächlich geringer ist als der Hülsendurchmesser.

DORNDURCHMESSER Dies ist eine Bezeichnung für den Innendurchmesser (Di) der Werkzeugfeder. Raymond Werkzeugfedern sind in acht verschiedenen Hülsengrößen erhältlich, die Standard-Schaftschrauben entsprechen. Jede Feder wird so hergestellt, dass sie über den Dorn passt, so dass der Innendurchmesser der Federn tatsächlich größer ist als der Dorndurchmesser.

UNGESPANNTE LÄNGE Die Länge einer Feder, bevor sie einer Kraft oder Last ausgesetzt wird.

VORSPANNUNG Die Entfernung, in der die ungespannte Länge der Feder durch den Druck des Werkzeugs reduziert wird.

BETRIEBSWEG Die Entfernung die von der Federlänge subtrahiert wird, nachdem die Betätigungskraft ausgeübt wurde.

FEDERWEG Die Veränderung in der Federlänge, nachdem eine Betätigungskraft ausgeübt wurde. Die Drucklänge wird durch Subtrahieren des Feder-Ausgangsdrucks und des Arbeitswegs von der ungespannten Länge berechnet.

BLOCKLÄNGE Die Länge einer Feder, wenn diese von einer Last so komprimiert wird, dass alle Windungen aneinander liegen.

KRAFT Dies ist die Kraft, die durch das Zusammendrücken der Feder aufgebaut wird. Die Kraft wird in Newton ausgedrückt. Dies ist die Kraft der Feder für eine bestimmte Federwegeinheit. Es wird eine Kraft erzeugt und die Spannung der Windungen erhöht sich.

Auswahl von Werkzeugfedern

Als allgemeine Regel bei der Auswahl von Werkzeugfedern wird empfohlen, eine möglichst hohe Anzahl von Federn einzusetzen und die angegebenen Kräfte und Federwege nicht zu überschreiten. Dies erhöht die Nutzungsdauer der Federn und reduziert das Risiko eines Federausfalls und der damit verbundenen Ausfallzeiten Produktionsverluste und erhöhten Wartungskosten.

Die Kosten für die Federn stellen nur einen geringen Anteil der Gesamtkosten für das Werkzeug dar. Es ist eine falsche Sparsamkeit, bei der Auswahl von Werkzeugfedern einige Cents einsparen zu wollen, da dies letztendlich zu hohen Zeit- und Arbeitskraftverlusten und damit Ertragseinbußen führen kann. Je schneller eine Feder arbeitet, desto mehr Aufmerksamkeit muss ihrer Dauerfestigkeit gewidmet werden. Bei langsamen Werkzeugen oder Vorrichtungen kann man eine gute Leistung mit Federn mit fast maximalen Federwegen erzielen. Bei einer erhöhten Betriebsgeschwindigkeit nimmt die Lebenserwartung der Feder bei diesen Federwegen ab.

Auf den folgenden Seiten können Sie Federn für Abstreifer, Druckkissen und andere Werkzeugkomponenten auswählen. Bei der Auswahl einer Werkzeugfeder muss die von den Federn erwartete Leistung bestimmt werden: kurzzeitig, normal oder für einen längeren Einsatz. Für kurze und normale Einsätze sollten die in den Spalten für eine lange Lebensdauer aufgeführten Federwege verwendet werden. Für langfristige Anwendungen werden Federwege basierend auf der optimalen Lebensdauer verwendet. Die empfohlenen Federwege für jede Feder je nach der erforderlichen Leistung werden auf den folgenden Seiten angezeigt.

Eine andere Methode bei der Auswahl einer Feder ist die Verwendung des Arbeitsweges, dem die Federn ausgesetzt werden (anhand der Werkzeugzeichnung zu bestimmen). Wählen Sie Federn in der entsprechenden Belastungsklasse aus, die bei dem erforderlichen Arbeitsweg effizient arbeiten. Berechnen Sie die Anzahl der benötigten Federn, indem Sie die von einer Feder zur Verfügung gestellte Kraft durch die erforderliche Gesamtkraft teilen. Runden Sie die Gesamtzahl der Federn zur nächsten geraden Zahl ab, um eine ausgeglichene Leistung zu gewährleisten.

I

ULTERIORI INFORMAZIONI TECNICHE

TERMINOLOGIA COMUNE DELLE MOLLE PER STAMPI

DIAMETRO DEL FORO: identifica il diametro esterno (Do) della molla. Le molle per stampi Raymond sono disponibili in otto differenti diametri del foro che si adattano perfettamente alle dimensioni standard delle punte foratrici. Ogni molla viene fabbricata in modo da essere inserita nel foro, in questo modo il diametro esterno della molla è inferiore a quello del diametro del foro.

DIAMETRO DEL PERNO: denominazione del diametro interno (Di) della molla. Le molle per stampi Raymond sono disponibili in otto differenti diametri del foro che si adattano perfettamente alle dimensioni standard dei perni. Ogni molla viene fabbricata in modo da adattarsi perfettamente al perno, perciò il suo diametro interno è superiore a quello del perno.

LUNGHEZZA LIBERA: la lunghezza di una molla per stampi prima di essere sottoposta a un'operazione di forza o carico.

PRECARICA: la lunghezza libera viene ridotta dalla pressione del montaggio.

CORSA DI LAVORO: la distanza sottratta dalla lunghezza della molla dopo l'applicazione di un carico.

DEFLESSIONE: variazione della lunghezza della molla dopo l'applicazione del carico. La lunghezza compressa si ottiene sottraendo la compressione iniziale e la corsa di lavoro alla lunghezza libera.

ALTEZZA A BLOCCO: la lunghezza di una molla quando viene compressa da un carico sufficiente da mettere le spirali a contatto tra loro.

CARICO: forza generata dalla compressione della molla. Viene espresso in Newton e corrisponde alla forza ottenuta dalla molla a un certo livello di deflessione. Quando viene generato il carico la pressione aumenta.

Scegliere le molle per stampi

Una regola generale da seguire nella scelta delle molle è quella di utilizzare sempre il numero di molle che lo stampo potrà ospitare, il che produrrà il carico richiesto con la minima deflessione. Questo allungherà il ciclo di vita della molla, ridurrà le possibilità di rottura della stessa e del conseguente tempo passivo, della perdita di produzione e dei costi elevati di manutenzione.

Il costo delle molle per stampi costituiscono una piccola percentuale del costo totale dello stampo. Il risparmio di qualche centesimo su una molla potrebbe comportare un notevole spreco di tempo e manodopera.

Quanto più rapidamente lavora una molla, tanto più è necessario prestare attenzione ai suoi limiti di tensione. Nei cicli lenti, è possibile ottenere ottimi risultati con molle che lavorano al livello massimo di deflessione. Man mano che aumenta la velocità il ciclo di vita delle molle diminuisce.

Nelle pagine seguenti è possibile scegliere molle per presse e altri componenti. Quando si sceglie una molla per stampi è necessario determinare il tipo di performance richiesta: ciclo breve, normale o lungo. Per le applicazioni a ciclo breve o medio si utilizzano le deflessioni segnalate nella colonna del ciclo di vita. Le deflessioni consigliate per ogni molla in relazione ai risultati desiderati sono elencate nelle pagine seguenti.

Un altro dettaglio da considerare nella scelta di una molla è il numero di cicli che la molla stessa dovrà effettuare, come indicato sullo stampo. Selezionare le molle appartenenti alla categoria di carico appropriato affinché funzionino in modo efficace a seconda del risultato desiderato. Calcolare il numero di molle necessarie dividendo il carico totale per il carico fornito da una sola molla. Arrotondare per eccesso il numero complessivo delle molle per ottenere un risultato ottimale.

P

INFORMAÇÕES TECNICAS ADICIONAIS

TERMINOLOGIA TÍPICA DE MOLAS DE MATRIZ

DIÂMETRO DO FURO: Identifica o diâmetro externo (DE) da mola de matriz. As molas de matriz Raymond existem em oito diferentes tamanhos de furo que correspondem às dimensões padrão de brocas. Cada mola é fabricada para caber no furo, de maneira que o DE da mola seja efetivamente menor que o diâmetro do furo.

DIÂMETRO DA HASTE: Esta é a identificação nominal do diâmetro interno (Di) da mola de matriz. As molas de matriz Raymond existem em oito diferentes tamanhos de furo que correspondem às dimensões padrão de pinos extratores padrão. Cada mola é fabricada para envolver a haste, de maneira que o Di da mola seja efetivamente maior que o diâmetro da haste.

COMPRIMENTO LIVRE: O comprimento de uma mola de matriz antes de estar sujeita a qualquer solicitação ou carga operacional.

PRÉ-CARGA: A redução do comprimento de uma mola de matriz devido à pressão do ferramental montado.

PERCURSO DE OPERAÇÃO: A distância subtraída do comprimento da mola depois de ser aplicada a força de acionamento.

DEFLEXÃO: O valor da modificação no comprimento da mola depois de ser aplicada a força do acionamento. O comprimento comprimido é calculado, subtraíndo-se do comprimento livre a compressão original e o percurso de operação.

ALTURA SÓLIDA: O comprimento da mola quando comprimida por uma carga sólida suficiente para todas as espirais se encostem uma nas outras.

CARGA: Esta é a força acumulada pela compressão da mola. A carga é expressa em termos de um total de Newtons, que corresponde à carga sobre a mola por unidade específica de deflexão. Uma carga é gerada e aumenta a solicitação sobre as espirais de mola.

Seleção de Molas de Matriz

Uma regra geral para seleção de molas é sempre usar o numero máximo de molas comportadas pela matriz e que produza a carga exigida com o mínimo de deflexão. Isto aumentará a vida útil da mola, reduzirá a possibilidade de falha da mola e dos resultantes tempos de parada, perdas na produção e aumentos nas despesas de manutenção.

As despesas das molas de matriz constituem uma porcentagem muito pequena do custo total da matriz. Uma pequena economia nas molas matriz pode ser um ato mal-orientado que pode resultar em grandes gastos de tempo perdido e mão-de-obra.

Quando mais rápido o funcionamento de uma mola, mais atenção deve ser prestada aos seus limites de fadiga. Para matrizes ou dispositivos de acionamento lento, é possível obter um bom desempenho com molas que operam próximo à sua deflexão máxima. Ao aumentar-se a velocidade de acionamento, diminui a vida útil da mola, com a mesma deflexão.

Molas para extratores, coxins de pressão, e outros componentes de matrizes podem ser selecionadas nas seguintes paginas. Ao selecionar uma mola de matriz, é necessário determinar o tipo de desempenho esperado da mola: curso curto, médio ou longo. Para aplicações de curso curto ou médio, use as deflexões tabuladas nas colunas para vida longa. Para aplicações de curso longo, use as deflexões baseadas em vida máxima. As deflexões recomendadas para cada mola, com base no desempenho exigido, aparecem nas paginas abaixo.

Outro método de seleção de uma mola é calcular primeiro o valor do curso operacional a que as molas estarão sujeitas, conforme indicado no layout da matriz. Selecione as molas na faixa apropriada de serviço que operarão eficazmente no curso exigido. Calcule o número necessário de molas, dividindo a carga total exigida pela carga proporcionada por uma só mola. Arredonde o número de molas até o número par mais alto para obter um desempenho equilibrado.

UK

ADDITIONAL TECHNICAL DATA

PROBLEMS AND ANSWERS

Most problems that arise in the use of die springs usually result from improper application... failure to take advantage of and protect the features engineered into the spring.

Spring Guidance

Raymond die springs are manufactured with ends ground and squared so that they stand on their own base and compress evenly under load. There is a positive relationship between the spring's outside diameter and total length which determines whether or not a spring will buckle under load.

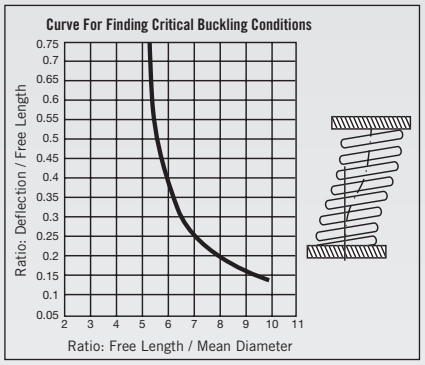


FIG. A

Generally, if the free length is more than four times the mean diameter of the spring, it could have a buckling problem under compression. This is solved by providing guidance by a pocket, a rod, or both to reduce buckling. It is always recommended to provide guidance for any die spring.

Figure A provides information as to whether a specific spring with squared, ground ends is subject to buckling. The curve indicates that buckling may occur to a squared-and-ground spring, both ends of which are compressed against parallel plates, if the values fall above and to the right of the curve.

Temperature

Heat is a frequently ignored factor in spring failure or load loss. The maximum rated service temperature for our chromium alloy steel is 230°C. **Figure B** shows the percentage of load-loss due to heat and stress combinations. Thought should be given to the heat generated by the working die which can be significant in many applications. Heat absorbed by the tool can be transferred to the springs resulting in a loss of load and premature spring failure.

Corrosion

Frequently, spring failure can be traced to corrosive elements. Reduction of material or pitting of the spring will reduce its useful life. Be alert to conditions that may effect the spring's surface such as rust, lubricants, soaps, chemicals, etc. Clean, protected springs give the best job performance.

Load Loss vs. Temperature

INTIAL STRESS MPa	CARBON STEEL			CHROMIUM ALLOY		
	Approximate Percent Loss of Load			Approximate Percent Loss of Load		
	Degrees ºC			Degrees ºC		
	120	177	200	120	177	230
276	2.0	3.5	4.5	1.0	2.0	5.0
345	2.0	4.0	5.0	1.0	2.0	5.0
414	2.5	4.5	5.5	1.0	2.0	5.5
483	3.0	5.5	6.5	1.0	2.5	6.0
552	3.0	6.0	8.0	1.5	2.5	6.0
620	4.0	8.0	9.0	1.5	3.0	7.0
689	4.5	9.5	10.5	2.0	4.0	8.0
758	7.0	11.5	14.0	2.0	5.0	10.0
827	9.5	13.0	17.5	3.5	8.0	13.0

FIG. B

F

DONNEES TECHNIQUES ADDITIONNELLES

PROBLÈMES ET SOLUTIONS

La majorité des problèmes qui apparaissent dans l'utilisation des ressorts d'outil de presse proviennent généralement d'une mauvaise utilisation.

Guidage

Les ressorts "Raymond" sont fabriqués avec des extrémités rapprochées et meulées, de facon à ce qu'ils soient bien à plat une fois en position de travail, et que la pression soit appliquée sur toute la surface de la base. Il y a une relation positive entre le diamètre extérieur du ressort et la longueur totale, qui détermine si le ressort risque de se déformer sous charge.

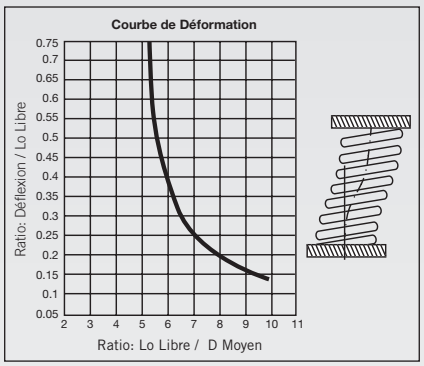


FIG. A

Généralement, si la longueur libre est supérieure à 4 fois le diamètre moyen du ressort, il pourrait y avoir risque de déformation sous compression. Ce problème peut être résolu en guidant le ressort, soit par un logement, un axe, ou les deux. Il est toujours recommandé de guider le ressort pour une utilisation sans risque.

Figure A Courbe de déformation pour un ressort aux extrémités rapprochées et meulées. Les valeurs ne doivent pas tomber en dessous et à droite de la courbe.

Température

La chaleur est un facteur fréquemment négligé. La température maximum que peut supporter un acier au Chrome Vanadium est de 230°C. La **figure B** montre le pourcentage de perte de charge causée par la chaleur et la pression combinées. L'attention est attirée sur la chaleur générée par la presse en action, qui peut être conséquente dans beaucoup d'applications. La chaleur absorbée peut être transmise aux ressorts, ce qui peut provoquer une rupture prématurée du ressort.

Corrosion

Fréquemment les problèmes causés aux ressorts proviennent d'éléments corrosifs. La corrosion risque de limiter considérablement la durée de vie. Méfiez-vous des environnements qui pourraient altérer le ressort, comme la rouille, les lubrifiants, détergents, produits chimiques, etc. Des ressorts propres et bien protégés donnent la meilleure performance possible.

Perte de Charge / Temperature

INTIAL STRESS MPa	ACIER CARBONE			CHROME VANADIUM		
	Pourcentage approx. de perte de charge			Pourcentage approx. de perte de charge		
	Degrés ºC			Degrés ºC		
	120	177	200	120	177	230
276	2.0	3.5	4.5	1.0	2.0	5.0
345	2.0	4.0	5.0	1.0	2.0	5.0
414	2.5	4.5	5.5	1.0	2.0	5.5
483	3.0	5.5	6.5	1.0	2.5	6.0
552	3.0	6.0	8.0	1.5	2.5	6.0
620	4.0	8.0	9.0	1.5	3.0	7.0
689	4.5	9.5	10.5	2.0	4.0	8.0
758	7.0	11.5	14.0	2.0	5.0	10.0
827	9.5	13.0	17.5	3.5	8.0	13.0

FIG. B

E

INFORMACIÓN TÉCNICA ADICIONAL

PROBLEMAS Y SOLUCIONES

La mayoría de los problemas que aparecen en la utilización de los muelles de troquel vienen provocados por la mala aplicación de los mismos.

Guía del muelle

Los muelles de troquel Raymond se fabrican con los extremos de sección transversal cuadrada, por lo que se sujetan sobre su propia base y se comprimen aún por de bajo de su carga. Existe una relación positiva entre el diámetro exterior del muelle y la longitud total, que es la que determina si el muelle corre el riesgo de deformarse o no con una carga inferior.

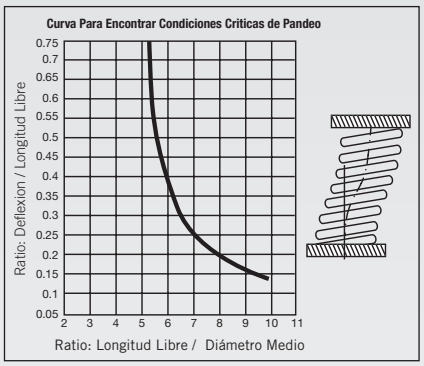


FIG. A

Como norma general, si la longitud libre es cuatro veces mayor que el diámetro medio del muelle, podría producirse la deformación bajo compresión. Para solucionarlo basta con guiarlo por una cavidad o una varilla o ambas opciones. Se recomienda siempre suministrar una guía para cualquier muelle de troquel.

La figura A aporta información acerca de si un muelle específico con extremos de sección transversal cuadrada está sujeto a posibles deformaciones. La curva indica que un muelle con los extremos de sección transversal cuadrada que se comprime por ambos lados puede sufrir deformaciones si los valores caen por debajo o a la derecha de la curva.

Temperatura

El calor es un problema que se ignora frecuentemente en el fallo del muelle o en la pérdida de carga. La temperatura máxima que puede soportar el acero al cromo de aleación es de 230°C. La **figura B** muestra el porcentaje de pérdida de carga atribuido a la combinación del calor y la tensión. Llama la atención el calor generado por el troquel en marcha que puede ser muy significativo en numerosas aplicaciones. El calor que absorbe la herramienta puede ser transferido a los muelles y de esta forma producirse una pérdida de carga y el fallo prematuro del muelle.

Corrosión

Con frecuencia, los fallos del muelle se deben a elementos corrosivos. La corrosión reduce considerablemente la vida útil del muelle. Tenga cuidado con los productos que puedan modificar el muelle, tales como el óxido, los lubricantes, detergentes, productos químicos, etc. Los muelles limpios y protegidos proporcionan mejores resultados.

Pérdida de Carga / Temperatura

TENSIÓN INICIAL MPa	ACERO AL CARBONO			CLORO ALEADO		
	Porcentage aproximate de pérdida de carga			Porcentage aproximate de pérdida de carga		
	Grados ºC			Grados ºC		
	120	177	200	120	177	230
276	2.0	3.5	4.5	1.0	2.0	5.0
345	2.0	4.0	5.0	1.0	2.0	5.0
414	2.5	4.5	5.5	1.0	2.0	5.5
483	3.0	5.5	6.5	1.0	2.5	6.0
552	3.0	6.0	8.0	1.5	2.5	6.0
620	4.0	8.0	9.0	1.5	3.0	7.0
689	4.5	9.5	10.5	2.0	4.0	8.0
758	7.0	11.5	14.0	2.0	5.0	10.0
827	9.5	13.0	17.5	3.5	8.0	13.0

FIG. B

D

ZUSÄTZLICHE TECHNISCHEN ANGABEN

PROBLEME UND ANTWORTEN

Die meisten Probleme, die bei der Verwendung von Federn auftreten, sind gewöhnlich auf deren inkorrekten Einsatz oder die Nichtausnutzung ihrer integrierten Merkmale zurückzuführen.

Federführung
Raymond Werkzeugfedern werden mit geschliffenen und quadratischen Enden hergestellt, so dass sie auf ihrer eigenen Basis stehen und unter Belastung gleichmäßig komprimiert werden. Es besteht eine a positive Beziehung zwischen dem Außendurchmesser der Feder und der Gesamtlänge, durch welche bestimmt wird, ob sich eine Feder unter der Last verformt oder nicht.

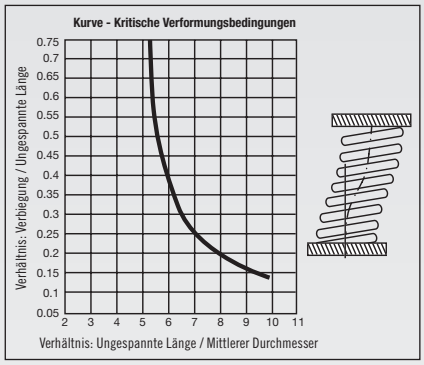


Abb. A

Im Allgemeinen gilt: Wenn die ungespannte Länge mehr als viermal dem mittleren Durchmesser der Feder entspricht, können unter Druck Verformungsprobleme auftreten. Dieses Problem wird gelöst, indem eine Führung (Aussparung, Stange oder beides) zur Verfügung gestellt wird, um die Verformung zu reduzieren. Es ist immer empfehlenswert, eine Führung für Werkzeugfedern zur Verfügung zu stellen.

Abbildung A enthält Informationen darüber, ob eine bestimmte Feder mit quadratischen geschliffenen Enden zur Verformung neigt oder nicht. Die Kurve zeigt an, dass einer geschliffenen Feder eine Verformung bei auftreten kann, deren beide Enden gegen parallele Platten gedrückt werden, wenn die Werte über oder rechts von der Kurve liegen.

Temperatur
Wärme ist ein häufig ignorierter Faktor, der zum Versagen von Federn oder Kraftverlusten führt. Die maximale Nennbetriebstemperatur für unseren chromlegierten Stahl beträgt 230°C. **Abbildung B** zeigt den Anteil des Kraftverlustes, der auf Wärme- und Spannungskombinationen zurückzuführen ist. Besondere Aufmerksamkeit sollte der vom Werkzeug erzeugten Wärme gewidmet werden, die bei vielen Anwendungen beträchtlich sein kann. Die vom Werkzeug aufgenommene Wärme kann auf die Federn übertragen werden, was zu Kraftverlusten und Federversagen führt.

Korrosion
Federversagen kann oft auf korrosive Elemente zurückgeführt werden. Materialschwund oder Rostfraß an der Feder reduzieren deren Lebensdauer. Achten Sie auf Bedingungen, die die Oberfläche der Feder beeinträchtigen können, wie Rost, Schmiermittel, Seife, Chemikalien usw. Saubere, geschützte Federn erzielen die besten Leistungen.

Kraftverlust im Vergleich zur Temperatur

Vorspannung MPa	KOHLENSTOFFSTAHL			CHROM-LEGIERUNG		
	Annähernder prozentualer Kraftverlust			Annähernder prozentualer Kraftverlust		
	Grad ºC			Grad ºC		
	120	177	200	120	177	230
276	2.0	3.5	4.5	1.0	2.0	5.0
345	2.0	4.0	5.0	1.0	2.0	5.0
414	2.5	4.5	5.5	1.0	2.0	5.5
483	3.0	5.5	6.5	1.0	2.5	6.0
552	3.0	6.0	8.0	1.5	2.5	6.0
620	4.0	8.0	9.0	1.5	3.0	7.0
689	4.5	9.5	10.5	2.0	4.0	8.0
758	7.0	11.5	14.0	2.0	5.0	10.0
827	9.5	13.0	17.5	3.5	8.0	13.0

Abb. B

I

ULTERIORI INFORMAZIONI TECNICHE

PROBLEMI E SOLUZIONI

La maggior parte dei problemi che scaturiscono nell'utilizzo delle molle per stampi sono generalmente provocati da errori di applicazione delle stesse.

Guida
Le molle Raymond hanno le estremità levigate e squadrate, in modo che, in posizione di lavoro, il carico eserciti la pressione su tutta la superficie della base. Esiste un rapporto positivo tra il diametro esterno della molla e la lunghezza totale, che determina il deformarsi o meno della molla quando si trova sotto carico.

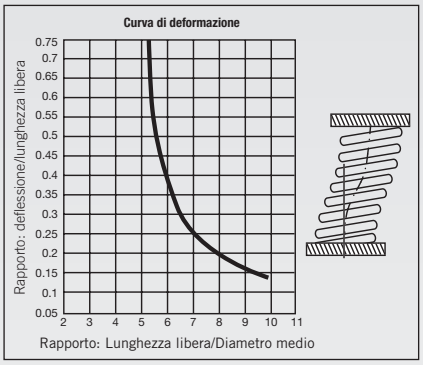


FIG. A

Generalmente, se la lunghezza libera è quattro volte superiore al diametro medio della molla, può sussistere un rischio di deformazione sotto compressione. Questo problema può essere risolto guidando la molla lungo una cavità o un perno, o entrambi. E' consigliabile guidare sempre la molla per evitare rischi.

La figura A illustra come una molla con le estremità squadrate può essere soggetta a una deformazione. Per evitare tale deformazione i valori non devono precipitare in basso e a destra della curva.

Temperatura
Il calore è un fattore che viene spesso ignorato nella rottura di una molla o nella perdita del carico. La temperatura massima che l'acciaio al cromo può sopportare è di 230°C. La **Figura B** mostra la percentuale di perdita di carico dovuta alla combinazione di calore e tensione. Un dettaglio degno di nota è il calore generato dallo stampo in azione, che può risultare significativo in molte applicazioni. Il calore assorbito può venire trasmesso alle molle, il che potrebbe provocare una rottura prematura della molla stessa.

Corrosione
Spesso i problemi sono causati anche da elementi corrosivi. La corrosione rischia di ridurre notevolmente il ciclo di vita delle molle. E' raccomandabile usare precauzione con gli agenti che potrebbero alterare la molla, quali ruggine, lubrificanti, detergenti e prodotti chimici. Per offrire i risultati migliori le molle dovrebbero essere ben protette e in condizioni di pulizia ottimali.

Perdita di carico contro la temperatura

TENSIONE INIZIALE MPa	ACCIAIO AL CARBONIO			ACCIAIO AL CROMO		
	Percentuale approssimativa della perdita di carico			Percentuale approssimativa della perdita di carico		
	Gradi ºC			Gradi ºC		
	120	177	200	120	177	230
276	2.0	3.5	4.5	1.0	2.0	5.0
345	2.0	4.0	5.0	1.0	2.0	5.0
414	2.5	4.5	5.5	1.0	2.0	5.5
483	3.0	5.5	6.5	1.0	2.5	6.0
552	3.0	6.0	8.0	1.5	2.5	6.0
620	4.0	8.0	9.0	1.5	3.0	7.0
689	4.5	9.5	10.5	2.0	4.0	8.0
758	7.0	11.5	14.0	2.0	5.0	10.0
827	9.5	13.0	17.5	3.5	8.0	13.0

FIG. B

P

INFORMAÇÕES TECNICAS ADICIONAIS

PROBLEMAS E SOLUÇÕES

A maioria dos problemas que surgem na utilização de molas matriz é geralmente o resultado de uma aplicação imprópria ... Falhas na utilização e proteção das qualidades inerentes na fabricação da mola.

Guias para molas
As molas Raymond são fabricadas com usinagem quadrada das extremidades, de modo que mantêm-se em pé sobre sua própria base e se comprimem uniformemente sob a carga. Existe uma relação positiva entre o diâmetro externo e o comprimento total de uma mola, o que determina se a mola irá deformar-se sob a carga.

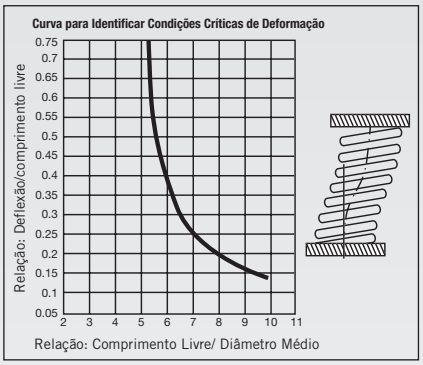


FIG. A

Geralmente, se o comprimento livre for mais de quatro vezes o diâmetro médio da mola, ela poderá apresentar problemas de deformação sob compressão. A solução é proporcionar guias por meio de cavidade, uma haste, ou ambos para reduzir a deformação. É sempre recomendado proporcionar guias para qualquer mola matriz.

A Figura A apresenta informações sobre a possibilidade de deformação das molas especificas com usinagem quadrada nas extremidades. A curva indica que deformação poderá ocorrer em uma mola com usinagem quadrada nas extremidades, comprimida entre placas paralelas, se os valores couberem acima e à direita da curva.

Temperatura
O calor é um fator frequentemente desconsiderado na falha das molas ou na perda de carga. A temperatura máxima de serviço para o nosso aço cromo é 230°C. A **Figura B** indica as percentagens de perda de carga como resultado de combinação de calor e solicitações. Deve ser considerado o calor gerado por uma matriz em serviço, o qual pode ser substancial em muitas aplicações. O calor absorvido pela ferramenta pode ser transferido às molas, resultando na perda de carga e falhas prematuras das molas.

Corrosão
Frequentemente, as falhas das molas podem ser o resultado de elementos corrosivos. A redução do material ou picagem por corrosão da mola pode reduzir a sua vida útil. Esteja alerta a condições que podem afetar a superfície da mola, tais como ferrugem, lubrificantes, detergentes, produtos uimicos, etc. As molas limpas e protegidas proporcionam o melhor desempenho

Perda de carga vs. Temperatura

SOLICITAÇÃO INICIAL MPa	AÇO CARBONO			AÇO CROMO		
	Porcentagem Apropriada de Perda de Carga			Porcentagem Apropriada de Perda de Carga		
	Graus ºC			Graus ºC		
	120	177	200	120	177	230
276	2.0	3.5	4.5	1.0	2.0	5.0
345	2.0	4.0	5.0	1.0	2.0	5.0
414	2.5	4.5	5.5	1.0	2.0	5.5
483	3.0	5.5	6.5	1.0	2.5	6.0
552	3.0	6.0	8.0	1.5	2.5	6.0
620	4.0	8.0	9.0	1.5	3.0	7.0
689	4.5	9.5	10.5	2.0	4.0	8.0
758	7.0	11.5	14.0	2.0	5.0	10.0
827	9.5	13.0	17.5	3.5	8.0	13.0

FIG. B

DIE SPRINGS - ISO

LIGHT DUTY *ISO COLOUR CODED* ***GREEN***

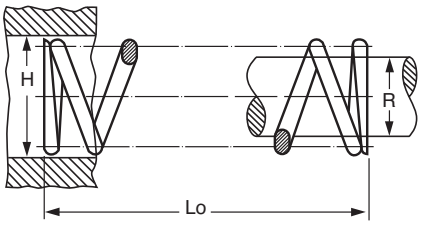
CHARGE LÉGÈRE *NORME ISO COULEUR* ***VERTE***

CARGA LIGERA ***VERDE*** *CÓDIGO COLOR SEGÚN ISO*

GERINGE BEANSPRUCHUNG *ISO FARBUNTERLEGTES* ***GRÜN***

CARICHI LEGGERI *COLORE* ***VERDE*** *SECONDO NORMA ISO*

CARGA LEVE *COR* ***VERDE*** *(ISO)*



H	R	Lo	Part No.	P/f	L_1		L_2		L_3		L_4	
					N	D	N	D	N	D	N	D
		25	R203-104	10.0	62.5	6.3	75.0	7.5	87.5	8.8	103.0	10.3
		32	R203-105	8.5	68.0	8.0	81.6	9.6	95.2	11.2	111.4	13.1
		38	R203-106	6.8	64.6	9.5	77.5	11.4	90.4	13.3	106.1	15.6
10	5	44	R203-107	6.0	66.0	11.0	79.2	13.2	92.4	15.4	108.0	18.0
		51	R203-108	5.0	63.8	12.8	76.5	15.3	89.3	17.9	104.5	20.9
		64	R203-110	4.3	68.8	16.0	82.6	19.2	96.3	22.4	111.8	26.0
		76	R203-112	3.2	60.8	19.0	73.0	22.8	85.1	26.6	99.8	31.2
		305	R203-148	1.1	83.9	76.3	100.7	91.5	117.4	106.8	137.5	125
		25	R203-204	17.9	111.9	6.3	134.3	7.5	156.6	8.8	184.4	10.3
		32	R203-205	16.4	131.2	8.0	157.4	9.6	183.7	11.2	214.8	13.1
		38	R203-206	13.6	129.2	9.5	155.0	11.4	180.9	13.3	212.2	15.6
		44	R203-207	12.1	133.1	11.0	159.7	13.2	186.3	15.4	217.8	18.0
12.5	6.3	51	R203-208	11.4	145.4	12.8	174.4	15.3	203.5	17.9	238.3	20.9
		64	R203-210	9.3	148.8	16.0	178.6	19.2	208.3	22.4	244.6	26.3
		76	R203-212	7.1	134.9	19.0	161.9	22.8	188.9	26.6	221.5	31.2
		89	R203-214	5.4	120.2	22.3	144.2	26.7	168.2	31.2	197.1	36.5
		305	R203-248	1.4	106.8	76.3	128.1	91.5	149.5	106.8	175.0	125.0
		25	R203-304	23.4	146.3	6.3	175.5	7.5	204.8	8.8	241.0	10.3
		32	R203-305	22.9	183.2	8.0	219.8	9.6	256.5	11.2	300.0	13.1
		38	R203-306	19.3	183.4	9.5	220.0	11.4	256.7	13.3	301.1	15.6
		44	R203-307	17.1	188.1	11.0	225.7	13.2	263.3	15.4	307.8	18.0
16	8	51	R203-308	15.7	200.2	12.8	240.2	15.3	280.2	17.9	328.1	20.9
		64	R203-310	10.7	171.2	16.0	205.4	19.2	239.7	22.4	281.4	26.3
		76	R203-312	10.0	190.0	19.0	228.0	22.8	266.0	26.6	312.0	31.2
		89	R203-314	8.6	191.4	22.3	229.6	26.7	267.9	31.2	313.9	36.5
		102	R203-316	7.8	198.9	25.5	238.7	30.6	278.5	35.7	326.0	41.8
		305	R203-348	2.5	190.6	76.3	228.8	91.5	266.9	106.8	312.5	125.0
		25	R203-404	55.8	348.8	6.3	418.5	7.5	488.3	8.8	569.2	10.2
		32	R203-405	45.0	360.0	8.0	432.0	9.6	504.0	11.2	562.5	12.5
		38	R203-406	33.3	316.4	9.5	379.6	11.4	442.9	13.3	499.5	15.0
		44	R203-407	30.0	330.0	11.0	396.0	13.2	462.0	15.4	540.0	18.0
		51	R203-408	24.5	312.4	12.8	374.9	15.3	437.3	17.9	490.0	20.0
		64	R203-410	20.0	320.0	16.0	384.0	19.2	448.0	22.4	500.0	25.0
20	10	76	R203-412	16.0	304.0	19.0	364.8	22.8	425.6	26.6	480.0	30.0
		89	R203-414	14.0	311.5	22.3	373.8	26.7	436.1	31.2	490.0	35.0
		102	R203-416	12.0	306.0	25.5	367.2	30.6	428.4	35.7	492.0	41.0
		115	R203-418	10.9	313.4	28.8	376.1	34.5	438.7	40.3	501.4	46.0
		127	R203-420	9.5	301.6	31.8	362.0	38.1	422.3	44.5	484.5	51.0
		139	R203-422	8.4	291.9	34.8	350.3	41.7	408.7	48.7	470.4	56.0
		152	R203-424	7.5	285.0	38.0	342.0	45.6	399.0	53.2	457.5	61.0
		305	R203-448	4.0	305.0	76.3	366.0	91.5	427.0	106.8	488.0	122.0
		25	R203-504	100.0	625.0	6.3	750.0	7.5	875.0	8.8	1020	10.2
		32	R203-505	80.3	642.4	8.0	770.9	9.6	899.4	11.2	1003.8	12.5
		38	R203-506	62.0	589.0	9.5	706.8	11.4	824.6	13.3	930.0	15.0
		44	R203-507	52.9	581.9	11.0	698.3	13.2	814.7	15.4	952.2	18.0
		51	R203-508	44.0	561.0	12.8	673.2	15.3	785.4	17.9	880.0	20.0
		64	R203-510	35.2	563.2	16.0	675.8	19.2	788.5	22.4	880.0	25.0
		76	R203-512	28.0	532.0	19.0	638.4	22.8	744.8	26.6	840.0	30.0
25	12.5	89	R203-514	24.0	534.0	22.3	640.8	26.7	747.6	31.2	840.0	35.0
		102	R203-516	21.1	538.1	25.5	645.7	30.6	753.3	35.7	865.1	41.0
		115	R203-518	18.7	537.6	28.8	645.2	34.5	752.7	40.3	860.2	46.0
		127	R203-520	16.7	530.2	31.8	636.3	38.1	742.3	44.5	851.7	51.0
		139	R203-522	15.3	531.7	34.8	638.0	41.7	744.3	48.7	856.8	56.0
		152	R203-524	14.0	532.0	38.0	638.4	45.6	744.8	53.2	854.0	61.0
		178	R203-528	12.5	556.3	44.5	667.5	53.4	778.8	62.3	887.5	71.0
		203	R203-532	10.4	527.8	50.8	633.4	60.9	738.9	71.1	842.4	81.0
		305	R203-548	7.0	533.8	76.3	640.5	91.5	747.3	106.8	854.0	122.0
		38	R203-606	94.0	893.0	9.5	1071.6	11.4	1250.2	13.3	1410.0	15.0
		44	R203-607	79.5	874.5	11.0	1049.4	13.2	1224.3	15.4	1431.0	18.0
		51	R203-608	67.0	854.3	12.8	1025.1	15.3	1196.0	17.9	1340.0	20.0
		64	R203-610	53.0	848.0	16.0	1017.6	19.2	1187.2	22.4	1325.0	25.0

DIE SPRINGS - ISO

LIGHT DUTY *ISO COLOUR CODED* ***GREEN***

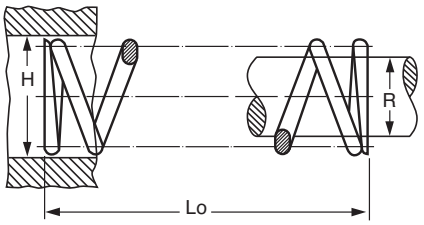
CHARGE LÉGÈRE *NORME ISO COULEUR* ***VERTE***

CARGA LIGERA ***VERDE*** *CÓDIGO COLOR SEGÚN ISO*

GERINGE BEANSPRUCHUNG *ISO FARBUNTERLEGTES* ***GRÜN***

CARICHI LEGGERI *COLORE* ***VERDE*** *SECONDO NORMA ISO*

CARGA LEVE *COR* ***VERDE*** *(ISO)*



H	R	Lo	Part No.	P/f	L_1		L_2		L_3		L_4	
					N	D	N	D	N	D	N	D
		76	R203-612	44.0	836.0	19.0	1003.2	22.8	1170.4	26.6	1320.0	30.0
		89	R203-614	37.2	827.7	22.3	993.2	26.7	1158.8	31.2	1302.0	35.0
32	16	102	R203-616	32.0	816.0	25.5	979.2	30.6	1142.4	35.7	1312.0	41.0
		115	R203-618	29.0	833.8	28.8	1000.5	34.5	1167.3	40.3	1334.0	46.0
		127	R203-620	25.0	793.8	31.8	952.5	38.1	1111.3	44.5	1275.0	51.0
		139	R203-622	23.0	799.3	34.8	959.1	41.7	1119.0	48.7	1288.0	56.0
		152	R203-624	21.5	817.0	38.0	980.4	45.6	1143.8	53.2	1311.5	61.0
		178	R203-628	18.2	809.9	44.5	971.9	53.4	1133.9	62.3	1292.2	71.0
		203	R203-632	15.8	801.9	50.8	962.2	60.9	1122.6	71.1	1279.8	81.0
		254	R203-640	12.5	793.8	63.5	952.5	76.2	1111.3	88.9	1275.0	102.0
		305	R203-648	10.3	785.4	76.3	942.5	91.5	1099.5	106.8	1256.6	122.0
		51	R203-708	92.0	1173.0	12.8	1407.6	15.3	1642.2	17.9	1840.0	20.0
		64	R203-710	73.0	1168.0	16.0	1401.6	19.2	1635.2	22.4	1825.0	25.0
		76	R203-712	63.0	1197.0	19.0	1436.4	22.8	1675.8	26.6	1890.0	30.0
		89	R203-714	51.0	1134.8	22.3	1361.7	26.7	1588.7	31.2	1785.0	35.0
		102	R203-716	43.0	1096.5	25.5	1315.8	30.6	1535.1	35.7	1763.0	41.0
40	20	115	R203-718	39.6	1138.5	28.8	1366.2	34.5	1593.9	40.3	1821.6	46.0
		127	R203-720	37.0	1174.8	31.8	1409.7	38.1	1644.7	44.5	1887.0	51.0
		139	R203-722	32.0	1112.0	34.8	1334.4	41.7	1556.8	48.7	1792.0	56.0
		152	R203-724	28.0	1064.0	38.0	1276.8	45.6	1489.6	53.2	1708.0	61.0
		178	R203-728	25.2	1121.4	44.5	1345.7	53.4	1570.0	62.3	1789.2	71.0
		203	R203-732	22.7	1152.0	50.8	1382.4	60.9	1612.8	71.1	1838.7	81.0
		254	R203-740	17.0	1079.5	63.5	1295.4	76.2	1511.3	88.9	1734.0	102.0
		305	R203-748	14.8	1128.5	76.3	1354.2	91.5	1579.9	106.8	1805.6	122.0
		64	R203-810	156.0	2496.0	16.0	2995.2	19.2	3494.4	22.4	3900.0	25.0
		76	R203-812	125.0	2375.0	19.0	2850.0	22.8	3325.0	26.6	3750.0	30.0
		89	R203-814	109.0	2425.3	22.3	2910.3	26.7	3395.4	31.2	3815.0	35.0
		102	R203-816	94.0	2397.0	25.5	2876.4	30.6	3355.8	35.7	3854.0	41.0
		115	R203-818	81.0	2328.8	28.8	2794.5	34.5	3260.3	40.3	3726.0	46.0
50	25	127	R203-820	71.0	2254.3	31.8	2705.1	38.1	3156.0	44.5	3621.0	51.0
		139	R203-822	66.5	2310.9	34.8	2773.1	41.7	3235.2	48.7	3724.0	56.0
		152	R203-824	60.0	2280.0	38.0	2736.0	45.6	3192.0	53.2	3660.0	61.0
		178	R203-828	52.0	2314.0	44.5	2776.8	53.4	3239.6	62.3	3692.0	71.0
		203	R203-832	44.0	2233.0	50.8	2679.6	60.9	3126.2	71.1	3564.0	81.0
		254	R203-840	35.0	2222.5	63.5	2667.0	76.2	3111.5	88.9	3570.0	102.0
		305	R203-848	28.5	2173.1	76.3	2607.8	91.5	3042.4	106.8	3477.0	122.0
		76	R203-912	189.0	3591.0	19.0	4309.2	22.8	5027.4	26.6	5670.0	30.0
		89	R203-914	158.0	3515.5	22.3	4218.6	26.7	4921.7	31.2	5530.0	35.0
		102	R203-916	131.0	3340.5	25.5	4008.6	30.6	4676.7	35.7	5371.0	41.0
		115	R203-918	116.0	3335.0	28.8	4002.0	34.5	4669.0	40.3	5336.0	46.0
63	38	127	R203-920	103.0	3270.3	31.8	3924.3	38.1	4578.4	44.5	5253.0	51.0
		152	R203-924	84.3	3203.4	38.0	3844.1	45.6	4484.8	53.2	5142.3	61.0
		178	R203-928	71.5	3181.8	44.5	3818.1	53.4	4454.5	62.3	5076.5	71.0
		203	R203-932	61.7	3131.3	50.8	3757.5	60.9	4383.8	71.1	4997.7	81.0
		254	R203-940	47.0	2984.5	63.5	3581.4	76.2	4178.3	88.9	4794.0	102.0
		305	R203-948	38.2	2912.8	76.3	3495.3	91.5	4077.9	106.8	4660.4	122.0

DIE SPRINGS - ISO

MEDIUM DUTY *ISO COLOUR CODED* ***BLUE***

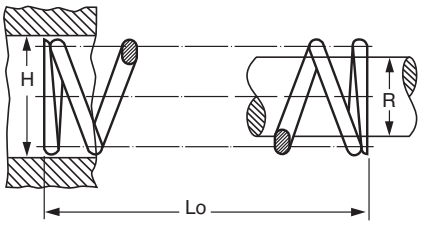
CHARGE MOYENE *NORME ISO COULEUR* ***BLEUE***

CARGA MEDIA ***AZUL*** *CÓDIGO COLOR SEGÚN ISO*

MITTLERE BEANSPRUCHUNG *ISO FARBUNTERLEGTES* ***BLAU***

CARICHI MEDI *COLORE* ***BLU*** *SECONDO NORMA ISO*

CARGA MEDIA *COR* ***AZUL*** *(ISO)*



H	R	Lo	Part No.	P/f	L_1		L_2		L_3		L_4	
					N	D	N	D	N	D	N	D
		25	R204-104	16.0	80.0	5.0	100.0	6.3	120.0	7.5	152.0	9.5
		32	R204-105	13.0	83.2	6.4	104.0	8.0	124.8	9.6	158.6	12.2
		38	R204-106	11.9	90.4	7.6	113.1	9.5	135.7	11.4	171.4	14.4
10	5	44	R204-107	10.3	90.6	8.8	113.3	11.0	136.0	13.2	172.0	16.7
		51	R204-108	8.9	90.8	10.2	113.5	12.8	136.2	15.3	172.7	19.4
		64	R204-110	7.5	96.0	12.8	120.0	16.0	144.0	19.2	182.3	24.3
		76	R204-112	5.3	80.6	15.2	100.7	19.0	120.8	22.8	153.2	28.9
		305	R204-148	1.6	97.6	61.0	122	76.3	146.4	91.5	185.6	116
		25	R204-204	30.0	150.0	5.0	187.5	6.3	225	7.5	285.0	9.5
		32	R204-205	24.8	158.7	6.4	198.4	8.0	238.1	9.6	302.6	12.2
		38	R204-206	21.4	162.6	7.6	203.3	9.5	244	11.4	308.2	14.4
		44	R204-207	18.5	162.8	8.8	203.5	11.0	244.2	13.2	309.0	16.7
12.5	6.3	51	R204-208	15.5	158.1	10.2	197.6	12.8	237.2	15.3	300.7	19.4
		64	R204-210	12.1	154.9	12.8	193.6	16.0	232.3	19.2	294.0	24.3
		76	R204-212	10.2	155.0	15.2	193.8	19.0	232.6	22.8	294.8	28.9
		89	R204-214	8.4	149.5	17.8	186.9	22.3	224.3	26.7	283.9	33.8
		305	R204-248	2.1	128.1	61.0	160.1	76.3	192.2	91.5	243.6	116.0
		25	R204-304	49.4	247.0	5.0	308.8	6.3	370.5	7.5	469.3	9.5
		32	R204-305	37.1	237.4	6.4	296.8	8.0	356.2	9.6	452.6	12.2
		38	R204-306	33.9	257.6	7.6	322.1	9.5	386.5	11.4	488.2	14.4
		44	R204-307	30.0	264.0	8.8	330.0	11.0	396.0	13.2	501.0	16.7
16	8	51	R204-308	26.4	269.3	10.2	336.6	12.8	403.9	15.3	512.2	19.4
		64	R204-310	20.5	262.4	12.8	328.0	16.0	393.6	19.2	498.2	24.3
		76	R204-312	17.8	270.6	15.2	338.2	19.0	405.8	22.8	514.4	28.9
		89	R204-314	15.2	270.6	17.8	338.2	22.3	405.8	26.7	513.8	33.8
		102	R204-316	13.5	275.4	20.4	344.3	25.5	413.1	30.6	523.8	38.8
		305	R204-348	4.8	292.8	61.0	366.0	76.3	439.2	91.5	556.8	116.0
		25	R204-404	98.0	490.0	5.0	612.5	6.3	735.0	7.5	921.2	9.4
		32	R204-405	72.6	464.6	6.4	580.8	8.0	697.0	9.6	871.2	12.0
		38	R204-406	56.0	425.6	7.6	532.0	9.5	638.4	11.4	784.0	14.0
		44	R204-407	47.5	418.0	8.8	522.5	11.0	627.0	13.2	783.8	16.5
		51	R204-408	41.7	425.3	10.2	531.7	12.8	638.0	15.3	792.3	19.0
		64	R204-410	32.3	413.4	12.8	516.8	16.0	620.2	19.2	775.2	24.0
20	10	76	R204-412	25.1	381.5	15.2	476.9	19.0	572.3	22.8	702.8	28.0
		89	R204-414	22.0	391.6	17.8	489.5	22.3	587.4	26.7	726.0	33.0
		102	R204-416	19.8	403.9	20.4	504.9	25.5	605.9	30.6	752.4	38.0
		115	R204-418	18.1	416.3	23.0	520.4	28.8	624.5	34.5	778.3	43.0
		127	R204-420	16.6	421.6	25.4	527.1	31.8	632.5	38.1	796.8	48.0
		139	R204-422	15.1	419.8	27.8	524.7	34.8	629.7	41.7	785.2	52.0
		152	R204-424	13.2	401.3	30.4	501.6	38.0	601.9	45.6	752.4	57.0
		305	R204-448	6.1	372.1	61.0	465.1	76.3	558.2	91.5	695.4	114.0
		25	R204-504	147.0	735.0	5.0	918.8	6.3	1102.5	7.5	1381.8	9.4
		32	R204-505	118.0	755.2	6.4	944.0	8.0	1132.8	9.6	1416.0	12.0
		38	R204-506	93.0	706.8	7.6	883.5	9.5	1060.2	11.4	1302.0	14.0
		44	R204-507	80.8	711.0	8.8	888.8	11.0	1066.6	13.2	1333.2	16.5
		51	R204-508	68.6	699.7	10.2	874.7	12.8	1049.6	15.3	1303.4	19.0
		64	R204-510	53.0	678.4	12.8	848.0	16.0	1017.6	19.2	1272.0	24.0
		76	R204-512	43.2	656.6	15.2	820.8	19.0	985.0	22.8	1209.6	28.0
		89	R204-514	38.2	680.0	17.8	850.0	22.3	1019.9	26.7	1260.6	33.0
25	12.5	102	R204-516	33.0	673.2	20.4	841.5	25.5	1009.8	30.6	1254.0	38.0
		115	R204-518	28.0	644.0	23.0	805.0	28.8	966.0	34.5	1204.0	43.0
		127	R204-520	25.9	657.9	25.4	822.3	31.8	986.8	38.1	1243.2	48.0
		139	R204-522	23.2	645.0	27.8	806.2	34.8	967.4	41.7	1206.4	52.0
		152	R204-524	20.8	632.3	30.4	790.4	38.0	948.5	45.6	1185.6	57.0
		178	R204-528	17.8	633.7	35.6	792.1	44.5	950.5	53.4	1192.6	67.0
		203	R204-532	15.8	641.5	40.6	801.9	50.8	962.2	60.9	1200.8	76.0
		305	R204-548	10.2	622.2	61.0	777.8	76.3	933.3	91.5	1162.8	114.0
		38	R204-606	185.0	1406.0	7.6	1757.5	9.5	2109.0	11.4	2590.0	14.0
		44	R204-607	158.0	1390.4	8.8	1738.0	11.0	2085.6	13.2	2607.0	16.5
		51	R204-608	134.0	1366.8	10.2	1708.5	12.8	2050.2	15.3	2546.0	19.0
		64	R204-610	99.0	1267.2	12.8	1584.0	16.0	1900.8	19.2	2376.0	24.0

DIE SPRINGS - ISO

MEDIUM DUTY *ISO COLOUR CODED* ***BLUE***

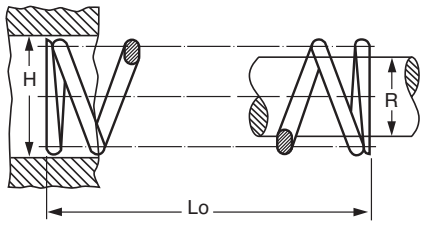
CHARGE MOYENE *NORME ISO COULEUR* ***BLEUE***

CARGA MEDIA ***AZUL*** *CÓDIGO COLOR SEGÚN ISO*

MITTLERE BEANSPRUCHUNG *ISO FARBUNTERLEGTES* ***BLAU***

CARICHI MEDI *COLORE* ***BLU*** *SECONDO NORMA ISO*

CARGA MEDIA *COR* ***AZUL*** *(ISO)*



H	R	Lo	Part No.	P/f	L_1		L_2		L_3		L_4	
					N	D	N	D	N	D	N	D
		76	R204-612	80.5	1223.6	15.2	1529.5	19.0	1835.4	22.8	2254.0	28.0
32	16	89	R204-614	69.1	1230.0	17.8	1537.5	22.3	1845.0	26.7	2280.3	33.0
		102	R204-616	58.8	1199.5	20.4	1499.4	25.5	1799.3	30.6	2234.4	38.0
		115	R204-618	51.5	1184.5	23.0	1480.6	28.8	1776.8	34.5	2214.5	43.0
		127	R204-620	44.8	1137.9	25.4	1422.4	31.8	1706.9	38.1	2150.4	48.0
		139	R204-622	42.3	1175.9	27.8	1469.9	34.8	1763.9	41.7	2199.6	52.0
		152	R204-624	37.8	1149.1	30.4	1436.4	38.0	1723.7	45.6	2154.6	57.0
		178	R204-628	32.5	1157.0	35.6	1446.3	44.5	1735.5	53.4	2177.5	67.0
32	16	203	R204-632	28.9	1173.3	40.6	1466.7	50.8	1760.0	60.9	2196.4	76.0
		254	R204-640	21.4	1087.1	50.8	1358.9	63.5	1630.7	76.2	2033.0	95.0
		305	R204-648	18.3	1116.3	61.0	1395.4	76.3	1674.5	91.5	2086.2	114.0
		51	R204-708	181.6	1852.3	10.2	2315.4	12.8	2778.5	15.3	3450.4	19.0
		64	R204-710	140.0	1792.0	12.8	2240.0	16.0	2688.0	19.2	3360.0	24.0
		76	R204-712	108.0	1641.6	15.2	2052.0	19.0	2462.4	22.8	3024.0	28.0
		89	R204-714	90.7	1614.5	17.8	2018.1	22.3	2421.7	26.7	2993.1	33.0
		102	R204-716	81.0	1652.4	20.4	2065.5	25.5	2478.6	30.6	3078.0	38.0
		115	R204-718	71.8	1651.4	23.0	2064.3	28.8	2477.1	34.5	3087.4	43.0
40	20	127	R204-720	62.7	1592.6	25.4	1990.7	31.8	2388.9	38.1	3009.6	48.0
		139	R204-722	57.5	1598.5	27.8	1998.1	34.8	2397.8	41.7	2990.0	52.0
		152	R204-724	51.6	1568.6	30.4	1960.8	38.0	2353.0	45.6	2941.2	57.0
		178	R204-728	44.1	1570.0	35.6	1962.5	44.5	2354.9	53.4	2954.7	67.0
		203	R204-732	36.7	1490.0	40.6	1862.5	50.8	2235.0	60.9	2789.2	76.0
		254	R204-740	30.1	1529.1	50.8	1911.4	63.5	2293.6	76.2	2859.5	95.0
		305	R204-748	24.6	1500.6	61.0	1875.8	76.3	2250.9	91.5	2804.4	114.0
		64	R204-810	209.0	2675.2	12.8	3344.0	16.0	4012.8	19.2	5016.0	24.0
		76	R204-812	168.0	2553.6	15.2	3192.0	19.0	3830.4	22.8	4704.0	28.0
		89	R204-814	140.0	2492.0	17.8	3115.0	22.3	3738.0	26.7	4620.0	33.0
		102	R204-816	119.0	2427.6	20.4	3034.5	25.5	3641.4	30.6	4522.0	38.0
		115	R204-818	106.0	2438.0	23.0	3047.5	28.8	3657.0	34.5	4558.0	43.0
50	25	127	R204-820	97.0	2463.8	25.4	3079.8	31.8	3695.7	38.1	4656.0	48.0
		139	R204-822	87.0	2418.6	27.8	3023.3	34.8	3627.9	41.7	4524.0	52.0
		152	R204-824	80.0	2432.0	30.4	3040.0	38.0	3648.0	45.6	4560.0	57.0
		178	R204-828	69.5	2474.2	35.6	3092.8	44.5	3711.3	53.4	4656.5	67.0
		203	R204-832	59.8	2427.9	40.6	3034.9	50.8	3641.8	60.9	4544.8	76.0
		229	R204-836	50.9	2331.2	45.8	2914.0	57.3	3496.8	68.7	4377.4	86.0
		254	R204-840	43.9	2230.1	50.8	2787.7	63.5	3345.2	76.2	4170.5	95.0
		305	R204-848	38.6	2354.6	61.0	2943.3	76.3	3531.9	91.5	4400.4	114.0
		76	R204-912	312.0	4742.4	15.2	5928.0	19.0	7113.6	22.8	8736.0	28.0
		89	R204-914	260.0	4628.0	17.8	5785.0	22.3	6942.0	26.7	8580.0	33.0
		102	R204-916	221.0	4508.4	20.4	5635.5	25.5	6762.6	30.6	8398.0	38.0
		115	R204-918	187.0	4301.0	23.0	5376.3	28.8	6451.5	34.5	8041.0	43.0
		127	R204-920	168.0	4267.2	25.4	5334.0	31.8	6400.8	38.1	8064.0	48.0
63	38	152	R204-924	136.0	4134.4	30.4	5168.0	38.0	6201.6	45.6	7752.0	57.0
		178	R204-928	114.0	4058.4	35.6	5073.0	44.5	6087.6	53.4	7638.0	67.0
		203	R204-932	100.0	4060.0	40.6	5075.0	50.8	6090.0	60.9	7600.0	76.0
		229	R204-936	89.2	4085.4	45.8	5106.7	57.3	6128.0	68.7	7671.2	86.0
		254	R204-940	78.4	3982.7	50.8	4978.4	63.5	5974.1	76.2	7448.0	95.0
		305	R204-948	64.7	3946.7	61.0	4933.4	76.3	5920.1	91.5	7375.8	114.0

DIE SPRINGS - ISO

HEAVY DUTY *ISO COLOUR CODED* ***RED***

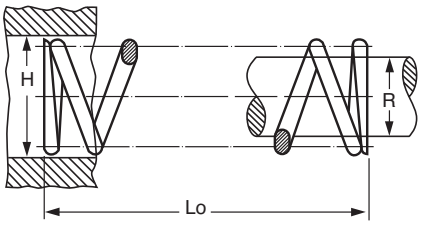
CHARGE FORTE *NORME ISO COULEUR* ***ROUGE***

CARGA FUERTE ***ROJO*** *CÓDIGO COLOR SEGÚN ISO*

STARKE BEANSPRUCHUNG *ISO FARBUNTERLEGTES* ***ROT***

CARICHI FORTI *COLORE* ***ROSSO*** *SECONDO NORMA ISO*

CARGA PESADA *COR* ***VERMELHA*** *(ISO)*



H	R	Lo	Part No.	P/f	L_1		L_2		L_3		L_4	
					N	D	N	D	N	D	N	D
		25	R205-104	22.1	82.9	3.8	110.5	5.0	138.1	6.3	165.8	7.5
		32	R205-105	17.5	84.0	4.8	112.0	6.4	140.0	8.0	168.0	9.6
		38	R205-106	17.1	97.5	5.7	130.0	7.6	162.5	9.5	194.9	11.4
10	5	44	R205-107	15.0	99.0	6.6	132.0	8.8	165.0	11.0	198.0	13.2
		51	R205-108	12.8	97.9	7.7	130.6	10.2	163.2	12.8	195.8	15.3
		64	R205-110	10.7	102.7	9.6	137.0	12.8	171.2	16.0	205.4	19.2
		76	R205-112	7.5	85.5	11.4	114.0	15.2	142.5	19.0	171.0	22.8
		305	R205-148	2.1	96.1	45.8	128.1	61.0	160.1	76.3	192.2	91.5
		25	R205-204	42.1	157.9	3.8	210.5	5.0	263.1	6.3	315.8	7.5
		32	R205-205	33.2	159.4	4.8	212.5	6.4	265.6	8.0	318.7	9.6
		38	R205-206	29.3	167.0	5.7	222.7	7.6	278.4	9.5	334.0	11.4
		44	R205-207	24.6	162.4	6.6	216.5	8.8	270.6	11.0	324.7	13.2
12.5	6.3	51	R205-208	19.6	149.9	7.7	199.9	10.2	249.9	12.8	299.9	15.3
		64	R205-210	15.0	144.0	9.6	192	12.8	240.0	16.0	288.0	19.2
		76	R205-212	13.2	150.5	11.4	200.6	15.2	250.8	19.0	301.0	22.8
		89	R205-214	11.4	152.2	13.4	202.9	17.8	253.7	22.3	304.4	26.7
		305	R205-248	2.8	128.1	45.8	170.8	61.0	213.5	76.3	256.2	91.5
		25	R205-304	75.7	283.9	3.8	378.5	5.0	473.1	6.3	567.8	7.5
		32	R205-305	52.8	253.4	4.8	337.9	6.4	422.4	8.0	506.9	9.6
		38	R205-306	48.5	276.5	5.7	368.6	7.6	460.8	9.5	552.9	11.4
		44	R205-307	42.8	282.5	6.6	376.6	8.8	470.8	11.0	565.0	13.2
16	8	51	R205-308	37.1	283.8	7.7	378.4	10.2	473.0	12.8	567.6	15.3
		64	R205-310	30.3	290.9	9.6	387.8	12.8	484.8	16.0	581.8	19.2
		76	R205-312	25.7	293.0	11.4	390.6	15.2	488.3	19.0	586.0	22.8
		89	R205-314	21.7	289.7	13.4	386.3	17.8	482.8	22.3	579.4	26.7
		102	R205-316	19.3	295.3	15.3	393.7	20.4	492.2	25.5	590.6	30.6
		305	R205-348	7.1	324.8	45.8	433.1	61.0	541.4	76.3	649.7	91.5
		25	R205-404	216.0	810.0	3.8	1080.0	5	1350.0	6.3	1620	7.5
		32	R205-405	168.0	806.4	4.8	1075.2	6.4	1344.0	8.0	1612.8	9.6
		38	R205-406	129.0	735.3	5.7	980.4	7.6	1225.5	9.5	1419.0	11.0
		44	R205-407	112.0	739.2	6.6	985.6	8.8	1232.0	11.0	1456.0	13.0
		51	R205-408	94.0	719.1	7.7	958.8	10.2	1198.5	12.8	1410.0	15.0
		64	R205-410	72.1	692.2	9.6	922.9	12.8	1153.6	16.0	1369.9	19.0
20	10	76	R205-412	59.7	680.6	11.4	907.4	15.2	1134.3	19.0	1373.1	23.0
		89	R205-414	50.5	674.2	13.4	898.9	17.8	1123.6	22.3	1363.5	27.0
		102	R205-416	44.2	676.3	15.3	901.7	20.4	1127.1	25.5	1370.2	31.0
		115	R205-418	38.4	662.4	17.3	883.2	23.0	1104.0	28.8	1344	35.0
		127	R205-420	34.1	649.6	19.1	866.1	25.4	1082.7	31.8	1295.8	38.0
		139	R205-422	31.0	646.4	20.9	861.8	27.8	1077.3	34.8	1302	42.0
		152	R205-424	28.2	643.0	22.8	857.3	30.4	1071.6	38.0	1297.2	46.0
		305	R205-448	15.0	686.3	45.8	915.0	61.0	1143.8	76.3	1365.0	91.0
		25	R205-504	375.0	1406.3	3.8	1875.0	5.0	2343.8	6.3	2812.5	7.5
		32	R205-505	297.0	1425.6	4.8	1900.8	6.4	2376.0	8.0	2851.2	9.6
		38	R205-506	219.0	1248.3	5.7	1664.4	7.6	2080.5	9.5	2409.0	11.0
		44	R205-507	187.0	1234.2	6.6	1645.6	8.8	2057.0	11.0	2431.0	13.0
		51	R205-508	156.0	1193.4	7.7	1591.2	10.2	1989.0	12.8	2340.0	15.0
		64	R205-510	123.0	1180.8	9.6	1574.4	12.8	1968.0	16.0	2337.0	19.0
		76	R205-512	99.0	1128.6	11.4	1504.8	15.2	1881.0	19.0	2277.0	23.0
		89	R205-514	84.0	1121.4	13.4	1495.2	17.8	1869.0	22.3	2268.0	27.0
25	12.5	102	R205-516	73.0	1116.9	15.3	1489.2	20.4	1861.5	25.5	2263.0	31.0
		115	R205-518	65.0	1121.3	17.3	1495.0	23.0	1868.8	28.8	2275	35.0
		127	R205-520	57.7	1099.2	19.1	1465.6	25.4	1832.0	31.8	2192.6	38.0
		139	R205-522	52.7	1098.8	20.9	1465.1	27.8	1831.3	34.8	2213.4	42.0
		152	R205-524	47.8	1089.8	22.8	1453.1	30.4	1816.4	38.0	2198.8	46.0
		178	R205-528	41.0	1094.7	26.7	1459.6	35.6	1824.5	44.5	2173.0	53.0
		203	R205-532	35.8	1090.1	30.5	1453.5	40.6	1816.9	50.8	2183.8	61.0
		305	R205-548	22.9	1047.7	45.8	1396.9	61.0	1746.1	76.3	2083.9	91.0
		38	R205-606	388.0	2211.6	5.7	2948.8	7.6	3686.0	9.5	4268.0	11.0
		44	R205-607	324.0	2138.4	6.6	2851.2	8.8	3564.0	11.0	4212.0	13.0
		51	R205-608	272.0	2080.8	7.7	2774.4	10.2	3468.0	12.8	4080.0	15.0
		64	R205-610	212.0	2035.2	9.6	2713.6	12.8	3392.0	16.0	4028.0	19.0

DIE SPRINGS - ISO

HEAVY DUTY *ISO COLOUR CODED* ***RED***

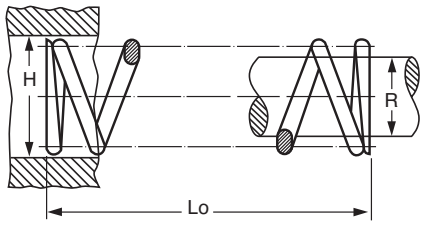
CHARGE FORTE *NORME ISO COULEUR* ***ROUGE***

CARGA FUERTE ***ROJO*** *CÓDIGO COLOR SEGÚN ISO*

STARKE BEANSPRUCHUNG *ISO FARBUNTERLEGTES* ***ROT***

CARICHI FORTI *COLORE* ***ROSSO*** *SECONDO NORMA ISO*

CARGA PESADA *COR* ***VERMELHA*** *(ISO)*



H	R	Lo	Part No.	P/f	L_1		L_2		L_3		L_4	
					N	D	N	D	N	D	N	D
		76	R205-612	172.0	1960.8	11.4	2614.4	15.2	3268.0	19.0	3956.0	23.0
32	16	89	R205-614	141.0	1882.4	13.4	2509.8	17.8	3137.3	22.3	3807.0	27.0
		102	R205-616	122.0	1866.6	15.3	2488.8	20.4	3111.0	25.5	3782.0	31.0
		115	R205-618	107.0	1845.8	17.3	2461.0	23	3076.3	28.8	3745.0	35.0
		127	R205-620	93.0	1771.7	19.1	2362.2	25.4	2952.8	31.8	3534.0	38.0
		139	R205-622	86.0	1793.1	20.9	2390.8	27.8	2988.5	34.8	3612.0	42.0
		152	R205-624	78.0	1778.4	22.8	2371.2	30.4	2964.0	38.0	3588.0	46.0
		178	R205-628	67.2	1794.2	26.7	2392.3	35.6	2990.4	44.5	3561.6	53.0
32	16	203	R205-632	59.1	1799.6	30.5	2399.5	40.6	2999.3	50.8	3605.1	61.0
		254	R205-640	46.4	1767.8	38.1	2357.1	50.8	2946.4	63.5	3526.4	76.0
		305	R205-648	38.0	1738.5	45.8	2318.0	61.0	2897.5	76.3	3458.0	91.0
		51	R205-708	350.0	2677.5	7.7	3570.0	10.2	4462.5	12.8	5250.0	15.0
		64	R205-710	269.0	2582.4	9.6	3443.2	12.8	4304.0	16.0	5111.0	19.0
		76	R205-712	219.0	2496.6	11.4	3328.8	15.2	4161.0	19.0	5037.0	23.0
		89	R205-714	190.0	2536.5	13.4	3382.0	17.8	4227.5	22.3	5130.0	27.0
		102	R205-716	163.0	2493.9	15.3	3325.2	20.4	4156.5	25.5	5053.0	31.0
		115	R205-718	142.0	2449.5	17.3	3266.0	23.0	4082.5	28.8	4970.0	35.0
40	20	127	R205-720	128.0	2438.4	19.1	3251.2	25.4	4064.0	31.8	4864.0	38.0
		139	R205-722	115.0	2397.8	20.9	3197.0	27.8	3996.3	34.8	4830.0	42.0
		152	R205-724	105.0	2394.0	22.8	3192.0	30.4	3990.0	38.0	4830.0	46.0
		178	R205-728	89.0	2376.3	26.7	3168.4	35.6	3960.5	44.5	4717.0	53.0
		203	R205-732	77.0	2344.7	30.5	3126.2	40.6	3907.8	50.8	4697.0	61.0
		254	R205-740	61.0	2324.1	38.1	3098.8	50.8	3873.5	63.5	4636.0	76.0
		305	R205-748	51.0	2333.3	45.8	3111.0	61.0	3888.8	76.3	4641.0	91.0
		64	R205-810	413.0	3964.8	9.6	5286.4	12.8	6608.0	16.0	7847.0	19.0
		76	R205-812	339.0	3864.6	11.4	5152.8	15.2	6441.0	19.0	7797.0	23.0
		89	R205-814	288.0	3844.8	13.4	5126.4	17.8	6408.0	22.3	7776.0	27.0
		102	R205-816	245.0	3748.5	15.3	4998.0	20.4	6247.5	25.5	7595.0	31.0
		115	R205-818	215.0	3708.8	17.3	4945.0	23.0	6181.3	28.8	7525.0	35.0
		127	R205-820	192.0	3657.6	19.1	4876.8	25.4	6096.0	31.8	7296.0	38.0
50	25	139	R205-822	168.0	3502.8	20.9	4670.4	27.8	5838.0	34.8	7056.0	42.0
		152	R205-824	154.0	3511.2	22.8	4681.6	30.4	5852.0	38.0	7084.0	46.0
		178	R205-828	134.0	3577.8	26.7	4770.4	35.6	5963.0	44.5	7102.0	53.0
		203	R205-832	117.0	3562.7	30.5	4750.2	40.6	5937.8	50.8	7137.0	61.0
		254	R205-840	89.0	3390.9	38.1	4521.2	50.8	5651.5	63.5	6764.0	76.0
		305	R205-848	73.0	3339.8	45.8	4453.0	61.0	5566.3	76.3	6643.0	91.0
		305	R204-848	38.6	2354.6	61.0	2943.3	76.3	3531.9	91.5	4400.4	114.0

DIE SPRINGS - ISO

EXTRA HEAVY DUTY *ISO COLOUR CODED* ***YELLOW***

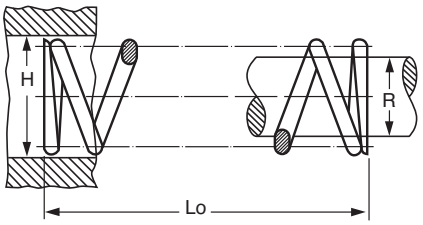
CHARGE EXTRA FORTE *NORME ISO COULEUR* ***JAUNE***

CARGA EXTRA FUERTE ***AMARILLO*** *CÓDIGO COLOR SEGÚN ISO*

EXTRA STARKE BEANSPRUCHUNG *ISO FARBUNTERLEGTES* ***GELB***

CARICHI EXTRA FORTI *COLORE* ***GIALLO*** *SECONDO NORMA ISO*

CARGA EXTRA PESADA *COR* ***AMARELA*** *(ISO)*



H	R	Lo	Part No.	P/f	L_1		L_2		L_3		L_4	
					N	D	N	D	N	D	N	D
		25	R206-104	36.8	138.0	3.8	156.4	4.3	184	5.0	228.2	6.2
		32	R206-105	27.9	133.9	4.8	151.8	5.4	178.6	6.4	223.2	8.0
		38	R206-106	23.7	135.1	5.7	153.1	6.5	180.1	7.6	225.2	9.5
10	5	44	R206-107	19.2	126.7	6.6	143.6	7.5	169.0	8.8	211.2	11.0
		51	R206-108	16.5	126.2	7.7	143.1	8.7	168.3	10.2	214.5	13.0
		64	R206-110	13.2	126.7	9.6	143.6	10.9	169.0	12.8	211.2	16.0
		76	R206-112	10.9	124.3	11.4	140.8	12.9	165.7	15.2	207.1	19.0
		305	R206-148	2.6	119.0	45.8	134.8	51.9	158.6	61.0	197.6	76.0
		25	R206-204	58.5	219.4	3.8	248.6	4.3	292.5	5.0	362.7	6.2
		32	R206-205	43.9	210.7	4.8	238.8	5.4	281.0	6.4	351.2	8.0
		38	R206-206	36.0	205.2	5.7	232.6	6.5	273.6	7.6	342	9.5
		44	R206-207	30.3	200.0	6.6	226.6	7.5	266.6	8.8	333.3	11.0
12.5	6.3	51	R206-208	26.2	200.4	7.7	227.2	8.7	267.2	10.2	340.6	13.0
		64	R206-210	21.2	203.5	9.6	230.7	10.9	271.4	12.8	339.2	16.0
		76	R206-212	17.1	194.9	11.4	220.9	12.9	259.9	15.2	324.9	19.0
		89	R206-214	14.5	193.6	13.4	219.4	15.1	258.1	17.8	319	22.0
		305	R206-248	4.3	196.7	45.8	223	51.9	262.3	61.0	326.8	76.0
		25	R206-304	118.0	442.5	3.8	501.5	4.3	590.0	5.0	731.6	6.2
		32	R206-305	89.0	427.2	4.8	484.2	5.4	569.6	6.4	712.0	8.0
		38	R206-306	72.1	411.0	5.7	465.8	6.5	548.0	7.6	685.0	9.5
		44	R206-307	60.9	401.9	6.6	455.5	7.5	535.9	8.8	669.9	11.0
16	8	51	R206-308	52.3	400.1	7.7	453.4	8.7	533.5	10.2	679.9	13.0
		64	R206-310	41.2	395.5	9.6	448.3	10.9	527.4	12.8	659.2	16.0
		76	R206-312	34.1	388.7	11.4	440.6	12.9	518.3	15.2	647.9	19.0
		89	R206-314	29.5	393.8	13.4	446.3	15.1	525.1	17.8	649	22.0
		102	R206-316	25.6	391.7	15.3	443.9	17.3	522.2	20.4	665.6	26.0
		305	R206-348	8.4	384.3	45.8	435.5	51.9	512.4	61.0	638.4	76.0
		25	R206-404	293.0	1098.8	3.8	1245.3	4.3	1465.0	5.0	1816.6	6.2
		32	R206-405	224.0	1075.2	4.8	1218.6	5.4	1433.6	6.4	1792.0	8.0
		38	R206-406	177.0	1008.9	5.7	1143.4	6.5	1345.2	7.6	1681.5	9.5
		44	R206-407	149.0	983.4	6.6	1114.5	7.5	1311.2	8.8	1639.0	11.0
		51	R206-408	128.0	979.2	7.7	1109.8	8.7	1305.6	10.2	1664.0	13.0
		64	R206-410	99.0	950.4	9.6	1077.1	10.9	1267.2	12.8	1584.0	16.0
20	10	76	R206-412	81.7	931.4	11.4	1055.6	12.9	1241.8	15.2	1552.3	19.0
		89	R206-414	69.5	927.8	13.4	1051.5	15.1	1237.1	17.8	1529.0	22.0
		102	R206-416	60.6	927.2	15.3	1050.8	17.3	1236.2	20.4	1575.6	26.0
		115	R206-418	53.0	914.3	17.3	1036.2	19.6	1219.0	23.0	1537.0	29.0
		127	R206-420	47.5	904.9	19.1	1025.5	21.6	1206.5	25.4	1520.0	32.0
		139	R206-422	43.0	896.6	20.9	1016.1	23.6	1195.4	27.8	1505.0	35.0
		152	R206-424	39.0	889.2	22.8	1007.8	25.8	1185.6	30.4	1482.0	38.0
		305	R206-448	21.2	969.9	45.8	1099.2	51.9	1293.2	61.0	1611.2	76.0
		32	R206-505	374.4	1797.1	4.8	2036.7	5.4	2396.2	6.4	2995.2	8.0
		38	R206-506	346.0	1972.2	5.7	2235.2	6.5	2629.6	7.6	3287.0	9.5
		44	R206-507	244.0	1610.4	6.6	1825.1	7.5	2147.2	8.8	2684.0	11.0
		51	R206-508	207.5	1587.4	7.7	1799.0	8.7	2116.5	10.2	2697.5	13.0
		64	R206-510	161.0	1545.6	9.6	1751.7	10.9	2060.8	12.8	2576.0	16.0
		76	R206-512	130.8	1491.1	11.4	1689.9	12.9	1988.2	15.2	2485.2	19.0
		89	R206-514	110.5	1475.2	13.4	1671.9	15.1	1966.9	17.8	2431	22.0
25	12.5	102	R206-516	96.3	1473.4	15.3	1669.8	17.3	1964.5	20.4	2503.8	26.0
		115	R206-518	85.7	1478.3	17.3	1675.4	19.6	1971.1	23.0	2485.3	29.0
		127	R206-520	76.3	1453.5	19.1	1647.3	21.6	1938.0	25.4	2441.6	32.0
		152	R206-524	63.5	1447.8	22.8	1640.8	25.8	1930.4	30.4	2413.0	38.0
		178	R206-528	53.9	1439.1	26.7	1631.0	30.3	1918.8	35.6	2371.6	44.0
		203	R206-532	47.0	1431.2	30.5	1622.0	34.5	1908.2	40.6	2397.0	51.0
		305	R206-548	30.9	1413.7	45.8	1602.2	51.9	1884.9	61.0	2348.4	76.0
		38	R206-606	528.2	3010.7	5.7	3412.2	6.5	4014.3	7.6	5017.9	9.5
		44	R206-607	424.4	2801.0	6.6	3174.5	7.5	3734.7	8.8	4668.4	11.0
		51	R206-608	353.0	2700.5	7.7	3060.5	8.7	3600.6	10.2	4589.0	13.0
		64	R206-610	269.2	2584.3	9.6	2928.9	10.9	3445.8	12.8	4307.2	16.0
		76	R206-612	218.5	2490.9	11.4	2823.0	12.9	3321.2	15.2	4151.5	19.0
		89	R206-614	180.3	2407.0	13.4	2727.9	15.1	3209.3	17.8	3966.6	22.0

DIE SPRINGS - ISO

EXTRA HEAVY DUTY *ISO COLOUR CODED* ***YELLOW***

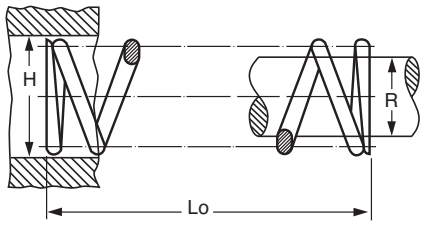
CHARGE EXTRA FORTE *NORME ISO COULEUR* ***JAUNE***

CARGA EXTRA FUERTE ***AMARILLO*** *CÓDIGO COLOR SEGÚN ISO*

EXTRA STARKE BEANSPRUCHUNG *ISO FARBUNTERLEGTES* ***GELB***

CARICHI EXTRA FORTI *COLORE* ***GIALLO*** *SECONDO NORMA ISO*

CARGA EXTRA PESADA *COR* ***AMARELA*** *(ISO)*



H	R	Lo	Part No.	P/f	L_1		L_2		L_3		L_4	
					N	D	N	D	N	D	N	D
32	16	102	R206-616	155.0	2371.5	15.3	2687.7	17.3	3162.0	20.4	4030.0	26.0
		115	R206-618	140.0	2415.0	17.3	2737.0	19.6	3220.0	23.0	4060.0	29.0
		127	R206-620	124.0	2362.2	19.1	2677.2	21.6	3149.6	25.4	3968.0	32.0
		152	R206-624	102.0	2325.6	22.8	2635.7	25.8	3100.8	30.4	3876.0	38.0
		178	R206-628	88.2	2354.9	26.7	2668.9	30.3	3139.9	35.6	3880.8	44.0
		203	R206-632	76.0	2314.2	30.5	2622.8	34.5	3085.6	40.6	3876.0	51.0
		254	R206-640	60.8	2316.5	38.1	2625.3	43.2	3088.6	50.8	3891.2	64.0
32	16	305	R206-648	49.0	2241.8	45.8	2540.7	51.9	2989.0	61.0	3724.0	76.0
		51	R206-708	628.0	4804.2	7.7	5444.8	8.7	6405.6	10.2	8164.0	13.0
		64	R206-710	487.0	4675.2	9.6	5298.6	10.9	6233.6	12.8	7792.0	16.0
		76	R206-712	379.0	4320.6	11.4	4896.7	12.9	5760.8	15.2	7201.0	19.0
		89	R206-714	321.0	4285.4	13.4	4856.7	15.1	5713.8	17.8	7062.0	22.0
		102	R206-716	281.0	4299.3	15.3	4872.5	17.3	5732.4	20.4	7306.0	26.0
40	20	115	R206-718	245.0	4226.3	17.3	4789.8	19.6	5635.0	23.0	7105.0	29.0
		127	R206-720	221.0	4210.1	19.1	4771.4	21.6	5613.4	25.4	7072.0	32.0
		152	R206-724	168.0	3830.4	22.8	4341.1	25.8	5107.2	30.4	6384.0	38.0
		203	R206-732	132.0	4019.4	30.5	4555.3	34.5	5359.2	40.6	6732.0	51.0
		254	R206-740	107.0	4076.7	38.1	4620.3	43.2	5435.6	50.8	6848.0	64.0
		305	R206-748	87.8	4016.9	45.8	4552.4	51.9	5355.8	61.0	6672.8	76.0
		64	R206-810	709.0	6806.4	9.6	7713.9	10.9	9075.2	12.8	11344.0	16.0
		76	R206-812	572.0	6520.8	11.4	7390.2	12.9	8694.4	15.2	10868.0	19.0
		89	R206-814	475.0	6341.3	13.4	7186.8	15.1	8455.0	17.8	10450.0	22.0
		102	R206-816	405.0	6196.5	15.3	7022.7	17.3	8262.0	20.4	10530.0	26.0
50	25	115	R206-818	352.0	6072.0	17.3	6881.6	19.6	8096.0	23.0	10208.0	29.0
		127	R206-820	316.0	6019.8	19.1	6822.4	21.6	8026.4	25.4	10112.0	32.0
		152	R206-824	239.0	5449.2	22.8	6175.8	25.8	7265.6	30.4	9082.0	38.0
		203	R206-832	187.0	5694.2	30.5	6453.4	34.5	7592.2	40.6	9537.0	51.0
		254	R206-840	153.0	5829.3	38.1	6606.5	43.2	7772.4	50.8	9792.0	64.0
		305	R206-848	127.0	5810.3	45.8	6585.0	51.9	7747.0	61.0	9652.0	76.0

UK

CONICAL SPRINGS

Spec conical springs are cone shaped compression springs designed to provide a near constant spring rate and a solid height lower than a normal spring. Each spring features a variable pitch to achieve the constant spring rate and coils which nest during deflection to provide a solid height of approximately equal to two wire diameters.

All springs are manufactured from stainless steel for use in a multitude of environments.

MATERIALS
Stainless steel: Type 302 as per ASTM A313 or AMS 5688 spring temper

FINISH
Standard finish is passivated to ASTM A967.

DIRECTION OF HELIX
Right hand.

ENDS
Squared ends not ground.

SPRING RATE
The spring rate is linear due to the variable pitch.

SOLID HEIGHT
Due to coil nesting, the solid height is approximately equal to two wire diameters.

KEY TO MEASUREMENTS
Do (S) = Outside diameter (small end)
Do (L) = Outside diameter (large end)
Lo = Free Length
P_1 = Load at 50% load
P_2 = Load at solid height
R = Rate

F

RESSORTS DE COMPRESSION CONIQUES

Les ressorts coniques SPEC sont des ressorts de compression destinés à offrir une élasticité constante et une hauteur emboîtée plus basse que celles d'une raideur constante. Chaque ressort a un pas variable qui permet d'obtenir le taux d'élasticité constant et des spires qui s'emboîtent pendant la flexion pour donner une hauteur emboîtée à peu près égale à deux diamètres de fil.

Tous les ressorts sont fabriqués en acier inoxydable pour être utilisés dans une multitude d'environnements.

MATÉRIAUX
Acier Inoxydable. Trempe de ressort type 302 par ASTM A313 ou AMS5688. (Chimique et physique seulement).

FINITION
Finition standard passivée selon ASTM A967

ENROULEMENT
A droite.

EXTRÉMITÉS
Equarries et non meulées.

RAIDEUR
La raideur est linéaire en raison du pas variable.

HAUTEUR A SPIRES JOINTIVES
En raison de l'emboîtement des spires, la hauteur à spires jointives est à peu près égale à deux diamètres de fil.

INDEX DES MESURES
Do (S) = Diamètre Ext. (petite extrémité)
Do (L) = Diamètre Ext. (grande extrémité)
Lo = Longueur Libre
P_1 = Charge à 50% de la course
P_2 = Charge à bloc
R = Raideur

E

MUELLES/RESORTES DE COMPRESIÓN CONICOS

Los muelles/resortes cónicos de SPEC son muelles/resortes de compresión con forma cónica diseñados para suministrar una casi constante tasa de compre-sión y una altura sólida menor que la de un muelle/resorte normal. Cada muelle genera un paso variable para obtener la tasa de compresión constante y unas espiras que se comprimen durante la deflexión para obtener una altura sólida aproximadamente igual a dos diámetros del hilo.

Todos los muelles/resortes se fabrican en acero inoxidable para ser usados en multitud de ambientes diferentes.

MATERIAL
Acero inoxidable tipo 302 según ASTM A313 ó muelle/resorte templado según AMS 5688.

ACABADO
Acabado estándar según la norma ASTM A967

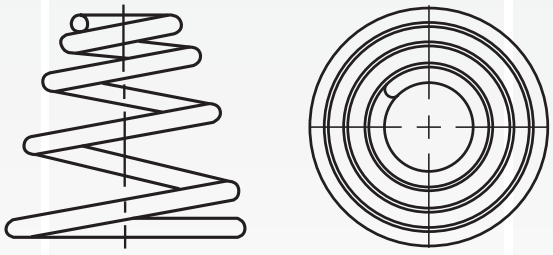
DIRECCIÓN DE LA ESPIRA
A derechas.

EXTREMOS
Extremos refrentados sin rectificar

RATIO DE COMPRESIÓN
El ratio de compresión es lineal debido al paso variable.

ALTURA A BLOQUE
Debido a la compresión de las espiras, la altura a bloque es aproximadamente igual a dos veces el diámetro del hilo.

CLAVES DE CARACTERÍSTICAS
Do (S) = Diámetro exterior (extremo grande)
Do (L) = Diámetro exterior (extremo pequeño)
Lo = Longitud libre
P_1 = Carga al 50%
P_2 = Carga a altura bloque
R = Ratio



D

KEGELFEDERN

Die lagermäßig vorrätigen Kegelfedern sind so ausgelegt, dass eine nahezu konstante Federrate erreicht wird. Die Blocklänge ist wesentlich kleiner als bei Druckfedern. Jede Kegelfeder hat eine sich verändernde Steigung aus der sich eine konstante Federrate ergibt. Bei Einfederung legt sich Windung in Windung bis maximal 2 Drahtdurchmesser an Blocklänge erreicht werden.

Alle Federn sind aus rostfreier Federstahldraht für Anwendung bei Viezahl von Umgebungen.

WERKSTOFFE
Rostfreier Federstahldraht: 302 nach ASTM A313 oder AMS 5688 gehärte Feder

OBERFLÄCHE
Standard-Finish ist nach ASTM A967 passiviert.

WINDUNGSRICHTUNG
Rechtsgewickelt.

ENDWINDUNGEN
Nur angelegt.

FEDERRATE
Konstante Federrate wegen der Variabilität der Steigung.

BLOCKLÄNGE
Bei Einfederung legt sich Windung in Windung bis maximal 2 Drahtdurchmesser.

KENNZEICHNEN DER ABMESSUNGEN
Do (S) = Äußerer Windungsdurchmesser
Do (L) = Äußerer Windungsdurchmesser
Lo = Länge der unbelasteten Feder
P_1 = Federkraft bei 50% Federlänge
P_2 = Federkraft bei Blocklänge
R = Rate

I

MOLLE A COMPRESSIONE CONICHE

Le molle coniche SPEC sono molle a compressione destinate a offrire una elasticità costante e un'altezza a blocco più bassa di quelle di una molla normale. Ogni molla ha un passo variabile che permette d'ottenere tassi d'elasticità costanti e delle spire che si avvicinano durante la flessione per determinare un'altezza a blocco pressoché uguale a due diametri di filo.

Tutte le molle vengono fabbricate in acciaio inox per essere utilizzate in una grande varietà di ambienti operativi

MATERIALE
Acciaio inox tipo 302 da ASTM A313 o AMS 5688.

FINITURA
La finitura standard è passivato a ASTM A967

AVVITAMENTO DELL'ELICA
A destra

ESTREMITA'
Squadrate e non rettificate.

RIGIDITA'
Lineare a causa del passo variabile

SPIRE , ALTEZZA A BLOCCO
Le molle sono concepite per permettere alle spire attive di avvicinarsi le une dentro le altre. Ciò determina un'altezza a blocco uguale a circa due diametri del filo.

LEGENDA
Do (S) = Diametro esterno (piccolo)
Do (L) = Diametro esterno (largo)
Lo = Lunghezza Libera
P_1 = Carico al 50%
P_2 = Carico a pacco
R = Carico flessionale unitario

P

MOLAS DE COMPRESSÃO CÓNICAS

As molas cónicas SPEC, tratam-se de molas de compressão de formato cónico, concebidas para disponibilizar uma força de compressão quase constante e uma altura sólida inferior à de uma mola normal. Cada mola gera um passo variável disponibilizando força de compressão constante e espiras que se comprimem durante a flexão, para se obter uma altura sólida aproximadamente igual a dois diâmetros do fio.

Todas as molas são fabricadas em aço inoxidável para utilização em muitas aplicações diferentes.

MATERIAL
Aço inoxidável tipo 302 conforme à especificação ASTM A313, ou mola temperada conforme à especificação MAS 5688.

ACABAMENTO
Acabemento padrão é passivel à ASTM A967

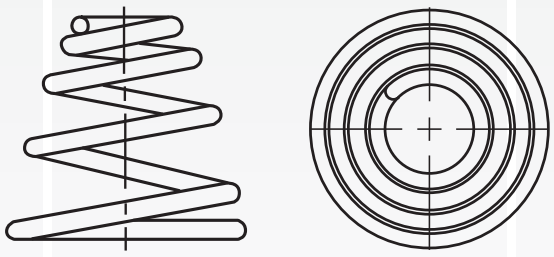
DIRECÇÃO DO CONE
Para a direita

EXTREMIDADES
Extremidades quadradas sem rectificação

FORÇA DE COMPRESSÃO
A força de compressão é linear dado o passo variável

ALTURA SÓLIDA
Com a compressão das espiras, a altura sólida corresponde aproximadamente ao dobro do diâmetro do fio.

MEDIDAS PADRÃO
Do (S) = Diâmetro Externo (Extremidade Menor)
Do (L) = Diâmetro Interno (Extremidade Maior)
Lo = Comprimento Livre
P_1 = Carga a 50%
P_2 = Carga em Bloco
R = Constante



KegelfedernKegelfedernKegelfedernKegelfedernKeg
MolleACompressioneConicheMolleACompressioneC
MolasDeCompressãoCónicasMolasDeCompressãoC

STOCK CONICAL COMPRESSION SPRINGS

Part Number	Do (L) (mm)	Do (S) (mm)	d (mm)	Lo (mm)	P_1 (N)	P_2 (N)	R (N/mm)
A360-029-025	9.14	3.18	0.74	6.35	15.35	23.53	4.83
A420-029-037	10.67	3.96	0.74	9.53	11.12	18.82	2.34
A420-029-031	10.67	4.75	0.74	7.92	10.05	16.37	2.54
A420-029-025	10.67	5.54	0.74	6.35	9.07	13.97	2.87
A420-032-031	10.67	3.96	0.81	7.92	16.15	25.66	4.07
A420-032-025	10.67	4.75	0.81	6.35	14.19	21.08	4.46
A420-035-025	10.67	4.75	0.89	6.35	22.64	32.60	7.14
A480-029-062	12.19	4.75	0.74	15.88	9.56	17.35	1.20
A480-029-050	12.19	5.54	0.74	12.70	8.58	15.12	1.35
A480-029-037	12.19	6.35	0.74	9.53	7.07	12.01	1.49
A480-029-031	12.19	7.14	0.74	7.92	6.81	11.08	1.71
A480-032-062	12.19	3.96	0.81	15.88	15.21	27.27	1.91
A480-032-050	12.19	4.75	0.81	12.70	12.81	22.33	2.02
A480-032-037	12.19	5.54	0.81	9.53	11.39	18.86	2.39
A480-032-031	12.19	6.35	0.81	7.92	10.54	16.81	2.66
A480-035-037	12.19	4.75	0.89	9.53	17.44	28.33	3.66
A480-035-031	12.19	5.54	0.89	7.92	15.48	23.97	3.90
A480-038-031	12.19	4.75	0.97	7.92	22.33	33.80	5.63
A480-038-025	12.19	5.54	0.97	6.35	21.13	29.40	6.66
A600-026-125	15.24	7.92	0.66	31.75	4.45	8.54	0.28
A600-026-100	15.24	8.71	0.66	25.40	3.74	7.03	0.29
A600-026-075	15.24	9.53	0.66	19.05	3.25	6.05	0.34
A600-029-125	15.24	6.35	0.74	31.75	6.94	13.21	0.44
A600-029-100	15.24	7.14	0.74	25.40	6.18	11.61	0.49
A600-029-075	15.24	8.71	0.74	19.05	5.25	9.74	0.55
A600-029-062	15.24	9.53	0.74	15.88	4.98	9.03	0.63
A600-032-075	15.24	7.14	0.81	19.05	8.01	14.68	0.84
A600-032-062	15.24	8.71	0.81	15.88	7.29	13.12	0.92
A600-032-050	15.24	9.53	0.81	12.70	6.81	11.88	1.07
A600-035-075	15.24	5.54	0.89	19.05	12.10	21.93	1.27
A600-035-062	15.24	7.14	0.89	15.88	10.72	19.04	1.35
A600-035-050	15.24	7.92	0.89	12.70	9.61	16.55	1.51
A600-038-062	15.24	6.35	0.97	15.88	15.88	27.89	2.00
A600-038-050	15.24	7.14	0.97	12.70	14.32	24.24	2.26
A600-038-037	15.24	7.92	0.97	9.53	11.65	18.59	2.45
A600-040-062	15.24	5.54	1.02	15.88	20.28	35.36	2.55
A600-040-050	15.24	6.35	1.02	12.70	18.10	30.38	2.85
A600-040-037	15.24	7.92	1.02	9.53	15.83	24.95	3.32
A600-042-050	15.24	5.54	1.07	12.70	22.82	37.94	3.59
A600-042-037	15.24	7.14	1.07	9.53	19.35	30.02	4.06
A600-045-037	15.24	6.35	1.14	9.53	27.09	41.14	5.69
A720-035-125	18.29	8.71	0.89	31.75	9.07	17.17	0.57
A720-035-100	18.29	9.53	0.89	25.40	8.01	14.86	0.63
A720-035-075	18.29	11.13	0.89	19.05	7.21	13.08	0.76
A720-038-125	18.29	7.14	0.97	31.75	13.30	24.95	0.84
A720-038-100	18.29	8.71	0.97	25.40	11.74	21.71	0.93
A720-038-075	18.29	9.53	0.97	19.05	9.74	17.53	1.02
A720-038-062	18.29	11.13	0.97	15.88	9.34	16.41	1.18
A720-040-100	18.29	7.14	1.02	25.40	14.72	27.04	1.16
A720-040-075	18.29	8.71	1.02	19.05	12.28	21.88	1.29
A720-040-062	18.29	9.53	1.02	15.88	10.90	18.99	1.37
A720-040-050	18.29	11.13	1.02	12.70	10.54	17.70	1.66
A720-042-100	18.29	7.14	1.07	25.40	18.64	34.12	1.47
A720-042-075	18.29	8.71	1.07	19.05	15.30	27.18	1.61
A720-042-062	18.29	9.53	1.07	15.88	14.46	25.00	1.82
A720-045-075	18.29	7.14	1.14	19.05	21.48	37.76	2.25
A720-045-062	18.29	8.71	1.14	15.88	19.35	33.09	2.44
A720-045-050	18.29	9.53	1.14	12.70	17.30	28.33	2.72
A720-049-062	18.29	7.14	1.24	15.88	28.73	48.48	3.62
A720-049-050	18.29	8.71	1.24	12.70	25.49	40.97	4.01
A720-049-037	18.29	9.53	1.24	9.53	21.53	31.80	4.52
A720-055-050	18.29	7.14	1.40	12.70	45.01	70.19	7.09
A720-055-037	18.29	7.92	1.40	9.53	37.10	52.40	7.79
A850-042-150	21.59	8.71	1.07	38.10	13.70	25.89	0.72
A850-042-125	21.59	9.53	1.07	31.75	12.01	22.42	0.76
A850-042-100	21.59	11.13	1.07	25.40	10.45	19.17	0.82
A850-042-075	21.59	14.22	1.07	19.05	10.50	18.64	1.10
A850-045-150	21.59	8.71	1.14	38.10	18.64	35.05	0.98
A850-045-125	21.59	9.53	1.14	31.75	16.68	30.96	1.05
A850-045-100	21.59	11.13	1.14	25.40	14.59	26.55	1.15
A850-045-075	21.59	12.70	1.14	19.05	13.34	23.44	1.40

STOCK CONICAL COMPRESSION SPRINGS

Part Number	Do (L) (mm)	Do (S) (mm)	d (mm)	Lo (mm)	P_1 (N)	P_2 (N)	R (N/mm)
A850-049-125	21.59	7.92	1.24	31.75	25.26	46.57	1.59
A850-049-075	21.59	11.13	1.24	19.05	18.95	32.92	1.99
A850-049-062	21.59	12.70	1.24	15.88	17.97	30.34	2.26
A850-055-100	21.59	7.14	1.40	25.40	37.81	67.34	2.98
A850-055-075	21.59	8.71	1.40	19.05	31.94	54.49	3.35
A850-055-062	21.59	11.13	1.40	15.88	29.27	48.22	3.69
A850-059-075	21.59	7.92	1.50	19.05	44.48	74.95	4.67
A850-059-062	21.59	9.53	1.50	15.88	39.41	63.92	4.97
A850-063-062	21.59	7.92	1.60	15.88	54.35	86.78	6.84
A850-063-050	21.59	9.53	1.60	12.70	49.33	73.84	7.76
A850-067-050	21.59	9.53	1.70	12.70	66.05	96.70	10.41
A975-049-150	24.77	11.13	1.24	38.10	17.26	32.29	0.91
A975-049-125	24.77	12.70	1.24	31.75	15.83	29.18	1.00
A975-049-100	24.77	14.22	1.24	25.40	14.63	26.38	1.15
A975-049-075	24.77	15.88	1.24	19.05	13.03	22.64	1.37
A975-055-150	24.77	9.53	1.40	38.10	30.60	56.76	1.61
A975-055-125	24.77	11.13	1.40	31.75	27.09	49.37	1.71
A975-055-100	24.77	12.70	1.40	25.40	24.02	42.75	1.89
A975-055-075	24.77	14.22	1.40	19.05	21.48	36.65	2.25
A975-059-125	24.77	8.71	1.50	31.75	37.67	68.23	2.37
A975-059-100	24.77	11.13	1.50	25.40	32.92	58.09	2.59
A975-059-075	24.77	12.70	1.50	19.05	28.65	48.26	3.01
A975-063-100	24.77	8.71	1.60	25.40	44.57	77.88	3.51
A975-063-075	24.77	11.13	1.60	19.05	38.21	63.56	4.01
A975-067-075	24.77	9.53	1.70	19.05	50.89	83.53	5.34
A975-067-062	24.77	11.13	1.70	15.88	45.68	71.79	5.75
A975-072-075	24.77	9.53	1.83	19.05	71.66	115.78	7.53
A975-072-062	24.77	11.13	1.83	15.88	66.05	101.64	8.32
A975-074-062	24.77	11.13	1.88	15.88	74.95	114.36	9.44

UK

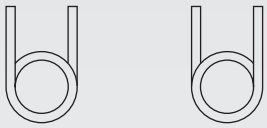
TORSION SPRINGS

SPEC torsion springs are widely useful to store and release energy of rotation or to maintain pressure over a short distance. Our stock selection includes stainless steel torsion springs with four end positions, and music wire springs with three end positions as shown in the drawings.

MATERIALS
Stainless steel: Type 302 as per ASTM A313 or AMS 5688 spring temper

Music wire: ASTM-A228 or AMS 5112

DIRECTION OF HELIX
Must be specified by adding a suffix to the catalogue number. Use L for left-hand wound or R for right-hand wound. See illustration for example.



TOLERANCES
Outer diameter ± 5% stainless steel
± 2% music wire

KEY TO MEASUREMENTS
Do = Outside diameter
d = Wire diameter
R = Loaded position
T = Torque N/mm
M = Recommended mandrel size
E = Leg length (from centreline)
A = Minimum axial length
Fig = Position of legs
Deg° = Degrees deflection
INOX = Stainless Steel
MW = Music Wire

F

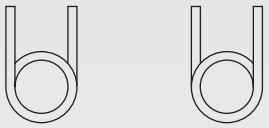
RESSORTS DE TORSION

Les ressorts de torsion SPEC sont souvent utiles pour amasser et libérer l'énergie de rotation ou pour maintenir une pression sur une courte distance. Notre sélection sur stock comprend des ressorts Inox avec quatre différentes positions relatives des extrémités et des ressorts Acier avec trois positions, comme indiqué dans les dessins.

MATERIAUX
Acier inoxydable commercial Type 302 / AMS 5688.

Corde à Piano : ASTM-A228 ou AMS 5112

SENS D'ENROULEMENT
La direction d'enroulement doit être précisée par un suffixe au numéro de référence du catalogue.
Utilisez 'L' pour l'enroulement à gauche et 'R' pour l'enroulement à droite. (Voir l'illustration)



TOLERANCES
Diamètre extérieur ± 5% pour l'Inox
± 2% pour l'Acier

INDEX DES MESURES
Do = Diamètre extérieur
d = Diamètre du fil
R = Position de la charge
T = Couple N/mm
M = Taille de mandrin recommandée
E = Longueur du pied (de l'axe)
A = Longueur d'arbre minimum
Fig = Position des pieds
Deg° = Déflexion en degrés
INOX = Acier inoxydable
MW = Corde à Piano

E

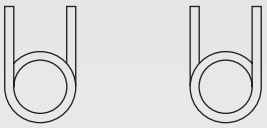
MUELLES/RESORTES DE TORSION

Los muelles/resortes de torsión de SPEC se utilizan extensamente para almacenar y liberar la energía de rotación o para mantener una presión sobre un recorrido corto. En nuestro surtido de stock se incluyen muelles/resortes de torsión con cuatro posiciones de extremo, tal como se muestra en los dibujos.

MATERIAL
Acero inoxidable : Tipo 302 según ASTM A313 ó templado de resorte AMS 5688.

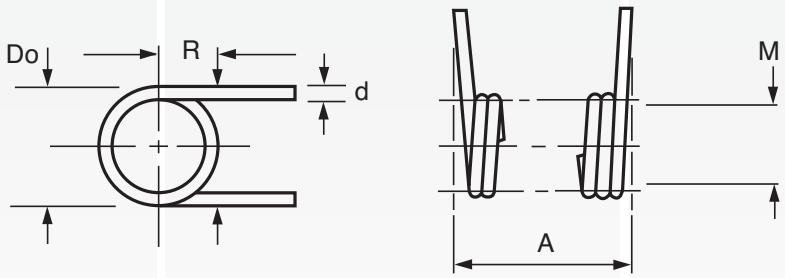
Alambre de piano: ASTM A228 ó AMS 5112

DIRECCIÓN DE LA ESPIRA
Se debe especificar el sentido de hélice añadiendo un sufijo al número de catálogo. Utilice L para muelles/resortes enrollados a izquierdas, R para muelles/resortes enrollados a derechas.



TOLERANCIAS
Diámetro externo ± 5% acero inoxidable
± 2% alambre de piano

CLAVES DE CARACTERÍSTICAS
Do = Diámetro exterior
d = Diámetro del alambre
R = Posición de carga
T = Par N/mm
M = Tamaño eje recomendado
E = Longitud pata (desde centro)
A = Longitud de eje mínima
Fig = Posición patas
Deg° = Grados deflexión
INOX = Alambre de piano
MW = Acero inoxidable



D

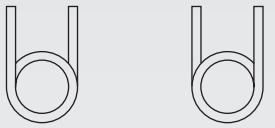
TORSIONSFEDERN

Torsionsfedern aus rostfreiem Federstahl-Lagerprogram Unsere Torsionsfedern werden zur Aufnahme und Abgabe von Kräften eingesetzt. Unser Lagerprogramm besteht aus 4 Schenckelstellungen für rostfreien Federstahldraht und aus 3 Schenckelstellungen für gezogenen Federstahldraht die in der Zeichnung dargestellt sind.

WERKSTOFFE
Rostfreier Federstahldraht: 302 nach ASTM A313 oder AMS 5688 gehärte Feder

Gezogener Federstahldraht: ASTM A228 oder AMS 5112

WINDUNGSRICHTUNG
Fügen Sie eine Nachbuchstabe am Ende der Katalog-Bestell-Nummer zu.
Nachbuchstabe der Bestellnummer „R" gilt für rechts-, der Nachbuchstabe „L" für linksgewickelt.
Zieh Zeichnung für Beispiel.



TOLERANZEN
Außendurchmesser ± 5% für rostfreien Federstahldraht
± 2% für gezogenen Federstahldraht

KENNZEICHNEN DER ABMESSUNGEN
Do = Außendurchmesser
d = Drahtdurchmesser
R = Belastete Stellung
T = Drehmoment N/mm
M = Dorndurchmesser
E = Schenkellänge vom Mittelpunkt an
A = Minimale Länge der Feder
Fig = Schenkelstellung
Deg° = Schenkelwinkel
INOX = Rostfreier Federstahldraht
MW = Gezogener Federstahldraht

I

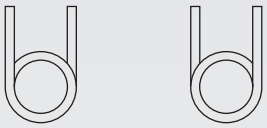
MOLLE A TORSIONE

Le molle a torsione SPEC vengono ampiamente utilizzate per immagazzinare e rilasciare energia di rotazione o per mantenere una pressione su breve distanza. La nostra selezione a magazzino prevede molle di torsione con quattro tipi di estremità, come illustrato nei disegni a lato.

MATERIALE
Acciaio inossidabile: Tipo 302 AMS 5688
Certificati di conformità disponibili a richiesta.

Filo Armonico: DIN 17223 o JIS G4314 A313 SWP-A/B o AMS 5112

SENSO DI AVVOLGIMENTO
L'orientamento dell'ellisse deve essere specificato aggiungendo un prefisso al numero di particolare a catalogo. L per avvolgimento sinistro, R per avvolgimento destro.



TOLLERANZE
Diametro esterno ± 5% acciaio inox
± 2% filo armonico

LEGENDA
Do = Diametro esterno
d = Diametro filo
R = Posizione in carico (tutte le parti)
T = Torsione N/mm
M = Dimensione mandrino consigliata
E = Lunghezza estremità di torsione (dall'asse centrale)
A = Lunghezza minima asse
Fig = Posizione estremità
Deg° = Gradi deflessione
INOX = Acciaio inossidabile
MW = Filo Armonico

P

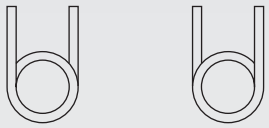
MOLAS DE TORÇÃO

As molas de torção da SPEC servem principalmente para armazenar e libertar a energia de rotação, ou para manter pressão num curso reduzido. O nosso sortido de stock compreende molas de torção com quatro posições finais, como se indica nos desenhos.

MATERIAL
Aço inoxidável tipo comercial 302 ams 5688

Fio de corda de piano: Din 17233 ou JIS G4314 A313 SWP-A/B AMS 5112

SENTIDO DA ESPIRA
Devera ser especificada adicionando o sufixo " R " (direito) e " L " (esquerdo). Veja a ilustração como exemplo.



TOLERANCIAS
Binário de torção ± 10%
Ø ext. ± 5%

LEGENDA
Do = Diametro Externo
d = Diametro do fio
R = Posição de carga
T = Torque N/mm
M = Tamanho Mandril
E = Tam braço desde o centro
A = Minimo comprimim. axial
Fig = Posição dos braços
Deg° = Graus de deflexão
INOX = Aço inoxidável
MW = Fio de corda de piano

INOX

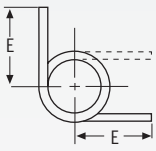


Fig 1. 90°

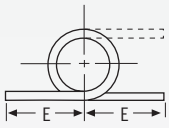


Fig 2. 180°

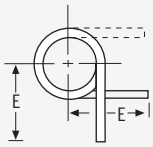


Fig 3. 270°

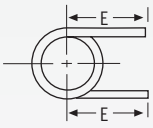


Fig 4. 360°

MW

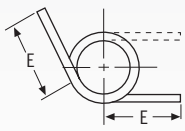


Fig 5. 120°

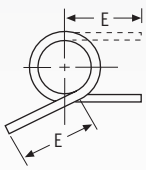


Fig 6. 210°

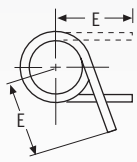


Fig 7. 300°

UK

ADDITIONAL TECHNICAL DATA

TORSION SPRINGS

SPEC torsion springs are normally used over a supporting mandrel or arbor. Suggested mandrel sizes allow about 10% clearance at the deflections listed. If greater deflections are used, the arbor size should be reduced. Sufficient room (minimum axial space) must be provided in the assembly for the spring to function properly.

Spec torsion springs should be used in the direction that winds the coils. In the unwinding direction the maximum load is lower because of residual stresses.

Torque values listed are suitable for average conditions. These values can be increased about 20% for static conditions with only slight setting.

To determine the load at any working length use rate proposed deflection.

ENDS
Straight torsion ends are standard.

FINISH
Plain finish is standard. Allow additional time for special finishes.

For inspection purposes, the load should be applied at ½ leg length (E). Using other lengths appreciably alters the active length of wire and affects the test results.

The reference torque values listed can be translated to the approximate direct load by use of the formula P=T/En where P is the load applied at the new length En.

Torque values at intermediate deflections can be calculated proportionally.

F

DONNEES TECHNIQUES ADDITIONNELLES

RESSORTS DE TORSION

Les ressorts de torsion SPEC sont normalement utilisés sur un mandrin ou un arbre de support. Les dimensions de mandrin recommandées permettent environ 1% de jeu aux déflexions listées. Si on utilise des déflexions plus importantes, le diamètre du mandrin doit être réduit. Suffisamment de place (jeu minimum axial) doit être prévue dans un assemblage pour que le ressort fonctionne correctement.

Les ressorts de torsion SPEC doivent être utilisés dans la direction qui enroule les spires. Dans la direction de déroulement la charge maximum est plus basse en raison des tensions résiduelles.

Les valeurs de couple listées sont compatibles avec des conditions moyennes. Ces valeurs peuvent être augmentées de 20% pour des conditions statiques avec seulement une déflexion permanente mineure. Une longévité infinie peut être obtenue si les conditions de montage sont bonnes, en utilisant des valeurs de couple d'environ 20% inférieures à celles à 50% de la plage de tension.

EXTRÉMITÉS
Les extrémités droites des torsion sont standard.

FINITION
Une finition naturelle est standard. Prévoyez du temps de livraison supplémentaire pour des finitions spéciales.

Pour contrôler, la force doit être appliquée à la moitié de la longueur du pied (E). Utiliser d'autres longueurs altère la partie active du fil et affecte les résultats du test.

Les valeurs de couple indiquées pour référence peuvent être converties en valeurs approximatives de charges correspondantes en utilisant la formule P=T/En où P est la charge à la nouvelle longueur de pied En.

Les valeurs de couple intermédiaire peuvent être calculées proportionnellement à la déflexion totale.

E

INFORMACIÓN TÉCNICA ADICIONAL

MUELLES/RESORTES DE TORSION

Los muelles/resortes de torsión de SPEC se utilizan generalmente sobre un mandril o eje. Los tamaños de eje sugeridos permiten una holgura del 10% aproximadamente en las deflexiones indicadas. En caso de que se utilicen deflexiones mayores, se debería reducir el diámetro del eje. Se debe dejar suficiente espacio (espacio axial mínimo) en el montaje de forma que el muelle pueda funcionar correctamente.

Los muelles/resortes de torsión de SPEC deberían utilizarse en el sentido que se enrollen las bobinas. En el sentido de desenrollar la carga máxima es menor debido a las tensiones residuales.

Los valores de torsión son adecuados para condiciones medias. Dichos valores pueden ser aumentados en un 20% para condiciones estáticas, con una ligera flecha solamente.

EXTREMOS
Los extremos rectos de torsión son estándar.

ACABADO
El acabado simple es estándar. Dejen un tiempo adicional para acabados especiales.

A la hora de realizar comprobaciones, la carga debe medirse a ½ de la longitud de la pata (E). La utlización de otras longitudes afecta significativamente a la longitud activa y a los resultados de la prueba.

El par torsor de referencia indicado puede traducirse a una carga directa mediante P=T/En , donde P es la carga aplicada en la nueva longitud En.

El par torsor en deflexiones intermedias puede calcularse mediante un prorateo.

D

ZUSÄTZLICHE TECHNISCHEN ANGABEN

TORSIONSFEDERN

Torsionsfedern werden normalerweise über einem Dom geführt. Der angegebene Dorn M ergibt 10% Spiel zur gespannten Feder. Bei größerer Spannung der Feder muß der Dorndurchmesser verkleinert werden. Auch sollte axiales Spiel beim Einbau berücksichtigt werden um eine einwandfreie Funktion der Feder zu gewährleisten.

Verwenden Sie die Feder in Richtung der Windung. Bei Verwendung entgegen der Windungsrichtung können Sie die Feder nicht optimal nutzen.

Die angegebenen Drehmomente sind für Standardanwendungen vorgesehen. Diese Werte können um 20% überschritten werden, wenn Statische Lasten vorhanden sind; dabei tritt nur eine leicht Setzung ein.

SCHENKELFORM
Gerade Schenkeln sind Standard.

OBERFLÄCHE
Gewönlich Oberfläche ist Standard. Sondern Oberfläche verlangen längere Lieferzeiten.

Aus Gründen der Übersichtlichkeit¸ haben wir das Drehmoment in der ½ Schenkellänge E angegeben (Halblänge des Schenkels). Bei anderen Längen wird das Drehmoment erheblich ändern.

Die Federkraft bei dem angegebenen Drehmomentwert dürfen Sie mittels der Formula P=T/En wo P is die Federkraft bei neuem Hebelarm En berechnen.

Die erreichbare Kraft bei einem bestimmten Winkel dürfen Sie mittels direkt Zuteiling kalkulieren.

I

ULTERIORI INFORMAZIONI TECNICHE

MOLLE A TORSIONE

Le molle di torsione SPEC vengono normalmente montate su di un perno di supporto. Le dimensioni di perno consigliate permettono circa il 10% di gioco alle deflessioni indicate. Se vengono adottate deflessioni maggiori, la dimensione del perno deve essere ridotta. Sufficente spazio (spazio assiale minimo) deve essere previsto durante il montaggio, affinchè la molla possa funzionare correttamente.

Le molle di torsione SPEC dovrebbero essere utilizzate secondo la direzione di avvolgimento delle spire in direzione contraria il carico massimo è minore a causa degli stress residui.

I valori di torsione indicati fanno riferimento a condizioni di impiego medie. Questi valori possono essere aumentati del 40% circa in condizioni statiche, con leggere deformazioni. Ci si può attendere un ciclo di vita praticamente infinito se le condizioni di montaggio sono ottimali e ci si tiene al di sotto del 20% dei valori di torsione indicati.

ESTREMITA'
Le estremità di torsione sono diritte.

FINITURA
Finitura standard liscia.
Su richiesta è possibile fornire finiture speciali.

Per controllo, la forza deve essere applicata a metà della lunghezza dei gambi (E). Utilizzando altre lunghezze si altera la lunghezza attiva del filo modificando il risultato del test.

Il valore di torsione indicato può essere convertito in valori approssimativi di carico utilizzando la formula P = T/En dove P è il carico applicato alla nuova lunghezza En.

I valori di torsione a deflessioni intermedie possono essere calcolati proporzionalmente.

P

INFORMAÇÕES TECNICAS ADICIONAIS

MOLAS DE TORÇÃO

As molas de torção SPEC utilizam-se de um modo geral com um mandril ou eixo de apoio. As dimensões de mandril sugeridas permitem cerca de 10% de folga nas deflexões indicadas. Em caso de utilização de deflexões maiores, deve reduzir-se a dimensão do eixo de apoio. Deve deixar-se espaço suficiente (espaço axial mínimo) durante a montagem para que a mola possa operar correctamente.

As molas de torção SPEC devem utilizar-se no sentido de enrolamento das bobinas. Em sentido contrário, a carga máxima é menor dada a presença de esforços residuais.

Os valores de torção são adequados a condições médias. Em condições estáticas, os referidos valores podem ser aumentados sem cerca de 40%, apenas com uma ligeira flecha. Em boas condições de montagem, é possível esperar uma resistência infinita à fadiga, recorrendo a valores de torção 20% inferiores aos indicados.

EXTREMIDADES
As extremidades direitas de torção são de série.

ACABAMENTO
O acabamento simples é de série. Deve ter-se em conta um período adicional no caso de acabamentos especiais.

Para fins de inspeção, a carga deve ser aplicada na metade do comprimento(E). Se usar outros comprimentos ativos, isso afetará o fio e tambem os resultados finais.

Os valores de referencia de torque listados podem ser encontrados como carga direta usando a Formula P=T/En, onde P é a carga aplicada no novo comprimento En.

Os valores de torque intermediarios podem ser calculados proporcionalmente.

TorsionsfedernTorsionsfedernTorsionsfedernTorsion
MolleATorsioneMolleATorsioneMolleATorsioneMolle
MolasDeTorçãoMolasDeTorçãoMolasDeTorçãoMola

TORSION SPRINGS - STAINLESS STEEL / INOX

Part Number	d (mm)	Do (mm)	Fig	Deg°	T (N/mm)	1/2 E (mm)	M (mm)	E (mm)	A (mm)
T012-090-055		2.36	1	90			1.40		1.37
T012-180-067		2.77	2	180		4.75	1.70	9.52	2.29
T012-270-062	0.30	2.59	3	270	5.31		1.57		3.53
T012-180-109		4.22	2	180			2.77		1.68
T012-270-109		4.32	3	270			2.77		2.29
T012-360-109		4.42	4	360		6.35	2.77	12.70	2.90
T014-090-063		3.15	1	90			1.60		1.70
T014-180-078		3.38	2	180			1.98		2.67
T014-270-063	0.36	3.15	3	270	7.91		1.60		4.09
T014-180-109		4.93	2	180			2.77		1.96
T014-270-125		5.11	3	270		9.52	3.18	19.05	2.67
T014-360-125		5.18	4	360			3.18		3.38
T015-090-062		2.79	1	90			1.57		1.71
T015-180-078		3.30	2	180		6.35	1.98	12.70	2.86
T015-270-078	0.38	3.15	3	270	10.51		1.98		4.39
T015-180-109		4.65	2	180			2.77		2.10
T015-270-109		5.05	3	270		9.52	2.77	19.05	2.86
T015-360-109		5.26	4	360			2.77		3.62
T017-090-093		4.06	1	90			2.36		2.06
T017-180-093		4.37	2	180		6.35	2.36	12.70	3.24
T017-270-093	0.43	4.06	3	270	13.22		2.36		4.97
T017-180-156		6.32	2	180			3.96		2.39
T017-270-156		6.58	3	270		9.52	3.96	19.05	3.24
T017-360-140		5.97	4	360			3.56		4.32
T018-090-109		4.50	1	90			2.77		2.06
T018-180-109		4.17	2	180		6.35	2.77	12.70	3.89
T018-270-109	0.46	4.06	3	270	15.82		2.77		5.79
T018-180-140		5.49	2	180			3.56		2.97
T018-270-156		6.22	3	270			3.96		3.81
T018-360-156		5.92	4	360		9.52	3.96	19.05	5.33
T020-090-109		4.85	1	90			2.77		2.41
T020-180-109		4.55	2	180			2.77		4.32
T020-270-093	0.51	4.45	3	270	21.10		2.36		6.35
T020-180-140		6.15	2	180			3.56		3.30
T020-270-172		6.81	3	270		12.70	4.37	25.40	4.19
T020-360-156		6.45	4	360			3.96		6.35
T021-090-109		4.72	1	90			2.77		2.40
T021-180-109		4.70	2	180		9.52	2.77	19.05	4.53
T021-270-109	0.53	4.67	3	270	24.60		2.77		6.76
T021-180-156		6.27	2	180			3.96		3.47
T021-270-187		7.19	3	270		12.70	4.75	25.40	4.53
T021-360-187		6.88	4	360			4.75		6.15
T023-090-109		5.18	1	90			2.77		2.77
T023-180-109		4.85	2	180		9.52	2.77	19.05	4.98
T023-270-109	0.58	4.75	3	270	34.80		2.77		7.30
T023-180-156		6.58	2	180			3.96		3.81
T023-270-156		6.38	3	270		12.70	3.96	25.40	5.55
T023-360-172		6.88	4	360			4.37		6.72
T025-090-140		5.97	1	90			3.56		2.86
T025-180-140		5.69	2	180		9.52	3.56	19.05	5.40
T025-270-140	0.64	5.56	3	270	42.40		3.56		8.03
T025-180-203		7.72	2	180			5.16		4.13
T025-270-218		8.64	3	270			5.54		5.40
T025-360-218		8.23	4	360			5.54		7.32
T028-090-156		6.78	1	90			3.96		3.38
T028-180-140		6.32	2	180		12.70	3.56	25.40	6.05
T028-270-140	0.71	6.22	3	270	58.20		3.56		8.89
T028-180-203		8.64	2	180			5.16		4.62
T028-270-203		8.36	3	270			5.16		6.76
T028-360-218		9.02	4	360			5.54		8.89
T030-090-172		7.14	1	90			4.37		3.43
T030-180-172		6.91	2	180			4.37		6.48
T030-270-172	0.76	6.86	3	270	70.60		4.37		9.65
T030-180-250		10.01	2	180			6.35		4.95
T030-270-250		9.58	3	270			6.35		7.11
T030-360-250		10.41	4	360		12.70	6.35	25.40	8.79
T032-090-172		7.32	1	90			4.36		3.86
T032-180-156		6.86	2	180			3.96		6.91
T032-270-156	0.81	6.71	3	270	92.70		3.96		10.97
T032-180-218		9.30	2	180			5.54		5.28
T032-270-218		8.99	3	270			5.54		7.72

TORSION SPRINGS - STAINLESS STEEL / INOX

Part Number	d (mm)	Do (mm)	Fig	Deg°	T (N/mm)	1/2 E (mm)	M (mm)	E (mm)	A (mm)
T032-360-234		9.70	4	360			5.95		9.35
T035-090-187		8.00	1	90			4.75		4.00
T035-180-187		7.70	2	180			4.75		7.56
T035-270-187	0.89	7.90	3	270	113.00		4.75		11.23
T035-180-281		11.43	2	180			7.14		5.78
T035-270-281		11.05	3	270			7.14		8.45
T035-360-312		11.96	4	360			7.92		10.29
T038-090-234		9.80	1	90			5.94		4.57
T038-180-218		9.35	2	180		15.88	5.54	31.75	8.20
T038-270-218	0.97	8.97	3	270	134.50		5.54		12.07
T038-180-312		12.37	2	180			8.08		6.27
T038-270-312		12.12	3	270			7.92		9.17
T038-360-328		13.06	4	360			8.33		12.07
T040-090-187		7.85	1	90			4.75		5.59
T040-180-218		8.84	2	180			5.54		9.65
T040-270-218	1.02	9.09	3	270	155.40		5.54		13.97
T040-180-343		13.16	2	180			8.71		6.60
T040-270-343		12.98	3	270		25.40	8.71	50.80	9.65
T040-360-343		12.88	4	360			8.71		12.90
T045-090-203		9.07	1	90			5.16		6.58
T045-180-218		9.58	2	180		15.88	5.54	31.75	10.86
T045-270-234	1.14	9.70	3	270	226.00		5.94		15.43
T045-180-359		14.61	2	180			9.12		7.44
T045-270-359		14.12	3	270		25.40	9.12	50.80	10.86
T045-360-359		13.94	4	360			9.12		14.29
T048-090-218		9.53	1	90			5.54		6.71
T048-180-250		10.26	2	180		15.88	6.35	31.75	11.58
T048-270-250	1.22	10.57	3	270	282.00		6.35		16.76
T048-180-406		15.70	2	180			10.31		7.92
T048-270-406		15.24	3	270			10.31		11.58
T048-360-406		15.09	4	360			10.31		15.49
T051-090-234		10.36	1	90			5.94		7.44
T051-180-250		10.92	2	180			6.35		12.32
T051-270-266	1.30	11.15	3	270	328.00		6.76		17.49
T051-180-344		14.12	2	180			8.74		9.72
T051-270-359		14.50	3	270			9.12		13.60
T051-360-406		15.95	4	360			10.31		16.19
T054-090-296		12.29	1	90			7.52		7.87
T054-180-312		12.93	2	180			7.92		13.00
T054-270-312	1.37	13.06	3	270	370.00		7.92		18.16
T054-180-421		16.61	2	180			10.69		10.29
T054-270-437		16.87	3	270			11.10		14.40
T054-360-453		17.63	4	360			11.51		17.91
T059-090-296		12.67	1	90			7.52		8.64
T059-180-328		13.36	2	180			8.33		14.24
T059-270-328	1.50	13.64	3	270	475.00		8.33		20.23
T059-180-437		17.30	2	180			11.10		11.30
T059-270-453		17.75	3	270			11.51		15.74
T059-360-459		18.01	4	360			11.66		20.23
T063-090-343		14.22	1	90		25.40	8.71	50.80	9.19
T063-180-359		15.01	2	180			9.12		15.24
T063-270-375	1.60	15.24	3	270	582.00		9.53		21.60
T063-180-500		19.48	2	180			12.70		12.07
T063-270-516		19.91	3	270			13.11		16.80
T063-360-516		20.27	4	360			13.11		21.60
T070-090-359		15.06	1	90			9.12		10.16
T070-180-390		15.88	2	180			9.91		16.89
T070-270-390	1.78	16.23	3	270	791.00		9.91		24.00
T070-180-515		20.57	2	180			13.08		13.34
T070-270-531		20.98	3	270			13.49		18.67
T070-360-546		21.41	4	360			13.87		24.00
T075-090-375		16.13	1	90			9.53		10.92
T075-180-422		17.15	2	180			10.72		18.10
T075-270-500	1.91	17.78	3	270	989.00		12.70		25.72
T075-180-484		19.69	2	180			12.29		16.26
T075-270-531		20.96	3	270			13.49		21.91
T075-360-640		24.77	4	360			16.26		26.67
T078-090-406		17.22	1	90			10.31		11.43
T078-180-453	1.98	18.49	2	180	1102.00		11.51		18.82
T078-270-453		18.49	3	270			11.51		26.16
T078-180-500		20.40	2	180			12.70		16.84

TORSION SPRINGS - STAINLESS STEEL / INOX

Part Number	d (mm)	Do (mm)	Fig	Deg°	T (N/mm)	1/2 E (mm)	M (mm)	E (mm)	A (mm)
T078-270-546	1.98	21.67	3	270	1102.00	25.40	13.87	50.80	22.78
T078-360-578		22.94	4	360			14.68		28.73
T085-090-422		18.16	1	90			10.72		12.42
T085-180-469		19.30	2	180			11.91		20.52
T085-270-500	2.16	20.07	3	270	1356.00	31.75	12.70	63.50	29.15
T085-180-641		25.25	2	180			16.28		16.21
T085-270-672		26.42	3	270			17.07		22.67
T085-360-688		26.77	4	360			17.48		29.15
T095-090-453		19.71	1	90			11.51		13.87
T095-180-531		22.07	2	180			13.49		22.94
T095-270-578	2.41	23.50	3	270	1808.00	38.10	14.68	76.20	32.58
T095-180-734		28.73	2	180			18.64		18.11
T095-270-797		30.56	3	270			20.24		25.34
T095-360-813		31.12	4	360			20.65		32.58
T105-090-500		21.54	1	90			12.70		15.34
T105-180-609		24.94	2	180			15.47		25.35
T105-270-703	2.67	27.69	3	270	2373.00	44.45	17.86	88.90	36.00
T105-180-813		31.70	2	180			20.65		20.02
T105-270-891		34.09	3	270			22.63		28.00
T105-360-906		34.77	4	360			23.01		36.00
T115-090-594		24.84	1	90			15.09		16.79
T115-180-641		26.49	2	180			16.28		27.76
T115-270-688	2.92	27.58	3	270	3164.00		17.48		39.43
T115-180-859		34.21	2	180			21.82		21.92
T115-270-938		36.45	3	270			23.83		30.67
T115-360-969		37.21	4	360			24.61		39.43
T125-090-591		25.12	1	90			15.01		21.44
T125-180-666		27.48	2	180			16.92		36.53
T125-270-751	3.18	30.20	3	270	3616.00	50.80	19.08	101.60	49.21
T125-180-885		34.44	2	180			22.48		30.18
T125-270-1013		38.51	3	270			25.73		39.69
T125-360-1084		40.77	4	360			27.53		49.21
T135-090-666		27.99	1	90			16.92		23.14
T135-180-735		30.20	2	180			18.67		39.45
T135-270-825	3.43	33.05	3	270	4519.00		20.96		53.15
T135-180-977		37.87	2	180			24.82		32.59
T135-270-1112		42.16	3	270			28.24		42.86
T135-360-1188		44.58	4	360			30.18		53.15

TORSION SPRINGS - MUSIC WIRE

Part Number	d (mm)	Do (mm)	Fig	Deg°	T (N/mm)	1/2 E (mm)	M (mm)	E (mm)	A (mm)
T016-120-125		4.83	5.00	120					2.31
T016-210-125	0.41	4.78	6.00	210	12.00	9.52	3.18	19.05	3.43
T016-300-125		4.78	7.00	300					4.55
T020-120-187		6.99	5.00	120					2.87
T020-210-187	0.51	6.96	6.00	210	20.00		4.75		4.27
T020-300-187		6.93	7.00	300					5.66
T024-120-250		9.19	5.00	120					3.45
T024-210-250	0.61	9.14	6.00	210	32.00				5.13
T024-300-250		9.12	7.00	300					6.81
T026-120-250		9.30	5.00	120	44.00				3.73
T026-210-250	0.66	9.25	6.00	210	43.00	12.70		25.40	5.56
T026-300-250		9.25	7.00	300	43.00				7.37
T029-120-250		9.27	5.00	120	53.00				4.90
T029-210-250	0.74	9.30	6.00	210	58.00		6.35		6.93
T029-300-250		9.32	7.00	300	60.00				8.97
T032-120-250		9.42	5.00	120	78.00				5.41
T032-210-250	0.81	9.37	6.00	210	75.00				8.46
T032-300-250		9.42	7.00	300	79.00				10.69
T035-120-250		9.58	5.00	120	108.00				5.92
T035-210-250	0.89	9.53	6.00	210	104.00				9.27
T035-300-250		9.58	7.00	300	112.00				11.71
T038-120-375		13.89	5.00	120	137.00		9.53		5.46
T038-210-312	0.97	11.71	6.00	210	134.00	15.88	7.92	31.75	9.09
T038-300-312		11.73	7.00	300	140.00		7.92		11.73
T040-120-375		14.02	5.00	120	167.00		9.53		5.77
T040-210-312	1.02	11.81	6.00	210	165.00				9.58
T040-300-312		11.76	7.00	300	155.00				13.39
T042-120-312		11.86	5.00	120	175.00				7.11
T042-210-312	1.07	11.81	6.00	210	170.00		7.92		11.13
T042-300-312		11.79	7.00	300	169.00				15.11
T045-120-312		12.04	5.00	120	229.00				7.62
T045-210-312	1.14	11.96	6.00	210	224.00				11.91
T045-300-312		11.94	7.00	300	221.00				16.21
T049-120-375		14.20	5.00	120	277.00				8.31
T049-210-375	1.24	14.12	6.00	210	266.00				12.98
T049-300-375		14.17	7.00	300	287.00				16.38
T055-120-375		14.33	5.00	120	357.00				10.72
T055-210-375	1.40	14.33	6.00	210	374.00	25.40		50.80	15.95
T055-300-375		14.33	7.00	300	382.00		9.53		21.18
T059-120-375		14.53	5.00	120	469.00				11.51
T059-210-375	1.50	14.45	6.00	210	444.00				18.62
T059-300-375		14.48	7.00	300	465.00				24.23
T063-120-375		14.61	5.00	120	513.00				13.87
T063-210-375	1.60	14.68	6.00	210	572.00				19.86
T063-300-375		14.66	7.00	300	561.00				27.48
T072-120-500		19.02	5.00	120	803.00				14.02
T072-210-500	1.83	19.05	6.00	210	835.00				20.88
T072-300-500		19.05	7.00	300	849.00		12.70		27.74
T081-120-500		19.33	5.00	120	1060.00				17.83
T081-210-500	2.06	19.41	6.00	210	1182.00				25.55
T081-300-500		19.38	7.00	300	1156.00	31.75		63.50	35.33
T085-120-625		23.52	5.00	120	1254.00				16.56
T085-210-625	2.16	23.55	6.00	210	1306.00				24.66
T085-300-625		23.55	7.00	300	1328.00				32.74
T092-120-625		23.88	5.00	120	1687.00				17.93
T092-210-625	2.34	23.77	6.00	210	1593.00		15.88		29.03
T092-300-625		23.83	7.00	300	1670.00	38.10		76.20	37.80
T096-120-625		24.10	5.00	120	1990.00				18.69
T096-210-625	2.44	23.98	6.00	210	1880.00				30.28
T096-300-625		23.95	7.00	300	1839.00				41.86
T105-120-750		28.37	5.00	120	2403.00				20.45
T105-210-750	2.67	28.40	6.00	210	2511.00	44.45		88.90	30.45
T105-300-750		28.30	7.00	300	2375.00				43.13
T112-120-750		28.75	5.00	120	3058.00				21.82
T112-210-750	2.84	28.60	6.00	210	2899.00				35.33
T112-300-750		28.65	7.00	300	3042.00		19.05		46.00
T125-120-750		29.16	5.00	120	3979.00				27.53
T125-210-750	3.18	29.16	6.00	210	4050.00	50.80		101.60	42.62
T125-300-750		29.08	7.00	300	3841.00				60.86
T135-120-750		29.51	5.00	120	4656.00				33.15
T135-210-750	3.43	29.46	6.00	210	4639.00				52.88
T135-300-750		29.51	7.00	300	4887.00				69.16

UK

INTERLOCK GARTER SPRINGS

Stock sizes in stainless steel
Garter springs are extension springs with the ends fastened together to form a ring. They are primarily used to maintain controlled pressure of a radial lip seal on a shaft and to compensate for lip wear, changes in volume or stiffness of the elastomer caused by the fluid, and the effect of temperature changes and time. Other uses include small motor belts and electrical connectors.

SPEC garter springs are engineered and manufactured to provide a consistent and reliable product. They feature high initial tension to provide constant load and a special tapered end to assure a strong connection and a continuous near uniform body diameter.

Applications
• Oil Seals • Lip Seals • Small Motor Belts
• Electrical Connectors

Lengths
SPEC garter springs are available in a variety of standard lengths which can be trimmed and assembled to meet your required inside diameter. Simply trim the non-tapered end to your needed length and assemble by screwing the tapered end into the non-tapered end as shown in figure G1.

Material
Stainless steel – plain finish.
Type 302 per ASTM A313 or AMS 5688 spring temper. (Chemical and physical only.) Certificate of chemical analysis available at additional charge.

Tolerances
Body O.D. ±0.13
Load at 4.75mm extension ±10%

Ends
Springs are sold in unassembled lengths with interlock ends.

KEY TO MEASUREMENTS
Do = Outside diameter
d = Wire diameter
D_1 = Internal diameter when assembled
L_1 = Approximate active length
L_2 = Loaded length
F_1 = Force at loaded length
D_2 = Maximum expanded internal diameter

F

GAINES À VISSER

Dimensions standard en acier inoxydable
Les gaines à visser sont des ressorts de traction dont les extrémités sont réunies pour former un anneau. Elles sont principalement utilisées pour maintenir une pression contrôlée d'un joint à lèvres radial sur un arbre et pour compenser l'usure des lèvres, les changements de volume ou de raideur de l'élastomère causés par le fluide, et l'effet des changements de température et du temps. Les autres usages comprennent notamment les courroies de petits moteurs et les connecteurs électriques.

Les gaines à visser SPEC sont conçues et fabriquées pour fournir un produit uniforme et fiable. Elles présentent une forte tension initiale qui assure une charge constante et une extrémité conique spéciale qui assure une liaison solide et un diamètre de corps pratiquement uniforme.

Applications
• Bagues d'étanchéité • Joints à lèvres
• Courroies de Petits moteurs • Connecteurs électriques

Longueurs
Les gaines à visser SPEC existent en diverses longueurs standard qui peuvent être raccourcies et peuvent être assemblées en fonction du diamètre intérieur requis. Il suffit de raccourcir l'extrémité non conique à la longueur voulue et d'assembler le tout en vissant l'extrémité conique dans l'extrémité non conique comme dans la Fig. G1.

Matériau
Acier inoxydable - finition ordinaire
Trempe de ressort type 302 par ASTM A313 ou AMS5688. (Chimique et physique seulement). Certificat d'analyse chimique disponible contre supplément.

Tolérances
Corps diam. ext. ±0,13
Charge à 4,75 mm extension ±10%

Extrémités
Les ressorts sont vendus par longueurs non montées avec des extrémités à verrouillage.

INDEX DES MESURES
Do = Diamètre Extérieur
d = Diamètre du fil
D_1 = Diamètre intérieur assemblé
L_1 = Longueur de corps active (approx.)
L_2 = Longueur en charge
F_1 = Charge en extension
D_2 = Diamètre intérieur maxi en extension

E

MUELLES/RESORTES VAINA ENTRELAZABLES

Tamaños en stock en acero inoxidable
Los muelles/resortes vaina son muelles/resortes de extensión con los extremos unidos para formar un aro. Se usan sobre todo para mantener la presión controlada en un borde radial de un eje y compensar el desgaste del borde, cambios en el volumen o en la rigidez del elastómero causados por el fluido, y el efecto de los cambios de temperatura y el paso del tiempo. Otras aplicaciones incluyen correas en motores pequeños y conectores eléctricos.

Los muelles/resortes vaina de SPEC están diseñados y fabricados para generar un producto consistente y de confianza. Desarrollan una fuerte tensión inicial para suministrar una fuerza constante y un extremo ahusado para asegurar una conexión fuerte y un diámetro de cuerpo uniforme y constante.

Aplicaciones
• Juntas de aceite • Juntas de bordes
• Correas de pequeños motores • Conectores eléctricos

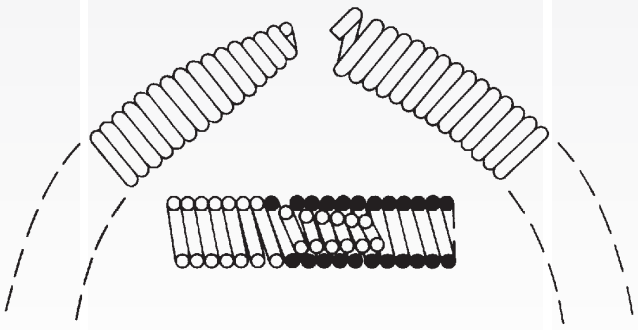
Longitudes
Los muelles/resortes vaina de SPEC están disponibles en una gran variedad de longitudes stándard recortados y montados para cumplir con sus necesidades de diámetro interior. Simplemente recortar el extremo no ahusado según sus necesidades de longitud y montarlo roscando el extremo ahusado en el no ahusado como aparece en la figura G1.

Material
Acero inoxidable – acabado plano
Muelles templado tipo 302 según ASTM A313 o AMS 5688 (Químico y físico solamente). El certificado de composición química está disponible contra pago adicional.

Tolerancias
Cuerpo D.E. +- 0.13
Fuerza a 4,75 mm. de extensión +-10%

Extremos
Los muelles/resortes se venden en longitudes sin montar con extremos entrelazables.

CLAVES DE DIMENSIONES
Do = Diámetro exterior (Max)
d = Diámetro del alambre
D_1 = Diámetro interior colocado
L_1 = Altura libre aproximada
L_2 = Longitud cargada
F_1 = Fuerza en la altura de carga
D_2 = Máximo diámetro interno expandido



D

WURMFEDERN

Größen in Edelstahl
Wurmfedern sind Zugfedern, deren Enden aneinander befestigt werden und einen Ring bilden. Sie werden hauptsächlich verwendet, um bei Radiallippendichtungen einen kontrollierten Druck auf die Welle aufrechtzuerhalten und den Dichtungsverschleiß sowie Veränderungen im Volumen oder der Steifigkeit des Elastomers auszugleichen, welche durch die Flüssigkeit und durch Temperaturveränderungen hervorgerufen werden können. Weitere Anwendungen sind kleine Motorriemen und elektrische Anschlüsse.

Bei der Entwicklung und Herstellung der SPEC Wurmfedern steht die Bereitstellung eines konsistenten und zuverlässigen Produkts im Mittelpunkt. Die Federn weisen eine hohe Vorspannung auf, um eine konstante Kraft zur Verfügung zu stellen, und haben ein besonderes verjüngtes Ende, um eine starke Verbindung und einen kontinuierlichen einheitlichen Durchmesser sicherzustellen.

Anwendungen
• Öldichtungen • Lippendichtungen • Kleine Motorriemen • Elektrische Anschlüsse

Längen
SPEC Wurmfedern sind in einer Vielzahl von Standardlängen erhältlich, welche je nach dem von Ihnen benötigten Innendurchmesser gekürzt und montiert werden können. Kürzen Sie das nicht verjüngte Ende einfach auf die benötigte Länge und montieren Sie die Feder, indem Sie das verjüngte Ende in das nicht verjüngte Ende schrauben (siehe Abbildung G1).

Material
Edelstahl – einfaches Finish.
Typ 302 - ASTM A313 oder AMS 5688 Federhärte. (nur chemisch und physikalisch) Zertifikat zur chemischen Analyse auf Wunsch gegen besondere Berechnung erhältlich.

Toleranzen
Körper O.D. ±0.13
Kraft bei 4.75mm Dehnung ±10%

Enden
Federn werden in unmontierten Längen mit Verriegelungsenden verkauft.

KENNZEICHNEN DER ABMESSUNGEN
Do = Außendurchmesser
d = Drahtdurchmesser
D_1 = Innendurchmesser nach Montage
L_1 = Ungefähre aktive Länge
L_2 = Gespannte Höhe
F_1 = Kraft bei gespannter Länge
D_2 = Maximaler erweiterter Innendurchmesser

I

MOLLE GARTER

Dimensioni standard in acciaio inox
Sono molle di trazione in cui le estremità sono riunite per formare unanello. Sono principalmente utilizzate per mantenere una pressione controllata in un giunto a labbri radiale su un albero e per compensare l'usura dei labbri, i cambi di volume o la rigidità dell'elastomero causati dal fluido, così come l'effetto dei cambiamenti di temperatura o atmosferici. Le altre utilizzazioni comprendono cinture per piccoli motorie i connettori elettrici.

Le molle garter SPEC sono concepite e fabbricate per fornire un prodotto uniforme e affidabile. Presentano una forte tensione iniziale che assicura un carico costante e un'estremità conica speciale che assicura una solida connessione e un diametro del corpo praticamente uniforme.

Applicazioni
• Dispositivi di tenuta dell'olio • Giunti a labbri
• Cinture per piccoli motori • Connettori elettrici

Lunghezze
Le molle garter SPEC esistono in diverse lunghezze standard che possono essere accorciate ed essere assemblate in funzione del diametro interno richiesto. Basta accorciare fino alla lunghezza voluta l'estremità non conica e assemblare il tutto avvitando l'estremità conica dentro quella non conica come da fig. G1

Materiale
Acciaio inox - finitura ordinaria.
Tipo 302 da ASTM A313 o AMS5688. Il certificato d'analisi chimica è disponibile dietro supplemento.

Tolleranze
Corpo diam est. ± 0,13
Carico a 4,75 mm estensione ± 10%

Estremità
Le molle vengono vendute per lunghezze non montate con le estremità a chiusura.

LEGENDA
Do = Diametro esterno
d = Diametro del filo
D_1 = Diametro interno assemblato
L_1 = Lunghezza libera approssimativa
L_2 = Lunghezza in carico
F_1 = Carico alla lunghezza in carico
D_2 = Massima espansione diametro interno

P

MOLAS AUTOTRAVANTES GARTER

Padronizadas em aço inox
As molas Garter são molas com as extremidades unidas para formar um anel. Essas peças são usadas para manter a pressão em uma aba selada para prevenir o desgaste do eixo. Tambem são usadas para manter os fluidos de um elastômero. Outros usos são em pequenas correias de motores e conectores elétricos.

As autotravantes SPEC são desenhadas para manter a pressão inicial uma constante em qualquer que seja seu uso.

Aplicações
• Lacres de óleo • Lacres de abas
• Correias de pequenos motores • Conectores elétricos

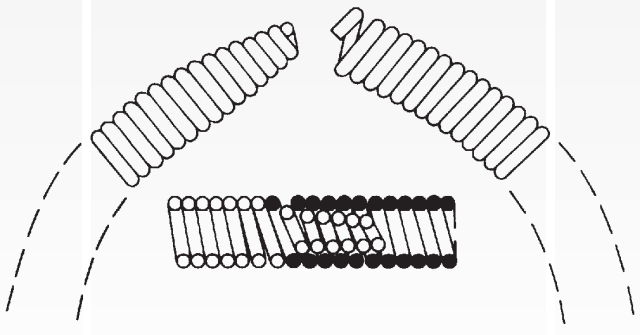
Comprimentos
São disponíveis em uma variedade de comprimentos padrão para ir de encontro ao seu diâmetro de uso. Simplesmente corte uma das extremidades a junte à outra, obtendo o diâmetro necessário, veja na figura G1.

Material
Aço inox Acabamento Comum
Tipo 302 ASTM A313 ou AMS 5688 tipo mola.
Certificado de analise química, disponível a custo extra.

Tolerancias
Corpo (Diam.Externo) + - 0.13
Carga a 4,75mm extensão + - 10%¨

Extremidades
As molas são fornecidas desmontadas com as travas nas extremidades.

LEGENDA
Do = Diâmetro externo
d = Diâmetro do arame
D_1 = Diâmetro interno quando montado
L_1 = Comprimento ativo aproximado
L_2 = Comprimento em Carga
F_1 = Carga em L_1
D_2 = Diâmetro interno Maximo (montado)



WurmfedernWurmfedernWurmfedernWurmfedernWu
MolleGarterMolleGarterMolleGarterMolleGarterMoll
MolasAutotravantesGarterMolasAutotravantesGarter

INTERLOCK GARTER SPRINGS

Part Number	Do (mm)	d (mm)	D_1 (mm)	L_1 (mm)	L_2 (mm)	F_1 (N)	D_2 (mm)
G040-008-0813-S	1.02	0.20	65.53	206.50	209.68	0.70	79.83
G050-009-0170-S	1.27	0.23	13.56	43.33	49.00	1.53	16.29
G050-009-0249-S	1.27	0.23	19.94	63.35	72.47	1.32	25.56
G050-010-0370-S	1.27	0.25	29.72	94.16	101.50	1.53	35.97
G050-010-0695-S	1.27	0.25	56.01	176.76	184.73	1.81	65.03
G050-011-0492-S	1.27	0.28	39.55	125.12	133.02	1.88	46.25
G062-008-0078-S	1.57	0.20	6.12	19.86	26.16	0.70	8.26
G062-010-0168-S	1.57	0.25	13.36	42.77	50.27	1.53	17.63
G062-010-0350-S	1.57	0.25	28.04	88.90	93.65	0.91	37.30
G062-010-0700-S	1.57	0.25	56.34	177.80	182.55	0.80	76.06
G062-010-1400-S	1.57	0.25	112.93	355.60	360.35	0.75	152.45
G062-011-0249-S	1.57	0.28	19.91	63.35	74.04	1.33	26.88
G062-011-0350-S	1.57	0.28	28.02	88.90	93.65	1.20	36.70
G062-011-0366-S	1.57	0.28	29.36	93.12	103.96	1.62	38.55
G062-011-0700-S	1.57	0.28	56.31	177.80	182.55	1.01	75.02
G062-011-1400-S	1.57	0.28	112.90	355.60	360.35	0.92	151.60
G062-012-0350-S	1.57	0.30	27.99	88.90	93.65	1.71	34.33
G062-012-0538-S	1.57	0.30	43.26	136.86	146.43	1.95	53.48
G062-012-0694-S	1.57	0.30	55.85	176.43	188.01	2.18	68.04
G062-012-0700-S	1.57	0.30	56.29	177.80	182.55	1.41	70.26
G062-012-1074-S	1.57	0.30	86.59	272.97	291.57	3.34	97.22
G062-012-1400-S	1.57	0.30	112.88	355.60	360.35	1.26	142.18
G062-013-0820-S	1.57	0.33	66.04	208.51	220.40	2.64	77.90
G062-013-0952-S	1.57	0.33	76.71	242.01	255.60	2.92	89.38
G062-015-1281-S	1.57	0.38	103.20	325.40	337.95	4.17	111.45
G078-010-0107-S	1.98	0.25	8.41	27.20	35.92	0.90	11.35
G078-011-0217-S	1.98	0.28	17.30	55.22	65.02	1.25	23.35
G078-012-0350-S	1.98	0.30	27.99	88.90	93.65	2.07	35.44
G078-012-0700-S	1.98	0.30	56.29	177.80	182.55	1.93	72.90
G078-012-1400-S	1.98	0.30	112.88	355.60	360.35	1.87	147.75
G078-013-0324-S	1.98	0.33	25.88	82.35	89.94	1.95	34.51
G078-014-0350-S	1.98	0.36	27.94	88.90	93.65	3.40	32.22
G078-014-0700-S	1.98	0.36	56.24	177.80	182.55	3.09	66.47
G078-014-0869-S	1.98	0.36	69.90	220.73	232.28	2.64	87.52
G078-014-1400-S	1.98	0.36	112.83	355.60	360.35	2.93	134.98
G078-015-0491-S	1.98	0.38	39.37	124.89	136.04	3.34	48.19
G078-015-0700-S	1.98	0.38	56.24	177.88	189.43	3.61	67.15
G078-015-1390-S	1.98	0.38	112.06	353.26	367.54	3.34	134.47
G080-016-1413-S	2.03	0.41	113.89	359.08	372.97	3.89	134.27
G080-016-1663-S	2.03	0.41	134.09	422.53	438.28	3.89	158.16
G094-014-0350-S	2.39	0.36	27.94	88.90	93.65	2.26	37.71
G094-014-0700-S	2.39	0.36	56.24	177.80	182.55	2.10	75.92
G094-014-1400-S	2.39	0.36	112.83	355.60	360.35	2.03	152.32
G094-016-0350-S	2.39	0.41	27.89	88.90	93.65	2.96	35.29
G094-016-0700-S	2.39	0.41	56.18	177.80	182.55	2.62	73.05
G094-016-1400-S	2.39	0.41	112.78	355.60	360.35	2.45	148.48
G094-017-1279-S	2.39	0.43	103.02	325.02	340.82	3.61	129.62
G094-017-1443-S	2.39	0.43	116.31	366.75	384.71	4.03	143.87
G094-018-1589-S	2.39	0.46	128.07	403.76	420.52	4.31	155.76
G094-018-2065-S	2.39	0.46	166.50	524.51	541.25	5.35	194.16
G109-016-0350-S	2.77	0.41	27.89	88.90	93.65	2.44	37.65
G109-016-0700-S	2.77	0.41	56.18	177.80	182.55	2.24	75.85
G109-016-1400-S	2.77	0.41	112.78	355.60	360.35	2.14	152.25
G109-018-0350-S	2.77	0.46	27.84	88.90	93.65	3.14	36.44
G109-018-0700-S	2.77	0.46	56.13	177.80	182.55	2.75	75.74
G109-018-1400-S	2.77	0.46	112.73	355.60	360.35	2.57	152.18
G125-020-0700-S	3.18	0.51	55.98	177.80	182.55	5.05	70.32
G125-020-1400-S	3.18	0.51	112.57	355.60	360.35	4.47	146.71
G125-020-1587-S	3.18	0.51	127.81	403.12	422.12	4.31	172.43
G125-020-1959-S	3.18	0.51	157.94	497.76	512.37	3.41	213.22
G125-020-2600-S	3.18	0.51	209.60	660.40	665.15	4.20	277.62
G125-024-2167-S	3.18	0.61	174.63	550.55	565.05	7.58	208.09
G188-024-0700-S	4.76	0.61	55.98	177.80	182.55	3.50	75.58
G188-024-1400-S	4.76	0.61	112.57	355.60	360.35	3.36	151.97
G188-024-2600-S	4.76	0.61	209.60	660.40	665.15	3.30	282.96
G250-024-0700-S	6.35	0.61	55.98	177.80	182.55	3.16	75.58
G250-024-1400-S	6.35	0.61	112.57	355.60	360.35	3.11	151.97
G250-024-2600-S	6.35	0.61	209.60	660.40	665.15	3.08	282.96

UK

BELLEVILLE SPRING WASHERS

Belleville spring washers are especially suited for applications requiring high loads in small spaces. By combining them in varying sequences, each size gives numerous load-carrying possibilities. These washers have had all set removed during the manufacturing process.

MATERIAL
Spring steel
Commercial 1074 - certified to ASTM A684

Stainless steel (parts with suffix 'S')
Thickness (t) up to and including 1.83mm
Commercial - Type 302
Government AMS 5906 type 302

Thickness (t) over 1.83mm
Commercial - Type 17-7PH certified to AMS 5528

LOAD & DEFLECTION
Typical load-deflection curves for three characteristics proportions of washers listed are shown Figure 1 below From them, loads at intermediate heights may be estimated. The nominal amount of dish or cone (h) is found by subtracting 't' from 'Lo'.

These typical curves are shown with dotted lines beyond 75% of deflection to indicate that load characteristics in this area are not reliable because of partial bottoming of the washers. Load at 75% deflection is approximately 87% of the load at flat position

KEY TO MEASUREMENTS
Do = Outside diameter (max)
Di = Inside diameter (min)
t = Thickness
Lo = Approximate Free Height
L_1 = Loaded Height
P_1 = Load at deflection F (min/max)
F = Deflection Lo-L_1
Dh = Free fit in hole diameter
Dr = Free fit over rod diameter
Pf = Load at flat position

F

RONDELLES BELLEVILLE

Les rondelles Belleville sont particulièrement adaptées à des charges élevées dans des espaces réduits. En les combinant en séquence variée, chaque modèle offre de nombreuses possibilités de capacité de charge. Toute éventuelle perte de hauteur après mise à plat a été supprimée durant la fabrication.

MATÉRIAUX
Acier à ressort
Commercial - 1074 - Certifié suivant ASTM-A684

Acier inoxydable (avec le suffixe « S ») :
Epaisseur (t) jusqu'à 1,83mm inclus:
Commercial - Type 302
Gouvernement - MIL-S-5059 Type 302

Epaisseur (t) supérieure à 1,83mm
Commercial - Type 17-7 PH certifié suivant AMS 5528

CHARGES ET DEFLECTIONS
Des courbes de charge-déflection types pour trois types caractéristiques de rondelles sont indiquées dans la figure 1. A partir de celles-ci, les charges à des hauteurs intermédiaires peuvent être estimées. La quantité nominale de concavité est obtenue en soustrayant "t" de "Lo".

Ces courbes type sont en pointillés au delà de 75% de déflection pour indiquer que les charges indiquées dans cette zone ne sont pas fiable car les rondelles sont partiellement à plat.

ABBREVIATIONS UTILISEES
Do = Diamètre Extérieur (max)
Di = Diamètre Intérieur (min)
t = Epaisseur
Lo = Hauteur libre approx
L_1 = Hauteur en charge
P_1 = Charge à déflection F (min/max)
F = Déflection Lo-L_1
Dh = Jeu du diamètre de logement
Dr = Jeu du diamètre de l'axe
Pf = Charge à plata

E

ARANDELAS ELASTICAS BELLEVILLE

Las arandelas elásticas Belleville son especialmente adecuadas para cargas altas en espacios pequeños. Mediante su combinación en secuencias variables, cada tamaño ofrece numerosas posibilidades para soportar cargas. La flecha de estas arandelas ha sido eliminada durante la fabricación.

MATERIAL
Acero para resortes
Comercial 1074 - Certificado según ASTM-A684

Acero inoxidable (referencia con sufijo "S")
Espesores (t) hasta e incluyendo 1,83 mm
Comercial - Tipo 302
Government AMS 5906 type 302

Espesores (t) superiores a 1,83 mm
Comercial - Tipo 17-7 PH certificado según AMS 5528

CARGAS Y DEFLEXIONES
Las curvas de deflexión de carga típicas para tres tamaños usuales de arandelas se indican en Fig. 1. A partir de las mismas, se pueden estimar cargas a alturas intermedias. La cantidad nominal de concavidad o conicidad (h) se halla restando "t" de "Lo".

Las curvas típicas mostradas a partir del 75% de la deflexión son discontínuas para indicar que las cargas en esta área no son fiables debido a la apertura de las arandelas.

CLAVES DE DIMENSIONES
Do = Diámetro externo (max)
Di = Diámetro interno (min)
t = Espesor
Lo = Altura libre
L_1 = Altura cargada
P_1 = Carga a deflexión F (min/max)
F = Deflexión Lo-L_1
Dh = Juego en el diámetro de la cavidad
Dr = Juego sobre el diámetro del vástago
Pf = Carga en posición plana

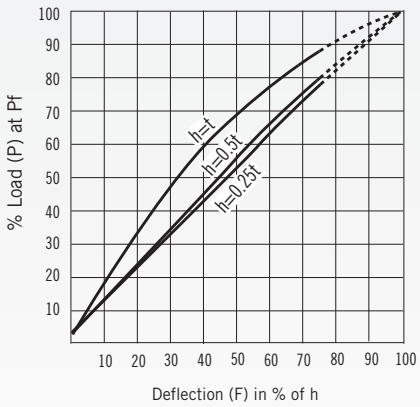
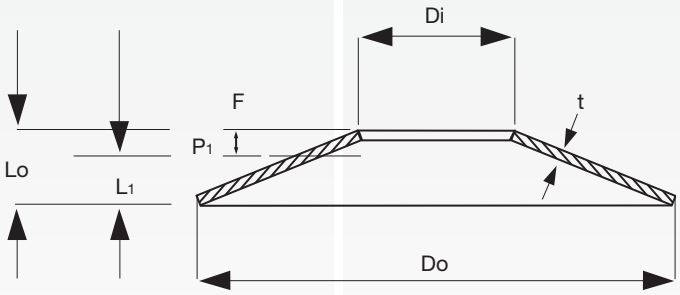


Fig. 1



D

TELLERFEDERN TYPE BELLEVILLE

Tellerfedern der Ausführung Belleville sind anwendbar bei hohen Kräften bei wenig Platzbedarf. Je nach Schichtung ergibt jede Abmessung unterschiedliche Kräftereihen. Alle Tellerfedern wurden bei der Herstellung gesetzt.

WERKSTOFFE
Federstahl
Commercial 1074 - testiert nach ASTM A684.

Rostfreierstahl (Bestellnummer mit "S" Nachbuchstabe) bis Materialstärken (t) einschließlich 1,83 mm.
Commercial - Type 302
Government AMS 5906 Type-302.

Materialstärken (t) über 1,83 mm.
Commercial - Type 17-7PH testiert nach AMS 5528.

KRAFT UND EINFEDERUNG
Typische Kraft/Einfederungskurven sind in Fig. 1 dargestellt. Mit Hilfe dieser Kurven können Kräfte bei unterschiedlichen Einfederungen bestimmt werden. Der Nominelle Wert h wird durch Subtraktion t von Lo ermittelt.

Diese Kraft/Einfederungskurven bei 75% der Einfederung sind mit Strichlinien gezeichnet um dass die Kraft, wegen der Eröffnung der Tellerfedern, in diesem Bereich nicht zuverlässig ist anzugeben.

KENNZEICHNEN DER ABMESSUNGEN
Do = Äußerer Durchmesser (max.)
Di = Innerer Durchmesser (min.)
t = Materialdicke
Lo = Länge der unbelasteten Tellerfeder
L_1 = Länge der belasteten Tellerfeder
P_1 = Federkraft bei Federlänge F (min/max)
F = Federweg Lo-L_1
Dh = Spielpassung in Hülsendurchmesser
Dr = Spielpassung über Dorndurchmesser
Pf = Kraft bei flacher Position

I

RONDELLE "BELLEVILLE"

Le rondelle "Belleville" sono appositamente concepite per sopportare carichi forti in piccoli spazi. Con la possibilità di combinazione delle rondelle in sequenza, ogni dimensione offre infinite capacità di carico. Nelle Rondelle SPEC la deformazione iniziale successiva alla fabbricazione è stata eliminata.

MATERIALE
Acciaio per molle Commerciale-1074- certificato per ASTM-A684

Acciaio inossidabile
Spessore fino a 1.83 mm compresi
Commerciale - Tipo 302
- MIL - S 5059 Tipo 302

Spessore oltre 1.83 mm
Commerciale - Tipo 17 - 7PH certificato per AMS 5528

CARICHI E DEFLESSIONI
Le curve tipiche di deflessione per tre esempi caratteristici sono riportate in Fig. 2. Da esse possono essere calcolati i carichi ad altezze intermedie. La quota nominale di cono (h) si ottiene sottraendo "t" da Lo.

Queste curve sono tratteggiate oltre il 75% della deflessione per indicare che le caratteristiche di carico non sono affidabili in quanto le rondelle sono quasi in posizione piatta.

LEGENDA
Do = Diametro esterno (max)
Di = Diametro interno (min)
t = Spessore
Lo = Altezza libera
L_1 = Altezza in carico
P_1 = Carico in deflessione F (min/max)
F = Deflessione Lo-L_1
Dh = Diametro sede
Dr = Diametro perno
Pf = Carico in posizione piatta

P

ANILHAS DE MOLA BELLEVILLE

As anilhas de mola Belleville são especialmente adequadas a cargas elevadas em espaços reduzidos. Dada a respectiva combinação em sequências variáveis, cada um dos tamanhos permite diversas possibilidades de suporte de cargas. A flecha destas anilhas foi eliminada durante o fabrico.

MATERIAL
Aço para molas comercial – 1074 – com certificação conforme à especificação ASTM – A684

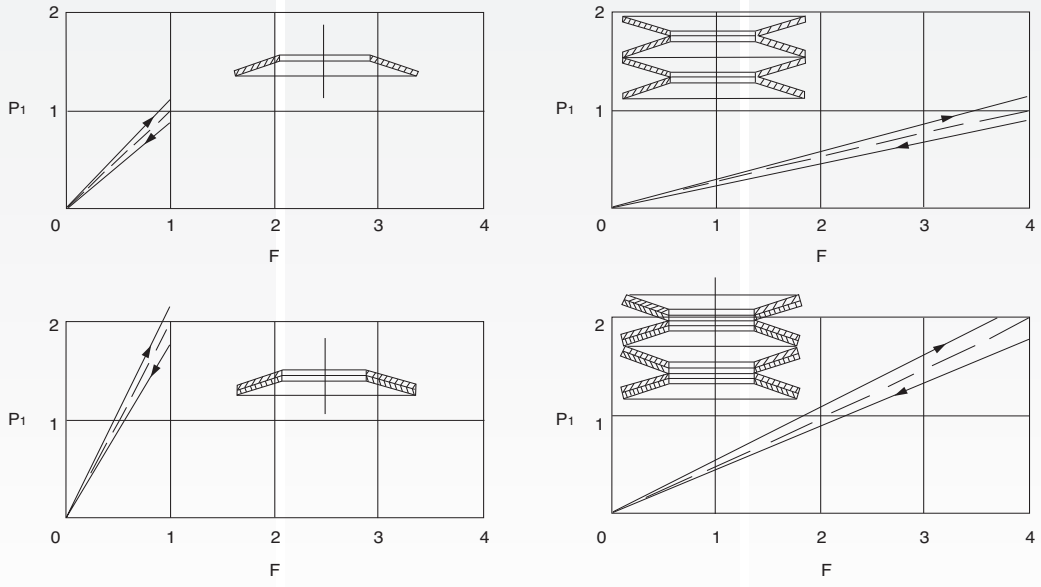
Aço inoxidável (peças com sufixo S),
Espessuras (t) até e incluindo 1,83 mm
Comercial – Tipo 302
Governo – MAS 5906 Tipo 302

Espessuras superiores a 1,83 mm
Comercial – Tipo 17-7PH com certificação conforme à especificação AMS 5528

CARGA E DEFLEXÃO
As curvas de deflexão de carga típicas para os três tamanhos mais comuns de anilhas, constam da Fig. 1 abaixo,(incluso graficos do catalogo). A partir destas, é possível estimar cargas a alturas intermédias. O valor nominal de concavidade ou conicidade (h) determina-se subtraindo "t" a 'Lo'.

Essas curvas são tipicamente marcadas por pontuação abaixo de 75% de deflexação para indicar as caracteristicas de carga nao pertinente devido a deflexão partial das mesmas

LEGENDA
Do = Diam Externo
Di = Diam Interno (max)
t = Esoessura
Lo = Altura livre
L_1 = Carga em L_1
P_1 = Deflexão em carga F (min/max)
F = Deflexão Lo-L_1
Dh = Espaço livre no furo
Dr = Espeço lovre no eixo
Pf = Carga na posição totalmente comprimida



STOCK BELLEVILLE SPRING WASHERS

Part Number	Dr (mm)	Di (mm)	Do (mm)	Dh (mm)	t (mm)	Lo (mm)	L_1 (mm)	P_1 (N)	Pf (N)
B0187-007					0.17	0.33	0.25	25.4-34.7	44
B0187-007-S	2.36	2.36	4.75	4.76	0.17	0.33	0.25	25.4-34.7	44
B0187-010					0.25	0.38	0.32	57.8-78.3	124
B0187-010-S					0.25	0.38	0.32	57.8-78.3	124
B0250-009					0.22	0.44	0.33	44-60.1	75
B0250-009-S					0.22	0.44	0.33	44-60.1	75
B0250-013	3.18	3.18	6.35	6.35	0.34	0.51	0.43	97.9-133.5	214
B0250-013-S					0.34	0.51	0.43	97.9-133.5	214
B0375-019			9.53	9.53	0.47	0.71	0.58	156.7-211.8	325
B0281-010					0.25	0.51	0.38	56.8-76.8	102
B0281-013					0.33	0.53	0.43	92.5-125.4	191
B0281-015	3.51	3.51	7.14	7.14	0.38	0.58	0.48	124.3-173.2	276
B0281-015-S					0.38	0.58	0.48	126.8-171.2	276
B0437-022			11.10	11.13	0.56	0.81	0.69	208.2-281.6	440
B0312-011					0.27	0.55	0.41	70.3-95.2	120
B0312-011-S	3.97	3.96	7.92	7.95	0.27	0.55	0.41	70.3-95.2	120
B0312-017					0.42	0.64	0.53	155.7-214	334
B0312-017-S					0.42	0.64	0.53	155.7-214	334
B0343-013					0.33	0.61	0.46	94.6-127.9	169
B0343-016					0.41	0.66	0.53	136.1-184.1	289
B0343-019	4.17	4.17	8.71	8.74	0.47	0.71	0.58	191.3-302.5	414
B0343-019-S					0.47	0.71	0.58	191.3-302.5	414
B0499-025			12.70	12.70	0.64	0.94	0.79	274-371	583
B0375-015					0.38	0.69	0.53	129-177.9	245
B0375-015-S					0.38	0.69	0.53	129-177.9	245
B0375-018					0.44	0.71	0.58	173-236	360
B0375-020	4.78	4.83	9.53	9.53	0.51	0.76	0.64	227-307	489
B0375-020-S					0.51	0.76	0.64	227-307	489
B0375-030					0.76	0.91	0.84	471.5-640.6	1036
B0562-019			14.27	14.30	0.48	0.94	0.71	169-231	298
B0562-028					0.71	1.07	0.89	329-445	725
B0437-016					0.41	0.79	0.58	151.2-205	267
B0437-016-S					0.41	0.79	0.58	151.2-205	267
B0437-020	5.49	5.59	11.10	11.13	0.51	0.81	0.66	213-393	436
B0437-023					0.58	0.86	0.74	289-396	618
B0687-034			17.45	17.48	0.86	1.27	1.07	471-641	1019
B0500-018					0.46	0.86	0.66	169-231	311
B0500-018-S					0.46	0.86	0.66	169-231	311
B0500-022					0.55	0.91	0.74	245-343	512
B0500-022-S			12.70	12.70	0.55	0.91	0.74	245-343	512
B0500-025					0.64	0.97	0.79	356-489	712
B0500-025-S	6.35	6.48			0.64	0.97	0.79	356-489	712
B0500-038					0.97	1.19	1.09	716-974	1779
B0500-038-S					0.97	1.19	1.09	716-974	1779
B0637-032			16.18	16.28	0.81	1.22	1.02	444-605	988
B0750-025					0.64	1.24	0.94	289-395	507
B0750-036			19.05	19.05	0.91	1.37	1.14	555-750	1161
B0750-052					1.32	1.65	1.47	1174-1592	2491
B0625-022					0.56	1.07	0.81	262-360	467
B0625-022-S					0.56	1.07	0.81	262-360	467
B0625-032			15.88	15.88	0.81	1.22	1.02	547-743	1157
B0625-032-S	7.94	8.05			0.81	1.22	1.02	547-743	1157
B0625-047					1.19	1.50	1.35	1134-1535	2669
B0625-047-S					1.19	1.50	1.35	1134-1535	2669
B0937-030					0.76	1.52	1.14	415.9-564.9	707
B0937-045			23.80	23.83	1.14	1.70	1.42	823-1117	1757
B0937-045-S					1.14	1.70	1.42	823-1117	1757
B0750-028					0.71	1.30	0.99	414-565	778
B0750-028-S					0.71	1.30	0.99	414-565	778
B0750-034					0.86	1.40	1.12	627-850	1254
B0750-034-S			19.05	19.05	0.86	1.40	1.12	627-850	1254
B0750-040					1.02	1.50	1.24	885-1205	1846
B0750-040-S	9.53	9.65			1.02	1.50	1.24	885-1205	1846
B0750-056					1.42	1.78	1.60	1624-2202	3759
B0750-056-S					1.42	1.78	1.60	1624-2202	3759
B0950-047			24.13	24.21	1.19	1.78	1.47	986-1334	2060
B1125-053					1.35	2.03	1.68	1128-1530	2380
B1125-053-S			28.58	28.58	1.35	2.03	1.68	1128-1530	2380
B1125-078					1.98	2.46	2.24	2251-3056	5494
B0875-031	11.11	11.23	22.23	22.23	0.79	1.50	1.14	507-694	912
B0875-031-S					0.79	1.50	1.14	507-694	912
B0875-045	11.11	11.23	22.23	22.23	1.14	1.70	1.42	1018-1383	2202
B0875-045-S					1.14	1.70	1.42	1018-1383	2202

STOCK BELLEVILLE SPRING WASHERS

Part Number	Dr (mm)	Di (mm)	Do (mm)	Dh (mm)	t (mm)	Lo (mm)	L_1 (mm)	P_1 (N)	Pf (N)
B1000-035					0.89	1.70	1.30	658-899	1157
B1000-035-S					0.89	1.70	1.30	658-899	1157
B1000-043					1.09	1.80	1.45	943-1281	1917
B1000-043-S			25.40	25.40	1.09	1.80	1.45	943-1281	1917
B1000-050					1.27	1.91	1.57	1286-1739	2669
B1000-050-S	12.70	12.83			1.27	1.91	1.57	1286-1739	2669
B1000-073					1.85	2.31	2.08	2549-3456	5938
B1000-073-S					1.85	2.31	2.08	2549-3456	5938
B1262-060			32.05	32.16	1.52	2.31	1.91	1548-2091	3252
B1500-047					1.19	2.36	1.78	947-1285	1628
B1500-070			38.10	38.10	1.78	2.64	2.21	1868-2535	3986
B1500-070-S					1.78	2.64	2.21	1868-2535	3986
B1500-102					2.59	3.25	2.92	3928-5316	9163
B1125-038					0.97	1.85	1.40	733-1001	1268
B1125-038-S	14.29	14.40	28.58	28.58	0.97	1.85	1.40	733-1001	1268
B1125-056					1.42	2.13	1.78	1530-2073	3269
B1125-056-S					1.42	2.13	1.78	1530-2073	3269
B1250-040					1.02	2.08	1.55	867-1179	1468
B1250-040-S					1.02	2.08	1.55	867-1179	1468
B1250-051					1.30	2.21	1.75	1361-1664	2589
B1250-062			31.75	31.75	1.57	2.34	1.96	1793-2433	3870
B1250-062-S					1.57	2.34	1.96	1793-2433	3870
B1250-089	15.88	16.00			2.26	2.82	2.54	3705-5013	8514
B1250-089-S					2.26	2.82	2.54	3705-5013	8514
B1875-057					1.45	2.92	2.16	1481-1810	2322
B1875-086			47.63	47.63	2.18	3.28	2.72	2758-3737	5867
B1875-086-S					2.18	3.28	2.72	2758-3737	5867
B1875-127					3.23	4.01	3.61	5223-8420	13812
B1375-044					1.12	2.24	1.65	1001-1357	1668
B1375-044-S	17.46	17.58	34.93	34.93	1.12	2.24	1.65	1001-1357	1668
B1375-067					1.70	2.57	2.13	2260-2767	4559
B1500-045					1.14	2.36	1.75	1072-1450	1779
B1500-045-S					1.14	2.36	1.75	1072-1450	1779
B1500-060					1.52	2.59	2.06	1721-2326	3443
B1500-062-S					1.57	2.72	2.06	1618-2428	3443
B1500-072			38.10	38.10	1.83	2.72	2.26	2513-3403	5249
B1500-072-S	19.05	19.18			1.83	2.72	2.26	2513-3403	5249
B1500-107					2.72	3.40	3.07	5293-7162	12602
B1500-107-S					2.72	3.40	3.07	5293-7162	12602
B2250-068					1.73	3.48	2.62	2059-2460	3256
B2250-102			57.15	57.15	2.59	3.89	3.23	4048-4951	8105
B2250-150					3.81	4.78	4.29	8242-11161	19105
B1750-057					1.45	2.90	2.16	1699-2304	2891
B1750-057-S	22.23	22.23	44.45	44.45	1.45	2.90	2.16	1699-2304	2891
B1750-085					2.16	3.25	2.69	3180-4915	7251
B1750-085-S					2.16	3.25	2.69	2668-5427	7251
B2000-065					1.65	3.30	2.49	2233-3020	3825
B2000-065-S					1.65	3.30	2.49	2233-3020	3825
B2000-084					2.13	3.45	2.79	3322-4372	6619
B2000-097	25.40	25.40	50.80	50.80	2.46	3.68	3.07	4457-6041	9519
B2000-097-S					2.46	3.68	3.07	4457-6041	9519
B2000-142					3.61	4.50	4.06	9110-12330	21458
B3000-090			76.20	76.20	2.29	4.57	3.43	3234-4372	5534
B3000-135					3.43	5.13	4.27	6886-8420	13870
B2250-073					1.85	3.76	2.87	2762-3736	4893
B2250-111	28.58	28.58	57.15	57.15	2.82	4.19	3.53	5520-7468	12366
B2250-159					4.04	5.03	4.55	11343-15390	26569
B2500-080					2.03	4.06	3.05	3287-4448	5605
B2500-080-S					2.03	4.06	3.05	3287-4448	5605
B2500-120	31.75	31.75	63.50	63.50	3.05	4.57	3.81	6655-9003	14234
B2500-120-S					3.05	4.57	3.81	6655-9003	14234
B2500-175					4.45	5.56	5.00	13722-18571	31800
B3750-168			95.25	95.25	4.27	6.38	5.31	10444-12766	21147
B2750-087	34.93	34.93	69.85	69.85	2.21	4.39	3.35	3630-4911	6405
B2750-132					3.35	4.98	4.19	7375-9977	14279
B3000-093	38.10	38.10	76.20	76.20	2.36	4.80	3.63	4199-5681	7251
B3000-143					3.63	5.41	4.57	9127-11156	19483
B4000-125	50.80	50.80	101.60	101.60	3.18	6.35	4.75	7602-10284	12944
B4000-187					4.75	7.11	5.92	15163-20514	32383

UK

DISC SPRING WASHERS

Manufactured under strict quality control to conform DIN2093, disc springs in the SPEC range are for arduous applications which require high resistance to fatigue. These washers have had the set removed during the manufacturing process.

In addition to the standard sizes held in stock, intermediate sizes and larger sizes are available on request.

NB Items * are available in Stainless steel and other materials on request.

MATERIAL
Thickness less than 1.25mm: Carbon steel per C1074-1075 – CK67, Phosphate + oil finish.
Thickness 1.25mm and up: Chrome Vanadium per SAE 6150 – 50CrV4, Phosphate + oil finish.

TOLERANCES
DIAMETER: Di and Do shown are minimum and maximum dimensions, respectively.

LOAD: Values shown are for reference only. Loads shown are theoretical and approximate.

KEY TO MEASUREMENTS
Do = Outside Diameter (max)
Di = Inside Diameter (min)
t = Thickness
Lo = Free Height (ref only)
L_1 = Loaded height
P_1 = Load at deflection (N) (+/- 15%)
F = Deflection Lo-L_1

F

RESSORTS DISQUE

Fabriqués sous contrôles de qualité sévère pour assurer la conformité à la DIN2093, les ressorts disque SPEC sont prévus pour des applications extrêmes qui requièrent une haute résistance à la fatigue. Toute éventuelle perte de hauteur après mise à plat a été supprimée durant la fabrication.

En plus des dimensions standards du catalogue, d'autres tailles peuvent être obtenues sur demande.

NB Les références marquées * sont disponibles en inox ou autres matériaux sur demande.

MATERIAU
Epaisseurs inférieures à 1.25mm : Acier au carbone type C1074-1075 – CK67, finition phosphatée et huilée.
Epaisseurs 1.25mm et plus : Chrome vanadium SAE 6150 – 50CrV4, finition phosphatée et huilée.

TOLERANCES
DIAMETRES : les diamètres intérieurs et extérieurs indiqués sont respectivement des dimensions minimum et maximum.

CHARGES : Les valeurs indiquées le sont pour référence uniquement. Les charges données sont théoriques et approximatives.

INDEX DES MESURES
Do = Diamètre Extérieur (max)
Di = Diamètre Intérieur (min)
t = Epaisseur
Lo = Hauteur libre (pour réf.)
L_1 = Hauteur en charge
P_1 = Charge à L_1 (N) (+/- 15%)
F = Déflection Lo-L_1

E

MUELLES/RESORTES DE DISCO

Para uso general. Estos muelles/resortes de disco se fabrican bajo los más estrictos controles de calidad para que las dimensiones indicadas en el catálogo coincidan con las reales.

Nuestros muelles/resortes de disco SPEC son la solución óptima para aquellas aplicaciones donde las tolerancias de carga no sean muy estrechas. Además, se les ha sometido a un proceso de liberación de tensiones para evitar la pérdida de altura después de comprimirlos.

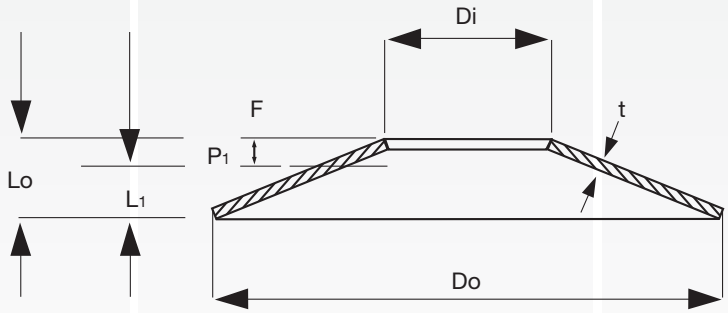
Nota: Las referencias marcadas * están disponibles en acero inoxidable y en otros materiales bajo pedido

MATERIAL
Espesores de material menores de 1,25mm: Acero al carbono C1074-1075 Espesores de material iguales o mayores de 1,25mm: Acero al carbono C1074-1075 ó Cromo Vanadio según SAE 6150.

TOLERANCIAS
DIÁMETRO: Los diámetros internos y externos muestran valores mínimos y máximos, respectivamente.

CARGA: Los valores deben tomarse como referencia exclusivamente. Las cargas son teóricas y aproximadas.

CLAVES DE CARACTERÍSTICAS
Do = Diámetro externo (max)
Di = Diámetro interno (min)
t = Espesor
Lo = Altura libre (referencia solo)
L_1 = Altura cargada
P_1 = Carga a deflexión (N) (+/- 15%)
F = Deflexión Lo-L_1



D

TELLERFEDERN

Sie werden in verschiedenen Anwendungsgebieten eingesetzt. Sie werden unter scharfen Qualitätskontrolle hergestellt um die Massen die in Katalog angegeben werden abzustimmen.

Unsere SPEC Tellerfedern passen am besten in Anwendungsgebieten wo engen Krafttoleranzen nicht erfordert werden. Alle Tellerfedern wurden bei der Herstellung gesetzt.

NB. Artikel * sind in Edelstahl und auf Anfrage in anderen Materialien erhältlich.

WERKSTOFF
Materialdicke bis 1,25mm: Kohlenstoffstahl C1074-1075
Materialdicke =>1,25mm: Kohlenstoffstahl C1074-1075 oder Chromvanadiumstahl SAE 6150.

TOLERANZEN
Durchmesser: Innen und Aussendurchmesser sind minimale und, beziehungsweise, maximale Massangaben.

KRAFT:Angaben sollten nur als Information verwandt werden. Kraften sind wie teoretisch und annähernden Werte zu betrachten.

KENNZEICHNEN DER ABMESSUNGEN
Do = Äußerer Durchmesser (max.)
Di = Innerer Durchmesser (min.)
t = Materialdicke
Lo = Länge der unbelasteten Tellerfeder
L_1 = Länge der belasteten Tellerfeder
P_1 = Federkraft bei Federlänge (N) (+/-15%)
F = Federweg Lo-L_1

I

MOLLE A TAZZA

Fabbricate sotto i più stretti controlli di qualità, le molle a tazza SPEC vengono utilizzate per applicazioni estreme che richiedono alta resistenza alla fatica e dove non è richiesta una elevata tolleranza sul carico della molla. Questi articoli sono stati assestati per minimizzare l'accorciamento dopo il lavoro in compressione.

Oltre alle dimensioni standard a magazzino, sono fornibili dimensioni intermedie su richiesta.

NB Gli articoli * sono fornibili in acciaio inox

MATERIALE
Per spessori minori di 1.25 mm: acciaio al carbonio secondo C1074-1075
Spessore da 1.25 mm in su: Acciaio al carbonio secondo C1074-1075 o Cromo Vanadio secondo SAE 6150

TOLLERANZE
Diametri: diametro interno e diametro esterno sono rispettivamente la minima e la massima dimensione possibile.

Carico: I valori riportati sono solo per riferimento. I carichi indicati sono teorici e approssimativi.

LEGENDA
Do = Diametro esterno (max)
Di = Diametro interno (min)
t = Spessore
Lo = Altezza libera (solo rif)
L_1 = Altezza in carico
P_1 = Carico in deflessione (N) (+/-15%)
F = Deflessione Lo-L_1

P

MOLAS DISCO

Construidas para uso geral. Estes itens são construidos sob um rigido controle de qualidade, para satisfazer as dimensões físicas listadas nas tabelas abaixo. Nossas molas de disco SPEC, são ideais para uso quando uma tolerancia apertada não é requerida. Essas peças teem sido usadas para minimizar perda de carga depois de comprimidas.

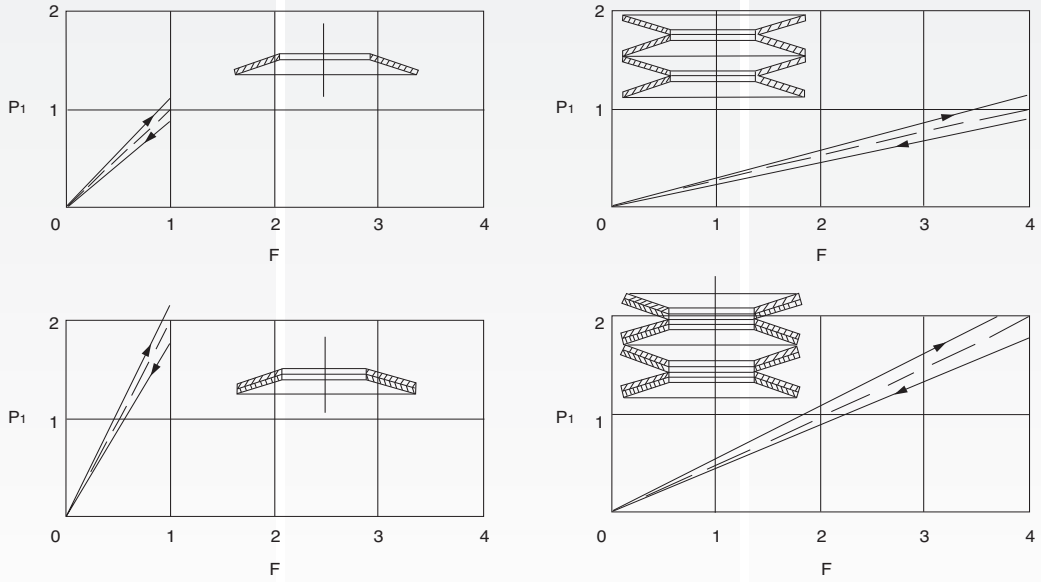
NB * São Disponíveis em Aço Inox ou outro Material Requisitado

MATERIAL
Espessura menor que 1,25mm : Aço Carbono C1074-1075
Espessura maior que 1,25mm : Aço Carbono C1074-1075 ou Cromo vanádio SAE 6150.

TOLERANCIAS
DIAMETROS: Di e Do mostrados são mínimos e máximos, respectivamente.

CARGA: Valores mostradas são referencia somente. Cargas aparentam ser teoricas e aproximadas.

LEGENDA
Do = Diam Externo
Di = Diam Interno (max)
t = Esoessura
Lo = Altura livre (Somente ref)
L_1 = Carga em L_1
P_1 = Deflexão em carga (N) (+/- 15%)
F = Deflexão Lo-L_1



DISC SPRING WASHERS

Part Number	Di (mm)	Do (mm)	t (mm)	Lo (mm)	L_1 (mm)	P_1 (N)
S4201 *	3.2	6	0.30	0.45	0.34	119
S4202	3.2	8	0.20	0.40	0.25	26
S4203 *	3.2	8	0.30	0.55	0.36	104
S4204 *	3.2	8	0.40	0.60	0.45	185
S4205	3.2	8	0.50	0.70	0.55	357
S4206	4.2	8	0.20	0.45	0.26	39
S4207 *	4.2	8	0.30	0.55	0.36	119
S4208 *	4.2	8	0.40	0.60	0.45	210
S4209	3.2	10	0.30	0.65	0.39	98
S4210	3.2	10	0.40	0.70	0.48	179
S4211	3.2	10	0.50	0.75	0.56	278
S4212	4.2	10	0.40	0.70	0.48	189
S4213	4.2	10	0.50	0.75	0.56	294
S4214	4.2	10	0.60	0.85	0.66	502
S4215	5.2	10	0.25	0.55	0.33	58
S4216 *	5.2	10	0.40	0.70	0.48	213
S4217 *	5.2	10	0.50	0.75	0.56	329
S4218	4.2	12	0.40	0.80	0.50	178
S4219	4.2	12	0.50	0.85	0.59	284
S4220	4.2	12	0.60	1.00	0.70	556
S4221	5.2	12	0.50	0.90	0.60	349
S4222 *	5.2	12	0.60	0.95	0.69	506
S4223 *	6.2	12	0.50	0.85	0.59	326
S4224	6.2	12	0.60	0.95	0.69	551
S4225	5.2	12.5	0.50	0.85	0.59	272
S4226	6.2	12.5	0.35	0.80	0.46	152
S4227 *	6.2	12.5	0.50	0.85	0.59	291
S4228 *	6.2	12.5	0.70	1.00	0.78	673
S4229	7.2	14	0.35	0.80	0.46	123
S4230 *	7.2	14	0.50	0.90	0.6	279
S4231 *	7.2	14	0.80	1.10	0.87	813
S4232 *	5.2	15	0.40	0.95	0.54	175
S4233	5.2	15	0.50	1.00	0.63	278
S4234	5.2	15	0.60	1.05	0.71	407
S4235 *	5.2	15	0.70	1.10	0.80	555
S4236 *	6.2	15	0.50	1.00	0.63	289
S4237	6.2	15	0.60	1.05	0.71	423
S4238	6.2	15	0.70	1.10	0.80	577
S4239	8.2	15	0.50	1.00	0.63	333
S4240 *	8.2	15	0.70	1.10	0.80	665
S4241	8.2	15	0.80	1.20	0.90	982
S4242 *	8.2	16	0.40	0.90	0.53	155
S4243 *	8.2	16	0.60	1.05	0.71	412
S4244	8.2	16	0.70	1.15	0.81	637
S4245 *	8.2	16	0.80	1.20	0.90	825
S4246 *	8.2	16	0.90	1.25	0.99	1000
S4247	6.2	18	0.40	1.00	0.55	139
S4248	6.2	18	0.50	1.10	0.65	245
S4249	6.2	18	0.60	1.20	0.75	400
S4250	6.2	18	0.70	1.25	0.84	552
S4251 *	6.2	18	0.80	1.30	0.92	725
S4252	8.2	18	0.50	1.10	0.65	265
S4253	8.2	18	0.70	1.25	0.84	596
S4254	8.2	18	0.80	1.30	0.92	582
S4255	8.2	18	1.00	1.40	1.10	1181
S4256 *	9.2	18	0.45	1.05	0.6	214
S4257 *	9.2	18	0.70	1.20	0.83	572
S4258 *	9.2	18	1.00	1.40	1.1	1250
S4259	8.2	20	0.60	1.30	0.77	412
S4260	8.2	20	0.70	1.35	0.86	568
S4261	8.2	20	0.80	1.40	0.95	751
S4262 *	8.2	20	0.90	1.45	1.04	953
S4263	8.2	20	1.00	1.55	1.14	1294
S4264 *	10.2	20	0.50	1.15	0.66	254
S4265 *	10.2	20	0.80	1.35	0.94	745
S4266 *	10.2	20	0.90	1.45	1.04	1049
S4267	10.2	20	1.00	1.55	1.14	1424
S4268 *	10.2	20	1.10	1.55	1.21	1530
S4269 *	10.2	20	1.25	1.75	1.38	2475
S4270 *	10.2	20	1.50	1.80	1.58	2520
S4271 *	11.2	23	0.60	1.40	0.8	426

DISC SPRING WASHERS

Part Number	Di (mm)	Do (mm)	t (mm)	Lo (mm)	L_1 (mm)	P_1 (N)
S4272 *	11.2	23	0.80	1.45	0.96	710
S4273 *	11.2	23	1.25	1.75	1.38	1950
S4274 *	8.2	23	0.70	1.50	0.90	543
S4275 *	8.2	23	0.80	1.55	0.99	718
S4276	8.2	23	0.90	1.60	1.07	918
S4277	8.2	23	1.00	1.70	1.17	1239
S4278	10.2	23	0.90	1.65	1.09	1057
S4279 *	10.2	23	1.00	1.70	1.17	1315
S4280 *	10.2	23	1.25	1.90	1.41	2038
S4281	12.2	23	1.25	1.85	1.40	2330
S4282 *	12.2	23	1.50	2.00	1.63	3295
S4283	10.2	25	1.00	1.75	1.19	1171
S4284 *	12.2	25	0.70	1.60	0.92	601
S4285 *	12.2	25	0.90	1.60	1.07	868
S4286	12.2	25	1.00	1.80	1.20	1358
S4287 *	12.2	25	1.25	1.95	1.42	2213
S4288 *	12.2	25	1.50	2.05	1.64	2910
S4289	10.2	28	0.80	1.75	1.04	661
S4290	10.2	28	1.00	1.90	1.23	1129
S4291 *	10.2	28	1.25	2.05	1.45	1852
S4292	10.2	28	1.50	2.25	1.67	2721
S4293 *	12.2	28	1.00	1.95	1.24	1267
S4294	12.2	28	1.25	2.10	1.46	2081
S4295 *	12.2	28	1.50	2.25	1.69	3075
S4296 *	14.2	28	0.80	1.80	1.05	801
S4297 *	14.2	28	1.00	1.80	1.2	1102
S4298 *	14.2	28	1.25	2.10	1.46	2238
S4299 *	14.2	28	1.50	2.15	1.66	2850
S4300	12.2	31.5	1.50	2.35	1.71	2686
S4301 *	16.3	31.5	0.80	1.85	1.06	687
S4302 *	16.3	31.5	1.25	2.15	1.48	1912
S4303 *	16.3	31.5	1.50	2.40	1.73	3228
S4304 *	16.3	31.5	1.75	2.45	1.92	3900
S4305 *	16.3	31.5	2.00	2.75	2.19	6170
S4306	12.2	34	1.00	2.25	1.31	1172
S4307	12.2	34	1.25	2.35	1.53	1814
S4308	12.2	34	1.50	2.50	1.75	2719
S4309 *	14.3	34	1.25	2.40	1.54	1988
S4310 *	14.3	34	1.50	2.55	1.76	2982
S4311 *	16.3	34	1.50	2.55	1.76	3153
S4312 *	16.3	34	2.00	2.85	2.21	5779
S4313 *	18.3	35.5	0.90	2.05	1.19	831
S4314 *	18.3	35.5	1.25	2.25	1.5	1700
S4315 *	18.3	35.5	2.00	2.80	2.2	5190
S4316	14.2	40	1.25	2.65	1.60	1779
S4317 *	14.2	40	1.50	2.75	1.81	2544
S4318 *	14.2	40	2.00	3.05	2.26	4766
S4319	16.3	40	1.50	2.80	1.83	2748
S4320 *	16.3	40	2.00	3.10	2.28	5166
S4321	18.3	40	2.00	3.15	2.29	5653
S4322 *	20.4	40	1.00	2.30	1.33	1016
S4323 *	20.4	40	1.50	2.65	1.79	2620
S4324 *	20.4	40	2.00	3.10	2.28	5698
S4325 *	20.4	40	2.25	3.15	2.48	6497
S4326 *	20.4	40	2.50	3.45	2.74	9384
S4327	22.4	45	1.25	2.85	1.65	1890
S4328 *	22.4	45	1.75	3.05	2.08	3644
S4329 *	22.4	45	2.50	3.50	2.75	7720
S4330 *	18.3	50	1.50	3.30	1.95	2602
S4331	18.3	50	2.00	3.50	2.38	4564
S4332	18.3	50	2.50	4.10	2.90	9300
S4333	18.3	50	3.00	4.40	3.35	13666
S4334	20.4	50	2.00	3.50	2.38	4685
S4335 *	20.4	50	2.50	3.85	2.84	7915
S4336	22.4	50	2.00	3.60	2.40	5219
S4337 *	22.4	50	2.50	3.90	2.85	8505
S4338	25.4	50	1.25	2.85	1.65	1550
S4339 *	25.4	50	2.00	3.40	2.35	4760
S4340 *	25.4	50	2.50	3.90	2.85	9058
S4341 *	25.4	50	3.00	4.10	3.28	11970
S4342	28.5	56	1.50	3.45	1.99	2620

DISC SPRING WASHERS

Part Number	Di (mm)	Do (mm)	t (mm)	Lo (mm)	L_1 (mm)	P_1 (N)
S4343 *	28.5	56	2.00	3.60	2.4	4440
S4344 *	28.5	56	3.00	4.30	3.33	11382
S4345	20.5	60	2.00	4.10	2.52	4724
S4346	20.5	60	2.50	4.30	2.95	7293
S4347	20.5	60	3.00	4.70	3.42	11563
S4348 *	25.5	60	2.50	4.65	2.97	8159
S4349 *	25.5	60	3.00	4.65	3.41	11762
S4350	30.5	60	2.50	4.30	2.95	8337
S4351	30.5	60	3.00	4.70	3.42	13219
S4352 *	30.5	60	3.50	5.00	3.88	18143
S4353	31.0	63	1.80	4.15	2.39	4240
S4354 *	31.0	63	2.50	4.25	2.94	7180
S4355	31.0	63	3.00	4.80	3.45	12530
S4356	31.0	63	3.50	4.90	3.85	15000
S4357 *	25.5	70	2.00	4.50	2.63	4435
S4358	30.5	70	2.50	4.90	3.10	8026
S4359	30.5	70	3.00	5.10	3.52	11420
S4360	35.5	70	3.00	5.10	3.52	12281
S4361 *	35.5	70	4.00	5.80	4.45	23910
S4362 *	40.5	70	4.00	5.60	4.40	23338
S4363 *	40.5	70	5.00	6.20	5.30	33653
S4364 *	36.0	71	2.00	4.60	2.65	5140
S4365 *	36.0	71	2.50	4.50	3	6730
S4366 *	36.0	71	4.00	5.60	4.4	20500
S4367	31.0	80	2.50	5.30	3.20	7235
S4368	31.0	80	3.00	5.50	3.63	10346
S4369	31.0	80	4.00	6.10	4.52	19384
S4370	36.0	80	3.00	5.70	3.67	11912
S4371 *	36.0	80	4.00	6.20	4.55	21388
S4372 *	41.0	80	2.25	5.20	2.99	6610
S4373 *	41.0	80	3.00	5.30	3.58	10500
S4374	41.0	80	4.00	6.20	4.55	22861
S4375	41.0	80	5.00	6.70	5.42	33700
S4376 *	46.0	90	2.50	5.70	3.3	7680
S4377	46.0	90	3.50	6.00	4.13	14200
S4378	46.0	90	5.00	7.00	5.5	31400
S4379	41.0	100	4.00	7.20	4.80	20240
S4380	41.0	100	5.00	7.75	5.69	32344
S4381	51.0	100	2.70	6.20	3.58	8610
S4382	51.0	100	3.50	6.30	4.2	13100
S4383	51.0	100	4.00	7.00	4.75	20662
S4384	51.0	100	5.00	7.80	5.70	36319
S4385	51.0	100	6.00	8.20	6.55	48000
S4386 *	57.0	112	3.00	6.90	3.97	10483
S4387	57.0	112	4.00	7.20	4.87	17743
S4388	57.0	112	6.00	8.50	6.63	43683
S4389	41.0	125	4.00	8.20	5.05	17336
S4390	51.0	125	4.00	8.50	5.13	19806
S4391	51.0	125	5.00	8.90	5.97	30652
S4392	51.0	125	6.00	9.40	6.85	44283
S4393	61.0	125	5.00	9.00	6.00	33947
S4394	61.0	125	6.00	9.60	6.90	50694
S4395	61.0	125	7.50	10.90	8.72	93526
S4396	64.0	125	3.50	8.00	4.63	15407
S4397	64.0	125	5.00	8.50	5.88	29892
S4398	64.0	125	7.50	10.60	8.65	85879
S4399	71.0	125	6.00	9.30	6.88	51189
S4400	71.0	125	7.50	10.40	8.60	85447
S4401	71.0	125	9.30	11.80	10.45	124056
S4402	72.0	140	3.80	8.38	5.02	17186
S4403	72.0	140	5.00	9.00	6.00	27905
S4404	72.0	140	7.50	11.20	8.80	85204
S4405	61.0	150	5.00	10.30	6.88	31024
S4406	61.0	150	6.00	10.80	7.20	45481
S4407	71.0	150	6.00	10.80	7.20	48129
S4408	71.0	150	7.50	12.00	9.00	89802
S4409	81.0	150	7.50	11.70	8.92	89483
S4410	81.0	150	9.40	13.00	10.75	139051
S4411	82.0	160	4.30	9.90	5.70	21831
S4412	82.0	160	6.00	10.50	7.13	40985
S4413	82.0	160	9.40	13.50	10.88	138255

DISC SPRING WASHERS						
Part Number	**Di (mm)**	**Do (mm)**	**t (mm)**	**Lo (mm)**	**L_1 (mm)**	**P_1 (N)**
S4414	92.0	180	4.80	11.00	6.35	26468
S4415	92.0	180	6.00	11.10	7.27	37481
S4416	92.0	180	9.40	14.00	11.00	125349
S4417	82.0	200	7.60	14.20	9.55	77992
S4418	82.0	200	9.60	15.50	11.38	129374
S4419	82.0	200	11.50	16.60	13.15	182637
S4420	92.0	200	9.50	15.60	11.40	137612
S4421	92.0	200	11.40	16.80	13.20	199160
S4422	92.0	200	13.20	18.10	15.02	267081
S4423	102.0	200	6.00	12.50	7.25	36092
S4424	102.0	200	7.50	13.60	9.40	76336
S4425	102.0	200	9.50	15.60	11.40	145277
S4426	102.0	200	11.40	16.19	13.05	182920
S4427	102.0	200	13.10	18.20	15.05	289023
S4428	112.0	200	11.40	16.20	13.05	195723
S4429	112.0	200	13.10	17.50	14.88	256618
S4430	112.0	200	14.70	18.80	16.70	304934
S4431	112.0	225	6.20	13.60	8.27	44556
S4432	112.0	225	7.50	14.50	9.63	70710
S4433	112.0	225	11.30	17.00	13.25	170923
S4434	102.0	250	9.70	18.00	12.00	126318
S4435	102.0	250	11.30	19.00	13.75	182862
S4436	127.0	250	6.50	14.80	8.95	50438
S4437	127.0	250	9.40	17.00	11.75	118988
S4438	127.0	250	11.30	19.30	13.82	210691
S4439	127.0	250	13.10	19.60	15.40	248692
S4440	127.0	250	15.10	21.80	17.45	382807

UK

CLOVER DOME SPRING WASHERS™

Clover Dome™ spring washers are well suited for applications where a belleville washer or disc spring does not provide adequate deflection, or where the load obtained from a wave washer is not sufficient for application. By combining washers in various sequences, each size provides multiple load-carrying or deflection possibilities. These washers have had the set removed during the manufacturing process.

MATERIAL
Stainless steel: 17-7 PH per AMS5529
Carbon steel: Commercial 1074 - certified to ASTM A684

LOAD & DEFLECTION
(Include drawing from catalogue)
Typical load-deflection curves for three characteristic proportions of washers listed are shown Figure 1 below (include graph from catalogue)
From them, loads at intermediate heights may be estimated. The nominal amount of dish or cone (h) is found by subtracting 't' from 'H'.

The typical curves show deflections beyond 75%. The area beyond 75% should be avoided due to partial bottoming of the Clover Dome™ and excessive stress concentrations above 75% deflection

KEY TO MEASUREMENTS
Do = Outside diameter (maximum)
Di = Inside diameter (minimum)
t = Thickness
Lo = Approximate Free Height
L_1 = Loaded Height
P_1 = Load at deflection F (min/max)
F = Deflection Lo-L_1
Dh = Free fit in hole diameter
Dr = Free fit over rod diameter
Pf = Load at flat position

F

RONDELLES RESSORT CLOVER DOME™

Les rondelles ressort Clover Dome™ conviennent pour les applications où les rondelles Belleville ou les ressorts disque n'offrent pas assez de déflection, ou quand la charge d'une rondelle ondulée n'est pas suffisante.
En combinant ces rondelles en différentes séquences, chaque taille permet de nombreuses combinaisons de charges-déflections. Toute éventuelle perte de hauteur après mise à plat a été supprimée durant la fabrication.

MATERIAU
Acier Inoxydable: 17-7 PH selon AMS5529
Acier à ressort: Commercial - 1074 - Certifié suivant ASTM-A684

CHARGE & DEFLECTION
Des courbes de charge-déflection types pour trois types caractéristiques de rondelles sont indiquées dans la figure 1.
A partir de celles-ci, les charges à des hauteurs intermédiaires peuvent être estimées. La quantité nominale de concavité est obtenue en soustrayant "t" de "H".

Ces courbes type montrent des charges au delà de 75%. Cette zone de travail doit être évitée car les rondelles Clover Dome™ y sont partiellement à plat ; de plus , après 75% de déflection, le taux de stress est excessif.

ABBREVIATIONS UTILISEES
Do = Diamètre Extérieur (max)
Di = Diamètre Intérieur (min)
t = Epaisseur
Lo = Hauteur libre approx
L_1 = Hauteur en charge
P_1 = Charge à déflection F (min/max)
F = Déflection Lo-L_1
Dh = Jeu du diamètre de logement
Dr = Jeu du diamètre de l'axe
Pf = Charge à plat

E

ARANDELAS ELÁSTICAS CLOVER DOME™

Las arandelas elásticas Clover Dome™ son una alternativa en aquellas aplicaciones en las que las arandelas belleville o muelles de disco DIN 2093 no proporcionan la carrera adecuada ó donde la carga que genera una arandela ondulada es insuficiente. Combinando las arandelas Clover Dome™ en distintas secuencias, cada tamaño posibilita múltiples cargas y carreras.

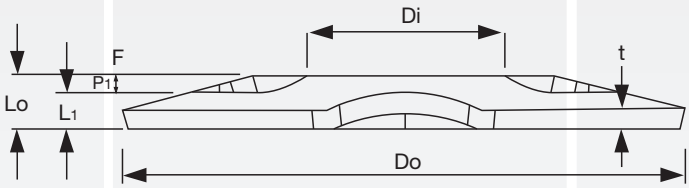
MATERIAL
Acero inoxidable: 17-7 PH por AMS5529
Acero para resortes: Comercial 1074 - Certificado según ASTM-A684

CARGA Y DEFLEXIÓN
Las curvas típicas de carga-deflexión para tres combinaciones de arandelas pueden observarse en la figura 1 mostrada a continuación.

Para las mismas, se podrían calcular cargas a distintas alturas. El número de discos o conos (h) puede calcularse sustrayendo "t" de "H".

Las curvas típicas en la figura 1 muestran deflexiones mayores del 75%. El area por encima del 75% debería evitarse debido a abombamiento parcial de las arandelas CLOVER DOME™ y la concentración de tensión excesiva en deflexiones de más del 75%.

CLAVES DE DIMENSIONES
Do = Diámetro externo (max)
Di = Diámetro interno (min)
t = Espesor
Lo = Altura libre
L_1 = Altura cargada
P_1 = Carga a deflexión F (min/max)
F = Deflexión Lo-L_1
Dh = Juego en el diámetro de la cavidad
Dr = Juego sobre el diámetro del vástago
Pf = Carga en posición plana



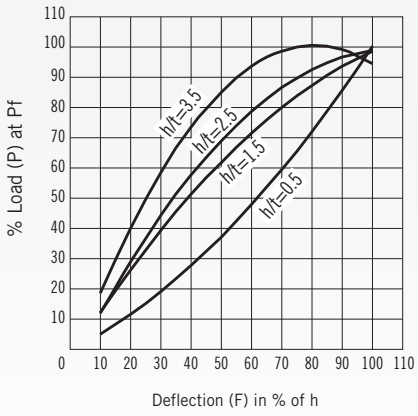


Fig. 1

CloverDomeSpringWashersCloverDomeSpringWashe
RondellesRessortCloverDomeRondellesRessortClove
ArandelasElásticasCloverDomeArandelasElásticasC

D

CLOVER DOME TELLERFEDERN ALLGEMEINE

Tellerfedern der Ausführung Clover Dome sind anwendbar wo Belleville oder gewohnte Tellerfedern nicht genugen Federweg oder wo gewellte Federscheiben wenig Federkraft anbieten. Je nach Schichtung ergibt jede Abmessung unterschiedliche Kräftereihen. Alle Tellerfedern wurden bei der Herstellung gesetzt.

WERKSTOFF
Rostfreier Federstahldraht: 17-7 PH per AMS5529
Federstahl: Commercial 1074 - testiert nach ASTM A684.

KRAFT UND EINFEDERUNG
Typische Kraft/Einfederungskurven sind in Fig. 1 dargestellt.

Mit Hilfe dieser Kurven können Kräfte bei unterschiedlichen Einfederungen bestimmt werden. Der Nominelle Wert h wird durch Subtraktion t von H ermittelt.

Diese Kraft/Einfederungskurven bei 75% der Einfederung sind mit Strichlinien gezeichnet um dass die Kraft, wegen der Eröffnung der Clover Dome Tellerfedern und der Überspannung, in diesem Bereich nicht zuverlässig ist anzugeben

KENNZEICHNEN DER ABMESSUNGEN
Do = Äußerer Durchmesser (max.)
Di = Innerer Durchmesser (min.)
t = Materialdicke
Lo = Länge der unbelasteten Tellerfeder
L_1 = Länge der belasteten Tellerfeder
P_1 = Federkraft bei Federlänge F (min/max)
F = Federweg Lo-L_1
Dh = Spielpassung in Hülsendurchmesser
Dr = Spielpassung über Dorndurchmesser
Pf = Kraft bei flacher Position

I

RONDELLE CLOVER DOME™

Le rondelle Clover Dome ™ vengono utilizzate nelle applicazioni dove le rondelle Belleville o le molle a tazza non forniscono una adeguata deflessione o dove il carico ottenuto da una rondella ondulata non è sufficiente per l'applicazione. Montando le rondelle in varie sequenze, ogni misura fornisce dei multipli di carico o di deflessione.

MATERIALE
Acciaio Inox: Tipo 17-7 PH – Certificato per AMS 5529
Acciaio al carbonio: commerciale 1074 – certificato per ASTM A684

CARICHI E DEFLESSIONI
La tipica curva carico-deflessione per tre tipi di rondella si può osservare nella figura 1. grazie alla curva si può calcolare approssimativamente i carichi a differenti altezze di lavoro. Il numero di rondelle (h) da utilizzare può essere calcolato sottraendo "t" da "H".

La curva indicata mostra deflessioni maggiori del 75%. L'area oltre il 75% dovrebbe essere evitata a causa dell'eccessivo schiacciamento e di conseguenza eccessivo stress.

LEGENDA
Do = Diametro esterno (max)
Di = Diametro interno (min)
t = Spessore
Lo = Altezza libera
L_1 = Altezza in carico
P_1 = Carico in deflessione F (min/max)
F = Deflessione Lo-L_1
Dh = Diametro sede
Dr = Diametro perno
Pf = carico in posizione piatta

P

ANILHAS DE MOLA CLOVER DOME™

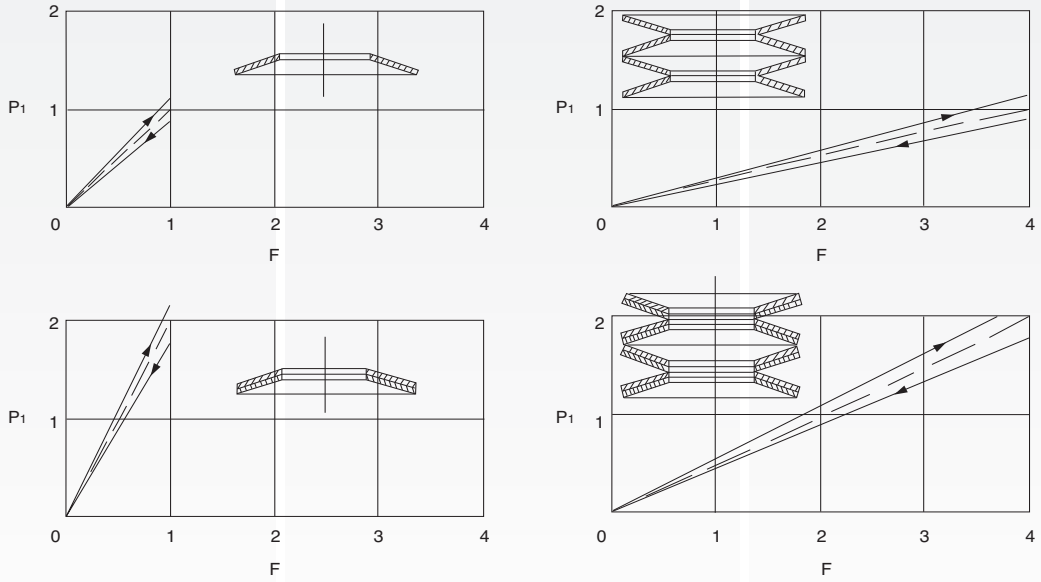
As anilhas de mola Clover Dome™ constituem uma alternativa nas aplicações em que as anilhas belleville ou as anilhas de mola DIN 2093, não disponibilizam um curso adequado, ou nos casos em que a carga gerada por uma anilha ondulada não é suficiente. Combinando as anilhas Clover Dome™ em diferentes sequências, cada tamanho possibilita diferentes cargas e cursos.

MATERIAL
Aço Inox 17-7 PH – MAS 5529
Aço Carbono 1074 ASTM AG84

CARGA E DEFLEXÃO
As curvas típicas de carga/deflexão para quatro relações de anilhas podem observar-se na figura 1 em baixo. Para estas, podem calcular-se cargas a diferentes alturas. O número de discos ou de cones (h) pode ser calculado subtraindo "t" de "H".

As curvas típicas na figura 1 mostram deflexões superiores a 75%. As deflexões superiores a 75% devem ser evitadas dada a deformação parcial das anilhas CLOVER DOME™ e a concentração excessiva de tensão, em deflexões superiores a 75%.

LEGANDA
Do = Diam Externo
Di = Diam Interno (max)
t = Espessura
Lo = Altura livre
L_1 = Carga em L_1
P_1 = Deflexão em carga F (min/max)
F = Deflexão Lo-L_1
Dh = Espaço livre no furo
Dr = Espaço livre no eixo
Pf = Carga na posição totalmente comprimida



CLOVER DOME SPRING WASHERS™ - STAINLESS / INOX

Part Number	Dr (mm)	Di (mm)	Do (mm)	Dh (mm)	t (mm)	Lo (mm)	L_1 (mm)	P_1 (N)	Pf (N)
BC0250-008-S	3.18	3.18	6.35	6.35	0.20	0.56	0.29	27.1 - 40.5	49
BC0250-012-S					0.30	0.66	0.39	78.3 - 117	151
BC0312-012-S	3.51	3.63	7.92	7.95	0.30	0.81	0.43	81.4-122.4	102
BC0312-018-S					0.46	0.97	0.58	198 - 299	396
BC0343-014-S					0.36	0.86	0.48	106.3-159.7	156
BC0343-016-S	4.17	4.29	8.71	8.74	0.41	0.91	0.53	118 - 179	231
BC0343-020-S					0.51	1.02	0.64	231 - 349	463
BC0375-010-S					0.25	0.79	0.39	48-73	44
BC0375-016-S					0.41	0.94	0.54	102 - 155	200
BC0375-018-S	4.95	4.95	9.53	9.53	0.46	0.99	0.59	145 - 220	285
BC0375-020-S					0.51	1.04	0.64	200 - 302	400
BC0562-020-S			14.27	14.30	0.51	1.57	0.77	181 - 274	311
BC0562-030-S					0.76	1.83	1.03	613 - 926	1210
BC0437-018-S	5.59	5.59	11.10	11.13	0.46	1.09	0.62	160.1 - 240.2	316
BC0437-022-S					0.56	1.19	0.72	363.4 - 545.4	725
BC0500-014-S					0.36	1.07	0.53	93.9 - 140.6	160
BC0500-018-S					0.46	1.17	0.64	127.7 - 191.7	222
BC0500-022-S	6.35	6.48	12.70	12.70	0.56	1.27	0.74	303.4 - 455.1	596
BC0500-026-S					0.66	1.37	0.84	397.7 - 596.5	796
BC0709-015-S					0.38	1.70	0.71	79.2 - 118.8	120
BC0709-020-S			18.01	18.26	0.51	1.83	0.84	151 - 226.4	249
BC0709-025-S					0.64	1.96	0.97	252.7 - 379	431
BC0625-018-S					0.46	1.37	0.69	112.5 - 169	196
BC0625-022-S	7.95	8.05	15.88	15.88	0.56	1.47	0.79	233.5 - 350.1	409
BC0625-030-S					0.76	1.68	0.99	626 - 940.6	1232
BC0625-033-S					0.84	1.75	1.07	677.5 - 1016	1352
BC0896-015-S					0.38	2.06	0.80	76.2 - 114.3	85
BC0896-020-S	8.00	8.13	22.76	23.02	0.51	2.18	0.93	141.9 - 212.8	209
BC0896-025-S					0.64	2.31	1.05	241.9 - 362.9	400
BC0750-022-S					0.56	1.65	0.83	205.5 - 308.3	351
BC0750-026-S					0.66	1.75	0.93	326.5 - 489.8	569
BC0750-030-S					0.76	1.85	1.04	458.2 - 687.3	899
BC0750-033-S	9.53	9.65	19.05	19.05	0.84	1.93	1.11	613.9 - 920.8	1205
BC0750-039-S					0.99	2.08	1.26	981.7 - 1472.4	1957
BC0750-043-S					1.09	2.18	1.37	1323.8 - 1985.7	2642
BC1070-020-S		10.16	27.15	28.00	0.51	2.46	1.00	141.8 - 212.7	209
BC1070-025-S					0.64	2.59	1.12	222.3 - 334.4	347
BC0875-030-S	11.13	11.23	22.23	22.23	0.76	2.03	1.08	409.7 - 614.7	716
BC0875-033-S					0.84	2.11	1.16	529.3 - 793.6	1036
BC1000-033-S					0.84	2.29	1.20	454.6 - 681.5	792
BC1000-037-S	12.70	12.83	25.40	25.40	0.94	2.39	1.30	672.1 - 1008.4	1170
BC1000-039-S					0.99	2.44	1.35	822 - 1233.5	1610
BC1000-043-S					1.09	2.54	1.45	1130.7 - 1695.7	2215

CLOVER DOME SPRING WASHERS™ - CARBON STEEL

Part Number	Dr (mm)	Di (mm)	Do (mm)	Dh (mm)	t (mm)	Lo (mm)	L_1 (mm)	P_1 (N)	Pf (N)
BC0250-008-CA	2.79	3.00	6.35	6.35	0.20	0.57	0.29	19.8 - 29.7	36
BC0250-012-CA	3.18	3.18			0.30	0.66	0.39	98.5 - 147.7	177
BC0312-012-CA	3.51	3.63	7.92	7.95	0.30	0.78	0.43	97.2 - 145.9	159
BC0312-018-CA			8.13	8.20	0.46	0.80	0.58	164.1 - 246.2	252
BC0343-014-CA					0.35	0.80	0.48	121.9 - 182.8	262
BC0343-016-CA	4.17	4.29	8.71	8.74	0.41	0.81	0.53	161.2 - 241.8	319
BC0343-020-CA					0.51	0.84	0.64	179.1 - 268.6	348
BC0375-010-CA					0.25	0.80	0.38	50.4 - 75.6	59
BC0375-016-CA					0.41	0.82	0.54	165.3 - 247.9	368
BC0375-018-CA	4.83	4.95	9.65	9.93	0.46	0.83	0.59	177.8 - 266.7	303
BC0375-020-CA					0.51	0.82	0.64	240.0 - 360.0	296
BC0562-020-CA			14.27	14.30	0.51	1.42	0.77	151.9 - 227.9	259
BC0562-030-CA					0.76	1.52	1.03	535.6 - 803.4	1334
BC0437-018-CA	5.49	5.59	11.10	11.13	0.45	1.08	0.62	198.3 - 297.4	324
BC0437-022-CA					0.55	1.17	0.72	349.1 - 523.7	510
BC0500-014-CA					0.35	1.07	0.53	90.5 - 135.7	245
BC0500-018-CA					0.45	1.16	0.64	176.6 - 264.9	358
BC0500-022-CA	6.35	6.48	12.75	13.11	0.55	1.25	0.74	327.3 - 491.0	660
BC0500-026-CA					0.65	1.34	0.84	467.0 - 700.5	693
BC0709-015-CA					0.38	1.70	0.71	914.1 - 1371.1	2060
BC0709-020-CA			18.26	18.67	0.51	1.80	0.84	112.2 - 168.2	392
BC0709-025-CA					0.64	1.90	0.96	436.1 - 654.1	2021
BC0625-018-CA					0.45	1.36	0.69	140.1 - 210.1	422
BC0625-022-CA		8.05	16.00	16.28	0.55	1.45	0.79	250.8 - 376.1	746
BC0625-030-CA					0.75	1.63	0.99	594.6 - 891.9	1295
BC0625-033-CA	7.95				0.85	1.72	1.07	778.4 - 1167.5	1619
BC0896-015-CA					0.38	2.13	0.80	68.1 - 102.2	172
BC0896-020-CA		8.13	22.99	23.02	0.51	2.26	0.94	118.0 - 176.9	343
BC0896-025-CA					0.64	2.36	1.07	240.8 - 361.2	1391
BC0750-022-CA					0.55	1.64	0.83	253.3 - 380.0	716
BC0750-026-CA					0.65	1.73	1.26	271.9 - 407.9	834
BC0750-030-CA					0.75	1.82	1.04	544.2 - 816.3	1275
BC0750-033-CA	9.53	9.65	19.30	19.46	0.85	1.91	1.11	782.5 - 1173.7	1834
BC0750-039-CA					1.00	2.05	1.26	815.7 - 1223.5	2286
BC0750-043-CA					1.10	2.14	1.37	1462.8 - 2194.2	3286
BC1070-020-CA		10.16	27.15	28.19	0.51	2.51	1.01	127.6 - 191.4	373
BC1070-025-CA					0.64	2.54	1.12	182.5 - 273.7	1109
BC0875-030-CA	11.13	11.23	22.33	22.63	0.75	2.02	1.08	489.8 - 734.7	1157
BC0875-033-CA					0.85	2.11	1.16	590.2 - 885.3	1055
BC1000-033-CA					0.85	2.30	1.20	582.7 - 874.0	1709
BC1000-037-CA	12.70	12.83	25.53	25.80	0.95	2.39	1.30	733.1 - 1099.7	1766
BC1000-039-CA					1.00	2.43	1.26	952.5 - 1428.7	2158
BC1000-043-CA					1.10	2.52	1.45	827.3 - 1241.0	2570

UK

DISC SPRING WASHERS FOR FLANGE APPLICATIONS

Stock sizes in stainless steel
SPEC flange discs are designed to compensate for thermal expansion and mechanical shock associated with bolted joints. Typical applications include valves, pipe connections, pump connections and compression joints. These washers have had their set removed during manufacture.

Material
Stainless steel
Commercial – Type 17-7 PH
Maximum application temperature for 17-7 is 570˚F (300˚C).
Certificate of chemical analysis available at extra cost.

Stacked disc washers
Additional load or deflection can be obtained by the stacking of discs in series or parallel. See the standard line of disc spring washers for information on stacking of disc washers.

Load tolerances
Load tolerances are plus or minus 20.0% of the values shown.

KEY TO MEASUREMENTS
Dr = Free fit Bolt or Rod diameter
Di = Inside diameter (min)
Do = Outside diameter (max)
t = Thickness
Lo = Approximate Free Height
Tf = Calculated torque to flat position (N/M)
Pf = Calculated load at flat position (N)

F

RESSORTS DISQUE POUR BRIDES

Dimensions standard en acier inoxydable
Les disques à bride SPEC sont conçus pour compenser la dilatation thermique et l'impact mécanique associés aux joints boulonnés. Les applications types comprennent les valves, les raccords de tuyaux, les raccords de pompes et les joints de compression. Toute déformation de ces rondelles a été éliminée lors de la fabrication.

Matériau
Acier inoxydable
Commercial - Type 17-7 PH
Température d'application maximale pour 17-7° de 300°C.
Certificat d'analyse chimique disponible contre supplément.

Ressorts disque empilés
Une charge ou une flexion supplémentaire peut être obtenue en empilant les disques en série ou en parallèle. Se reporter à la ligne standard de ressorts disque pour toute information concernant l'empilage.

Tolérances de charge
Les tolérances de charge font plus ou moins 20,0% des valeurs indiquées.

INDEX DES MESURES
Dr = Diamètre d'axe ou de filetage recommandé
Di = Diamètre intérieur (min)
Do = Diamètre extérieur (max)
t = Epaisseur
Lo = Hauteur libre approximative
Tf = Couple calculé pour la position à plat (N-m)
Pf = Charge á plat

E

ARANDELAS MUELLE/RESORTE DE DISCO PARA APLICACIONES DE BRIDA

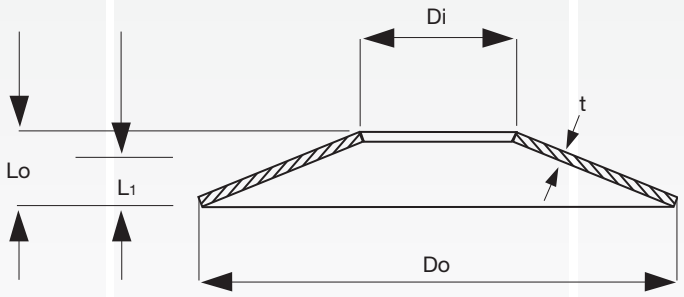
Medidas de stock en acero inoxidable
Los discos de brida SPEC están diseñados para compensar la expansión termal y golpes mecánicos asociados con las juntas atornilladas. Aplicaciones típicas incluyen válvulas, conexiones de tuberías, conexiones de bombas y juntas de compresión. Las deformaciones de estas arandelas han sido eliminadas durante la fabricación.

Material
Acero inoxidable
Comercial – Tipo 17-7 PH
Máxima temperatura de aplicación para el 17-7 es de 300ºC
Disponible el certificado de composición química bajo coste extra.

Arandelas de disco acumulables
Se pueden obtener fuerzas o deflexiones adicionales, acumulando discos ya sea en serie o en paralelo. Ver la línea estándar de arandelas muelle de disco para más información sobre acumulación de arandelas de disco.

Tolerancias de fuerzas
Las tolerancias de las fuerzas son más o menos un 20% de las fuerzas que aparecen.

CLAVES DE DIMENSIONES
Dr = Juego del tornillo o del diámetro del vástago
Di = Diámetro interior (Min)
Do = Diámetro Exterior (Max)
t = Grosor
Lo = Altura libre aproximada
Tf = Torsión calculada en posición plana (N/M)
Pf = Fuerza calculada en la posición plana (N)



D

TELLERFEDERSCHEIBEN FÜR FLANSCH-ANWENDUNGEN

Größen in Edelstahl
SPEC Flanschscheiben haben die Aufgabe, die Wärmeausdehnung und mechanische Belastung bei Schraubenverbindungen auszugleichen. Typische Anwendungen sind Ventile, Rohrverbindungen, Pumpenanschlüsse und Klemmverbindungen. Set wird bei der Herstellung entfernt.

Material
Edelstahl Kommerziell – Typ 17-7 PH
Maximale Einsatztemperatur für 17-7 ist 300°C.
Zertifikat zur chemischen Analyse auf Wunsch gegen besondere Berechnung erhältlich.

Geschichtete Tellerfederscheiben
Zusätzliche Kraft/Federweg kann durch die parallele oder reihenweise Schichtung der Scheiben erreicht werden (siehe Standardreihe von Tellerscheiben für Informationen zur Schichtung von Tellerfederscheiben).

Lasttoleranzen
Lasttoleranzen plus oder minus 20,0% der angezeigten Werte.

KENNZEICHNEN DER ABMESSUNGEN
Dr = Spielpassung über Schraube oder Dorndurchmesser
Di = Innendurchmesser (min.)
Do = Außendurchmesser (max.)
t = Dicke
Lo = Annähernde ungespannte Höhe
Tf = Berechnetes Drehmoment zur flachen Position (N/M)
Pf = Berechnete Last/Kraft bei flacher Position (N)

I

RONDELLE A TAZZA PER APPLICAZIONI A FLANGIA

Dimensioni standard in acciaio inox
I dischi a flangia SPEC sono concepiti per compensare la dilatazione termica e l'impatto meccanico associati ai giunti bullonati. Le applicazioni tipo comprendono le valvole, i raccordi dei tubi, i raccordi delle pompe e i giunti di compressione. Ogni deformazione di queste rondelle è stata limitata durante la fabbricazione.

Materiale
Acciaio inox Commerciale - Tipo 17 - 7PH
Temperatura massima d'applicazione per 17-7 è 570° F (300° C)
Il certificato di analisi chimica è disponibile con costo aggiuntivo.

Rondelle a tazza sovrapposte
Un carico o una flessione addizionali possono essere ottenute sovrapponendo i dischi in serie o in parallelo. Per informazioni sulla sovrapposizione vedi linea standard delle rondelle a tazza.

Tolleranze di carico
Le tolleranze di carico costituiscono più o meno il 20% dei valori indicati.

LEGENDA
Dr = Dimensione consigliata del perno
Di = Diametro interno (min)
Do = Diametro esterno (max)
t = Spessore
Lo = Altezza libera approssimativa
Tf = Valore della coppia calcolato in posizione piatta (N/M)
Pf = Carico in posizione piatta

P

MOLAS DISCO PARA APLICAÇÃO EM FLANGES

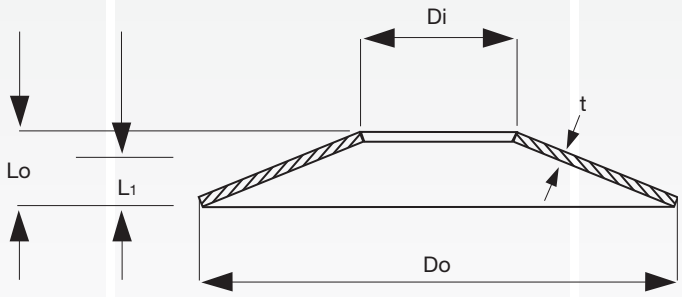
Padronizadas em Aço Inox
As molas disco para flange SPEC, são desenhadas para compensar expansões termicas e choques mecanicos. Aplicações típicas são para válvulas, tubos, e bombas elétricas.

Material
Aço Inox – tipo comercial 17-7 PH
Temperatura máxima de operação 17-7 PH (570 F) (300 C)
Analise química disponível a custo extra.

Empilhamento
Carga adicional pode ser obtida empilhando-se as peças em serie ou em paralelo. Veja a linha padrão para informação de empilhamento.

Tolerâncias
São de mais ou menos 20% da tabela.

LEGENDA
Dr = Diâmetro livre
Di = Diâmetro interno (min)
Do = Diâmetro externo (max)
t = Espessura
Lo = Altura livre (aproximado)
Tf = Torque na posição totalmente comprimida (N/M)
Pf = Carga na posição totalmente comprimida



DISC SPRING WASHERS FOR FLANGE APPLICATIONS

Part Number	Dr (mm)	Di (mm)	Do (mm)	t (mm)	Lo (mm)	Tf (N/M)	Pf (N)
B0714-080-S	9.5	9.91	18.14	2.03	2.18	11	5338
B0820-080-S	11	11.48	20.83	2.03	2.46	31	12455
B0900-089-S	12	13.08	22.86	2.26	2.54	26	9340
B1145-125-S	16	16.66	29.08	3.18	3.63	95	26688
B1365-131-S	19	19.84	34.67	3.33	3.81	95	22685
B1585-160-S	22	23.01	40.26	4.06	4.57	153	11580
B1805-168-S	26	26.21	45.85	4.27	4.95	211	18250
B2020-187-S	29	29.36	51.31	4.75	5.51	294	47150
B2240-190-S	32	32.54	56.90	4.83	5.72	324	46700
B2450-250-S	35	35.71	62.23	6.35	7.37	780	102300
B2680-250-S	38	38.89	68.07	6.35	7.37	705	84500
B2950-262-S	42	42.85	74.93	6.65	7.80	799	88960
B3170-281-S	45	46.02	80.52	7.14	8.36	989	102300
B3380-300-S	48	49.20	85.85	7.62	8.97	1301	124550
B3600-318-S	52	52.37	91.44	8.08	9.53	1518	142340
B4040-356-S	58	58.72	102.62	9.04	10.62	2168	173470
B4470-394-S	64	65.07	113.54	10.01	11.79	2981	213500

METRIC DISC SPRING WASHERS FOR FLANGE APPLICATIONS

Part Number	Dr (mm)	Di (mm)	Do (mm)	t (mm)	Lo (mm)	Tf (N/M)	Pf (N)
B15-125-S	8	8.4	15	1.25	1.7	9.5	6000
B15-200-S	8	8.4	15	2	2.3	30	17000
B18-200-S	10	10.4	18	2	2.3	24	11000
B22-230-S	12	12.4	22	2.3	2.6	34	13000
B25-250-S	14	14.4	25	2.5	2.95	56	18000
B36-400-S	20	20.8	36	4	4.6	190	43000
B43-400-S	24	24.8	43	4	4.8	200	39000
B49-430-S	27	27.8	49	4.3	5	240	40000
B54-480-S	30	30.8	54	4.8	5.6	275	42000
B68-640-S	36	36.8	68	6.4	7.5	725	92000
B70-640-S	39	39.8	70	6.4	7.5	725	91000

UK

HIGH LOAD DISC WASHERS

Stock sizes in carbon steel
SPEC high load disc washers provide loads which are substantially greater than our standard washers of similar diameters. These washers have not had their set removed during manufacturing since most applications are static applications. Set generally is removed during installation which results in a reduction of the free height.

Material
Carbon spring steel C1070-C1075 or chrome vanadium based on availability at time of manufacture.

Certificate of chemical analysis available at extra cost.

Parts made from 17-7 are available as a special order.

Loads
Maximum load is achieved at flat. Loads are calculated values.

Stacked disc washers
Additional load or deflection can be obtained by the stacking of discs in series or parallel. See the standard line of disc spring washers for information on stacking of disc washers.

KEY TO MEASUREMENTS
Dr = Free fit Bolt or Rod diameter
Di = Inside diameter (Min)
Do = Outside diameter (Max)
t = Thickness
Lo = Approx Free Height
L_1 = Loaded Height
Pf = Cal Load flat. Newton
F_1 = Deflection = Lo-L_1

F

RESSORTS DISQUE A CHARGE ELEVEE

Dimensions standard en acier inoxydable
Les rondelles à disque à charge élevée SPEC assurent des charges considérablement plus élevées que nos rondelles standard de même diamètre. La déformation de ces rondelles n'a pas été éliminée lors de la fabrication car la plupart des applications sont statiques. La déformation est généralement éliminée durant l'installation, ce qui entraîne une réduction de la hauteur libre.

Matériau
Acier pour ressorts au carbone C1070-C1075 ou chrome-vanadium selon la disponibilité au moment de la fabrication.

Certificat d'analyse chimique disponible contre supplément.

Les pièces fabriquées à partir de 17-7 sont disponibles sur commande spéciale.

Charges
La charge maximale est obtenue à plat. Les charges sont des valeurs calculées.

Ressorts disque empilé
Une charge ou une flexion supplémentaire peut être obtenue en empilant les disques en série ou en parallèle. Se reporter à la ligne standard de ressorts disque pour toute information concernant l'empilage.

INDEX DES MESURES
Dr = Diamètre d'axe ou de filetage recommandé
Do = Diamètre extérieur (Min)
Di = Diamètre intérieur (Max)
t = Epaisseur
Lo = Hauteur libre approximative
L_1 = Hauter en charge
Pf = Charge á plat
F_1 = Déflexion = Lo-L_1

E

ARANDELAS DE DISCO DE ALTA FUERZA

Medidas de stock en acero al carbono
Las arandelas de disco de alta fuerza suministran fuerzas que son sustancialmente mayores que las suministradas por nuestras arandelas estándar con diámetros similares. A estas arandelas no se les han eliminado las deformaciones durante la fabricación ya que muchas de sus aplicaciones son en estático. La deformación generalmente se elimina durante el proceso de instalación lo que provoca una reducción de la altura libre.

Material
Acero al carbón de muelle C1070-C1075 ó cromo vanadio dependiendo de la disponibilidad en el momento de fabricación.

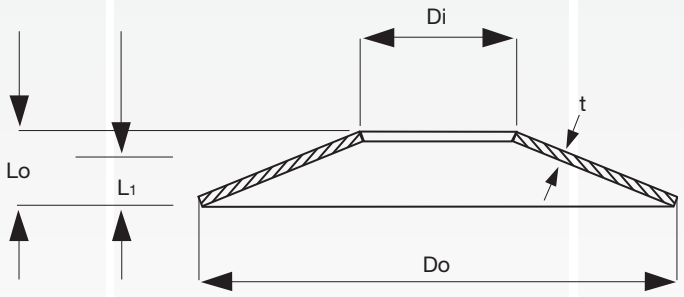
Disponible el certificado de composición química bajo coste extra.

Se pueden fabricar piezas en 17-7 bajo pedido especial.

Fuerzas
La fuerza máxima se obtiene en la posición plana. Las fuerzas son los valores calculados.

Arandelas de disco acumulables
pueden obtener fuerzas o deflexiones adicionales, acumulando discos ya sea en serie o en paralelo. Ver la línea estándar de arandelas muelle de disco para más información sobre acumulación de arandelas de disco.

CLAVES DE DIMENSIONES
Dr = Juego del tornillo o del diámetro del vástago
Do = Diámetro Exterior (Max)
Di = Diámetro interior (Min)
t = Grosor
Lo = Altura libre aproximada
L_1 = Altura con carga
Pf = Fuerza calculada en la posición plana (N)
F_1 = Deflexión = Lo-L_1



D

TELLERFEDERSCHEIBEN FÜR HOHE BELASTUNGEN

Größen in Kohlenstoffstahl
SPEC Tellerfederscheiben für hohe Belastungen stellen wesentlich höhere Kräfte zur Verfügung als unsere Standardscheiben mit ähnlichen Durchmessern. Bei diesen Scheiben wurde das Set nicht bei der Herstellung entfernt, da es sich bei den meisten Anwendungen um statische Anwendungen handelt (Set wird im Allgemeinen während der Installation entfernt, was zu einer Reduzierung der ungespannten Höhe führt).

Material
Kohlenstoff-Federstahl C1070-C1075 oder Chrom-Vanadium je nach Verfügbarkeit zur Zeit der Herstellung.

Zertifikat zur chemischen Analyse auf Wunsch gegen besondere Berechnung erhältlich.

Aus 17-7 hergestellte Teile sind als Sonderbestellung erhältlich.

Kräfte
Maximale Kraft wird in flacher Position erreicht. Kräfte sind errechnete Werte.

Geschichtete Tellerfederscheiben
Zusätzliche Kraft/Federweg kann durch die parallele oder reihenweise Schichtung der Scheiben erreicht werden (siehe Standardreihe von Tellerscheiben für Informationen zur Schichtung von Tellerfederscheiben).

KENNZEICHNEN DER ABMESSUNGEN
Dr = Spielpassung über Schraube oder Dorndurchmesser
Di = Innendurchmesser (Min)
Do = Außendurchmesser (Max)
t = Dicke
Lo = Annähernde ungespannte Höhe
L_1 = Gespannte Höhe
Pf = Berechnete Kraft flach/ Newton
F_1 = Verbiegung = Lo-L_1

I

RONDELLE A TAZZA PER CARICHI FORTI

Dimensioni standard in acciaio al carbonio
Le rondelle a tazza per carichi forti SPEC assicurano dei carichi considerevolmente più elevati che non le nostre rondelle standard dello stesso diametro. La deformazione di queste rondelle non è stata eliminata durante la fabbricazione poiché la maggior parte delle applicazioni sono statiche. Generalmente la deformazione viene eliminata durante l'installazione, il che comporta una riduzione dell'altezza libera.

Materiale
Acciaio per molle al carbonio C1070 - C1075 o al cromo - vanadio secondo la disponibilità al momento della fabbricazione.

Il certificato d'analisi chimica è disponibile con costo aggiuntivo.

Carichi
Il carico massimo è ottenuto a piatto. I carichi sono dei valori calcolati.

Rondelle a tazza sovrapposte
Un carico o una flessione addizionali possono essere ottenute sovrapponendo i dischi in serie o in parallelo. Per informazioni sulla sovrapposizione vedi linea standard delle rondelle a tazza.

LEGENDA
Dr = Dimensione consigliata del perno
Di = Diametro interno (min)
Do = Diametro esterno (max)
t = Spessore
Lo = Altezza libera approssimativa
L_1 = Altezza in carico
Pf = carico in posizione piatta
F_1 = deflessione Lo – L_1

P

ANILHAS DE DISCO DE CARGA PESADA

Padronizadas em aço carbono
As anilhas de carga pesada SPEC agüentam mais carga que as anilhas comuns de mesmo diâmetro.Essa anilhas na sua produção permanecem com a forma, que será retirada durante a instalação o que resulta numa perda de altura livre.

Material
Aço Carbono C1070-1075 ou Cromo Vanádio, baseado a disponibilidade na hora da fabricação.

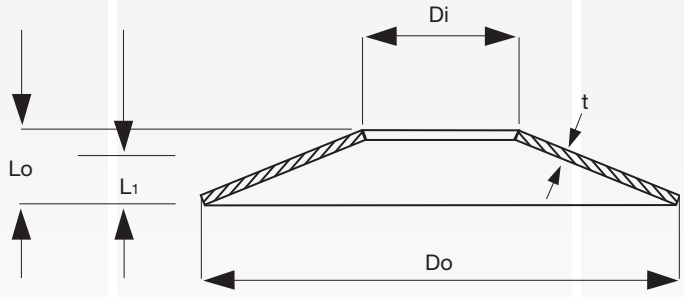
Certificado de analise quimica , a custo extra.

Peças feitas com 17-7 são disponíveis como pedido especial.

Carga
Maxima carga é atingida quando a peça esta completamente comprimida.

Empilhagem
Adicional cargas ou deflexão podem ser obtidas empilhando as peças em paralelo ou em serie.]
Veja a linha padrão para informações de empilhamento.

LEGENDA
Dr = Diâmetro livre
Di = Diâmetro interno
Do = Diâmetro externo
t = Espessura
Lo = Altura livre (aproximado)
L_1 = Carga na altura
Pf = Carga na posição totalmente comprimida
F_1 = Deflexão Lo-L_1.



HIGH LOAD DISC WASHERS

Part Number	Dr (mm)	Di (mm)	Do (mm)	t (mm)	Lo (mm)	L_1 (mm)	Pf (N)
B0197-012	2	2.20	5.00	0.30	0.51	0.41	289
B0236-016	2.5	2.70	6.00	0.41	0.66	0.51	649
B0276-020	3	3.20	7.00	0.51	0.76	0.64	934
B0315-020	3.5	3.70	8.00	0.51	0.79	0.69	783
B0354-031	4	4.30	8.99	0.79	1.09	0.94	2624
B0433-039	5	5.30	11.00	0.99	1.40	1.19	4759
B0551-050	6	6.40	14.00	1.27	1.70	1.42	6183
B0669-059	7	7.40	17.00	1.50	2.01	1.78	8006
B0709-078	8	8.40	18.00	1.98	2.59	2.24	21150
B0827-098	8	8.40	21.00	2.49	3.00	2.74	23770
B0906-078	10	10.50	23.00	1.98	2.69	2.39	14230
B0945-118	10	10.50	24.00	3.00	3.71	3.30	35540
B1142-098	12	13.00	29.00	2.49	3.30	2.95	20900
B1260-138	12	13.00	32.00	3.51	4.29	3.96	44040
B1378-118	14	15.00	35.00	3.00	3.99	3.58	28900
B1535-157	14	15.00	39.00	3.99	5.00	4.60	53380
B1535-138	16	17.00	39.00	3.51	4.70	4.11	44480
B1654-157	16	17.00	42.00	3.99	5.18	5.11	57820
B1850-197	18	19.00	47.00	5.00	6.20	5.64	88960
B2047-236	20	21.00	52.00	5.99	7.29	6.25	137890
B2205-236	22	23.00	56.00	5.99	7.90	6.81	179150
B2441-256	24	25.00	62.00	6.50	8.51	7.39	193930
B2756-276	27	28.00	70.00	7.01	9.19	8.05	204600
B3031-295	30	31.00	77.00	7.49	9.80	8.71	217950

UK

CURVED SPRING WASHERS

Precision engineered curved washers are available in many stock sizes. These washers are made of finely tempered spring steel with some sizes being made of stainless steel. They come deburred and have had all set removed during manufacture. Curved washers exert relatively light thrust loads and are often used to absorb axial end play.

The rate is approximately linear between 10% and 80% of available deflection.

FINISH
Standard finish for high carbon steel is plain finish. Stainless steel is supplied in plain finish. On special order, high carbon steel washers may be mechanically plated, a process which substantially reduces the possibility of hydrogen embrittlement.

MATERIAL
Stainless steel (parts with suffix 'S')
Commercial - Type 301 per ASTM-A666 (chemical only)

High carbon steel:
Commercial - 1074-1095 per ASTM-A684

KEY TO DIMENSIONS
Do = Outside Diameter (max)
Di = Inside Diameter (min)
t = Thickness
Lo = Free Height (ref only)
L_1 = Loaded height
P_1 = Load at L_1 (N) (+/- 15%)
Dh = Free fit in hole diameter
Dr = Free fit over hole diameter

F

RONDELLES SINUS

Disponibilité sur stock en acier à haute teneur en carbone et en acier inoxydable. Les rondelles Sinus de précision sont disponibles sur stock chez Ressorts SPEC en un grand nombre de dimensions. Ces rondelles Sinus sont fabriquées en acier à ressort trempé, à haute teneur en carbone, certaines dimensions étant disponibles en acier inoxydable. Elles sont ébarbées et toute déformation est éliminée lors de leur fabrication. Les rondelles sinus exercent une poussée relativement faible et sont souvent utilisées pour compenser un jeu axial.

Leur raideur est pratiquement linéaire entre 10% et 80% de la course disponible.

FINITION
Une finition brute est standard pour l'acier à haute teneur en carbone. L'acier inoxydable est fourni avec une finition brute. Par commande spéciale, les rondelles en acier à haute teneur en carbone peuvent être plaquées mécaniquement, un procédé qui réduit énormément les risques de fragilisation par hydrogène.

MATERIAU
Acier Inoxydable (refs. Avec le suffixe « S ») :
Commercial – Type 301 / ASTM-A666 (chimique uniquement).

Acier au Carbone :
Commercial - 1074-1095 / ASTM-A684

INDEX DES MESURES
Do = Diamètre Extérieur (max)
Di = Diamètre Intérieur (min)
t = Epaisseur
Lo = Hauteur libre (pour référence)
L_1 = Hauteur en charge
P_1 = Charge à L_1 ±15% Newton
Dh = Jeu du diamètre de logement
Dr = Jeu du diamètre de l'axe

E

ARANDELAS ELASTICAS CURVADAS

Ponemos a su disposición una gran variedad de tamaños estándar de arandelas curvadas. Dichas arandelas se fabrican a partir de acero para resortes finamente templado y algunos tamaños están disponibles en acero inoxidable. Vienen sin rebabas y se ha eliminado la flecha durante la fabricación. Las arandelas curvadas ejercen cargas de empuje relativamente ligeras y se utilizan a menudo para absorber el juego axial.

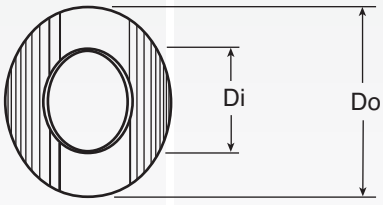
El coeficiente de compresión es aproximadamente lineal entre el 10% y el 80% de la deflexión.

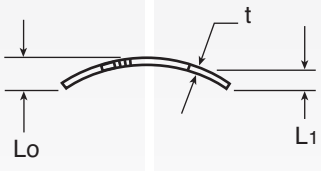
ACABADO
El acabado estándar para acero alto en carbono es el acabado simple. El acero inoxidable se suministra con el acabado simple. Bajo pedido, las arandelas de acero alto en carbono se pueden revestir mecánicamente, un proceso que reduce de forma substancial la posibilidad de la fisuración por fragilidad por absorción de hidrógeno.

MATERIAL
Acero inoxidable (referencia con sufijo "S")
Comercial - Tipo 301 según ASTM-A666 (solamente químico)

Acero al carbono:
Comercial - 1074-1095 según ASTM-A684

CLAVES DE CARACTERÍSTICAS
Do = Diámetro externo (max)
Di = Diámetro interno (min)
t = Espesor
Lo = Altura libre (referencia solo)
L_1 = Altura cargada
P_1 = Carga a deflexión (N) (+/- 15%)
Dh = Juego en el diámetro de la cavidad
Dr = Juego sobre el diámetro del vástago





D

FEDERSCHEIBEN-GEWÖLBT

Gewölbte Federscheiben sind in größere Lagermengen an bereit gehalten. Diese Federscheiben sind aus wärmebehandeltem Federstahl wobei einige Abmessungen aus rostfreiem Stahl hergestellt sind. Die Federscheiben sind entgratet und werden bereits während der Herstellung gesetzt. Federscheiben sind für leichte Lastaufnahmen konstruiert und werden oft für den Außgleich von Axialspiel eingesetzt.

Die Federrate ist lineal zwischen 10% und 80% des Federwegs.

OBERFLÄCHE
Gewöhnlich Oberfläche ist Standard. Gleich für Rostfreistahl. Als Sonderbestellung, könnten die Federscheiben mechanisch besichtet werden, wobei, die Wasserstoffversprödung erheblich reduziert wird.

WERKSTOFFE
Rostfreierstahl (Bestellnummer mit "S" Nachbuchstabe)
Commercial - Type 301 nach ASTM-A666 (nur chemisch)

Kohlenstoffstahl:
Commercial – 1774-1095 nach ASTM-A684

KENNZEICHNEN DER ABMESSUNGEN
Do = Äußerer Durchmesser (max.)
Di = Innerer Durchmesser (min.)
t = Materialdicke
Lo = Länge der unbelasteten Tellerfeder
L_1 = Länge der belasteten Tellerfeder
P_1 = Federkraft bei Federlänge (N) (+/-15%)
Dh = Spielpassung in Hülsendurchmesser
Dr = Spielpassung über Dorndurchmesser

I

RONDELLE ARCUATE

Le rondelle arcuate di precisione SPEC sono disponibili in numerose dimensioni pronte a magazzino. Le rondelle sono costruite in acciaio temprato ed in alcune dimensioni sono anche disponibili in acciaio inossidabile. Esse vengono fornite sbavate, con eliminazione della deformazione iniziale successiva alla fabbricazione. Le rondelle arcuate esercitano carichi relativamente leggeri e vengono normalmente utilizzate per l'assorbimento di giochi assiali.

Il carico è approssimativamente lineare fra il 10% e l'80% della deflessione.

FINITURA
Per l'acciaio ad alto contenuto di carbonio viene fornita una finitura standard.Su richiesta, le rondelle in acciaio possono essere placcate meccanicamente, un processo questo, che riduce sostanzialmente le possibilità di fragilità da idrogeno.

MATERIALE
Acciaio inox (codici con suffisso 'S')
Commerciale – Tipo 301 per ASTM-A666

Acciaio ad alto contenuto di carbonio
Commerciale – 1074-1095 per ASTM-A684

LEGENDA
Do = Diametro esterno (max)
Di = Diametro interno (min)
t = Spessore
Lo = Altezza libera (solo riferimento)
L_1 = Altezza sotto carico
P_1 = Carico a L_1 ±15%
Dh = Diametro sede
Dr = Diametro perno

P

ANILHAS DE MOLA CURVAS

Associated Springs dispõe de muitos tamanhos standard de anilhas curvas. Estas anilhas são fabricadas em aço para molas com têmpera fina e alguns tamanhos estão disponíveis em aço inoxidável. Estão isentas de rebarbas tendo sido também eliminada a flecha durante o fabrico. As anilhas curvas exercem cargas de encosto relativamente ligeiras, utilizando-se com frequência para compensação de folga axial.

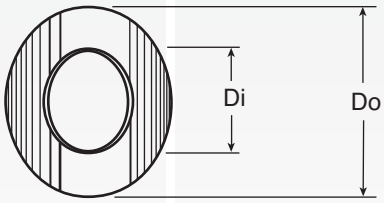
A taxa linear esta entre 10% a 80% de deeflexão

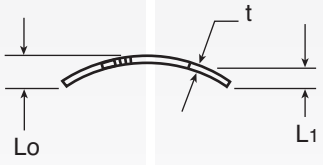
ACABAMENTO
O acabamento standard para aço de elevado teor de carbono, é o acabamento simples. O aço inoxidável é fornecido com acabamento simples. A pedido, as anilhas em aço de elevado teor de carbono podem ser revestivas mecanicamente, um processo que reduz de forma substancial a possibilidade de fissuras de fragilidade por absorção de hidrogénio.

MATERIAL
Aço Inoxidavel (peças com sufixo 'S')
Comercial - Tipo 301 por ASTM-A666 (quimicos somente)

Alto carbono:
Comercial - 1074-1095 por ASTM-A684

DIMENSÕES
Do = Diâmetro exterior (Máx)
Di = Diâmetro interior (Min)
t = Espessura
Lo = Altura livre aproximada
L_1 = Altura em carga
P_1 = Carga a L_1 ±15% Newtons
Dh = Espaço Livre do Furo
Dr = Espaço Livre da Haste





CURVED SPRING WASHERS

Part Number	Dr (mm)	Di (mm)	Do (mm)	Dh (mm)	Lo (mm)	L_1 (mm)	P_1 (N)	t (mm)
U093-0045-S	2.36	2.54	5.46	5.55	0.71	0.38	6.67	0.11
U093-0056-S	2.36	2.54	5.46	5.55	0.64	0.38	10.01	0.14
U125-0040-S	3.18	3.43	6.22	6.35	1.24	0.66	4.45	0.10
U125-0060-S	3.18	3.43	6.22	6.35	0.86	0.51	8.90	0.15
U125-0050-S	3.18	3.43	6.86	7.14	0.97	0.51	6.67	0.13
U125-0075-S	3.18	3.43	6.86	7.14	0.74	0.46	13.34	0.19
U125-0072-S	3.18	3.43	7.80	7.94	0.94	0.51	17.80	0.18
U125-0088-S	3.18	3.43	7.80	7.94	0.86	0.51	26.7	0.22
U138-0045-S	3.51	3.76	6.89	7.14	1.32	0.71	5.56	0.11
U138-0070-S	3.51	3.76	6.89	7.14	0.89	0.56	11.12	0.18
U138-0082-S	3.51	3.76	8.18	8.73	0.94	0.53	22.2	0.21
U138-0100-S	3.51	3.76	8.18	8.73	0.86	0.53	33.4	0.25
U164-0050-S	4.17	4.42	8.18	8.73	1.63	0.86	6.67	0.13
U164-0075-S	4.17	4.42	8.18	8.73	1.07	0.64	13.34	0.19
U164-0090-S	4.17	4.42	9.40	9.53	1.12	0.61	26.7	0.23
U164-0113	4.17	4.42	9.40	9.53	0.99	0.61	40.0	0.29
U164-0113-S	4.17	4.42	9.40	9.53	0.99	0.61	40.0	0.29
U190-0050-S	4.83	5.16	8.18	8.73	1.35	0.66	4.98	0.13
U190-0065-S	4.83	5.16	8.18	8.73	1.09	0.64	7.79	0.17
U190-0060-S	4.83	5.08	9.40	9.53	1.75	0.89	10.01	0.15
U190-0090-S	4.83	5.08	9.40	9.53	1.19	0.71	20.0	0.23
U190-0113	4.83	5.08	10.74	11.11	1.19	0.69	40.0	0.29
U190-0113-S	4.83	5.08	10.74	11.11	1.19	0.69	40.0	0.29
U190-0140	4.83	5.08	10.74	11.11	1.09	0.69	60.1	0.36
U216-0065-S	5.49	5.87	10.74	11.11	2.06	1.07	11.12	0.17
U216-0100-S	5.49	5.87	10.74	11.11	1.35	0.81	22.2	0.25
U216-0120	5.49	5.87	12.45	12.70	1.45	0.81	44.5	0.30
U216-0150	5.49	5.87	12.45	12.70	1.27	0.81	66.7	0.38
U250-0065-S	6.35	6.83	10.74	11.11	1.78	0.94	7.78	0.17
U250-0082-S	6.35	6.83	10.74	11.11	1.40	0.81	11.12	0.21
U250-0075-S	6.35	6.73	12.45	12.70	2.31	1.17	15.57	0.19
U250-0110	6.35	6.73	12.45	12.70	1.60	0.86	31.1	0.28
U250-0110-S	6.35	6.73	12.45	12.70	1.60	0.86	31.1	0.28
U250-0145	6.35	6.73	14.00	14.29	1.52	0.86	62.3	0.37
U250-0185	6.35	6.73	14.00	14.29	1.32	0.86	93.4	0.47
U250-0185-S	6.35	6.73	14.00	14.29	1.32	0.86	93.4	0.47
U281-0085-S	7.14	7.52	14.00	14.29	2.57	1.40	17.80	0.22
U281-0120	7.14	7.52	14.00	14.29	1.78	0.97	35.6	0.30
U312-0075-S	7.92	8.41	12.45	12.70	1.96	1.04	10.01	0.19
U312-0110	7.92	8.41	12.45	12.70	1.57	0.89	20.0	0.28
U312-0110-S	7.92	8.41	12.45	12.70	1.57	0.89	20.0	0.28
U312-0090-S	7.92	8.31	15.54	15.88	2.87	1.52	20.0	0.23
U312-0130	7.92	8.31	15.54	15.88	1.96	1.07	40.0	0.33
U312-0130-S	7.92	8.31	15.54	15.88	1.96	1.07	40.0	0.33
U312-0170	7.92	8.31	18.67	19.05	1.93	1.17	66.7	0.43
U312-0210	7.92	8.31	18.67	19.05	1.78	1.14	100.1	0.53
U343-0100-S	8.71	9.22	17.07	17.46	3.05	1.60	24.5	0.25
U343-0150	8.71	9.22	17.07	17.46	2.06	1.19	48.9	0.38
U375-0090-S	9.53	10.16	15.45	15.88	2.49	1.42	13.34	0.23
U375-0130	9.53	10.16	15.45	15.88	1.88	1.09	26.7	0.33
U375-0100-S	9.53	10.16	17.07	17.46	2.92	1.50	20.0	0.25
U375-0150	9.53	10.16	17.07	17.46	2.01	1.17	40.0	0.38
U375-0110	9.53	10.03	18.67	19.05	3.28	1.85	26.7	0.28
U375-0110-S	9.53	10.03	18.67	19.05	3.28	1.85	26.7	0.28
U375-0160	9.53	10.03	18.67	19.05	2.18	1.27	53.4	0.41
U375-0160-S	9.53	10.03	18.67	19.05	2.18	1.27	53.4	0.41
U437-0100-S	11.10	11.86	17.07	17.46	2.92	1.52	16.68	0.25
U437-0150	11.10	11.86	17.07	17.45	2.13	1.14	33.4	0.38
U437-0150-S	11.10	11.86	17.07	17.45	2.13	1.14	33.4	0.38
U437-0120	11.10	11.73	21.77	22.23	3.86	2.01	33.4	0.30
U437-0180	11.10	11.73	21.77	22.23	2.54	1.45	66.7	0.46
U437-0180-S	11.10	11.73	21.77	22.23	2.54	1.45	66.7	0.46
U437-0210	11.10	11.73	24.89	24.89	2.72	1.55	100.1	0.53
U500-0113	12.70	13.48	20.20	20.64	3.28	1.75	22.2	0.29
U500-0170	12.70	13.48	20.20	20.64	2.49	1.37	44.5	0.43
U500-0140	12.70	13.34	24.89	24.89	4.17	2.11	44.5	0.36
U500-0180	12.70	13.34	24.89	24.89	3.33	1.85	66.7	0.46
U500-0210	12.70	13.34	24.89	24.89	2.79	1.60	89.0	0.53
U500-0210-S	12.70	13.34	24.89	24.89	2.79	1.60	89.0	0.53
U500-0211	12.70	13.34	31.12	31.12	3.84	2.16	111.2	0.53
U562-0120-S	14.27	15.19	21.77	22.23	3.68	1.88	24.5	0.30

CURVED SPRING WASHERS								
Part Number	**Dr (mm)**	**Di (mm)**	**Do (mm)**	**Dh (mm)**	**Lo (mm)**	**L_1 (mm)**	**P_1 (N)**	**t (mm)**
U562-0180	14.27	15.19	21.77	22.23	2.79	1.50	48.9	0.46
U562-0180-S	14.27	15.19	21.77	22.23	2.79	1.50	48.9	0.46
U625-0140	15.88	16.84	24.89	24.89	4.29	2.34	31.1	0.36
U625-0210	15.88	16.84	24.89	24.89	3.00	1.70	62.3	0.53
U750-0160	19.05	20.32	28.02	28.58	4.70	2.49	35.6	0.41
U750-0210	19.05	20.32	28.02	28.58	3.51	1.75	53.4	0.53
U750-0210-S	19.05	20.32	28.02	28.58	3.51	1.75	53.4	0.53

UK

WAVE SPRING WASHERS

Wave spring washers are normally used in thrust-loading applications for small deflections, particularly where radial space is limited. A typical example is the axial loading of ball bearings.

The rate is approximately linear between 20% and 80% of available deflection.

MATERIAL
Stainless steel (parts with suffix 'R' or 'S')
Commercial – Type 302
Government per AMS 5906 (chemical only) – Type 302

High Carbon Steel
Part W0367-006 to W0855-010
Commercial – 1074-1095 certified to ASTM-A684
Part W0925-010 to W7325-065
Commercial – 1074-1095 certified to ASTM-A684

FINISH
Washers carried in stock are in plain finish suitable for various types of finishes: either with electroplated or mechanically plated, a process which reduces the possibility of hydrogen embrittlement.

KEY TO DIMENSIONS
*Do = Outside Diameter
*Di = Inside Diameter
t = Thickness
Lo = Free Height (ref only)
L_1 = Loaded Height
P_1 = Load at flat (Pf)

*Blank size before forming

F

RONDELLES ONDULEES

Fabriquées en acier à haute teneur en carbone, les rondelles ondulées SPEC sont spécialement utilisées pour compenser une charge axiale sous une déflexion minimale, surtout si l'espace radial est limité. L'exemple type est celui du chargement axial d'un roulement à billes.

Leur raideur est pratiquement linéaire entre 10% et 80% de la course disponible.

MATÉRIAU
Acier Inoxydable (refs. Avec le suffixe 'R' ou 'S')
Commercial – Type 302 – AMS 5906 (chimique uniquement).

Acier à haute teneur en Carbone
Ref. W0367-006 à W0855-010:
Commercial – 1074-1095 selon ASTM-A684
Ref. W0925-010 à W7325-065:
Commercial – 1074-1095 selon ASTM-A684

FINITION
Les rondelles tenues en stock ont une finition brute mais des traitements de surface sont possibles : placage électrolytique ou mécanique pour prévenir les risques de fragilisation par hydrogène.

INDEX DES MESURES
*Do = Diamètre extérieur
*Di = Diamètre intérieur
t = Epaisseur
Lo = Hauteur libre (pour référence)
L_1 = Hauteur en charge
P_1 = Charge à plat (approx.)

*Dimensions avant mise en forme

E

ARANDELAS ELASTICAS ONDULADAS

Fabricadas en acero alto en carbono, las arandelas elásticas onduladas se utilizan habitualmente en aplicaciones con cargas axiales para pequeñas deflexiones, especialmente donde el espacio radial es limitado. Un ejemplo típico es la carga axial en rodamientos a bolas.

El coeficiente de compresión es aproximadamente lineal entre el 10% y el 80% de la deflexión.

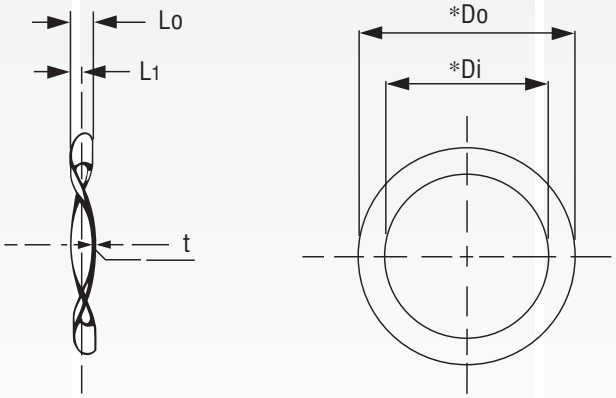
MATERIAL
Acero inoxidable (referencia con sufijo "R" ó "S")
Comercial – Tipo 302
Gubernamental según AMS 5906 (solo químico) – Tipo 302

Acero al carbono:
Referencia W0367-006 a W0855-010
Comercial – 1074-1095 según ASTM-A684
Referencia W0925-010 a W7325-065
Comercial – 1074-1095 según ASTM-A684

ACABADO
Bajo pedido, las arandelas de acero alto en carbono se pueden tratar electromecánicamente o mecánicamente, un proceso que reduce de forma substancial la posibilidad de la fisuras por absorción de hidrógeno.

CLAVES DE CARACTERÍSTICAS
*Do = Diámetro externo
*Di = Diámetro interno
t = Espesor
Lo = Altura libre (referencia sólo)
L_1 = Altura de carga
P_1 = Carga a posición plana (Pf)

*Dimensiones antes de carga



D

GEWELLTE FEDERSCHEIBEN

Gewellte Federscheiben werden normalerweise bei Anwendungen mit Längskräfte für kurze Federwegen verwendet, besonders wo Radialplatz eng ist. Ein gutes Beispiel ist die Längskräfte bei Kugellagern.

Die Federrate ist lineal zwischen 10% und 80% des Federwegs.

WERKSTOFFE
Rostfreierstahl (Bestellnummer mit “R” oder “S” Nachbuchstabe)
Commercial – Type 302
Government nach AMS 5906 (nur chemisch) – Type 302

Kohlenstoffstahl
Bestellnummer W0367-006 bis W0855-010
Commercial – 1774-1095 nach ASTM-A684
Bestellnummer W0925-010 bis W7325-065
Commercial – 1774-1095 nach ASTM-A684

OBERFLÄCHE
Gewöhnlich Oberfläche ist Standard. Als Sonderbestellung, könnten die Federscheiben mechanisch oder elektromechanisch besichtet werden, wobei, die Wasserstoffversprödung erheblich reduziert wird.

KENNZEICHNEN DER ABMESSUNGEN
*Do = Äußerer Durchmesser
*Di = Innerer Durchmesser
t = Materialdicke
Lo = Unbelastete Länge (approx.)
L_1 = Länge der belasteten Tellerfeder
P_1 = Federkraft bei flacher Stellung (Pf)

* Durchmesser vor Biegung

I

RONDELLE ONDULATE

Costruite in acciaio ad alto contenuto di carbonio, le rondelle ondulate sono ampiamente utilizzate per applicazioni di spinta con piccole deflessioni, particolarmente quando lo spazio radiale è limitato. Un tipico esempio è il carico assiale di un cuscinetto a sfera.

Il carico è approssimativamente lineare fra il 20% e l’80% della deflessione

MATERIALE
Acciaio inox (codici con suffisso ‘R’ o ‘S’)
Commercial –Type 302 per AMS 5906
Governativo pae AMS 5906 – Tipo 302

Acciaio ad alto contenuto di carbonio
Codici da W0367-006 a W0855-010
Commerciale – 1074-1095 certificato per ASTM-A684
Codici da W0925-010 a W7325-065
Commerciale – 1074-1095 certificato per ASTM-A684

FINITURA
Le rondelle disponibili a magazzino sono grezze. Sono fornibili con varie finiture su richiesta.

LEGENDA
*Do = Diametro esterno
*Di = Diametro interno
t = Spessore
Lo = Altezza libera (solo riferimento)
L_1 = Altezza in carico
P_1 = Carico a pacco (Pf) (approssimativo)

*molla a riposo

P

ANILHAS DE MOLA ONDULADAS

Fabricadas em aço com um elevado teor de carbono, as anilhas de mola onduladas da SPEC, utilizam-se habitualmente em aplicações de compensação de folga axial com pequenas deflexões, em especial em situações em que o espaço radial é limitado. Um exemplo típico é o da carga axial de rolamentos de esferas.

A taxa linear esta entre 10% a 80% de deeflexão

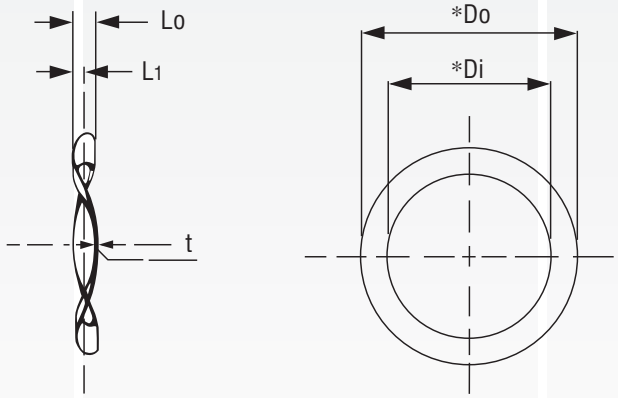
MATERIAL
Aço Inoxidavel (peças com sufixo ‘R’ ou ‘S’)
Comercial – Tipo 302
Oficial AMS 5906 (para produtos Quimicos) – Tipo 302

Aço alto carbono
De W0367-006 a W0855-010
Comercial – 1074-1095 certificado to ASTM-A684
De W0925-010 a W7325-065
Comercial – 1074-1095 certificado a ASTM-A684

ACABAMENTO
Anilhas em estoque são de acabamento pleno e servem para varios tipos de acabados: podem ser Folheados eletricamente ou mecanicamente , processo este que reduz desgaste prematuro.

LEGENDA
*Do = Diâmetro exterior
*Di = Diâmetro interior
t = Espessura
Lo = Altura livre (só para efeitos de referência)
L_1 = Altura em carga
P_1 = Carga a L_1

*Espaço em branco antes da dobra



STOCK WAVE SPRING WASHERS

Part Number	Equivalent Part Number	Do (mm)	Di (mm)	t (mm)	Lo (mm)	L_1 (mm)	P_1 (mm)
W61300R	W0183-004-S	4.65	3.40	0.09	0.58	0.30	1.1-2.2
W61310R	W0242-006-S	6.15	4.93	0.14	0.76	0.38	2.2-4.4
W61320R	W0305-007-S	7.75	6.17	0.17	0.76	0.38	2.2-4.4
W61330	W0367-006	9.32	6.73	0.15	0.76	0.38	9-18
W61340R	W0367-006-S	9.32	6.73	0.15	0.76	0.38	9-18
W61350	W0484-009	12.29	10.08	0.23	0.74	0.51	13-22
W61360	W0492-007	12.50	8.89	0.18	0.89	0.51	13-22
W61370R	W0492-007-S	12.50	8.89	0.18	0.89	0.51	13-22
W61380	W0608-008	15.44	11.66	0.20	0.94	0.64	13-22
W61380R	W0608-008-S	15.44	11.66	0.20	0.94	0.64	13-22
W61390	W0618-008	15.70	11.18	0.20	1.02	0.64	13-22
W61400R	W0618-008-S	15.70	11.18	0.20	1.02	0.64	13-22
W61410	W0731-009	18.57	14.94	0.23	1.19	0.76	13-22
W61420	W0734-009	18.64	13.49	0.23	1.27	0.76	18-31
W61430R	W0734-009-S	18.64	13.49	0.23	1.27	0.76	18-31
W61440	W0855-010	21.72	16.51	0.25	1.52	0.76	18-31
W61450R	W0855-010-S	21.72	16.51	0.25	1.52	0.76	18-31
W61460	W0925-010	23.50	18.26	0.25	1.68	0.84	27-40
W61460R	W0925-010-S	23.50	18.26	0.25	1.68	0.84	27-40
W61470	W1004-011	25.50	19.81	0.27	1.80	0.89	31-45
W61470R	W1004-011-S	25.50	19.81	0.27	1.80	0.89	31-45
W61480	W1080-012	27.43	21.31	0.29	1.85	0.91	36-53
W61490	W1102-012	27.99	21.74	0.30	1.91	0.94	40-58
W61500	W1159-013	29.44	22.89	0.33	2.03	1.02	44-62
W61510	W1235-014	31.37	24.41	0.36	2.21	1.09	53-80
W61520	W1351-015	34.32	26.70	0.38	2.51	1.24	67-93
W61520R	W1351-015-S	34.32	26.70	0.38	2.51	1.24	62-89
W61530	W1543-017	39.19	30.51	0.43	2.67	1.32	76-111
W61540	W1543-020	39.19	30.51	0.51	3.18	1.57	111-165
W61550	W1593-018	40.46	31.47	0.46	2.79	1.40	89-125
W61560	W1621-019	41.17	32.03	0.47	2.84	1.42	93-133
W61570	W1819-020	46.20	35.66	0.51	3.18	1.57	111-156
W61580	W2026-022	51.51	40.01	0.56	3.56	1.75	129-182
W61590	W2132-023	54.15	42.11	0.58	3.76	1.85	138-200
W61600	W2420-025	61.47	47.55	0.64	4.27	2.08	165-236
W61610	W2645-028	67.18	52.25	0.71	4.67	2.29	209-298
W61620	W2816-030	71.53	55.88	0.76	5.00	2.46	236-343
W61630	W3118-035	79.20	61.47	0.89	5.26	2.64	320-463
W61640	W3328-036	84.53	66.12	0.91	5.77	2.84	329-472
W61650	W3519-038	89.38	69.60	0.97	5.94	2.95	365-525
W61660	W3917-042	99.49	77.39	1.07	6.55	3.25	436-632
W61670	W4300-045	109.22	85.60	1.14	7.67	3.76	512-734
W61680	W4627-047	117.53	91.74	1.19	8.48	4.11	578-836
W61690	W4997-050	126.92	98.81	1.27	9.02	4.37	645-930
W61700	W5408-053	137.36	106.88	1.35	9.86	4.75	721-1032
W61710	W5817-055	147.75	115.06	1.40	11.18	5.31	792-1139
W61720	W6173-058	156.79	122.00	1.47	11.76	5.59	872-1254
W61730	W6550-061	166.37	130.05	1.55	12.60	5.97	930-1339
W61740	W6945-063	176.40	137.36	1.60	13.67	6.43	1028-1481
W61750	W7325-065	186.06	144.07	1.65	14.61	6.83	1112-1601

UK

WAVE SPRING WASHERS - COMPRESSION TYPE

Compression type wave washers are normally used in thrust loading applications for medium deflections. These washers have a higher free height and load than precision wave washers (as above). During initial installation the compression washers will take a slight set. Subsequent set after initial is minimal.

MATERIAL
AISI 1070 Carbon steel

FINISH
Washers carried in stock are in plain finish suitable for various types of finishes: either electroplated or mechanically plated, a process which reduces the possibility of hydrogen embrittlement.

KEY TO DIMENSIONS
Db = Ball bearing Diameter
*Do = Outside Diameter
*Di = Inside Diameter
t = Thickness
Lo = Free Height (ref only)
L_1 = Loaded height
R = N/mm
Pf = Load at flat (approx)
Wx = Number of waves

*Blank size before forming

F

RONDELLES ONDULEES – TYPE COMPRESSION

Ce type de rondelles ondulées est habituellement utilisé pour des applications de charges axiales à déflections moyennes. Ces rondelles ont une hauteur libre et une charge plus élevées que pour les rondelles ondulées de précision. Pendant l'installation initiale, les rondelles perdent légèrement de la hauteur. Par la suite, la perte est minimale.

MATERIAU
Acier au Carbone – AISI 1070

FINITION
Les rondelles tenues en stock ont une finition brute mais des traitements de surface sont possibles : placage électrolytique ou mécanique pour prévenir les risques de fragilisation par hydrogène.

INDEX DES MESURES
Db = Diamètre du roulement à billes
*Do = Diamètre extérieur
*Di = Diamètre intérieur
t = Epaisseur
Lo = Hauteur libre (pour référence)
L_1 = Hauteur en charge
R = N/mm
Pf = Charge à plat (approx.)
Wx = Nombre d'ondulations

*Dimensions avant mise en forme

E

ARANDELAS ONDULADAS DE COMPRESIÓN

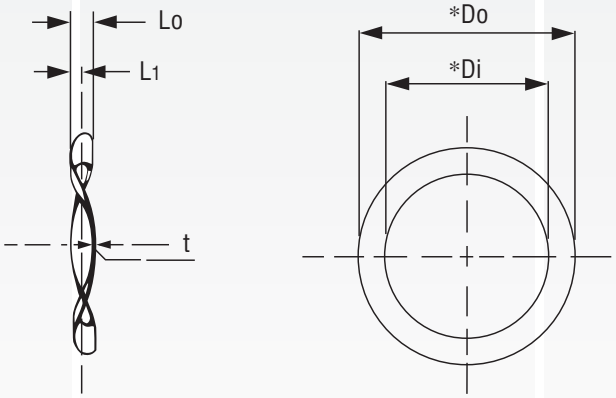
Los arandelas onduladas de compresión se utilizan habitualmente en aplicaciones con fuerzas axiales en deflexiones medias. Estas arandelas proporcionan una altura libre y una fuerza mayores que las arandelas onduladas normales (ver sección). Durante la instalación inicial, las arandelas de compresión sufrirán una pequeña pérdida de altura. Posteriormente a este montaje inicial, la pérdida de altura es mínima.

MATERIAL
Acero al carbono según AISI 1070

ACABADO
Las arandelas disponibles en stock pueden suministrarse con acabado electromecánico o mecánico bajo pedido, un proceso que reduce la posibilidad de fisuras por hidrógeno.

CLAVES DE CARACTERÍSTICAS
Db = Diámetro del rodamiento a bolas
*Do = Diámetro externo
*Di = Diámetro interno
t = Espesor
Lo = Altura libre (referencia sólo)
R = N/mm
L_1 = Altura cargada
Pf = Carga a deflexión (aprox.)
Wx = Número de olas

*Dimensiones antes de carga



D

GEWELLTE DRUCKFEDERSCHEIBEN

Gewellte Druckfederscheiben werden normalerweise bei Anwendungen mit Längskräfte für mittel Federwegen verwendet. Sie bieten eine grossere unbelastete Länge und Kraft als gewöhnte gewellte Federscheiben an (siehe oben). Am Anfang werden die Druckfederscheiben leicht gesetz. Danach, die Setzung bleibt minimal.

WERKSTOFFE
Kohlenstoffstahl nach AISI1070

OBERFLÄCHE
Gewöhnlich Oberfläche ist Standard. Als Sonderbestellung, könnten die Federscheiben mechanisch oder elektromechanisch besichtet werden, wobei, die Wasserstoffversprödung erheblich reduziert wird.

KENNZEICHNEN DER ABMESSUNGEN
Db = Kugellager-Durchmesser
*Do = Äußerer Durchmesser
*Di = Innerer Durchmesser
t = Materialdicke
Lo = Unbelastete Länge (approx.)
R = N/mm
L_1 = Belastete Länge
Pf = Federkraft bei Federlänge (approx.)
Wx = Anzahl der Wellen

* Durchmesser vor Biegung

I

RONDELLE ONDULATE – ANELLI DI COMPENSAZIONE

Questo tipo di rondella ondulata è normalmente utilizzata in applicazioni dove il carico viene applicato ad una media deflessione. Hanno un altezza libera ed un carico maggiore rispetto alle normali rondelle ondulate. Durante i primi cicli queste rondelle si assestano leggermente, successivamente l'assestamento sarà minimo.

MATERIALE
AISI 1070 Acciaio al carbonio

FINITURA
Le rondelle disponibili a magazzino sono grezze. Sono fornibili con varie finiture su richiesta.

LEGENDA
Db = Diametro del cuscinetto a sfera
*Do = Diametro esterno
*Di = Diametro interno
t = Spessore
Lo = Altezza libera (solo riferimento)
R = N/mm
L_1 = Altezza in carico
Pf = Carico a pacco (approssimativo)
Wx = Numero di onde

*molla a riposo

P

ANILHAS ONDULADAS DO TIPO COMPRESSÃO

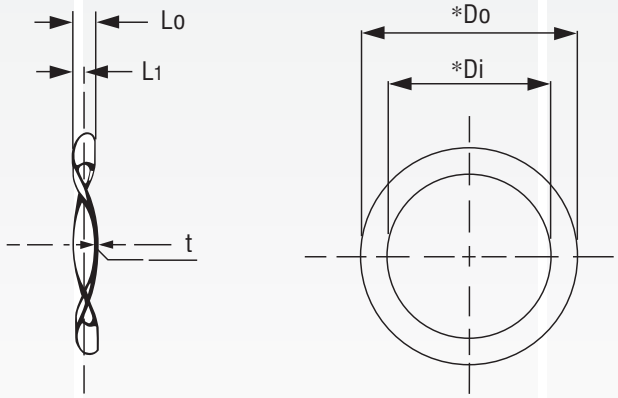
As Anilhas de onduladas de compressão são para aplicações de deflexão media. Essa anilhas teem Uma altura livre e carga maiores das anilhas de precisão. Durante a instalaçõa inicial, as anilhas terão um ajuste mais apertado , depois da instalação, terá um mínimo de diferença.

MATERIAL
AISI 1070 Aço Carbono.

ACABAMENTO
As anilhas em estoque tem acabamento pleno : podem ser folhados eletricamente ou mecanicamente , este processo diminuem a possibilidade de fragilização.

LEGENDA
Db = Diâmetro do Rolamento
*Do = Diâmetro Externo
*Di = Diâmetro Interno
t = Espessura
Lo = Altura livre (só para efeitos de referência)
R = N/mm
L_1 = Carga de trabalho
Pf = Carga maxima (approx)
Wx = Numero de ondas

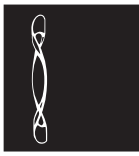
*Espaço vazio antes da dobra



STOCK WAVE SPRING WASHERS – COMPRESSION TYPE

Part Number	Db (mm)	Do (mm)	Di (mm)	t (mm)	Lo (mm)	R (N/mm)	Pf (N)	Wx
W0386-008	10	9.8	6.2	0.20	1.2	23.9	23.9	3
W0472-008	13	12.0	7.2	0.20	1.4	127.5	196.1	3
W0622-006	16	15.8	10.5	0.15	1.4	127.5	166.7	3
W0622-012	16	15.8	10.5	0.30	1.5	230.5	343.2	3
W0669-012	18	17.0	12.0	0.30	1.5	117.7	156.9	3
W0740-008	19	18.8	13.2	0.20	1.6	63.7	245.2	3
W0740-012	19	18.8	11.4	0.30	1.6	294.2	490.3	3
W0858-008	22	21.8	15.8	0.20	2.5	29.4	392.3	3
W0858-008A	22	21.8	15.8	0.20	1.6	44.1	112.8	3
W0858-010	22	21.8	15.8	0.25	3.0	29.4	147.1	3
W0858-012	22	21.8	14.0	0.30	1.6	147.1	343.2	3
W0858-012A	22	21.8	15.8	0.30	2.35	39.2	392.3	3
W0937-008	24	23.8	17.5	0.20	1.7	34.3	117.7	3
W0937-012	24	23.8	17.5	0.30	1.7	98.1	181.4	3
W1016-012	26	25.8	19.3	0.30	1.7	78.5	176.5	3
W1016-020	26	25.8	19.3	0.50	1.7	294.2	451.1	3
W1094-012	28	27.8	21.0	0.30	1.7	53.9	107.9	3
W1094-012F	28	27.8	20.0	0.30	3.0	53.9	176.5	3
W1094-020	28	27.8	21.0	0.50	1.7	294.2	539.4	3
W1169-008	30	29.7	22.5	0.20	1.7	16.7	39.2	3
W1169-012	30	29.7	22.5	0.30	1.8	53.9	127.5	3
W1169-016	30	29.7	22.5	0.40	1.6	191.2	259.9	3
W1169-020	30	29.7	22.5	0.50	2.0	230.5	559.0	3
W1220-012	32	31	26.5	0.30	2.7	24.5	147.1	3
W1220-016	32	31.0	26.5	0.40	2.0	49.0	205.9	3
W1248-014	32	31.7	24.5	0.35	2.2	53.9	255.0	3
W1248-016	32	31.7	26.5	0.40	2.0	44.1	166.7	3
W1248-020	32	31.7	26.5	0.50	2.4	98.1	382.5	3
W1252-012	32	31.8	23.0	0.30	3.5	53.9	215.7	3
W1358-016	35	34.5	28.0	0.40	3.0	58.8	539.4	3
W1358-016F	35	34.5	28.3	0.40	4.0	44.1	441.3	3
W1358-020	35	34.5	24.5	0.50	2.5	588.4	1176.8	4
W1358-020B	35	34.5	28.0	0.50	3.0	103.0	539.4	3
W1374-012	35	34.9	25.0	0.30	2.0	166.7	382.5	4
W1437-012	37	36.5	30.2	0.30	2.5	53.9	147.1	4
W1437-020	37	36.5	30.2	0.50	2.5	147.1	490.3	4
W1539-016	40	39.1	33.0	0.40	2.7	107.9	343.2	4
W1539-020	40	39.1	33.0	0.50	3.0	156.9	637.4	4
W1539-020A	40	39.1	33.0	0.50	4.0	186.3	666.9	4
W1567-012	40	39.8	33.3	0.30	3.0	44.1	225.6	4
W1567-016	40	39.8	30.0	0.40	5.0	49.0	431.5	3
W1575-020	42	40.0	30.0	0.50	3.0	205.9	676.7	4
W1614-014	42	41.0	34.5	0.35	3.0	58.8	255.0	4
W1772-020F	47	45.0	37.0	0.50	3.0	250.1	706.1	5
W1772-020	47	45	37	0.50	3.0	147.1	637.4	4
W1831-016	47	46.5	40.0	0.40	3.0	68.6	333.4	4
W1831-020	47	46.5	40	0.50	3.0	137.3	539.4	4
W1846-020	47	46.9	37.0	0.50	2.0	235.4	843.4	4
W2008-016	52	51	42	0.40	3.5	132.4	701.2	4
W2008-016H	52	51	44	0.40	3.5	53.9	343.2	4
W2008-020	52	51	42	0.50	3.5	210.8	1274.9	5
W2039-016G	52	51.8	41	0.40	4.0	98.1	637.4	4
W2039-016	52	51.8	41	0.40	2.0	83.4	181.4	4
W2039-020E	52	51.8	41	0.50	3.5	323.6	931.6	5
W2039-020	52	51.8	41	0.50	2.0	127.5	225.6	4
W2157-020	55	54.8	46.9	0.50	2.0	49.0	323.6	4
W2157-020A	55	54.8	46.9	0.50	3.5	68.6	353.0	4
W2244-020	58	57	48	0.50	3.5	156.9	490.3	4
W2402-016	62	61	51	0.40	3.5	127.5	372.7	4
W2402-020	62	61	51	0.50	3.5	313.8	931.6	5
W2402-020A	62	61	51	0.50	4.0	98.1	559.0	4
W2402-024	62	61	51	0.60	3.5	313.8	1274.9	5
W2437-020	62	61.9	50	0.50	4.0	137.3	1127.8	4
W2476-016	62	62.9	54.2	0.40	3.7	58.8	343.2	4
W2657-024	68	67.5	55	0.60	4.0	147.1	657.0	4
W2795-016	72	71	61	0.40	3.5	83.4	323.6	5
W2795-020A	72	71	61	0.50	4.0	58.8	367.7	4
W2795-020	72	71	61	0.50	3.5	122.6	559.0	5
W2795-031	72	71	61	0.80	4.0	509.9	1716.2	5
W2827-024	72	71.8	58	0.60	4.0	166.7	686.5	4
W2945-024	75	74.8	66	0.60	4.0	73.5	343.2	4

STOCK WAVE SPRING WASHERS – COMPRESSION TYPE								
Part Number	**Db (mm)**	**Do (mm)**	**Di (mm)**	**t (mm)**	**Lo (mm)**	**R (N/mm)**	**Pf (N)**	**Wx**
W3110-020	80	79	71	0.50	3.5	68.6	255.0	5
W3110-024	80	79	71	0.60	3.5	264.8	863.0	6
W3110-031	80	79	71	0.80	4.0	509.9	1716.2	6
W3142-028	80	79.8	64	0.70	4.0	255.0	980.7	4
W3307-020	85	84	74	0.50	3.6	73.5	323.6	5
W3307-024	85	84	74	0.60	3.5	279.5	1078.7	6
W3504-020	90	89	79	0.50	3.5	156.9	539.4	6
W3504-024	90	89	79	0.60	3.5	245.2	764.9	6
W3535-031	90	89.8	72	0.80	4.0	333.4	1323.9	4
W3898-020	100	99	89	0.50	4.0	98.1	451.1	6
W3898-024	100	99	89	0.60	3.5	196.1	647.2	6
W3929-035	100	99.8	82	0.90	4.0	343.2	1078.7	4
W4291-020	110	109	99	0.50	4.5	147.1	637.4	7
W4291-024	110	109	99	0.60	4.5	230.5	1147.4	7
W4291-028	110	109	99	0.70	4.5	323.6	1667.1	7
W4291-039	110	109	90	1.00	4.0	220.6	1225.8	4
W4685-031	120	119	104	0.80	4.0	480.5	1716.2	6
W4921-031	125	125	109	0.80	4.0	441.3	1471.0	6
W5079-031	130	129	110	0.80	4.0	441.3	1471.0	6
W5472-035	140	139	121	0.90	4.0	421.7	1569.1	6
W5866-035	150	149	126	0.90	4.0	490.3	1471.0	6
W6260-039	160	159	137	1.00	4.0	402.1	1618.1	6
W6654-039	170	169	147	1.00	4.0	568.8	1716.2	6



UK

MULTIWAVE COMPRESSION SPRINGS

Multiwave springs replace conventional round wire springs when space is critical; they will occupy only 1/3 to 1/2 of the compressed height space of a traditional round wire spring, while providing more deflection with the same load specifications.

SPEC Multiwave springs should be used for all applications requiring tight load deflection specifications where axial space is critical.

Unique manufacturing where a single filament of round edged, pre-tempered flat wire is used to form the springs from a continuous coil. This results in uniform diameters and wave heights.

MATERIAL
Stainless steel commercial type 17-7 PH (slightly magnetic).
Maximum application temperature is 650ºF (340ºC)

FINISH
Plain finish is standard

KEY TO DIMENSIONS
Dh = Hole Size
Dr = Shaft Size
t = Thickness
Lo = Free Height (ref only)
L_1 = Loaded height
N = Nominal load
R = Rate
F = Force
D = Deflection

F

RESSORTS DE COMPRESSION MULTIWAVE

Les ressorts Multiwave remplacent les ressorts de compression conventionnels quand l'encombrement est critique : ils occupent du tiers à la moitié de la place prise par un ressort comprimé, pour une course supérieure et une charge similaire.

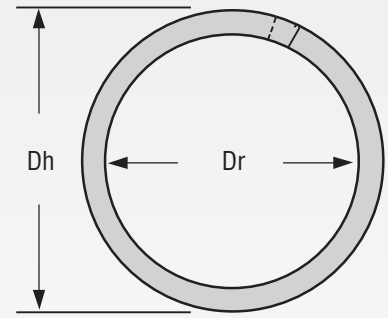
Les ressorts Multiwave SPEC doivent être utilisés pour les applications où le rapport course / encombrement est important.

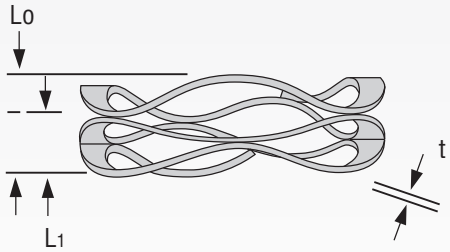
Le procédé de fabrication unique consiste en un filament de fil plat aux bords arrondis, pré-trempé, puis enroulé en continu. Il en résulte des diamètres et des hauteurs de vague uniformes.

MATERIAU
Acier inoxydable commercial type 17-7PH (légèrement magnétique).
Température maximum d'application : 340°C.

FINITION
Finition brute.

INDEX DES MESURES
Dh = Taille de logement
Dr = Taille d'axe
t = Epaisseur
Lo = Hauteur libre (pour référence)
L_1 = Hauteur en charge
N = Charge nominale
R = Raideur
F = Force
D = Déflexion





E

MUELLES/RESORTES DE COMPRESION ONDULADO

Los muelles/resortes de compresión ondulados reemplazan a los muelles/resortes convencionales de alambre de redondo allí donde el espacio es crítico; ocuparían solamente un tercio o la mitad de la altura comprimida de los muelles/resortes tradicionales de hilo redondo, mientras que proporcionan más recorrido con la misma carga.

Los muelles de compresión ondulado SPEC son idóneos en aquellas aplicaciones en donde se necesiten significativos ratios de carga/deflexión en espacios reducidos.

Partiendo de un fleje en acero para muelles/resortes con esquinas redondeadas y templado se fabrican estos muelles de compresión ondulados. Como resultado se obtiene un muelle/resorte con diámetros y altura de ondas uniformes.

MATERIALES
Acero inoxidable. Comercial tipo 17-7 PH (ligeramente magnético).
Temperatura máxima de trabajo 340º.

ACABADO
El acabado es el original del material.

CLAVES DE CARACTERÍSTICAS
Dh = Diámetro alojamiento
Dr = Diámetro eje
t = Espesor
Lo = Longitud libre (sólo de referencia)
L_1 = Longitud cargada
N = Carga
R = Coeficiente carga
F = Fuerza
D = Deflection

D

FEDERSCHEIBE MULTIGEWELLT

Die Federscheiben multigewellt ersetzen Druckfedern mit runden Querschnitten wenn die Bauhöhe begrenzt ist. Diese Feder hat eine 1/3-1/2 kleiner Blocklänge im Verhältnis zur Spiralfeder mit rundem Querschnitt bei linearem Kraft-Weg-Verlauf.

Alle Anwendungen mit leichten Belastungen bei kleinsten Bauräumen

Aus einem Flachdraht gefertigt
Ein an den Kanten abgerundeter, wärmebehandelter Flachdraht wird kontinuierlich zur einer Feder gewickelt mit gleichförmigen Wellen und Wellenhöhen.

WERKSTOFF
Rostfreier Federstahl Type Commercial Type 17-7 PH (leicht magnetisch)

Maximale Einsatztemperatur 340°C

OBERFLÄCHE
Mit glatter Oberfläche geliefert

KENNZEICHNEN DER ABMESSUNGEN
Dh = Hülsendurchmesser
Dr =Borndurchmesser
t = Materialdicke
Lo = Länge der unbelasteten Feder (approx.)
L_1 = Länge der belasteten Feder
N = Federkraft
R = Federrate
F = Kraft
D = Federweg

I

MOLLE A COMPRESSIONE MULTIWAVE

Le molle a compressione Multiwave sostituiscono le convenzionali molle a filo quando lo spazio è critico poiché occupano solo 1/3 o metà di una molla a filo compressa, assicurano una maggiore deflessione con le stesse specifiche di carico.

Le Multiwave dovrebbero essere utilizzate per tutte le applicazioni dove lo spazio di lavoro è ridotto.

Partendo da un unico nastro in acciaio temprato per molle si fabbrica questo tipo di molla ondulata. Come risultato si ottiene una molla con diametro e altezza delle onde uniforme.

MATERIALE
Acciaio inox commerciale tipo 17-7 PH (leggermente magnetico)

Massima temperatura 650°F (340°C)

FINITURA
Grezza

LEGENDA
Dh = Diametro sede
Dr = Diametro del perno
t = Spessore
Lo = Lunghezza libera (solo riferimento)
L_1 = Altezza in carico
N = Carico nominale
R = Rate
F = Forza
D = Deflessione

P

MOLAS DE COMPRESSÂO MULTI ONDULADAS

As molas multi onduladas substituem as molas convencionais em arame redondo, sempre que o espaço constitua um factor crítico; ocupam apenas entre 1/3 e 1/2 do espaço ocupado pelas molas de arame redondo comprimido, desenvolvendo maior deflexão com idênticas especificações de carga.

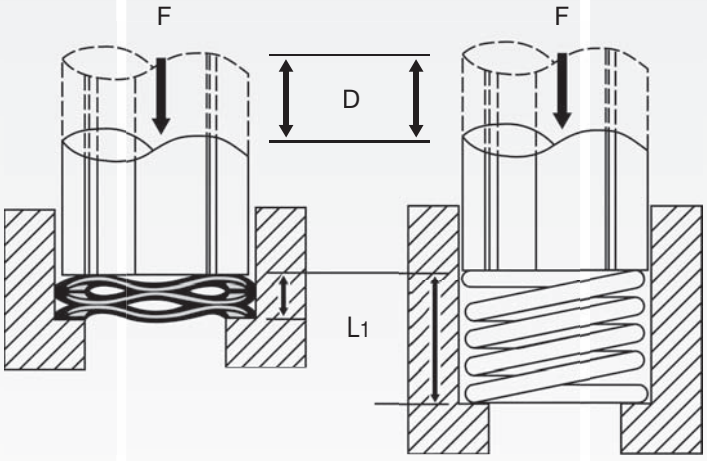
Todas as aplicações que carecem de especificações de deflexão e força rigorosas e em que o espaço constitua um factor crítico.

Utiliza-se um único filamento em aço com rebordo arredondado para formar a mola, a partir de um rolo de arame contínuo. Obtêm-se diâmetros uniformes e alturas em formato ondulado.

MATERIAL
Aço inoxidável.
Tipo Comercial 17-7 PH.
Este material é ligeiramente magnético e dispõe de um acabamento simples.
A temperatura de trabalho máxima é de 650 graus F. (340º C).

ACABAMENTO
O acabamento é simples

DIMENÇÕES
Dh = Furo
Dr = Haste
t = Espesura
Lo = Altura Livre (só para referencia)
L_1 = Carga
N = Carga Nominal
R = Taxa de compressão
F = Força
D = Deflexão



MULTIWAVE COMPRESSION SPRINGS

Part Number	Dh (mm)	Dr (mm)	t (mm)	Lo (mm)	L_1 (mm)	N (N)	R (N/mm)
MW0375-0150-04S	9.5	6.4	0.2	3.8	1.58	17.8	7.9
MW0375-0250-04S	9.5	6.4	0.2	6.4	2.74	17.8	4.9
MW0375-0350-04S	9.5	6.4	0.2	8.9	3.81	17.8	3.5
MW0375-0450-04S	9.5	6.4	0.2	11.4	4.95	17.8	2.8
MW0375-0150-07S	9.5	6.4	0.3	3.8	2.06	31.1	17.7
MW0375-0250-07S	9.5	6.4	0.3	6.4	3.68	31.1	11.7
MW0375-0350-07S	9.5	6.4	0.3	8.9	5.13	31.1	8.2
MW0375-0450-07S	9.5	6.4	0.3	11.4	6.66	31.1	6.5
MW0437-0165-04S	11.1	7.1	0.2	4.2	1.60	17.8	6.8
MW0437-0275-04S	11.1	7.1	0.2	7.0	2.77	17.8	4.2
MW0437-0385-04S	11.1	7.1	0.2	9.8	4.06	17.8	3.2
MW0437-0165-08S	11.1	7.1	0.3	4.2	2.08	35.6	16.8
MW0437-0275-08S	11.1	7.1	0.3	7.0	3.61	35.6	10.5
MW0437-0385-08S	11.1	7.1	0.3	9.8	5.03	35.6	7.5
MW0500-0180-05S	12.7	7.9	0.2	4.6	1.58	22.2	7.4
MW0500-0300-05S	12.7	7.9	0.2	7.6	2.72	22.2	4.6
MW0500-0420-05S	12.7	7.9	0.2	10.7	3.81	22.2	3.3
MW0500-0180-10S	12.7	7.9	0.3	4.6	1.65	44.5	15.2
MW0500-0300-10S	12.7	7.9	0.3	7.6	2.90	44.5	9.5
MW0500-0420-10S	12.7	7.9	0.3	10.7	4.12	44.5	6.8
MW0562-0195-05S	14.3	9.5	0.2	5.0	2.03	22.2	7.5
MW0562-0325-05S	14.3	9.5	0.2	8.3	3.43	22.2	4.6
MW0562-0455-05S	14.3	9.5	0.2	11.6	4.83	22.2	3.3
MW0562-0195-11S	14.3	9.5	0.3	5.0	2.18	48.9	17.7
MW0562-0325-11S	14.3	9.5	0.3	8.3	3.68	48.9	10.7
MW0562-0455-11S	14.3	9.5	0.3	11.6	5.31	48.9	7.9
MW0625-0180-06S	15.9	11.4	0.3	4.6	1.40	26.7	8.4
MW0625-0300-06S	15.9	11.4	0.3	7.6	2.16	26.7	4.9
MW0625-0420-06S	15.9	11.4	0.3	10.7	3.25	26.7	3.7
MW0625-0780-06S	15.9	11.4	0.3	19.8	6.05	26.7	1.9
MW0625-0180-12S	15.9	11.4	0.3	4.6	2.64	53.4	27.7
MW0625-0300-12S	15.9	11.4	0.3	7.6	4.45	53.4	16.8
MW0625-0420-12S	15.9	11.4	0.3	10.7	6.25	53.4	12.1
MW0625-0780-12S	15.9	11.4	0.3	19.8	11.53	53.4	6.5
MW0750-0250-07S	19.1	14.0	0.2	6.4	3.61	31.1	11.4
MW0750-0417-07S	19.1	14.0	0.2	10.6	6.25	31.1	7.2
MW0750-0250-13S	19.1	14.0	0.3	6.4	4.04	57.8	25.0
MW0750-0417-13S	19.1	14.0	0.3	10.6	6.86	57.8	15.4
MW0750-0250-22S	19.1	14.0	0.3	6.4	4.29	97.9	47.6
MW0750-0417-22S	19.1	14.0	0.3	10.6	7.39	97.9	30.6
MW0875-0250-12S	22.2	15.2	0.3	6.4	2.97	53.4	15.8
MW0875-0417-12S	22.2	15.2	0.3	10.6	5.26	53.4	10.0
MW0875-0250-18S	22.2	15.2	0.3	6.4	3.15	80.1	25.0
MW0875-0417-18S	22.2	15.2	0.3	10.6	5.44	80.1	15.6
MW0875-0250-25S	22.2	15.2	0.4	6.4	4.22	111.2	52.2
MW0875-0417-25S	22.2	15.2	0.4	10.6	7.06	111.2	31.5
MW0875-0583-25S	22.2	15.2	0.4	14.8	10.03	111.2	23.3
MW1000-0250-12S	25.4	18.5	0.3	6.4	2.13	53.4	12.6
MW1000-0417-12S	25.4	18.5	0.3	10.6	3.68	53.4	7.7
MW1000-0583-12S	25.4	18.5	0.3	14.8	5.11	53.4	5.4
MW1000-0250-18S	25.4	18.5	0.3	6.4	2.21	80.1	19.3
MW1000-0417-18S	25.4	18.5	0.3	10.6	3.76	80.1	11.7
MW1000-0583-18S	25.4	18.5	0.3	14.8	5.39	80.1	8.6
MW1000-0250-25S	25.4	18.5	0.4	6.4	3.33	111.2	36.8
MW1000-0417-25S	25.4	18.5	0.4	10.6	5.77	111.2	23.1
MW1000-0583-25S	25.4	18.5	0.4	14.8	8.10	111.2	16.6
MW1125-0300-12S	28.6	21.6	0.3	7.6	3.71	53.4	13.7
MW1125-0500-12S	28.6	21.6	0.3	12.7	6.35	53.4	8.4
MW1125-0700-12S	28.6	21.6	0.3	17.8	8.74	53.4	6.0
MW1125-0300-20S	28.6	21.6	0.4	7.6	4.06	89.0	25.0
MW1125.0500-20S	28.6	21.6	0.4	12.7	6.86	89.0	15.2
MW1125-0700-20S	28.6	21.6	0.4	17.8	9.68	89.0	11.0
MW1125-0300-30S	28.6	21.6	0.5	7.6	4.52	133.4	43.1
MW1125-0500-30S	28.6	21.6	0.5	12.7	7.70	133.4	26.6
MW1125-0700-30S	28.6	21.6	0.5	17.8	10.69	133.4	18.9
MW1250-0300-12S	31.8	25.4	0.3	7.6	2.13	53.4	9.8
MW1250-0500-12S	31.8	25.4	0.3	12.7	3.78	53.4	6.0
MW1250-0700-12S	31.8	25.4	0.3	17.8	5.26	53.4	4.2
MW1250-0300-20S	31.8	25.4	0.4	7.6	3.15	89.0	20.0
MW1250-0500-20S	31.8	25.4	0.4	12.7	5.46	89.0	12.3
MW1250-0700-20S	31.8	25.4	0.4	17.8	7.70	89.0	8.8

MULTIWAVE COMPRESSION SPRINGS							
Part Number	**Dh (mm)**	**Dr (mm)**	**t (mm)**	**Lo (mm)**	**L_1 (mm)**	**N (N)**	**R (N/mm)**
MW1250-0300-30S	31.8	25.4	0.5	7.6	4.01	133.4	36.8
MW1250-0500-30S	31.8	25.4	0.5	12.7	6.91	133.4	23.1
MW1250-0700-30S	31.8	25.4	0.5	17.8	9.75	133.4	16.6
MW1375-0300-15S	34.9	26.2	0.3	7.6	1.91	66.7	11.7
MW1375-0500-15S	34.9	26.2	0.3	12.7	3.28	66.7	7.0
MW1375-0700-15S	34.9	26.2	0.3	17.8	4.55	66.7	5.1
MW1375-0300-25S	24.9	26.2	0.4	7.6	3.61	111.2	27.7
MW1375-0500-25S	34.9	26.2	0.4	12.7	6.10	111.2	16.8
MW1375-0700-25S	34.9	26.2	0.4	17.8	8.64	111.2	12.1
MW1375-0300-35S	34.9	26.2	0.5	7.6	3.78	155.7	40.6
MW1375-0500-35S	34.9	26.2	0.5	12.7	6.27	155.7	24.2
MW1375-0700-35S	34.9	26.2	0.5	17.8	8.71	155.7	17.2
MW1500-0300-20S	38.1	29.0	0.4	7.6	3.28	89.0	20.5
MW1500-0500-20S	38.1	29.0	0.4	12.7	5.41	89.0	12.3
MW1500-0700-20S	38.1	29.0	0.4	17.8	7.65	89.0	8.8
MW1500-0300-35S	38.1	29.0	0.5	7.6	3.10	155.7	34.5
MW1500-0500-35S	38.1	29.0	0.5	12.7	5.23	155.7	20.8
MW1500-0700-35S	38.1	29.0	0.5	17.8	7.39	155.7	15.1
MW1500-0300-60S	38.1	29.0	0.5	7.6	4.22	266.9	78.4
MW1500-0500-60S	38.1	29.0	0.5	127.0	7.06	266.9	47.3
MW1500-0700-60S	38.1	29.0	0.5	17.8	9.91	266.9	34.0
MW1750-0375-25S	44.5	34.0	0.5	9.5	3.94	111.2	20.0
MW1750-0625-25S	44.5	34.0	0.5	15.9	6.73	111.2	12.1
MW1750-0870-25S	44.5	34.0	0.5	22.1	9.32	111.2	8.8
MW1750-0375-50S	44.5	34.0	0.5	9.5	4.78	222.4	46.7
MW1750-0625-50S	44.5	34.0	0.5	15.9	8.00	222.4	28.2
MW1750-0870-50S	44.5	34.0	0.5	22.1	11.48	222.4	21.0
MW1750-0375-90S	44.5	34.0	0.6	9.5	5.89	400.3	110.1
MW1750-0625-90S	44.5	34.0	0.6	15.9	10.39	400.3	73.0
MW1750-0870-90S	44.5	34.0	0.6	22.1	14.66	400.3	53.7
MW2000-0375-25S	50.8	40.6	0.5	9.5	2.39	111.2	15.6
MW2000-0625-25S	50.8	40.6	0.5	15.9	4.01	111.2	9.5
MW2000-0870-25S	50.8	40.6	0.5	22.1	5.51	111.2	6.7
MW2000-0375-50S	50.8	40.6	0.5	9.5	3.56	222.4	37.3
MW2000-0625-50S	50.8	40.6	0.5	15.9	6.22	222.4	23.1
MW2000-0870-50S	50.8	40.6	0.5	22.1	8.76	222.4	16.6
MW2000-0375-90S	50.8	40.6	0.6	9.5	5.00	400.3	88.6
MW2000-0625-90S	50.8	40.6	0.6	15.9	8.43	400.3	53.7
MW2000-0870-90S	50.8	40.6	0.6	22.1	11.81	400.3	38.9

UK

WAVE SPRINGS (ROUND WIRE)

Advantages
- Accurate high force loading with greater deflection then bellevilles
- Economical and stocked in both carbon and stainless steel
- Fits in tight radial and axial spaces with inline force
- Special designs available with No-Tooling-Charges

Applications
- Use in assemblies for variation as a result of tolerance stack-up
- Preload a mechanical assembly with greater force to reduce or eliminate vibration
- Compensate for the looseness that results in assembled components due to thermal expansion

Design
- Fits in 25% of the radial space required of a belleville
- The theoretical rate is accurate until the spring approaches its solid height; see graph

KEY TO MEASUREMENTS

Dh = Operates in Bore diameter
Dr = Clearance on Rod diameter
P_1 = Load (N)
L_1 = Loaded Height
Lo = Free Height
Wx = Number of Waves
d = Wire Diameter

F

RESSORTS ONDULEÉS (FIL ROND)

Advantages
- Fortes charges précises avec des déflections supérieures aux rondelles Belleville.
- Economiques – Stockés en acier et en Inox.
- Convient pour des espaces radiaux et axiaux limités, avec une force linéaire.
- Sur-mesure disponible sans frais d'outillage.

Applications
- Utilisation sur des assemblages pour compenser des tolérances de montage.
- Pré charge d'un montage mécanique pour réduire ou éliminer les vibrations.
- Compensation de jeu dû à des dilatations thermiques.

Design
- Occupe 25% de l'encombrement radial d'une rondelle Belleville.
- La courbe de raideur théorique est précise jusqu'à ce que le ressort approche de sa hauteur solide ; CF graphique.

INDEX DES MESURES

Dh = Opère dans un logement de diamètre
Dr = Jeu sur le diamètre d'axe
P_1 = Charge (N)
L_1 = Hauteur en charge
Lo = Hauteur libre
Wx = Nombre d'ondulations
d = Diamètre du fil

E

MUELLE/RESORTE ONDULADOS (ALAMBRE DE PIANO)

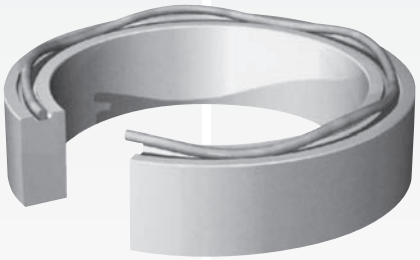
Ventajas
- Cargas más precisas con mayor recorrido que las arandelas Belleville.
- Económicas y disponibles en stock en acero al carbono y acero inoxidable.
- Encaja en alojamientos radiales y axiales estrechos, conservando la carga.

Aplicaciones
- Colóquelas para conseguir eliminar holguras.
- Precargue una mecanismo con mayor fuerza para eliminar vibraciones.
- Compense cualquier dilatación.

Diseño
- Se puede alojar en un 25% del espacio necesario para una arandela Belleville.
- El coeficiente de compresión se mantiene constante hasta alcanzar recorridos cercanos a la altura de bloque.

CLAVES DE DIMENSIONES

Dh = Trabaja en el diámetro del taladro
Dr = Juego en el diámetro del vástago
P_1 = Carga (N)
L_1 = Altura de carga
Lo = Altura libre
Wx = Número de ondulaciones
D = Diámetro del alambre



D

WELLENFEDERN (RUNDDRAHT)

Vorteile
- Akkurate Belastung mit hoher Kraft und mehr Federweg als Tellerfedern.
- Wirtschaftlich und in Kohlenstoff- und Edelstahl erhältlich.
- Passt in enge radiale und axiale Räume mit Inline-Kraft.
- Spezialkonstruktionen ohne Werkzeugkosten erhältlich.

Anwendungen
- Verwendung in Baugruppen zur Variation als Ergebnis von Toleranzberechnungen.
- Vorbelastung einer mechanischen Baugruppe mit größerer Kraft, um Schwingungen zu reduzieren oder zu eliminieren.
- Ausgleich für Locakerheit, die bei Baugruppen auf Grund von Wärmeausdehnung auftreten kann.

Design
- Passt in 25% des für eine Tellerfeder erforderlichen Platzes.
- Die theoretische Rate ist akkurat, bis die Feder ihre Blocklänge erreicht (siehe Darstellung)

KENNZEICHNEN DER ABMESSUNGEN

Dh = Operiert im Bohrungsdurchmesser
Dr = Spiel an Dorndurchmesser
P_1 = Kraft (N)
L_1 = Gespannte Höhe
Lo = Ungespannte Höhe
Wx = Anzahl der Wellen
d = Drahtdurchmesser

I

RONDELLE ONDULATE A FILO TONDO

Vantaggi:
- accurata ed elevata forza di carico con deflessioni maggiori rispetto alle rondelle Belleville
- economiche e disponibili sia in acciaio ad alto contenuto di carbonio che in acciaio inox
- adatte in spazi radiali e assiali molto ristretti, con una forza lineare
- modelli su misura disponibili senza costi di impianto

Applicazioni:
- utilizzo negli assemblaggi per compensare le tolleranze di montaggio
- pre-carica di un montaggio meccanico con una maggiore forza per ridurre o eliminare le vibrazioni.
- compensazione del gioco dovuto alla dilatazione termica

Design:
- occupano uno spazio radiale pari al 25% di quello richiesto dalle rondelle Belleville
- la curva di rigidità teorica è precisa fino a che la rondella non si avvicina alla sua altezza a blocco (vedere grafico):

LEGENDA

Dh = Dimensione consigliata sede
Dr = Dimensone consigliata perno
P_1 = Carico a L_1 (N)
L_1 = Altezza in carico
Lo = Altezza libera
Wx = Numero di onde
d = Diametro del filo

P

ARRUELAS CURVAS COM ARAME REDONDO

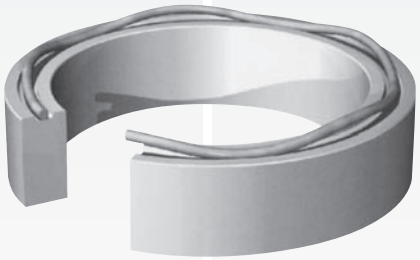
Vantagens
- Tem mais capacidade de deflexão que as molas prato, porem com mais capacidade.
- São padrão em aço Inox e carbono.
- Encaixam em ambos espaços radiais e axiais.
- Desenhos especias.

Aplicações
- Usadas em vários tipos de montagem como – resultado de sua tolerância na empilhagem.
- Precarga é usada para reduzir vibrações.
- compensar para componentes com expansão térmica.

Desenho
- Ajusta-se a 25% do espaço radial de molas prato
- O padrão teórico é correto até que a mola atija o bloco, ver gráfico.

LEGENDA

Dh = Operação do diâmetro do furo
Dr = Capacidade do diâmetro do furo
P_1 = Carga (N)
L_1 = Carga em P_1
Lo = Itura Livre
Wx = Numero de ondas
d = Diâmetro do fio



Wellenfedern(Runddraht)Wellenfedern(Runddraht)W
RondelleOndulateAFiloTondoRondelleOndulateAFilo
ArruelasCurvasComArameRedondoArruelasCurvasC

WAVE SPRINGS (ROUND WIRE)							
Part Number	**Dh (mm)**	**Dr (mm)**	**P_1 (N)**	**L_1 (mm)**	**Lo (mm)**	**Wx**	**d (mm)**
RW-0050	12.70	10.36	156	1.32	1.57	3	0.79
RW-0062	15.88	13.13	223	1.63	1.96	3	0.97
RW-0075	19.05	15.95	312	1.93	2.34	3	1.14
RW-0087	22.23	18.80	356	2.18	2.64	3	1.30
RW-0100	25.40	21.72	401	2.41	2.95	3	1.42
RW-0112	28.58	24.56	445	2.59	3.23	3	1.52
RW-0125	31.75	27.46	490	2.79	3.51	3	1.65
RW-0137	34.93	31.06	534	2.41	3.07	4	1.42
RW-0150	38.10	34.01	579	2.59	3.25	4	1.52
RW-0162	41.28	36.68	623	2.79	3.48	4	1.65
RW-0175	44.45	39.73	668	2.87	3.66	4	1.70
RW-0187	47.63	42.72	712	3.02	3.94	4	1.78
RW-0200	50.80	45.80	757	3.15	4.19	4	1.83
RW-0212	53.98	48.41	801	3.28	4.11	4	1.93
RW-0225	57.15	51.38	846	3.45	4.27	4	2.03
RW-0237	60.33	54.38	890	3.58	4.52	4	2.11
RW-0250	63.50	57.43	935	3.66	4.70	4	2.16
RW-0262	66.68	60.30	979	3.89	5.16	4	2.29
RW-0275	69.85	63.42	1024	3.91	5.38	4	2.31
RW-0287	73.03	66.50	1068	4.01	5.33	4	2.36
RW-0300	76.20	70.28	1113	3.58	4.55	5	2.11
RW-0312	79.38	73.10	1157	3.66	4.67	5	2.16
RW-0325	82.55	76.00	1202	3.89	4.83	5	2.29
RW-0337	85.73	79.12	1246	3.91	4.95	5	2.31
RW-0350	88.90	82.19	1291	4.01	5.11	5	2.36
RW-0362	92.08	85.24	1335	4.09	5.23	5	2.41
RW-0375	95.25	88.27	1380	4.22	5.38	5	2.49
RW-0387	98.43	91.31	1424	4.32	5.28	5	2.54
RW-0400	101.60	94.44	1469	4.32	5.72	5	2.54
RW-0412	104.78	97.21	1491	4.45	5.61	5	2.62
RW-0425	107.95	100.28	1535	4.52	5.72	5	2.67
RW-0437	111.13	103.20	1558	4.75	6.10	5	2.79
RW-0450	114.30	106.30	1602	4.75	6.27	5	2.79
RW-0462	117.48	109.47	1624	4.75	6.43	5	2.79
RW-0475	120.65	112.55	1669	4.83	6.53	5	2.84
RW-0487	123.83	115.70	1691	4.83	6.71	5	2.84
RW-0500	127.00	118.67	1736	4.95	6.73	5	2.95
RW-0512	130.18	121.21	1780	5.08	6.96	5	3.00
RW-0525	133.35	124.28	1825	5.18	7.09	5	3.05
RW-0537	136.53	127.94	1869	4.75	6.22	6	2.79
RW-0550	139.70	131.11	1914	4.75	6.38	6	2.79
RW-0562	142.88	134.19	1958	4.83	6.22	6	2.84
RW-0575	146.05	137.31	2003	4.83	6.38	6	2.84
RW-0587	149.23	140.31	2047	5.00	6.65	6	2.95
RW-0600	152.40	143.36	2092	5.08	6.81	6	3.00

UK

FINGER SPRING WASHERS

Our finger spring washers are designed to counteract noise, excess wear and vibrations, especially at high speeds. They promote efficiency and smooth operation, reducing skidding wear on rotating elements, as in ball bearing applications. They are also extremely useful in cases of unavoidable loose internal clearance due to special application conditions.

MATERIAL
High-carbon finely tempered spring steel. Type 1074

FINISH
Blued surface finish

SPECIFICATION
Finger height (L) is approximately 3.17mm for all sizes except F0595-010 which has approximately 2.38mm finger height.

KEY TO DIMENSIONS
Do = Outside Diameter ***
Di = Inside Diameter
Lo = Free Height (ref only)
L_1 = Loaded Height
P_1 = Load (N) at L_1
t = Thickness
Db = Outside diameter of bearing**

* This washer has three fingers only. All others have six fingers

** Not adapted to some special shaped bearings with double protruding seals

*** Maximum outside diameter of washer to be the same as that of specified bearing

F

RONDELLES RESSORT

Etudiées pour combattre le bruit, l'usure excessive et les vibrations, surtout à des vitesses élevées, les rondelles ressort renforcent l'efficacité et le fonctionnement sans à-coups, en réduisant l'usure par dérapage des éléments tournants, comme par exemple dans le cas de roulements à billes. Elles sont aussi spécialement utiles en cas de jeu excessif intérieur inévitable en raison des conditions d'application particulières.

MATÉRIAU
Acier à ressort, trempé à haute teneur en carbone. Type 1074

ETAT DE SURFACE
Bleui.

SPÉCIFICATION
La hauteur des doigts (L) est d'environ 3.17mm pour toutes les tailles sauf la référence F0595-010 dont les doigts mesurent environ 2.38mm.

INDEX DES MESURES
Do = Diamètre extérieur ***
Di = Diamètre intérieur
Lo = Hauteur libre (pour référence)
L_1 = Hauteur en charge
P_1 = Charge (N) à L_1
t = Epaisseur
Db = diamètre extérieur du roulement**

* Cette rondelle comporte seulement trois doigts.

** Non adaptée à certains types de roulements à joints doubles saillants.

*** Le diamètre extérieur de la rondelle devant être le même que celui du roulement correspondant.

E

ARANDELAS ELASTICAS DE OREJETAS

Concebidas para disminuir el ruido, el desgaste excesivo y vibraciones, especialmente a altas velocidades, las arandelas elásticas de orejetas facilitan la eficacia y un movimiento suave, reduciendo el desgaste debido al deslizamiento en elementos giratorios, tales como las aplicaciones de rodamientos a bolas. También son extremadamente útiles en casos de holguras internas inevitables, debido a condiciones especiales de la aplicación.

MATERIAL
Acero para muelle templado. Tipo 1074

ACABADO
Azul.

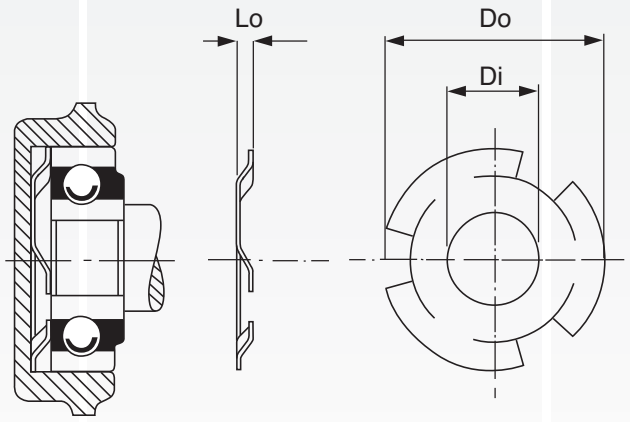
ESPECIFICACIONES
La altura libre (L) es de aproximadamente 3,17 mm excepto para la referencia F0595-010, que tiene una altura aproximada de 2,38 mm.

CLAVES DE CARACTERÍSTICAS
Do = Diámetro externo ***
Di = Diámetro interno
Lo = Altura libre (referencia sólo)
L_1 = Altura de carga
P_1 = Carga (N) en L_1
t = Espesor
Db = Diámetro exterior del rodamiento

* Esta arandela tiene solamente tres orejeras. Todas las demás tienen seis orejetas

** No se adapta a ciertas formas de rodamiento con juntas dobles afiladas.

*** El diámetro exterior máximo de la arandela debe ser el mismo que el del correspondiente rodamiento.



D

FEDERSCHEIBEN FÜR KUGELLAGER

Diese Federscheiben wurden entwickelt, um Geräusche zu dämpfen und Schwingungen bei übermäßiger Belastung zu kompensieren, besonders bei hohen Drehzahlen. Die Lebensdauer von Kugellagern wird durch den Einsatz dieser Federscheiben erhöht. Sie sind auch geignet für Montagen wo das Spiel zwischen Teilen unvermeidbar ist.

WERKSTOFF
Gehärteter Federstahldraht. 1074

OBERFLÄCHE
Angelassen.

ANGABEN
Federscheibenhöhe (L) circa 3,17 mm für alle Teilnummer ausserhalb F0595-010 mit circa 2,38 mm.

KENNZEICHNEN DER ABMESSUNGEN
Do = Äußerer Durchmesser ***
Di = Innerer Durchmesser
Lo = Unbelastete Länge (approx.)
L_1 = Länge der belasteten Tellerfeder
P_1 = Kraft(N) bei L_1
t = Materialdicke
Db = Außendurchmesser des Lagers**

* Diese Scheibe hat nur drei Finger. Alle anderen haben sechs Finger.

** Nicht an einige besonders geformte Lager mit doppelt vorstehenden Dichtungen angepasst.

*** Maximaler Außendurchmesser der Scheibe entspricht dem Durchmesser des jeweiligen Lagers.

I

RONDELLE PER CUSCINETTI A SFERA

Progettate per neutralizzare la rumorosità, l'eccesso di usura e le vibrazioni, particolarmente in applicazioni ad alta velocità, queste rondelle favoriscono l'efficenza e l'operatività omogenea riducendo l'usura dovuta allo slittamento di elementi rotanti, quali i cuscinetti a sfera. Esse sono anche estremamente utili in casi di grandi giochi interni dovuti a condizioni speciali di applicazione.

MATERIALE
Acciaio temprato ad alto contenuto di carbonio. Tipo 1074

FINITURA
Brunitura

SPECIFICHE
L'altezza liber (L) è approssimativamente 3.17 mm per tutte le dimensioni eccetto per F0595-010 che ha un'altezza libera di 2.38 mm

LEGENDA
Do = Diametro esterno ***
Di = Diametro interno
Lo = Altezza libera (solo riferimento)
L_1 = Altezza in carico
P_1 = Carico (N) a L_1
t = Spessore
Db = Diametro esterno del cuscinetto

* questa rondella ha tre linguette, tutte le altre ne hanno sei

** non adatte per alcuni cuscinetti sagomati con doppi ripari sporgenti

*** Diametro esterno massimo della rondella

P

ANILHAS DE MOLA DE PALHETAS

Concebidas para reduzir o ruído, o desgaste excessivo e as vibrações, em especial a velocidades elevadas, as anilhas de mola de palhetas promovem a eficácia e o trabalho sem problemas, reduzindo o desgaste resultante do deslizamento em elementos giratórios, tais como as aplicações de rolamentos de esferas. São de extrema utilidade em casos de folgas internas inevitáveis, devido a condições especiais de aplicação.

MATERIAL
Aço de elevado teor de carbono de têmpera fina para molas. Tipo 1074

ACABAMENTO
Externo pintado em azul

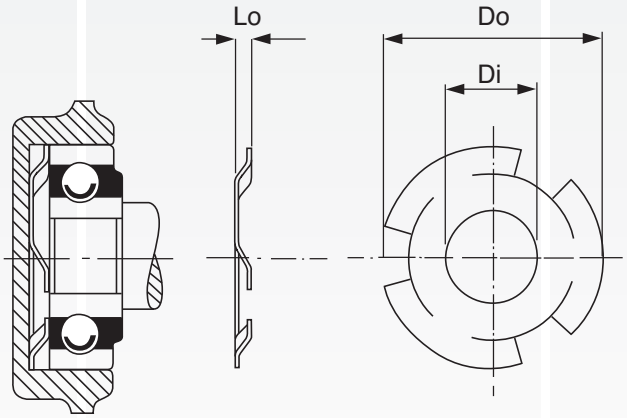
SPECIFICAÇÃO
Altura das palhetas(L) é de aproximadamente 3,17mm para todas as medidas exceto F0595-010 que tem aproximadamente 2,38mm.

DIMENSÕES
Do = Diâmetro exterior ***
Di = Diâmetro interior
Lo = Altura livre (só para efeitos de referência)
L_1 = Altura em carga
P_1 = Carga em L_1
t = Espessura
Db = Diâmetro Externo do Rolamento

* Arruela com três Lóbulos

** Não adaptáveis a alguns modelos com seladores duplos

*** Diametro Maximo da Arruela tem que ser o mesmo do Rolamento



FINGER SPRING WASHERS								
Part Number	**Alternative Part Number**	**Do*** (mm)**	**Di (mm)**	**Lo**	**L_1**	**P_1**	**t (mm)**	**Db****
F60400 *	F0595-010 *	15.11	7.92	2.38	1.57	1.33-4.45	0.254	16
F60410	F0728-006	18.49	8.74	3.18	1.57	17.79-35.6	0.152	19
F60420	F0846-006	21.49	11.51	3.18	1.57	13.34-31.1	0.152	22
F60430	F0846-008	21.49	11.51	3.18	1.57	40.0-62.2	0.203	22
F60440	F0926-007	23.52	11.51	3.18	1.57	26.7-44.5	0.178	24
F60450	F0926-010	23.52	8.74	3.18	1.57	93.3-133.4	0.254	24
F60460	F1004-006	25.50	13.11	3.18	1.57	22.2-44.5	0.152	26
F60470	F1004-007	25.50	13.11	3.18	1.57	31.1-57.8	0.178	26
F60480	F1164-009	29.57	17.48	3.18	1.57	35.6-62.2	0.229	30
F60490	F1164-010	29.57	10.31	3.18	1.57	62.2-102.2	0.254	30
F60500	F1164-018	29.57	17.48	3.18	1.57	244.5-360	0.018	30
F60510	F1240-008	31.50	17.48	3.18	1.57	40-66.7	0.203	32
F60520	F1240-009	31.50	14.30	3.18	1.57	66.7-97.8	0.229	32
F60530	F1240-010	31.50	17.48	3.18	1.57	62.2-102.2	0.254	32
F60540	F1360-011	34.54	20.68	3.18	1.57	44.5-75.6	0.279	35
F60550	F1360-014	34.54	20.68	3.18	1.57	71.1-115.6	0.36	35
F60560	F1555-014	39.50	24.66	3.18	1.57	57.8-102.2	0.36	40
F60570	F1555-018	39.50	25.40	3.18	1.57	124.5-186.7	0.457	40
F60580	F1830-016	46.48	30.20	3.18	1.57	62.2-115.6	0.406	47
F60590	F2022-019	51.36	34.52	3.18	1.57	57.8-120	0.483	52

UK

CONSTANT-FORCE SPRINGS

Constant-force springs are a very special variety of extension spring. They consist of a spiral of strip material with built-in curvature so that each turn of the strip wraps tightly on its inner neighbour. When the strip is extended (deflected) the inherent stress resists the loading force, just as in a common extension spring, but at a nearly constant (zero) rate.

The constant force spring is well suited to long extensions with no load build up. In use, the spring is usually mounted with the ID tightly wrapped on a drum and the free end attached to the loading force, such as in a counterbalance application. The relationship can be reversed, however, with the free end mounted stationary and the spring itself providing the working force, as with carbon brushes in electrical apparatus.

NOTE: Be sure to allow at least 1.1/2 cols of material on the drum at full extension. The spring ID will wrap tightly on the drum so that in most applications no fastening method on the drum is required.

MATERIAL
Type 301 stainless steel.

HOW TO MULTIPLY CONSTANT FORCE SPRING LOAD
Considerable flexibility is possible with constant-force springs because the load capacity can be multiplied by using two or more strips in tandem or back-to-back, as illustrated.

KEY TO DIMENSIONS

t	=	Material thickness
W	=	Width
Lo	=	Length
In/Ext	=	Initial extension
Wo/Ext	=	Working extension
Di	=	Inside diameter (+/-10%)
Do	=	Outside diameter (+/-10%)
P	=	Load (+/-10%)
A	=	End configuration centre-line hole to end
d	=	End configuration hole diameter
FL	=	Fatigue life (cycles)

F

RESSORTS A FORCE CONSTANTE

Les ressorts à force constante sont une variété spéciale de ressort de traction. Ils consistent en une bande d'acier spiralée avec une courbure afin que chaque tour de la bande s'enroule fermement autour de sa voisine. Lorsque la bande est allongée (étirée) la tension inhérente résiste à la charge appliquée, comme dans le cas d'un ressort de traction commun, mais à un taux presque constant (zéro).

Le ressort à force constante est bien adapté aux longues extensions sans augmentation de la charge. Pendant l'utilisation, le ressort est normalement monté avec son diamètre intérieur enroulé fermement autour d'un arbre et l'extrémité libre attachée à la charge appliquée, comme pour le cas d'un contre balancier. Néanmoins, cette relation peut être inversée en immobilisant l'extrémité libre et en faisant que le ressort lui-même fournisse l'effort de mouvement, comme dans le cas des balais en carbone.

NOTA: Assurez vous de prévoir au moins un tour et demi du ressort sur l'arbre en extension maximum. Le diamètre intérieur du ressort s'enroulera fermement sur l'arbre afin, pour la majorité des applications, qu'aucune méthode de fixation sur l'arbre ne soit nécessaire.

MATÉRIAU
Acier inoxydable type 301

COMMENT MULTILPLIER LA CHARGE DES RESSORTS A FORCE CONSTANTE
Ces ressorts permettent une grande flexibilité car les capacités de charges peuvent être ajoutées en utilisant deux (ou plus) bandes et en les montant en tandem ou dos-à-dos, comme sur l'illustration.

INDEX DES DIMENSIONS

t	=	Epaisseur du matériau
W	=	Largeur
Lo	=	Longueur
In/Ext	=	Extension initiale
Wo/Ext	=	Extension en utilisation
Di	=	Diamètre intérieur (+/-10%)
Do	=	Diamètre extérieur (+/-10%)
P	=	Charge (+/-10%)

Configurations d'extrémité:

A	=	Dimension axe du trou – extrémité
d	=	Diamètre du trou
FL	=	Durée de vie optimale (cycles)

E

MUELLES/RESORTES DE FUERZA CONSTANTE

Los muelles/resortes de fuerza constante representan una variedad especial de muelle de tracción. Consisten en un espiral o fleje con curvatura de forma que cada espiral del fleje se apriete fuertemente sobre la anterior. Cuando se extiende (deflexión), el esfuerzo inherente resiste la fuerza de carga, al igual que en el resorte de tracción común, pero con una constante casi constante (cero).

El muelle/resortes de fuerza continua es muy adecuado para largas extensiones sin acumulación de carga. En la utilización el muelle/resorte se monta normalmente con el diámetro interior enrollado apretadamente alrededor de un tambor y con el extremo libre fijado a la fuerza de carga, como en la aplicación de un contrapeso. Dicha relación puede invertirse, con el extremo libre fijo y la fuerza de trabajo siendo proporcionada por el mismo muelle/resorte, como en el caso de las escobillas en motores eléctricos.

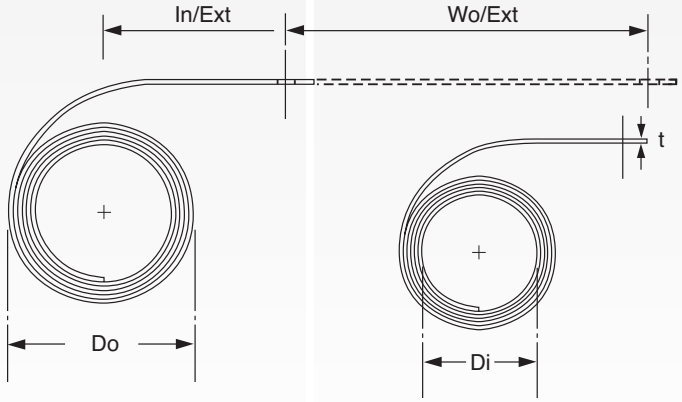
NOTA: Asegúrese de que al menos se queden 1-1/2 espirales de material sobre el tambor cuando está totalmente extendido. El diámetro interior del muelle se enrollará apretadamente alrededor del tambor de forma que en la mayoría de las aplicaciones no se requiere ningún método de sujeción sobre el tambor.

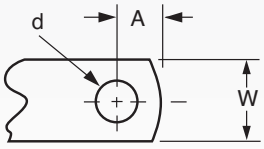
MATERIAL
Acero inoxidable tipo 301.

AUMENTO DE LA CARGA DE LOS MUELLES/RESORTES DE FUERZA CONSTANTE
La carga del muelle/resorte se puede aumentar mediante el montaje de dos o más muelles/resortes de fuerza constante en tándem u opuestos, como muestra el gráfico.

CLAVES DE CARACTERÍSTICAS

t	=	Espesor del material
W	=	Anchura
Lo	=	Longitud
In/Ext	=	Extensión inicial
Wo/Ext	=	Extensión de trabajo
Di	=	Diámetro interior (+/-10%)
Do	=	Diámetro externo (+/-10%)
P	=	Carga (+/-10%)
A	=	Tipo de extremo
d	=	Diámetro agujero
FL	=	Vida muelle en ciclos





D

KONSTANTKRAFTFEDERN

Konstant-Kraft Federn sind Sonderformen der Zugfedern. Sie Bestehen aus einer Spirale die so konstruiert ist, daß jede Windung leicht die nächste Windung berührt. Wenn sich die Federn ausdehnt, heben sich Reibungswiderstand und Kraft so auf, daß eine nahezu konstante Kraft entsteht.

Die Konstant-Kraft-Federn ist auf lange Federwege mit konstanter Kraft ausgelegt. In der Praxis wird die Feder fest auf einer Trommel befestigt, wobei das freie Ende die Last aufnimmt. Dieses Prinzip kann umgekehrt werden mit dem freien Ende besfestigt und die Feder nimmt die Last auf, wie, z. B., Köhlebürste.

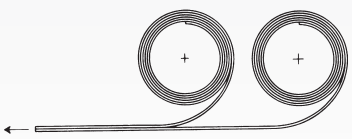
ANMERKUNG: Minimum 1,1/2 Federnwicklungen sollten bei voller Expansion der Feder auf der Trommel verbleiben. Der Innendurchmesser der Feder versucht sich auf der Trommel zu verkleinern, so daß normalerweise keine Befestigung auf der Trommel (Aufnahme) nötig ist.

WERKSTOFF
Rostfreierstahl Type 301.

WIE WIRD DIE FEDERKRAFT ERHÖHT
Die Feder kann flexibel angewendet werden, da die Kraftwerte durch Tandemanordnung oder gegenläufige Anordnung oder Ineinanderschachtelung erhöht werden können.

KENNZEICHNEN DER ABMESSUNGEN

t	=	Materialdicke
W	=	Materialbreite
Lo	=	Grundlänge
In/Ext	=	Anfanglänge
Wo/Ext	=	Arbeitslänge
Di	=	Innerer Durchmesser (+/-10%)
Do	=	Äußerer Durchmesser (+/-10%)
P	=	Federkraft (+/-10%)
A	=	Ende
d	=	Bohrungsdurchmesser
FL	=	Lebensdauern Hüben



I

MOLLE A SPIRALE

Le molle a spirale sono un tipo speciale di molla a trazione. Esse sono costituite da una striscia di lamiera curvata a spirale, in modo che ogni spira aderisca a quella interna. Quando la striscia viene estesa (deflessa) lo stress intrinseco resiste alla forza di carica come in una molla a trazione, ma in percentuale quasi costante (zero).

La molla a spirale viene utilizzata per lunghe estensioni senza incremento di carico. La molla viene normalmente montata con il diametro interno avvolto ad un perno e con l'estremità libera collegata alla forza di carico, ad esempio in applicazioni come contrappeso.

Questa relazione può essere anche invertita, con l'estremità libera montata fissa ed il corpo della molla a fungere da forza di lavoro, come per le spazzole in grafite nei motori elettrici.

Una notevole flessibilità è ottenibile con le molle a spirale, poichè la loro capacità di carico è moltiplicabile attraverso l'utilizzo di due o più striscie in tandem, in contrapposizione, o laminate.

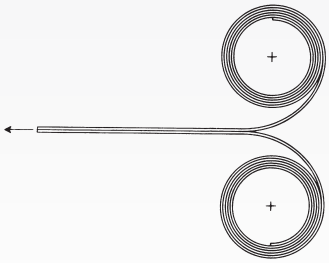
NOTA: Bisogna assicurarsi che almeno 1½ delle spire si avvolga sul perno a piena estensione. Il diametro interno della molla si stringerà saldamente sul perno in modo che nella maggior parte delle applicazioni sia possibile evitare un qualsiasi fissaggio della molla.

MATERIALE
Acciaio Inox Tipo 301

COME MOLTIPLICARE IL CARICO DELLE MOLLE A SPIRALE
Una notevole flessibilità è ottenibile con le molle a spirale, poiché la loro capacità di carico è moltiplicabile attraverso l'utilizzo di due o più nastri in tandem, in contrapposizione, o laminate.

LEGENDA

t	=	Spessore materiale
W	=	Larghezza
Lo	=	Lunghezza
In/Ext	=	Estensione iniziale
Wo/Ext	=	Estensione di lavoro
Di	=	Diametro interno (+/-10%)
Do	=	Diametro esterno (+/-10%)
P	=	Carico Newton (+/-10%)
A	=	Config. estremità (centro foro- estremità)
d	=	Diametro foro estremità
FL	=	Cicli



P

MOLAS DE FORÇA CONSTANTE

As molas de força constante são um tipo especial de molas de tracção. Consistem numa espiral ou flecha com uma curvatura incorporada, para que cada uma das espirais da flecha se encoste com firmeza à anterior. Quando em extensão (sem flexão), o esforço inerente resiste à força de carga, tal como acontece numa mola de tracção comum, embora com uma cadência quase constante (zero).

A mola de força contínua é muito adequada a extensões pronunciadas sem acumulação de carga. Na aplicação, a mola instala-se normalmente com o diâmetro interior apertadamente enrolado em torno de um tambor, e com a extremidade livre fixa à força de carga, como no caso da aplicação de um contrapeso. No entanto, este tipo de relação pode ser invertida, com a extremidade livre fixa, sendo a força de trabalho disponibilizada pela própria mola, como no caso das escovas de equipamentos eléctricos.

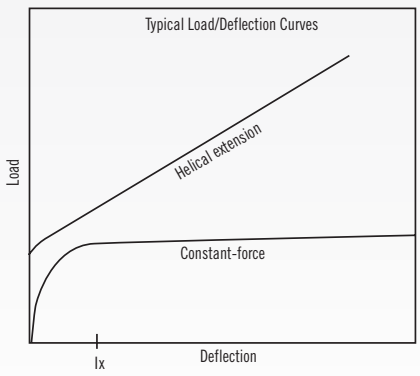
NOTA: Certifique-se de que ficam pelo menos 11/2 espirais de material sobre o tambor, quando em extensão total. O diâmetro interior da mola enrola-se apertadamente em torno do tambor, fazendo com que na maior parte das aplicações não seja necessário qualquer método de fixação ao tambor.

MATERIAL
Tipo 301 aço inoxidavel.

COMO MULTIPLICAR A CARGA DE MOLAS DE FORÇA CONSTANTE
Uma flexibidade consideravel é possivel com essas molas pois a capacidade de carga pode ser multiplicada encostando-se costas com costas ou uma acima da outra, como na ilustração.

LEGENDA

t	=	Espessura do material
W	=	Largura
Lo	=	Comprimento
In/Ext	=	Extensão inicial
Wo/Ext	=	Extensão de trabalho
Di	=	Diâmetro interior (ref) (+/-10%)
Do	=	Diâmetro externo (+/-10%)
P	=	Carga em Newtons (+/-10%)
Configuração da extremidade		
A	=	Orifício da linha central à extremidade
d	=	Diâmetro do orifício da configuração da extremidade
FL	=	Vida util (ciclos)



Initial Extension (minimum amount of extension needed to operate the spring and achieve a constant rate)

STOCK CONSTANT-FORCE SPRINGS - STAINLESS STEEL / INOX										
Part Number	**t (mm)**	**W (mm)**	**Lo (mm)**	**In/Ext (mm)**	**Wo/Ext (mm)**	**P N +/- 10%**	**Di mm +/- 10%**	**Do mm +/- 10%**	**A (mm)**	**d (mm)**
FL = 4,000										
CF012-0038	0.076	4.75	305	7.62	269	1.70	5.33	7.62	2.54	2.4
CF015-0049	0.1	4.75	381	10.16	333	2.20	7.36	10.16	2.54	2.4
CF015-0050	0.1	6.35	381	10.16	305	2.20	8.64	10.16	9.50	3.3
CF015-0065	0.1	6.35	381	10.16	333	2.90	6.35	10.16	4.75	3.3
CF018-0075	0.13	9.40	457	12.70	381	3.34	10.67	12.70	9.50	3.3
CF015-0083	0.1	7.90	381	10.16	333	3.70	7.11	10.16	4.75	3.3
CF017-0103	0.127	7.90	432	12.70	372	4.60	9.40	12.70	4.75	3.3
CF022-0112	0.15	9.40	559	15.75	457	4.98	12.95	15.75	9.50	3.3
CF024-0148	0.15	9.50	610	15.70	536	6.60	11.43	15.70	8.70	5.0
CF026-0162	0.18	12.70	660	19.05	533	7.21	14.99	19.05	9.50	3.3
CF025-0198	0.15	12.70	635	16.50	557	8.80	11.43	16.50	8.70	5.0
CF030-0237	0.2	14.99	762	22.10	610	10.54	17.27	22.10	9.50	4.7
CF030-0263	0.2	12.70	762	21.00	663	11.70	15.00	21.00	8.70	5.0
CF030-0330	0.2	15.87	762	21.00	663	14.70	15.50	21.00	8.70	5.0
CF034-0350	0.25	17.27	864	25.40	686	15.57	21.59	25.40	9.50	4.7
CF024-0402	0.23	19.00	610	21.00	511	17.90	15.75	21.00	8.70	5.0
CF033-0413	0.25	15.87	838	25.00	720	18.40	18.50	25.00	8.70	5.0
CF033-0494	0.25	19.00	838	24.60	722	22.00	18.00	24.60	8.70	5.0
CF038-0500	0.3	20.57	965	31.75	762	22.24	25.91	31.75	9.50	4.7
CF039-0595	0.3	19.00	991	30.00	850	26.50	22.40	30.00	8.70	5.0
CF043-0700	0.36	25.40	1092	38.10	838	31.14	30.23	38.10	9.50	4.7
CF039-0795	0.3	25.40	991	30.50	847	35.40	22.40	30.50	8.70	5.0
CF040-1063	0.4	25.40	1016	38.60	834	47.30	30.50	38.60	8.70	5.0
CF050-1656	0.5	31.75	1270	48.00	1044	73.70	37.30	48.00	8.70	5.0
CF052-2494	0.635	38.00	1321	57.00	1052	111.00	45.00	57.00	15.87	6.7 x 2
CF052-3303	0.635	50.80	1321	57.00	1052	147.00	45.25	57.00	15.87	6.7 x 2
CF060-4089	0.79	50.80	1524	77.00	1161	182.00	63.50	77.00	15.87	6.7 x 2
FL = 25,000										
CF018-0023	0.10	6.35	457	15.75	383	1.03	13.50	15.75	4.75	3.3
CF018-0036	0.13	7.90	457	20.00	363	1.61	17.50	20.00	4.75	3.3
CF025-0043	0.13	9.50	635	20.00	541	1.92	16.50	20.00	4.75	3.3
CF025-0052	0.15	9.50	635	18.00	550	2.30	13.20	18.00	8.70	5.0
CF025-0070	0.15	12.70	635	23.50	524	3.10	20.00	23.50	8.70	5.0
CF033-0094	0.20	12.70	838	31.25	691	4.20	27.00	31.25	8.70	5.0
CF035-0146	0.25	15.87	889	39.00	705	6.50	34.50	39.00	8.70	5.0
CF045-0209	0.30	19.00	1143	46.25	925	9.30	40.60	46.25	8.70	5.0
CF045-0281	0.30	25.40	1143	47.00	921	12.50	41.00	47.00	8.70	5.0
CF048-0350	0.38	25.40	1219	56.00	955	15.60	50.00	56.00	8.70	5.0
CF048-0438	0.38	31.75	1219	58.00	946	19.50	51.50	58.00	8.70	5.0
CF046-0411	0.40	25.40	1168	56.00	904	18.30	50.00	56.00	8.70	5.0
CF055-0584	0.50	31.75	1397	72.00	1058	26.00	64.26	72.00	8.70	5.0
CF060-0843	0.64	38.00	1524	94.00	1081	37.50	85.00	94.00	15.87	6.7 x 2
CF060-1175	0.64	50.80	1524	93.50	1083	52.30	85.60	93.50	15.87	6.7 x 2
CF070-1445	0.79	50.80	1778	120.50	1210	64.30	110.50	120.50	15.87	6.7 x 2
FL 40,000										
CF021-0025	0.15	9.40	533	34.54	305	1.11	28.70	34.54	9.50	3.3
CF025-0037	0.18	12.70	635	40.13	381	1.65	33.27	40.13	9.50	3.3
CF030-0050	0.20	14.99	762	45.97	457	2.22	38.35	45.97	9.50	4.7
CF036-0075	0.25	17.27	914	57.40	533	3.34	47.75	57.40	9.50	4.7
CF042-0112	0.30	20.57	1067	68.83	610	4.98	57.40	68.83	9.50	4.7
CF048-0162	0.36	25.40	1219	80.26	686	7.21	66.80	80.26	9.50	4.7

UK

GAS STRUTS

A Gas Spring (sometimes referred to as a Gas Strut) comprises of piston and rod that slides up and down a pressurised sealed tube. The pressure of the inert fill gas can be varied to change the force required to move the piston and rod. Gas Springs are most commonly used as a counterbalance for raising and lowering doors and hatches. Typical applications are Car Hatch Backs, Luggage Compartments, Skylights and Machine Guards. The tube contains a small amount of oil to lubricate the rod and to control damping at the end of the stroke. Gas Springs should always be mounted with the rod downwards to prolong the active life.

Nitrider – N Series
Gas spring strut, ulitlising the latest sealing technology for a longer service life. Black coated body and durable rod with nitrided anti-corrosive surface. A selection off end fittings are available for all sizes – to view, see end fittings.

This gas spring is an ideal choice where exceptional quality, corrosion resistance and an overall black appearance are important to your application.

Varilift – V Series
User adjustable version of the Nitrider Gas Spring. A bleed valve is fitted to enable the user to adjust the P_1 force of the spring. Each size is pressurised to the maximum available P_1 force for that range. Once installed, the adjustment may be made without removing the spring, saving considerable time and effort. This is ideal for prototyping new applications and those which cater for varying weights. Black coated body and durable rod with nitrided anti corrosive surface.

Stainless Steel – S Series
Made from 316 Stainless Steel, these gas springs are suited to exposure to harsh environmental conditions and will not rust or corrode. Ideal for marine, food and chemical industry applications. A selection of end fittings are available for all sizes – to view, see end fittings.

Stainless Steel - Varilift – X Series
User adjustable version of the Stainless Steel Gas Spring. A bleed valve is fitted to enable the user to adjust the P_1 force of the spring. Each size is pressurised to the maximum available P_1 force for that range. Once installed, the adjustment may be made without removing the spring, saving considerable time and effort. This is ideal for prototyping new applications and those which cater for varying weights.

F

AMORTISSEURS A GAZ

Un amortisseur à gaz (ou vérin/compas à gaz) est constitué d'une tige qui coulisse dans un sens ou dans l'autre dans un tube scellé sous pression. La tige comporte un piston riveté à une extrémité pour l'empêcher de ressortir à l'extrémité du tube sous pression.
La fonction la plus courante d'un amortisseur à gaz est de servir de compensateur pour relever et abaisser des portes. Les applications types comprennent les hayons de véhicules automobiles, les compartiments à bagages des cars, les lucarnes, les kiosques de vente et les déflecteurs de machines. Les amortisseurs à gaz utilisés de cette façon sur des applications bien étudiées devraient pouvoir effectuer des dizaines de milliers de cycles.

Nitrider – N Series
Ce sont nos Vérins à Gaz standard, utilisant les dernières technologies pour une plus longue durée de vie. Le tube est noir (peinture en poudre) et la tige a la surface nitrurée anticorrosion. Une large gamme d'attaches est disponible dans la section Attaches et Supports.

Ce Vérin à Gaz est idéal pour votre application si vous recherchez un produit de haute qualité, résistant à la corrosion et à l'apparence noire totale.

Varilift – V Series
Version réglable du Nitrider. Une valve de purge permet d'ajuster la force P_1 du vérin à gaz. Chaque taille est chargée à sa force P_1 maximum. Une fois en place, le réglage peut s'effectuer sans démonter le vérin, ce qui permet d'économiser du temps et des efforts. C'est l'idéal pour des prototypes ou quand le poids à soulever peut varier selon des options. Tube noir et tige à la surface nitrurée.

Acier Inoxydable – S Series
Fabriqués en Inox 316, ces vérins à gaz sont destinés aux applications où l'environnement est particulièrement difficile ; ils ne rouilleront pas. Idéal pour le nautisme, l'agro-alimentaire ou la chimie. Une large gamme d'attaches est disponible dans la section Attaches et Supports

Acier Inoxydable - Varilift – X Series
Version réglable du Vérin à gaz Inox. Une valve de purge permet d'ajuster la force P_1 du vérin à gaz. Chaque taille est chargée à sa force P_1 maximum. Une fois en place, le réglage peut s'effectuer sans démonter le vérin, ce qui permet d'économiser du temps et des efforts. C'est l'idéal pour des prototypes ou quand le poids à soulever peut varier selon des options.

E

AMORTIGUADORES DE GAS

Un amortiguador de gas se compone de un vástago que desliza dentro y fuera de un tubo sellado con presión. Un amortiguador de gas se usa de forma más habitual como contrapeso para elevar o bajar puertas. Existen aplicaciones típicas como los portones traseros de los coches, maleteros de autobuses, tragaluces, kioscos abatibles y protecciones de máquinas. El amortiguador contiene una pequeña cantidad de aceite para lubricar el vástago y la junta y controlar la velocidad de apertura. Los amortiguadores siempre deben montarse con el vástago apuntando hacia abajo para garantizar una vida óptima del producto.

Nitrider – N Series
Este amortiguador dispone de la última tecnología en juntas para una vida de servicio más larga. Tubo acabado en negro y un tratamiento sur-sulf anti corrosivo para el vástago. Se combinan con una gran variedad de amarres para todos los tamaños – para más detalle, ver sección de amarres.

Este amortiguador es la opción óptima para aquellas aplicaciones donde una gran calidad, una resistencia a la corrosión y una estética en negro son fundamentales.

Varilift – V Series
Versión ajustable en fuerza por parte del cliente del modelo Nitrider. El gas se puede liberar mediante una válvula , accesible por un lateral, que permite que se escape el gas y por tanto se reduzca la fuerza P_1. Están cargados a la máxima presión P_1 correspondiente a cada tamaño de amortiguador. Una vez montados, se pueden ajustar sin necesidad de desmontarlos. Esta opción es adecuada para prototipos y aplicaciones donde los pesos varíen. Tubo acabado en negro y un tratamiento sur-sulf anti corrosivo para el vástago.

Acero inoxidable – S Series
Fabricado en acero inoxidable 316, están especialmente diseñados para condiciones extremas sin problemas de corrosión u óxido. Para aplicaciones marinas, alimentación y industria química. Se combinan con una gran variedad de amarres para todos los tamaños – para más detalle, ver sección de amarres.

Acero inoxidable - Varilift – X Series
Versión ajustable en fuerza por parte del cliente del modelo en acero inoxidable. El gas se puede liberar mediante una válvula, accesible por un lateral, que permite que se escape el gas y por tanto se reduzca la fuerza P_1. Están cargados a la máxima presión correspondiente a cada tamaño de amortiguador. Una vez montados, se pueden ajustar sin necesidad de desmontarlos. Esta opción es adecuada para prototipos y aplicaciones donde los pesos varíen.

D

STICKSTOFFZYLINDER

Ein Stickstoffzylinder besteht aus einer Kolbenstange die sich in einem unter Druck stehenden geschlossenen Zylinder bewegt. Die Kraft des Stickstoffzylinders errechnet sich aus Querschnitt der Kolbenstange mal dem Druck im Zylinder Ein Stickstoffzylinder wird hauptsächlich zum ausbalancieren von Türen verwendet. Typische Anwendungen sind Türen am Auto, Kofferraumdämfungen, Schliessklappen und Maschinensicherungen.Durch die Veränderung der eingebauten Standard-Drossel (nur für Großserien veränderbar) kann die Geschwindigkeit bei Expansion des Zylinders verändet werden. Gasdruckfedern sollten immer mit der Kolbenstange abwärts montiert werden, um das Betriebsleben zu verlängern.

Nitrider – N Series
Gasdruckfedern, die die letzte Dichtungstechnologie für eine längere Betriebsdauer anbieten. Schwarzer angestrichener Druckrohr und Kolbenstange mit nitrierter Korrosionsschutz Oberfläche. Eine Auswahl von Anschlussteile ist für alle Größen verfügbar, - nähere Angaben darüber, siehe Anschlussteile Abschnitt.

Diese Gasdruckfeder ist eine ideale Wahl, wo außergewöhnliche Qualität, Korrosionswiderstand und ein gesamtes schwarzes Äusseres für Ihre Anwendung wichtig sind.

Varilift – V Series
Benutzer verstellbare Version der Nitrider Gasdruckfeder. Das Gas kann um die Kraft P1 zu regulieren über ein an der Seite angebrachtes Ventil abgelassen werden. Sie sind für jede Grösse mit maximalem Druck P1 gefüllt. Einmal eingebaut, kann die Anpassung gemacht werden, ohne die Gasdruckfedern zu entfernen, beträchtliche Zeit und Anstrengung sparend. Ideal für Prototypen und um Anwendungen mit unterschiedliche Gewichte. Schwarzer angestrichener Körper und Kolbenstange mit nitrierter Korrosionsschutz Oberfläche.

Rostfreier Stahl – S Series
Gemacht von 316 Rostfreiem Stahl, sind diese Gasdruckfedern besonders Entwickelt für Einsatz bei harten Umweltbedingungen und werden nicht verrosten oder korrodieren. Ideal für den Schiffbau, Lebensmittel und Chemische Industrien. Eine Auswahl von Anschlussteile ist für alle Größen verfügbar, – nähere Angaben darüber, siehe Anschlussteile Abschnitt.

Varilift – X Series
Benutzer verstellbare Version der rostefreien Stahl-Gasdruckfeder. Das Gas kann um die Kraft P1 zu regulieren über ein an der Seite angebrachtes Ventil abgelassen werden. Sie sind für jede Grösse mit maximalem Druck P1 gefüllt. Einmal eingebaut, kann die Anpassung gemacht werden, ohne die Gasdruckfedern zu entfernen, beträchtliche Zeit und Anstrengung sparend. Ideal für Prototypen und um Anwendungen mit unterschiedliche Gewichte

I

AMMORTIZZATORI A GAS

Un ammortizzatore a gas è costituito da un gambo che scorre in un senso o nell'altro dentro un tubo sigillato a pressione. Il gambo ha un pistone rivettato ad una estremità per impedire di uscire all'estremità sotto pressione. La forza dell'ammortizzatore a gas è quindi interamente fornita dalla compressione del gas che agisce sulla sezione trasversale del gambo. La funzione più comune di un ammortizzatore a gas è di servire da compensatore per alzare e abbassare delle porte. Le applicazioni tipiche comprendono i portelloni posteriori delle automobili, i bagagliai dei pullman, i lucernari, i chioschi di vendita e i deflettori delle auto. Gli ammortizzatori a gas utilizzati in tale modo su delle applicazioni studiate correttamente possono durare per diverse decine di migliaia di cicli.

Molle a Gas Standard (Nitrider) – N Series
Le molle a gas superano oltre 200 ore di test con lo spray al sale. Questi cilindri costituiscono una scelta ideale dove eccellente qualità, resistenza alla corrosione ed una totale apparenza nera sono richieste per la vostra applicazione.

Queste molle a gas costituiscono una scelta ideale dove eccellente qualità, resistenza alla corrosione ed una totale apparenza nera sono richieste per la vostra applicazione.

Molle a Gas a Forza regolabile (Varilift) – V Series
Questa particolare molla a gas si differenzia per la presenza di un valvola a rilascio alla fine del corpo molla che permette all'utilizzatore di regolare la forza della molla a gas in base all'applicazione. Tutti i codici vengono forniti con la massima carica possibile per le misure che avrà la molla in questione. Una volta che la molla a gas viene installata il gas all'interno può essere rilasciato gradualmente fino a raggiungere la forza desiderata. Sono disponibili sia in serie Nitrider che in Acciaio Inox.

Molle a Gas in Acciaio Inox – S Series
Le molle a gas in acciaio inox sono progettate utilizzando come materiale l'AISI 316 che fa di questo tipo di cilindro una scelta ideale dove sono presenti condizioni ambientali critiche. Tutte le superfici in acciaio inox sono inoltre rivestite con una speciale superficie che va ad aggiungere un ulteriore resistenza alla corrosione. Questo tipo di molla a gas è inoltre consigliato per le applicazioni marine e per quelle nel settore medico o alimentare dove un alto grado di pulizia è un obbligo.

Varilift – X Series
Questa particolare molla a gas si differenzia per la presenza di un valvola a rilascio alla fine del corpo molla che permette all'utilizzatore di regolare la forza della molla a gas in base all'applicazione. Tutti i codici vengono forniti con la massima carica possibile per le misure che avrà la molla in questione. Una volta che la molla a gas viene installata il gas all'interno può essere rilasciato gradualmente fino a raggiungere la forza desiderata. Serie X è in versione Inox.

P

AMORTECEDORES A GÁS

Um amortecedor a gás é composto por uma haste que desliza no interior e no exterior de um tubo dotado de pressão interna. A haste integra um êmbolo rebitado a uma extremidade, o que evita que se destaque pela acção da pressão interna. O amortecedor a gás utiliza-se vulgarmente como contrapeso, ao levantar ou baixar portas. As aplicações comuns são as portas traseiras dos automóveis, portas de autocarros, apoios de lâmpadas, clarabóias e protecções de máquinas. Os amortecedores cuja utilização respeite estas recomendações e aplicações de engenharia correctas, podem durar muitos milhares de ciclos.

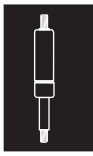
Nitrogenio – N Series
Nossos amortecedores a gás utilizam seladores com tecnologia de ultima geração que proporciona uma vida útil mais longa. O corpo é preto e contra corrosão por nitrogênio. A seleção das pontas pode ser vista em "fittings".

Essas molas a gas são ideias para aplicações onde o acabamento em preto , alta qualidade e anti corrasão são exigidos.

Diferencial – V Series
É possível libertar gás por intermédio de uma válvula de descarga, instalada lateralmente, e portanto reduzir a força do amortecedor. São sujeitos a pressão máxima determinada pelas respectivas dimensões. È possível ajustar a força do amortecedor em P1. Cada amortecedor é fornecido com sua força máxima em P1, uma vez instaladas o ajuste pode ser feito sem desmontar o amortecedor, economizando assim um bom tempo. Esta versão é ideal para protótipos com novas aplicações.

Aço Inoxidavel – S Series
Feitas com Aço inox 316, esses amortecedores são feitos para ambientes adversos de corrosão. Ideais para industria marinha, quimica e alimenticia. Existe uma grande variedade de extremidades disponíveis

VARILIX Serie X
È possível libertar gás por intermédio de uma válvula de descarga, instalada lateralmente, e portanto reduzir a força do amortecedor. São sujeitos a pressão máxima determinada pelas respectivas dimensões. È possível ajustar a força do amortecedor em P1. Cada amortecedor é fornecido com sua força máxima em P1, uma vez instaladas o ajuste pod



StickstoffzylinderStickstoffzylinderStickstoffzylinde
AmmortizzatoriAGasAmmortizzatoriAGasAmmortizza
AmortecedoresAGásAmortecedoresAGásAmortecedo

UK

ADDITIONAL TECHNICAL DATA

GAS STRUTS

Gas Springs are available in the following sizes:
Force increases on a linear scale as the Gas Spring is compressed.
6 – 15 - Load Ratio 1.2, M6 x 1.0 thread:
For door weights of 1 – 10 kg.
(6 – 15 refers to 6mm rod and 15mm tube dia)

8 – 18 - Load Ratio 1.3, M6 x 1.0 thread:
For door weights of 6 – 35 kg

10 – 23 - Load Ratio 1.3, M8 x 1.25 thread:
For door weights of 25 – 140 kg

14 – 28 - Load Ratio 1.5, M10 x 1.5 thread:
For door weights of 100 – 350 kg
(1kg = 9.8 N - 1lb = 4.45 N)

Calculating loads using load ratios
The ratio between initial load and final load is shown in example below.

Example: For a gas spring with an 8mm diameter rod and an intial load of 100N, the final load will be (100N x 1.3) = 130N (Final Load - intial Load x Load Ratio)
(1kg = 9.8 N - 1b = 4.45 N)

A page to assist you in selecting the correct Spring is included at the end of this section. If you are unsure of the spring to use, please contact us.

Replacement Gas Springs
Should you require replacement Gas Springs for your existing equipment, please provide us with the following information:

a. Diameter of Tube and Rod.
b. Extended length.
c. Type of end fittings used.
d Stroke length.
e. Any information given on the side of the existing Gas Spring.
f. Load if known.

FOR DETAILS OF GAS STRUT END FITTINGS SEE PAGES 194 – 197

KEY TO DIMENSIONS
L = Extended length
ØR = Rod diameter
ØT = Tube diameter
St = Stroke
P_1 = Initial force (N)

F

DONNEES TECHNIQUES ADDITIONNELLES

AMORTISSEURS A GAZ

Les Vérins à Gaz sont disponibles dans les tailles suivantes:
La force augmente de façon linéaire quand le vérin est comprimé.
6-15 – Ratio de charge 1,2 – filetage M6 x 1,0 :
Pour des portes de 1 à 10kg.
(6-15 signifie tige de Ø 6mm et tube de 15mm)

8-18 – Ratio de charge 1,3 – filetage M6 x 1,0 :
Pour des portes de 6 à 35kg.

10-23 – Ratio de charge 1,3 – filetage M8 x 1,25 :
Pour des portes de 25 à 140kg.

14-28 – Ratio de charge 1,5 – filetage M10 x 1,5 :
Pour des portes de 100 à 350kg.
(1kg = 9.8N – 1lb = 4.45N)

Calcul de charges en utilisant les ratios de charge
Le ratio entre les charges initiale et finale est donné ci-dessus.

Exemple: Pour un vérin à gaz de tige 8mm avec une force initiale de 100 N, la charge finale sera de (100Nx1,3) = 130N. (Force finale = Force initiale x ratio)
(1kg = 9.8 N - 1b = 4.45 N)

Une page d'aide à la sélection des vérins est incluse à la fin de cette section. Si vous n'êtes pas sûr de votre choix, contactez-nous.

Remplacement des amortisseurs a gaz :
Pour remplacer les amortisseurs à gaz de votre équipement actuel, veuillez fournir les renseignements suivants:

a) Diamètres de Tube et de Tige.
b) Entraxes à l'état déployé.
c) Type d'embouts.
d) Longueur de la course.
e) Toute information écrite sur le côté de l'amortisseur
f) Charge si possible.

POUR LES DETAILS CONCERNANT LES ATTACHES, VOIR PAGES 194 – 197

ABBREVIATIONS UTILISEES
L = Longueur déployée
ØR = Diamètre de la tige
ØT = Diamètre du tube
St = Course
P_1 = Charge initiale (N)

E

INFORMACIÓN TÉCNICA ADICIONAL

AMORTIGUADORES DE GAS

Se dispone de los siguientes tamaños:
La fuerza se incrementa linealmente a medida que el amortiguador se comprime.
6 - 15 – Ratio de fuerza 1,2, rosca M6 x 1,0 :
Para pesos de 1 - 10 kg.
(6 - 15 indica 6mm diá. Vástago y 15mm diá. tubo)

8 - 18 - Ratio de fuerza 1,3, rosca M6 x 1,0 :
Para pesos de 6 - 35 kg

10 - 23 - Ratio de fuerza 1,3, rosca M8 x 1,25 :
Para pesos de 25 - 140 kg

14 - 28 - Ratio de fuerza 1,5, rosca M10 x 1,5 :
Para pesos de 100 - 350 kg

(1kg = 9,8 N - 1lb = 4,45 N)

Cálculo de fuerzas con el ratio de fuerzas
La relación entre la fuerza inicial y final se muestra en la tabla anterior.

Ejemplo: Para un amortiguador de 8mm de diámetro de vástago y una fuerza inicial de 100N, la fuerza final sería (100Nx1,3) = 130N (Fuerza final-fuerza inicialxratio de fuerza). (1kg = 9,8 N - 1lb = 4,45 N)

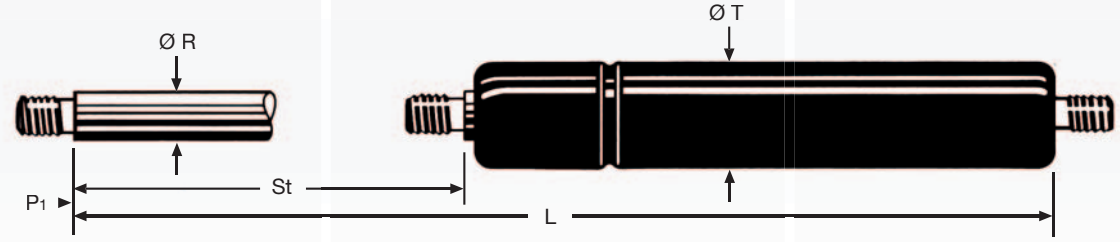
Se incluye una página para ayudarle a seleccionar el amortiguador adecuado al final de esta sección. Si no está seguro de que amortiguador seleccionar, por favor, contacte con nosotros.

Repuestos de amortiguadores a gas :
Si se necesitase un repuesto de amortiguador a gas para una máquina ya existente, háganos llegar la siguiente información:

a) Diámetro de tubo y vástago
b) Longitud extendida y comprimida entre centros.
c) Tipo de rotula (ver página opuesta)
d) Longitud de carrera
e) Cualquier información a escribirse en el lateral del cuerpo
f) Fuerza del amortiguador

PARA DETALLES SOBRE LOS TIPOS DE AMARRES, VER PAGINA 194 – 197

CLAVES DE DIMENSIONES
L = Longitud extendida
ØR = Diámetro vástago
ØT = Diámetro tubo
St = Carrera
P_1 = Fuerza inicial



D

ZUSÄTZLICHE TECHNISCHEN ANGABEN

GAS DRUCKFEDERN

Gasdruckfedern sind in den folgenden Größen verfügbar:
Wenn die Gasdruckfedern eingschoben wird, nimmt Die Federkraft mit einer linearen Ausprägung zu.
6 – 15 - Federkennung 1.2, M6 x 1.0 Gewinde:
Für Türgewichte von 1 - 10 kg.
(6 - 15 bezieht sich auf 6mm Stangen- und 15mm Schlauchdurchmesser)

8 – 18 - Federkennung 1.3, M6 x 1.0 Gewinde:
Für Türgewichte von 6 - 35 kg

10 – 23 - Federkennung 1.3, M8 x 1.25 Gewinde:
Für Türgewichte von 25 - 140 kg

14 – 28 - Federkennung 1.5, M10 x 1.5 Gewinde:
Für Türgewichte von 100 - 350 kg
(1kg = 9.8 N - 1lb = 4.45 N)

Das Rechnen von Federkraft mit Federkennungen
Die Ratio zwischen der anfänglichen Federkraft und Endfederkraft wird oben gegeben.

Beispiel: Ein Gasdruckfeder mit einer 8mm Durchmesser Stange und einer Anfangsfederkraft von 100N wird eine Endfederkraft (100N x 1.3) = 130N haben (Endfederkraft - Anfangsfederkraft X Federkennung)
(1 Kg = 9.8 N - 1b = 4.45 N)

Eine Seite, die Ihnen bei der Auswahl der korrekten Feder helfen soll, ist am Ende dieses Abschnitts enthalten. Wenn Sie nicht sicher sind, welche Feder Sie verwenden sollten, setzten Sie sich bitte mit uns in Verbindung.

Ersatz von Gasdruckfedern:
Wenn Sie Ersatz für Ihre Gasdruckfedern verlangen, versorgen Sie uns bitte mit der folgenden Information:

a. Durchmesser des Rohr und der Stange.
b. Unbelastete Länge.
c. Typ von verwendeten Anschlussteile.
d. Hub.
e. Jede auf der Seite des vorhandenen asdruckfedern gegebene Information.
f. Federkraft, wenn bekannt.

NÄHERE ANGABEN ÜBER ANSCHLUSSTEILE, SEHEN SIE SEITEN 194 – 197

KENNZEICHNEN DER ABMESSUNGEN
L = Erweiterte Länge
ØR = Dorndurchmesser
ØT = Rohrdurchmesser
St = Hub
P_1 = Anfangskraft (N)

I

ULTERIORI INFORMAZIONI TECNICHE

AMMORTIZZATORI A GAS

Caratteristiche di forza
Durante la compressione la forza dell'ammortizzatore aumenta in modo lineare di circa il 30%.
6 – 15 - rapporto di carico 1.2, filetto M6 x 1.0:
per porte del peso di 1 – 10 Kg
(6 – 15 si riferisce ad 6mm dello stelo e 15 mm della camicia)

8 – 18 - rapporto di carico 1.3, filetto M6 x 1.0:
per porte del peso di 6 – 35 Kg

10 – 23 - rapporto di carico 1.3, filetto M8 x 1.25:
per porte del peso di 25 – 140 Kg

14 – 28 - rapporto di carico 1.5, filetto M10 x 1.5:
per porte del peso di 100 – 350 Kg
(1Kg = 9.8N – 1lb = 4.45 N)

Calcolare il carico utilizzando il rapporto di carico
Il rapporto forza compressa/forza estesa (Rc) è indicato nella tabella 1 qui sotto

Esempio: per una molla a gas con uno stelo da 8 mm ed un carico iniziale di 100N, il carico finale sarà (100N x 1.3) = 130N. (carico finale = carico iniziale x scala di carico).

Una pagina per assistervi nella scelta adeguata del tipo di molla è presente alla fine di questa sezione. Se siete insicuri prego contattateci.

Sostituzione degli ammortizzatori a gas
Per sostituire gli ammortizzatori a gas della vostra attrezzatura attuale, vogliate fornirci le informazioni seguenti:

a) Diametro dello stelo e della camicia
b) Lunghezza in estensione tra i centri
c) Tipo di raccordo
d) Lunghezza della corsa
e) Carico se conosciuto
f) Ogni informazione scritta sul fianco dell'ammortizzatore

PER DETTAGLI SULLE ESTREMITÀ DISPONIBILI VEDI PAGINA 194 – 197

LEGENDA
L = Lunghezza estesa
ØR = Diametro stelo
ØT = Diametro corpo
St = Corsa
P_1 = Forza iniziale (N)

P

INFORMAÇÕES TECNICAS ADICIONAIS

AMORTECEDORES A GÁS

Amortecedores A Gas São Disponiveis Nos Seguintes Tamanhos:
As forças aumentam lineramente à medida que os cilindros se comprimem
6 – 15 Rateio de força 1,2 M6 x 1,0 : Para pesos de 1 a 10 kgs.
(6 a 15 indica 6mm diametro haste e 15 diam do Tubo)

8 a 18 Rateio de força 1,3 : Rosca M6 x 1,0 : Para pesos de 6 – 35 Kgs

10 a 23 Rateio de força 1,3 Rosca M8 x 1,25 : Para pesos 25 a 140 Kgs

14 a 28 Rateio de força 1,5 Rosca M10 x 1,5 : Para pesos de 100 a 350 kgs
(1 kg = 9,8 N – 1 lb = 4,45 N)

Calculo de carga usando Rateio de força
A relação entre força inicial e final mostra-se na tabela acima.

Exemplo: Para um amortecedor com 8 mm de haste, e uma força inicial de 100N, a força final seria de 130N (100Nx1,3) Força final – força inicial x rateio de força.

Existe uma pagina para ajudarlos a selecionar o maortecedor adequado no final desta seção.

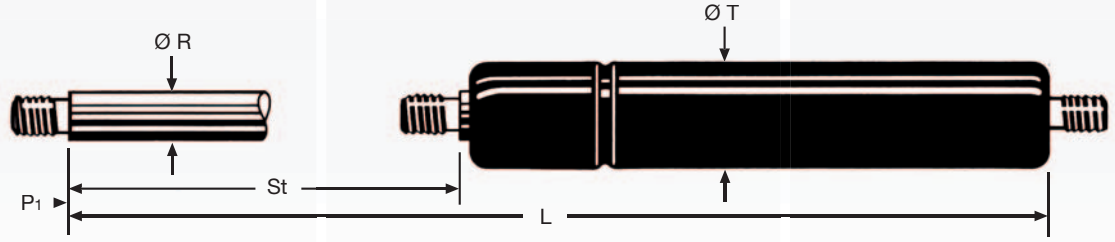
Se ainda assim tiver duvidas por fvr entre em contato.

Reposição para amortecedores ja existentes
Se precisarem de uma reposição de peças ja exitentes, informe o seguinte:

a) Diametro da haste e tubo
b) Longitude extendida e comprimento entre centros
c) Tipo de rotulo.
d) Comprimento de trabalho
e) Qualquer informação que esteja na lateral do corpo do amortecedor
f) Força do amortecedor

PARA DETALHES SOBRE TIPOS DE EXTREMIDADES VER PAGINA 194 – 197

LEGENDA
L = Comprimento Total
ØR = Diametro da Haste
ØT = Diametro do Corpo
St = Comprimento de Trabalho
P_1 = Força Inicial



UK

ADDITIONAL TECHNICAL DATA

GAS STRUTS

New applications

1. Determine the weight to be lifted
2. From Table 1 select your required strut size
3. Measure the width of door/lid ('W' on figs 1 and 2)
4. Referring to size listing on the next pages, select a Gas Strut with a stroke approximately 25% of dimension
5. Select your required end-fittings
6. Add the length of your chosen end fittings to the extended length of the Gas Strut to give the overall length between centres.
7. Draw a layout to scale and check that your Gas Strut will fit between your proposed fixing points both in the open and closed positions. If not, adjust accordingly.

   Note: *Ensure that the Gas Strut does not bottom-out only using 90% of the stroke*
8. Decide which of the applications shown below is most similar to yours.
9. Calculate the force F_1 using the appropriate formulae.

When Ordering
Specify the required ends and quantity, identifying the part numbers.

Fig 1
F_1 = Strut Force (extended)
F_2 = Strut Force (compressed)
L = Weight (N)
W = Width of door / Lid (mm)
S = Dist. From hinge to centre of gravity (mm)
1 kg = 9.81N
1 lb = 4.45N
LR = Load Ratio

Fig 2
n = Number of Struts used
d = distance from Gas Strut to perpendicular line drawn through hinge(mm)

= Centre of Gravity

F

DONNEES TECHNIQUES ADDITIONNELLES

AMORTISSEURS A GAZ

Nouvelles applications

1) Déterminer le poids à soulever
2) Dans le Tableau 1, sélectionner la taille d'amortisseur requise
3) Mesurer la largeur de la porte/du couvercle ("W" sur Fig. 1 et 2).
4) En se reportant au Tableau 2, sélectionner un amortisseur à gaz dont la course fait environ 25% de la dimension
5) Sélectionner les embouts requis.
6) Ajouter la longueur des embouts choisis à la longueur de l'amortisseur à gaz déployé pour obtenir l'entraxe total.
7) Tracer un plan à l'échelle et s'assurer que l'amortisseur pourra être monté entre les points de fixation choisis dans les positions ouvertes et fermées. Si cela est impossible, le régler en conséquence.

   Note: *S'assurer que l'amortisseur à gaz n'arrive pas en butée en utilisant seulement 90% de la course.*
8) Choisir parmi les applications ci-dessous celle qui se rapproche le plus de la votre.
9) Calculer la force F_1 avec la formule appropriée.

Pour commander
N'oubliez pas de spécifier la nature des éxtremités, en indiquant leur référence, ainsi que leur quantité.

Fig 1
F_1 = Force de l'amortisseur (déployé)
F_2 = Force de l'amortisseur (comprimé)
L = Poids (N)
W = Largeur de la Porte/du Capot
S = Distance de la charnière au centre de gravité (mm)
1 kg = 9,81 N
1 lb = 4,45 N
LR = Ratio de Charge

Fig 2
n = nbre d'amortisseurs utilisés
d = distance perpendiculaire de l'amortisseur à gaz au trait tracé à travers la charnière (mm)

= Centre de Gravité

E

INFORMACIÓN TÉCNICA ADICIONAL

AMORTIGUADORES DE GAS

Nuevas aplicaciones

1. Determinar el peso a ser levantado
2. Seleccionar el tamaño de amortiguador de la Tabla 1.
3. Medir la anchura de la puerta/tapa ("W" en las fig. 1 y 2)
4. Dentro de la los tamaños listados en las siguientes páginas, elegir un amortiguador con una carrera aproximadamente 25% de la dimensión.
5. Seleccionar los amarres
6. Añadir la longitud de los amarres elegidos a la longitud extendida del amortiguador de gas para poder obtener la longitud entre centros de los amarres.
7. Realizar un plano a escala y comprobar que las medidas del amortiguador tanto en su posición comprimida como su posición extendida encajan en los puntos de amarre. Si no fuese así, ajustar los puntos de amarre de forma correcta.
8. Decidir cuál de las aplicaciones que aparecen abajo se acerca más a su caso
9. Calcular la F_1 usando las formulas apropiadas.

A la hora de pedir
Especificar los amarres deseados y la cantidad, identificando las referencias.

Fig 1
F_1 = fuerza del amortiguador (extendido)
F_2 = fuerza del amortiguador (comprimido)
L = peso (N)
W = anchura de la puerta/tapa (mm)
S = dist. del eje al centro de gravedad (mm)
1 kg = 9.81 N
1 lb = 4.45 N
LR = Ratio de carga

Fig 2
n = numero de amortiguadores usados
d = distancia desde el amortiguador hasta la perpendicular del eje (mm)

= Centro de Gravedad

Table 1

ØR	LR	L
6	1.2	1-10Kg
8	1.3	6-35Kg
10	1.3	25-140Kg
14	1.5	100-300Kg
20	1.5	350+Kg

Fig 1

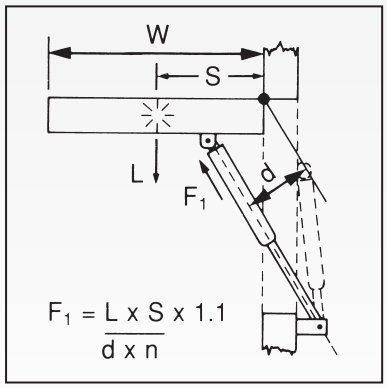
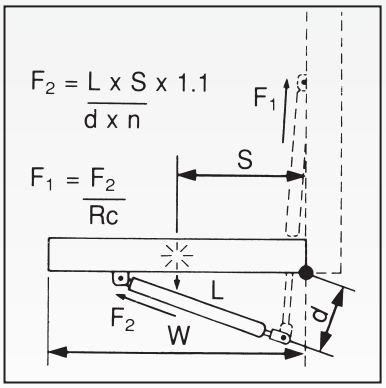


Fig 2



D

ZUSÄTZLICHE TECHNISCHEN ANGABEN

GAS DRUCKFEDERN

Neue Anwendungen

1. Bestimmen Sie das zu hebende Gewicht.
2. Wählen Sie Ihre benötigte Größe aus Tabelle 1 aus.
3. Messen Sie die Breite der Tür/des Deckels ("W" in Abb. 1 und 2)
4. Wählen Sie mit Hilfe der Größenauflistung auf den nächsten Seiten eine Gasdruckfeder mit einem Hub von ungefähr 25% der Abmessung aus.
5. Wählen Sie die von Ihnen benötigten Halterungen aus.
6. Addieren Sie die Länge Ihrer ausgewählten Halterungen zur erweiterten Länge der Gasdruckfeder, um die Gesamtlänge zwischen den Mittelpunkten zu erhalten.
7. Zeichnen Sie ein maßstabsgetreues Layout, um zu überprüfen, ob Ihre Gasdruckfeder sowohl in der offenen als auch geschlossenen Position zwischen Ihre vorgesehenen Befestigungspunkte passt.

   Hinweis: Stellen Sie sicher, dass die Gasdruckfeder nicht ausläuft und nur 90% des Hubs einsetzt.
8. Entscheiden Sie, welche der unten angezeigten Anwendungen Ihrer Anwendung am ähnlichsten ist.
9. Berechnen Sie die Kraft F_1 mit Hilfe der entsprechenden Formel.

Bei der Bestellung
Geben Sie die gewünschten Enden und die Menge sowie Teilenummern an.

Abb. 1
F_1 = Kraft (erweitert)
F_2 = Kraft (komprimiert)
L = Gewicht (N)
W = Breite der Tür /des Deckel (mm)
S = Entfernung vom Scharnier zum Schwerpunkt (mm)
1 kg = 9.81N
1 lb = 4.45N
LR = Federkennung

Abb. 2
n = Anzahl der verwendeten Streben
d = Entfernung von der Gasdruckfeder zur durch das Scharnier gezeichneten Senkrechtlinie (mm)

= Schwerpunkt

I

ULTERIORI INFORMAZIONI TECNICHE

AMMORTIZZATORI A GAS

Nuove applicazioni

1) Determinare il peso da sollevare
2) Nel quadro 1 selezionare la dimensione dell'ammortizzatore richiesta
3) Misurare la larghezza della porta, o del coperchio ("W" nella figura 1 e 2)
4) Facendo riferimento al quadro 2, selezionare un ammortizzatore a gas con una corsa circa al 25% della sua dimensione
5) Selezionare i raccordi richiesti
6) Aggiungere la lunghezza dei raccordi richiesti alla lunghezza dell'ammortizzatore in estensione per ottenere la lunghezza totale tra i centri.
7) Tracciare un disegno in scala e assicurarsi che l'ammortizzatore potrà essere montato tra i punti di fissaggio scelti in posizione aperta e chiusa. Se non è possibile regolarlo di conseguenza.

   Nota: Assicurarsi che l'ammortizzatore a gas non arrivi al limite utilizzando solo il 90% della corsa.
8) Scegliere tra le applicazioni qui sotto quella che si avvicina di più alla vostra
9) Calcolare la forza F_1 con la formula appropriata.

Per ordinare
Specificare i terminali di cui necessitate e la quantità. Identificare il codice articolo.

Fig 1
F_1 = Forza dell'ammortizzatore (esteso)
F_2 = Forza dell'ammortizzatore (compresso)
L = Peso (N)
W = Larghezza della porta/coperchio (mm)
S = Distanza dal cardine al centro di gravità (mm)
1 kg=9,81 N
1 lb=4,45 N
LR = Rapporto di carico

Fig 2
n = numero di ammortizzatori utilizzati
d = distanza perpendicolare dell'ammortizzatore a gas alla linea tracciata lungo il cardine (mm)

= Centro di Gravità

P

INFORMAÇÕES TECNICAS ADICIONAIS

AMORTECEDORES A GÁS

Novas Aplicações:

1. Determinar o peso a ser levantado
2. Selecionar o tamanho do amortecedor na tabela 1
3. Medir a largura da porta/tampa (W na figuras 1 e 2)
4. Dentro dos tamanhos listados nas paginas seguintes, escolher um amortecedor com um curso de 25% da dimensão.
5. Selecionar as extremidades
6. Medir as extremidades e a longitude extendida do amortecedor para poder obter a medida entre centros
7. Fazer um desenho em escala e medir as dimensões do amortecedor em descanso e tambem extendido, para que as extremidades se encaixem de forma correta.
8. Decidir qual das aplicações abaixo se encaixam melhor ao seu uso.
9. Calcular F_1 usando a formula apropriada.

Ao pedir
Especifique as extremidades e as quantidades desejadas identificando as referencias.

Fig 1
F_1 = Força do amortecedor (Extendido)
F_2 = Força do amortecedor (Comprimido)
L = Peso (N)
W = largura da porta/tampa (mm)
S = Distancia do eixo ao centro de gravidade (mm)
1Kg = 9.81N
1 lb = 1.45N
LR = Padrão de carga

Fig 2
n = Numero de amortecedores usados
d = Distancia do amortecedor á perpendicularidade do eixo (mm)

= Centro de Gravidade

Table 1

Ø R	LR	L
6	1.2	1-10Kg
8	1.3	6-35Kg
10	1.3	25-140Kg
14	1.5	100-300Kg
20	1.5	350+Kg

Fig 1

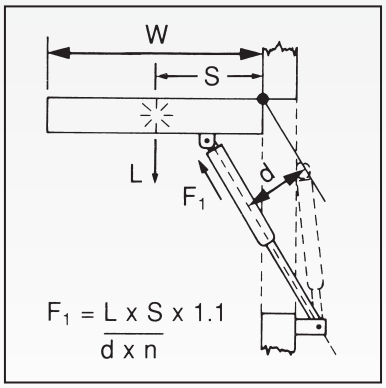
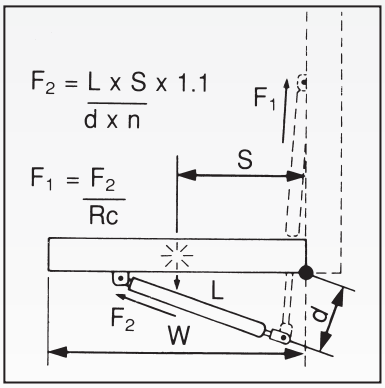


Fig 2



GAS STRUTS					N SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
N06AAA0050	6	15	50	154	50
N06AAA0100	6	15	50	154	100
N06AAA0150	6	15	50	154	150
N06AAA0200	6	15	50	154	200
N06AAA0250	6	15	50	154	250
N06AAA0300	6	15	50	154	300
N06AAA0350	6	15	50	154	350
N06AAA0400	6	15	50	154	400
N06BAB0050	6	15	60	160	50
N06BAB0100	6	15	60	160	100
N06BAB0150	6	15	60	160	150
N06BAB0200	6	15	60	160	200
N06BAB0250	6	15	60	160	250
N06BAB0300	6	15	60	160	300
N06BAB0350	6	15	60	160	350
N06BAB0400	6	15	60	160	400
N06VBN0050	6	15	73	183	50
N06VBN0100	6	15	73	183	100
N06VBN0150	6	15	73	183	150
N06VBN0200	6	15	73	183	200
N06VBN0250	6	15	73	183	250
N06VBN0300	6	15	73	183	300
N06VBN0350	6	15	73	183	350
N06VBN0400	6	15	73	183	400
N06CAF0050	6	15	75	214	50
N06CAF0100	6	15	75	214	100
N06CAF0150	6	15	75	214	150
N06CAF0200	6	15	75	214	200
N06CAF0250	6	15	75	214	250
N06CAF0300	6	15	75	214	300
N06CAF0350	6	15	75	214	350
N06CAF0400	6	15	75	214	400
N06DAD0050	6	15	80	200	50
N06DAD0100	6	15	80	200	100
N06DAD0150	6	15	80	200	150
N06DAD0200	6	15	80	200	200
N06DAD0250	6	15	80	200	250
N06DAD0300	6	15	80	200	300
N06DAD0350	6	15	80	200	350
N06DAD0400	6	15	80	200	400
N06EAL0050	6	15	90	269	50
N06EAL0100	6	15	90	269	100
N06EAL0150	6	15	90	269	150
N06EAL0200	6	15	90	269	200
N06EAL0250	6	15	90	269	250
N06EAL0300	6	15	90	269	300
N06EAL0350	6	15	90	269	350
N06EAL0400	6	15	90	269	400
N06FAG0050	6	15	100	240	50
N06FAG0100	6	15	100	240	100
N06FAG0150	6	15	100	240	150
N06FAG0200	6	15	100	240	200
N06FAG0250	6	15	100	240	250
N06FAG0300	6	15	100	240	300
N06FAG0350	6	15	100	240	350
N06FAG0400	6	15	100	240	400
N06GAM0050	6	15	120	280	50
N06GAM0100	6	15	120	280	100
N06GAM0150	6	15	120	280	150
N06GAM0200	6	15	120	280	200
N06GAM0250	6	15	120	280	250
N06GAM0300	6	15	120	280	300
N06GAM0350	6	15	120	280	350
N06GAM0400	6	15	120	280	400
N06HAQ0050	6	15	140	344	50
N06HAQ0100	6	15	140	344	100

GAS STRUTS					N SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
N06HAQ0150	6	15	140	344	150
N06HAQ0200	6	15	140	344	200
N06HAQ0250	6	15	140	344	250
N06HAQ0300	6	15	140	344	300
N06HAQ0350	6	15	140	344	350
N06HAQ0400	6	15	140	344	400
N06JAP0050	6	15	150	340	50
N06JAP0100	6	15	150	340	100
N06JAP0150	6	15	150	340	150
N06JAP0200	6	15	150	340	200
N06JAP0250	6	15	150	340	250
N06JAP0300	6	15	150	340	300
N06JAP0350	6	15	150	340	350
N06JAP0400	6	15	150	340	400
N06LAU0050	6	15	170	394	50
N06LAU0100	6	15	170	394	100
N06LAU0150	6	15	170	394	150
N06LAU0200	6	15	170	394	200
N06LAU0250	6	15	170	394	250
N06LAU0300	6	15	170	394	300
N06LAU0350	6	15	170	394	350
N06LAU0400	6	15	170	394	400
N06MAW0050	6	15	180	434	50
N06MAW0100	6	15	180	434	100
N06MAW0150	6	15	180	434	150
N06MAW0200	6	15	180	434	200
N06MAW0250	6	15	180	434	250
N06MAW0300	6	15	180	434	300
N06MAW0350	6	15	180	434	350
N06MAW0400	6	15	180	434	400
N06NAX0050	6	15	200	440	50
N06NAX0100	6	15	200	440	100
N06NAX0150	6	15	200	440	150
N06NAX0200	6	15	200	440	200
N06NAX0250	6	15	200	440	250
N06NAX0300	6	15	200	440	300
N06NAX0350	6	15	200	440	350
N06NAX0400	6	15	200	440	400
N06NBA0050	6	15	200	469	50
N06NBA0100	6	15	200	469	100
N06NBA0150	6	15	200	469	150
N06NBA0200	6	15	200	469	200
N06NBA0250	6	15	200	469	250
N06NBA0300	6	15	200	469	300
N06NBA0350	6	15	200	469	350
N06NBA0400	6	15	200	469	400
N08AAA0100	8	18	50	154	100
N08AAA0150	8	18	50	154	150
N08AAA0200	8	18	50	154	200
N08AAA0250	8	18	50	154	250
N08AAA0300	8	18	50	154	300
N08AAA0350	8	18	50	154	350
N08AAA0400	8	18	50	154	400
N08AAA0450	8	18	50	154	450
N08AAA0500	8	18	50	154	500
N08AAA0550	8	18	50	154	550
N08AAA0600	8	18	50	154	600
N08AAA0650	8	18	50	154	650
N08BAC0100	8	18	60	169	100
N08BAC0150	8	18	60	169	150
N08BAC0200	8	18	60	169	200
N08BAC0250	8	18	60	169	250
N08BAC0300	8	18	60	169	300
N08BAC0350	8	18	60	169	350
N08BAC0400	8	18	60	169	400
N08BAC0450	8	18	60	169	450

Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
N08BAC0500	8	18	60	169	500
N08BAC0550	8	18	60	169	550
N08BAC0600	8	18	60	169	600
N08BAC0650	8	18	60	169	650
N08CAF0100	8	18	75	214	100
N08CAF0150	8	18	75	214	150
N08CAF0200	8	18	75	214	200
N08CAF0250	8	18	75	214	250
N08CAF0300	8	18	75	214	300
N08CAF0350	8	18	75	214	350
N08CAF0400	8	18	75	214	400
N08CAF0450	8	18	75	214	450
N08CAF0500	8	18	75	214	500
N08CAF0550	8	18	75	214	550
N08CAF0600	8	18	75	214	600
N08CAF0650	8	18	75	214	650
N08DAE0100	8	18	80	209	100
N08DAE0150	8	18	80	209	150
N08DAE0200	8	18	80	209	200
N08DAE0250	8	18	80	209	250
N08DAE0300	8	18	80	209	300
N08DAE0350	8	18	80	209	350
N08DAE0400	8	18	80	209	400
N08DAE0450	8	18	80	209	450
N08DAE0500	8	18	80	209	500
N08DAE0550	8	18	80	209	550
N08DAE0600	8	18	80	209	600
N08DAE0650	8	18	80	209	650
N08EAJ0100	8	18	90	264	100
N08EAJ0150	8	18	90	264	150
N08EAJ0200	8	18	90	264	200
N08EAJ0250	8	18	90	264	250
N08EAJ0300	8	18	90	264	300
N08EAJ0350	8	18	90	264	350
N08EAJ0400	8	18	90	264	400
N08EAJ0450	8	18	90	264	450
N08EAJ0500	8	18	90	264	500
N08EAJ0550	8	18	90	264	550
N08EAJ0600	8	18	90	264	600
N08EAJ0650	8	18	90	264	650
N08EAL0100	8	18	90	269	100
N08EAL0150	8	18	90	269	150
N08EAL0200	8	18	90	269	200
N08EAL0250	8	18	90	269	250
N08EAL0300	8	18	90	269	300
N08EAL0350	8	18	90	269	350
N08EAL0400	8	18	90	269	400
N08EAL0450	8	18	90	269	450
N08EAL0500	8	18	90	269	500
N08EAL0550	8	18	90	269	550
N08EAL0600	8	18	90	269	600
N08EAL0650	8	18	90	269	650
N08WBO0100	8	18	95	274	100
N08WBO0150	8	18	95	274	150
N08WBO0200	8	18	95	274	200
N08WBO0250	8	18	95	274	250
N08WBO0300	8	18	95	274	300
N08WBO0350	8	18	95	274	350
N08WBO0400	8	18	95	274	400
N08WBO0450	8	18	95	274	450
N08WBO0500	8	18	95	274	500
N08WBO0550	8	18	95	274	550
N08WBO0600	8	18	95	274	600
N08WBO0650	8	18	95	274	650
N08FAH0100	8	18	100	249	100
N08FAH0150	8	18	100	249	150

GAS STRUTS N SERIES

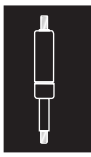
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
N08FAH0200	8	18	100	249	200
N08FAH0250	8	18	100	249	250
N08FAH0300	8	18	100	249	300
N08FAH0350	8	18	100	249	350
N08FAH0400	8	18	100	249	400
N08FAH0450	8	18	100	249	450
N08FAH0500	8	18	100	249	500
N08FAH0550	8	18	100	249	550
N08FAH0600	8	18	100	249	600
N08FAH0650	8	18	100	249	650
N08GAN0100	8	18	120	289	100
N08GAN0150	8	18	120	289	150
N08GAN0200	8	18	120	289	200
N08GAN0250	8	18	120	289	250
N08GAN0300	8	18	120	289	300
N08GAN0350	8	18	120	289	350
N08GAN0400	8	18	120	289	400
N08GAN0450	8	18	120	289	450
N08GAN0500	8	18	120	289	500
N08GAN0550	8	18	120	289	550
N08GAN0600	8	18	120	289	600
N08GAN0650	8	18	120	289	650
N08HAO0100	8	18	140	329	100
N08HAO0150	8	18	140	329	150
N08HAO0200	8	18	140	329	200
N08HAO0250	8	18	140	329	250
N08HAO0300	8	18	140	329	300
N08HAO0350	8	18	140	329	350
N08HAO0400	8	18	140	329	400
N08HAO0450	8	18	140	329	450
N08HAO0500	8	18	140	329	500
N08HAO0550	8	18	140	329	550
N08HAO0600	8	18	140	329	600
N08HAO0650	8	18	140	329	650
N08HAQ0100	8	18	140	344	100
N08HAQ0150	8	18	140	344	150
N08HAQ0200	8	18	140	344	200
N08HAQ0250	8	18	140	344	250
N08HAQ0300	8	18	140	344	300
N08HAQ0350	8	18	140	344	350
N08HAQ0400	8	18	140	344	400
N08HAQ0450	8	18	140	344	450
N08HAQ0500	8	18	140	344	500
N08HAQ0550	8	18	140	344	550
N08HAQ0600	8	18	140	344	600
N08HAQ0650	8	18	140	344	650
N08HAR0100	8	18	140	349	100
N08HAR0150	8	18	140	349	150
N08HAR0200	8	18	140	349	200
N08HAR0250	8	18	140	349	250
N08HAR0300	8	18	140	349	300
N08HAR0350	8	18	140	349	350
N08HAR0400	8	18	140	349	400
N08HAR0450	8	18	140	349	450
N08HAR0500	8	18	140	349	500
N08HAR0550	8	18	140	349	550
N08HAR0600	8	18	140	349	600
N08HAR0650	8	18	140	349	650
N08JAR0100	8	18	150	349	100
N08JAR0150	8	18	150	349	150
N08JAR0200	8	18	150	349	200
N08JAR0250	8	18	150	349	250
N08JAR0300	8	18	150	349	300
N08JAR0350	8	18	150	349	350
N08JAR0400	8	18	150	349	400
N08JAR0450	8	18	150	349	450
N08JAR0500	8	18	150	349	500

GAS STRUTS					N SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
N08JAR0550	8	18	150	349	550
N08JAR0600	8	18	150	349	600
N08JAR0650	8	18	150	349	650
N08JBV0100	8	18	150	385	100
N08JBV0150	8	18	150	385	150
N08JBV0200	8	18	150	385	200
N08JBV0250	8	18	150	385	250
N08JBV0300	8	18	150	385	300
N08JBV0350	8	18	150	385	350
N08JBV0400	8	18	150	385	400
N08JBV0450	8	18	150	385	450
N08JBV0500	8	18	150	385	500
N08JBV0550	8	18	150	385	550
N08JBV0600	8	18	150	385	600
N08JBV0650	8	18	150	385	650
N08JAU0100	8	18	150	394	100
N08JAU0150	8	18	150	394	150
N08JAU0200	8	18	150	394	200
N08JAU0250	8	18	150	394	250
N08JAU0300	8	18	150	394	300
N08JAU0350	8	18	150	394	350
N08JAU0400	8	18	150	394	400
N08JAU0450	8	18	150	394	450
N08JAU0500	8	18	150	394	500
N08JAU0550	8	18	150	394	550
N08JAU0600	8	18	150	394	600
N08JAU0650	8	18	150	394	650
N08KAT0100	8	18	160	369	100
N08KAT0150	8	18	160	369	150
N08KAT0200	8	18	160	369	200
N08KAT0250	8	18	160	369	250
N08KAT0300	8	18	160	369	300
N08KAT0350	8	18	160	369	350
N08KAT0400	8	18	160	369	400
N08KAT0450	8	18	160	369	450
N08KAT0500	8	18	160	369	500
N08KAT0550	8	18	160	369	550
N08KAT0600	8	18	160	369	600
N08KAT0650	8	18	160	369	650
N08LAU0100	8	18	170	394	100
N08LAU0150	8	18	170	394	150
N08LAU0200	8	18	170	394	200
N08LAU0250	8	18	170	394	250
N08LAU0300	8	18	170	394	300
N08LAU0350	8	18	170	394	350
N08LAU0400	8	18	170	394	400
N08LAU0450	8	18	170	394	450
N08LAU0500	8	18	170	394	500
N08LAU0550	8	18	170	394	550
N08LAU0600	8	18	170	394	600
N08LAU0650	8	18	170	394	650
N08MAV0100	8	18	180	409	100
N08MAV0150	8	18	180	409	150
N08MAV0200	8	18	180	409	200
N08MAV0250	8	18	180	409	250
N08MAV0300	8	18	180	409	300
N08MAV0350	8	18	180	409	350
N08MAV0400	8	18	180	409	400
N08MAV0450	8	18	180	409	450
N08MAV0500	8	18	180	409	500
N08MAV0550	8	18	180	409	550
N08MAV0600	8	18	180	409	600
N08MAV0650	8	18	180	409	650
N08MAW0100	8	18	180	434	100
N08MAW0150	8	18	180	434	150
N08MAW0200	8	18	180	434	200
N08MAW0250	8	18	180	434	250

GAS STRUTS					N SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
N08MAW0300	8	18	180	434	300
N08MAW0350	8	18	180	434	350
N08MAW0400	8	18	180	434	400
N08MAW0450	8	18	180	434	450
N08MAW0500	8	18	180	434	500
N08MAW0550	8	18	180	434	550
N08MAW0600	8	18	180	434	600
N08MAW0650	8	18	180	434	650
N08NAY0100	8	18	200	449	100
N08NAY0150	8	18	200	449	150
N08NAY0200	8	18	200	449	200
N08NAY0250	8	18	200	449	250
N08NAY0300	8	18	200	449	300
N08NAY0350	8	18	200	449	350
N08NAY0400	8	18	200	449	400
N08NAY0450	8	18	200	449	450
N08NAY0500	8	18	200	449	500
N08NAY0550	8	18	200	449	550
N08NAY0600	8	18	200	449	600
N08NAY0650	8	18	200	449	650
N08NBA0100	8	18	200	469	100
N08NBA0150	8	18	200	469	150
N08NBA0200	8	18	200	469	200
N08NBA0250	8	18	200	469	250
N08NBA0300	8	18	200	469	300
N08NBA0350	8	18	200	469	350
N08NBA0400	8	18	200	469	400
N08NBA0450	8	18	200	469	450
N08NBA0500	8	18	200	469	500
N08NBA0550	8	18	200	469	550
N08NBA0600	8	18	200	469	600
N08NBA0650	8	18	200	469	650
N08OBB0100	8	18	220	489	100
N08OBB0150	8	18	220	489	150
N08OBB0200	8	18	220	489	200
N08OBB0250	8	18	220	489	250
N08OBB0300	8	18	220	489	300
N08OBB0350	8	18	220	489	350
N08OBB0400	8	18	220	489	400
N08OBB0450	8	18	220	489	450
N08OBB0500	8	18	220	489	500
N08OBB0550	8	18	220	489	550
N08OBB0600	8	18	220	489	600
N08OBB0650	8	18	220	489	650
N08PBC0100	8	18	250	549	100
N08PBC0150	8	18	250	549	150
N08PBC0200	8	18	250	549	200
N08PBC0250	8	18	250	549	250
N08PBC0300	8	18	250	549	300
N08PBC0350	8	18	250	549	350
N08PBC0400	8	18	250	549	400
N08PBC0450	8	18	250	549	450
N08PBC0500	8	18	250	549	500
N08PBC0550	8	18	250	549	550
N08PBC0600	8	18	250	549	600
N08PBC0650	8	18	250	549	650
N10FAH0150	10	23	100	249	150
N10FAH0200	10	23	100	249	200
N10FAH0250	10	23	100	249	250
N10FAH0300	10	23	100	249	300
N10FAH0350	10	23	100	249	350
N10FAH0400	10	23	100	249	400
N10FAH0450	10	23	100	249	450
N10FAH0500	10	23	100	249	500
N10FAH0550	10	23	100	249	550
N10FAH0600	10	23	100	249	600
N10FAH0650	10	23	100	249	650

GAS STRUTS					N SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
N10FAH0700	10	23	100	249	700
N10FAH0750	10	23	100	249	750
N10FAH0800	10	23	100	249	800
N10FAH0850	10	23	100	249	850
N10FAH0900	10	23	100	249	900
N10FAH0950	10	23	100	249	950
N10FAH1000	10	23	100	249	1000
N10FAH1050	10	23	100	249	1050
N10FAH1100	10	23	100	249	1100
N10FAH1150	10	23	100	249	1150
N10FAH1200	10	23	100	249	1200
N10JAR0150	10	23	150	349	150
N10JAR0200	10	23	150	349	200
N10JAR0250	10	23	150	349	250
N10JAR0300	10	23	150	349	300
N10JAR0350	10	23	150	349	350
N10JAR0400	10	23	150	349	400
N10JAR0450	10	23	150	349	450
N10JAR0500	10	23	150	349	500
N10JAR0550	10	23	150	349	550
N10JAR0600	10	23	150	349	600
N10JAR0650	10	23	150	349	650
N10JAR0700	10	23	150	349	700
N10JAR0750	10	23	150	349	750
N10JAR0800	10	23	150	349	800
N10JAR0850	10	23	150	349	850
N10JAR0900	10	23	150	349	900
N10JAR0950	10	23	150	349	950
N10JAR1000	10	23	150	349	1000
N10JAR1050	10	23	150	349	1050
N10JAR1100	10	23	150	349	1100
N10JAR1150	10	23	150	349	1150
N10JAR1200	10	23	150	349	1200
N10NAY0150	10	23	200	449	150
N10NAY0200	10	23	200	449	200
N10NAY0250	10	23	200	449	250
N10NAY0300	10	23	200	449	300
N10NAY0350	10	23	200	449	350
N10NAY0400	10	23	200	449	400
N10NAY0450	10	23	200	449	450
N10NAY0500	10	23	200	449	500
N10NAY0550	10	23	200	449	550
N10NAY0600	10	23	200	449	600
N10NAY0650	10	23	200	449	650
N10NAY0700	10	23	200	449	700
N10NAY0750	10	23	200	449	750
N10NAY0800	10	23	200	449	800
N10NAY0850	10	23	200	449	850
N10NAY0900	10	23	200	449	900
N10NAY0950	10	23	200	449	950
N10NAY1000	10	23	200	449	1000
N10NAY1050	10	23	200	449	1050
N10NAY1100	10	23	200	449	1100
N10NAY1150	10	23	200	449	1150
N10NAY1200	10	23	200	449	1200
N10PBC0150	10	23	250	549	150
N10PBC0200	10	23	250	549	200
N10PBC0250	10	23	250	549	250
N10PBC0300	10	23	250	549	300
N10PBC0350	10	23	250	549	350
N10PBC0400	10	23	250	549	400
N10PBC0450	10	23	250	549	450
N10PBC0500	10	23	250	549	500
N10PBC0550	10	23	250	549	550
N10PBC0600	10	23	250	549	600
N10PBC0650	10	23	250	549	650
N10PBC0700	10	23	250	549	700
N10PBC0750	10	23	250	549	750

GAS STRUTS					N SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
N10PBC0800	10	23	250	549	800
N10PBC0850	10	23	250	549	850
N10PBC0900	10	23	250	549	900
N10PBC0950	10	23	250	549	950
N10PBC1000	10	23	250	549	1000
N10PBC1050	10	23	250	549	1050
N10PBC1100	10	23	250	549	1100
N10PBC1150	10	23	250	549	1150
N10PBC1200	10	23	250	549	1200
N10QBF0150	10	23	290	650	150
N10QBF0200	10	23	290	650	200
N10QBF0250	10	23	290	650	250
N10QBF0300	10	23	290	650	300
N10QBF0350	10	23	290	650	350
N10QBF0400	10	23	290	650	400
N10QBF0450	10	23	290	650	450
N10QBF0500	10	23	290	650	500
N10QBF0550	10	23	290	650	550
N10QBF0600	10	23	290	650	600
N10QBF0650	10	23	290	650	650
N10QBF0700	10	23	290	650	700
N10QBF0750	10	23	290	650	750
N10QBF0800	10	23	290	650	800
N10QBF0850	10	23	290	650	850
N10QBF0900	10	23	290	650	900
N10QBF0950	10	23	290	650	950
N10QBF1000	10	23	290	650	1000
N10QBF1050	10	23	290	650	1050
N10QBF1100	10	23	290	650	1100
N10QBF1150	10	23	290	650	1150
N10QBF1200	10	23	290	650	1200
N10RBE0150	10	23	300	649	150
N10RBE0200	10	23	300	649	200
N10RBE0250	10	23	300	649	250
N10RBE0300	10	23	300	649	300
N10RBE0350	10	23	300	649	350
N10RBE0400	10	23	300	649	400
N10RBE0450	10	23	300	649	450
N10RBE0500	10	23	300	649	500
N10RBE0550	10	23	300	649	550
N10RBE0600	10	23	300	649	600
N10RBE0650	10	23	300	649	650
N10RBE0700	10	23	300	649	700
N10RBE0750	10	23	300	649	750
N10RBE0800	10	23	300	649	800
N10RBE0850	10	23	300	649	850
N10RBE0900	10	23	300	649	900
N10RBE0950	10	23	300	649	950
N10RBE1000	10	23	300	649	1000
N10RBE1050	10	23	300	649	1050
N10RBE1100	10	23	300	649	1100
N10RBE1150	10	23	300	649	1150
N10RBE1200	10	23	300	649	1200
N10SBH0150	10	23	350	749	150
N10SBH0200	10	23	350	749	200
N10SBH0250	10	23	350	749	250
N10SBH0300	10	23	350	749	300
N10SBH0350	10	23	350	749	350
N10SBH0400	10	23	350	749	400
N10SBH0450	10	23	350	749	450
N10SBH0500	10	23	350	749	500
N10SBH0550	10	23	350	749	550
N10SBH0600	10	23	350	749	600
N10SBH0650	10	23	350	749	650
N10SBH0700	10	23	350	749	700
N10SBH0750	10	23	350	749	750
N10SBH0800	10	23	350	749	800
N10SBH0850	10	23	350	749	850



GAS STRUTS					N SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
N10SBH0900	10	23	350	749	900
N10SBH0950	10	23	350	749	950
N10SBH1000	10	23	350	749	1000
N10SBH1050	10	23	350	749	1050
N10SBH1100	10	23	350	749	1100
N10SBH1150	10	23	350	749	1150
N10SBH1200	10	23	350	749	1200
N10TBK0150	10	23	400	849	150
N10TBK0200	10	23	400	849	200
N10TBK0250	10	23	400	849	250
N10TBK0300	10	23	400	849	300
N10TBK0350	10	23	400	849	350
N10TBK0400	10	23	400	849	400
N10TBK0450	10	23	400	849	450
N10TBK0500	10	23	400	849	500
N10TBK0550	10	23	400	849	550
N10TBK0600	10	23	400	849	600
N10TBK0650	10	23	400	849	650
N10TBK0700	10	23	400	849	700
N10TBK0750	10	23	400	849	750
N10TBK0800	10	23	400	849	800
N10TBK0850	10	23	400	849	850
N10TBK0900	10	23	400	849	900
N10TBK0950	10	23	400	849	950
N10TBK1000	10	23	400	849	1000
N10TBK1050	10	23	400	849	1050
N10TBK1100	10	23	400	849	1100
N10TBK1150	10	23	400	849	1150
N10TBK1200	10	23	400	849	1200
N14FAK0150	14	28	100	266	150
N14FAK0200	14	28	100	266	200
N14FAK0250	14	28	100	266	250
N14FAK0300	14	28	100	266	300
N14FAK0350	14	28	100	266	350
N14FAK0400	14	28	100	266	400
N14FAK0450	14	28	100	266	450
N14FAK0500	14	28	100	266	500
N14FAK0550	14	28	100	266	550
N14FAK0600	14	28	100	266	600
N14FAK0650	14	28	100	266	650
N14FAK0700	14	28	100	266	700
N14FAK0750	14	28	100	266	750
N14FAK0800	14	28	100	266	800
N14FAK0850	14	28	100	266	850
N14FAK0900	14	28	100	266	900
N14FAK1000	14	28	100	266	1000
N14FAK1050	14	28	100	266	1050
N14FAK1100	14	28	100	266	1100
N14FAK1150	14	28	100	266	1150
N14FAK1200	14	28	100	266	1200
N14FAK1250	14	28	100	266	1250
N14FAK1300	14	28	100	266	1300
N14FAK1350	14	28	100	266	1350
N14FAK1400	14	28	100	266	1400
N14FAK1450	14	28	100	266	1450
N14FAK1500	14	28	100	266	1500
N14FAK1550	14	28	100	266	1550
N14FAK1600	14	28	100	266	1600
N14FAK1650	14	28	100	266	1650
N14FAK1700	14	28	100	266	1700
N14FAK1750	14	28	100	266	1750
N14FAK1800	14	28	100	266	1800
N14FAK1850	14	28	100	266	1850
N14FAK1900	14	28	100	266	1900
N14FAK1950	14	28	100	266	1950
N14FAK2000	14	28	100	266	2000
N14FAK2050	14	28	100	266	2050
N14FAK2100	14	28	100	266	2100
N14FAK2150	14	28	100	266	2150

GAS STRUTS					N SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
N14FAK2200	14	28	100	266	2200
N14FAK2250	14	28	100	266	2250
N14FAK2300	14	28	100	266	2300
N14FAK2350	14	28	100	266	2350
N14FAK2400	14	28	100	266	2400
N14FAK2450	14	28	100	266	2450
N14FAK2500	14	28	100	266	2500
N14JAS0150	14	28	150	366	150
N14JAS0200	14	28	150	366	200
N14JAS0250	14	28	150	366	250
N14JAS0300	14	28	150	366	300
N14JAS0350	14	28	150	366	350
N14JAS0400	14	28	150	366	400
N14JAS0450	14	28	150	366	450
N14JAS0500	14	28	150	366	500
N14JAS0550	14	28	150	366	550
N14JAS0600	14	28	150	366	600
N14JAS0650	14	28	150	366	650
N14JAS0700	14	28	150	366	700
N14JAS0750	14	28	150	366	750
N14JAS0800	14	28	150	366	800
N14JAS0850	14	28	150	366	850
N14JAS0900	14	28	150	366	900
N14JAS1000	14	28	150	366	1000
N14JAS1050	14	28	150	366	1050
N14JAS1100	14	28	150	366	1100
N14JAS1150	14	28	150	366	1150
N14JAS1200	14	28	150	366	1200
N14JAS1250	14	28	150	366	1250
N14JAS1300	14	28	150	366	1300
N14JAS1350	14	28	150	366	1350
N14JAS1400	14	28	150	366	1400
N14JAS1450	14	28	150	366	1450
N14JAS1500	14	28	150	366	1500
N14JAS1550	14	28	150	366	1550
N14JAS1600	14	28	150	366	1600
N14JAS1650	14	28	150	366	1650
N14JAS1700	14	28	150	366	1700
N14JAS1750	14	28	150	366	1750
N14JAS1800	14	28	150	366	1800
N14JAS1850	14	28	150	366	1850
N14JAS1900	14	28	150	366	1900
N14JAS1950	14	28	150	366	1950
N14JAS2000	14	28	150	366	2000
N14JAS2050	14	28	150	366	2050
N14JAS2100	14	28	150	366	2100
N14JAS2150	14	28	150	366	2150
N14JAS2200	14	28	150	366	2200
N14JAS2250	14	28	150	366	2250
N14JAS2300	14	28	150	366	2300
N14JAS2350	14	28	150	366	2350
N14JAS2400	14	28	150	366	2400
N14JAS2450	14	28	150	366	2450
N14JAS2500	14	28	150	366	2500
N14NAZ0150	14	28	200	466	150
N14NAZ0200	14	28	200	466	200
N14NAZ0250	14	28	200	466	250
N14NAZ0300	14	28	200	466	300
N14NAZ0350	14	28	200	466	350
N14NAZ0400	14	28	200	466	400
N14NAZ0450	14	28	200	466	450
N14NAZ0500	14	28	200	466	500
N14NAZ0550	14	28	200	466	550
N14NAZ0600	14	28	200	466	600
N14NAZ0650	14	28	200	466	650
N14NAZ0700	14	28	200	466	700
N14NAZ0750	14	28	200	466	750
N14NAZ0800	14	28	200	466	800
N14NAZ0850	14	28	200	466	850

GAS STRUTS					N SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
N14NAZ0900	14	28	200	466	900
N14NAZ1000	14	28	200	466	1000
N14NAZ1050	14	28	200	466	1050
N14NAZ1100	14	28	200	466	1100
N14NAZ1150	14	28	200	466	1150
N14NAZ1200	14	28	200	466	1200
N14NAZ1250	14	28	200	466	1250
N14NAZ1300	14	28	200	466	1300
N14NAZ1350	14	28	200	466	1350
N14NAZ01400	14	28	200	466	1400
N14NAZ1450	14	28	200	466	1450
N14NAZ1500	14	28	200	466	1500
N14NAZ1550	14	28	200	466	1550
N14NAZ1600	14	28	200	466	1600
N14NAZ1650	14	28	200	466	1650
N14NAZ1700	14	28	200	466	1700
N14NAZ1750	14	28	200	466	1750
N14NAZ1800	14	28	200	466	1800
N14NAZ1850	14	28	200	466	1850
N14NAZ1900	14	28	200	466	1900
N14NAZ1950	14	28	200	466	1950
N14NAZ2000	14	28	200	466	2000
N14NAZ2050	14	28	200	466	2050
N14NAZ2100	14	28	200	466	2100
N14NAZ2150	14	28	200	466	2150
N14NAZ2200	14	28	200	466	2200
N14NAZ2250	14	28	200	466	2250
N14NAZ2300	14	28	200	466	2300
N14NAZ2350	14	28	200	466	2350
N14NAZ2400	14	28	200	466	2400
N14NAZ2450	14	28	200	466	2450
N14NAZ2500	14	28	200	466	2500
N14PBD0150	14	28	250	566	150
N14PBD0200	14	28	250	566	200
N14PBD0250	14	28	250	566	250
N14PBD0300	14	28	250	566	300
N14PBD0350	14	28	250	566	350
N14PBD0400	14	28	250	566	400
N14PBD0450	14	28	250	566	450
N14PBD0500	14	28	250	566	500
N14PBD0550	14	28	250	566	550
N14PBD0600	14	28	250	566	600
N14PBD0650	14	28	250	566	650
N14PBD0700	14	28	250	566	700
N14PBD0750	14	28	250	566	750
N14PBD0800	14	28	250	566	800
N14PBD0850	14	28	250	566	850
N14PBD0900	14	28	250	566	900
N14PBD1000	14	28	250	566	1000
N14PBD1050	14	28	250	566	1050
N14PBD1100	14	28	250	566	1100
N14PBD1150	14	28	250	566	1150
N14PBD1200	14	28	250	566	1200
N14PBD1250	14	28	250	566	1250
N14PBD1300	14	28	250	566	1300
N14PBD1350	14	28	250	566	1350
N14PBD1400	14	28	250	566	1400
N14PBD1450	14	28	250	566	1450
N14PBD1500	14	28	250	566	1500
N14PBD1550	14	28	250	566	1550
N14PBD1600	14	28	250	566	1600
N14PBD1650	14	28	250	566	1650
N14PBD1700	14	28	250	566	1700
N14PBD1750	14	28	250	566	1750
N14PBD1800	14	28	250	566	1800
N14PBD1850	14	28	250	566	1850
N14PBD1900	14	28	250	566	1900
N14PBD1950	14	28	250	566	1950
N14PBD2000	14	28	250	566	2000

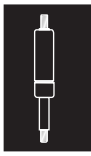
GAS STRUTS					N SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
N14PBD2050	14	28	250	566	2050
N14PBD2100	14	28	250	566	2100
N14PBD2150	14	28	250	566	2150
N14PBD2200	14	28	250	566	2200
N14PBD2250	14	28	250	566	2250
N14PBD2300	14	28	250	566	2300
N14PBD2350	14	28	250	566	2350
N14PBD2400	14	28	250	566	2400
N14PBD2450	14	28	250	566	2450
N14PBD2500	14	28	250	566	2500
N14RBG0150	14	28	300	666	150
N14RBG0200	14	28	300	666	200
N14RBG0250	14	28	300	666	250
N14RBG0300	14	28	300	666	300
N14RBG0350	14	28	300	666	350
N14RBG0400	14	28	300	666	400
N14RBG0450	14	28	300	666	450
N14RBG0500	14	28	300	666	500
N14RBG0550	14	28	300	666	550
N14RBG0600	14	28	300	666	600
N14RBG0650	14	28	300	666	650
N14RBG0700	14	28	300	666	700
N14RBG0750	14	28	300	666	750
N14RBG0800	14	28	300	666	800
N14RBG0850	14	28	300	666	850
N14RBG0900	14	28	300	666	900
N14RBG1000	14	28	300	666	1000
N14RBG1050	14	28	300	666	1050
N14RBG1100	14	28	300	666	1100
N14RBG1150	14	28	300	666	1150
N14RBG1200	14	28	300	666	1200
N14RBG1250	14	28	300	666	1250
N14RBG1300	14	28	300	666	1300
N14RBG1350	14	28	300	666	1350
N14RBG1400	14	28	300	666	1400
N14RBG1450	14	28	300	666	1450
N14RBG1500	14	28	300	666	1500
N14RBG1550	14	28	300	666	1550
N14RBG1600	14	28	300	666	1600
N14RBG1650	14	28	300	666	1650
N14RBG1700	14	28	300	666	1700
N14RBG1750	14	28	300	666	1750
N14RBG1800	14	28	300	666	1800
N14RBG1850	14	28	300	666	1850
N14RBG1900	14	28	300	666	1900
N14RBG1950	14	28	300	666	1950
N14RBG2000	14	28	300	666	2000
N14RBG2050	14	28	300	666	2050
N14RBG2100	14	28	300	666	2100
N14RBG2150	14	28	300	666	2150
N14RBG2200	14	28	300	666	2200
N14RBG2250	14	28	300	666	2250
N14RBG2300	14	28	300	666	2300
N14RBG2350	14	28	300	666	2350
N14RBG2400	14	28	300	666	2400
N14RBG2450	14	28	300	666	2450
N14RBG2500	14	28	300	666	2500
N14SBJ0150	14	28	350	766	150
N14SBJ0200	14	28	350	766	200
N14SBJ0250	14	28	350	766	250
N14SBJ0300	14	28	350	766	300
N14SBJ0350	14	28	350	766	350
N14SBJ0400	14	28	350	766	400
N14SBJ0450	14	28	350	766	450
N14SBJ0500	14	28	350	766	500
N14SBJ0550	14	28	350	766	550
N14SBJ0600	14	28	350	766	600
N14SBJ0650	14	28	350	766	650
N14SBJ0700	14	28	350	766	700

GAS STRUTS					N SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
N14SBJ0750	14	28	350	766	750
N14SBJ0800	14	28	350	766	800
N14SBJ0850	14	28	350	766	850
N14SBJ0900	14	28	350	766	900
N14SBJ1000	14	28	350	766	1000
N14SBJ1050	14	28	350	766	1050
N14SBJ1100	14	28	350	766	1100
N14SBJ1150	14	28	350	766	1150
N14SBJ1200	14	28	350	766	1200
N14SBJ1250	14	28	350	766	1250
N14SBJ1300	14	28	350	766	1300
N14SBJ1350	14	28	350	766	1350
N14SBJ1400	14	28	350	766	1400
N14SBJ1450	14	28	350	766	1450
N14SBJ1500	14	28	350	766	1500
N14SBJ1550	14	28	350	766	1550
N14SBJ1600	14	28	350	766	1600
N14SBJ1650	14	28	350	766	1650
N14SBJ1700	14	28	350	766	1700
N14SBJ1750	14	28	350	766	1750
N14SBJ1800	14	28	350	766	1800
N14SBJ1850	14	28	350	766	1850
N14SBJ1900	14	28	350	766	1900
N14SBJ1950	14	28	350	766	1950
N14SBJ2000	14	28	350	766	2000
N14SBJ2050	14	28	350	766	2050
N14SBJ2100	14	28	350	766	2100
N14SBJ2150	14	28	350	766	2150
N14SBJ2200	14	28	350	766	2200
N14SBJ2250	14	28	350	766	2250
N14SBJ2300	14	28	350	766	2300
N14SBJ2350	14	28	350	766	2350
N14SBJ2400	14	28	350	766	2400
N14SBJ2450	14	28	350	766	2450
N14SBJ2500	14	28	350	766	2500
N14TBL0150	14	28	400	866	150
N14TBL0200	14	28	400	866	200
N14TBL0250	14	28	400	866	250
N14TBL0300	14	28	400	866	300
N14TBL0350	14	28	400	866	350
N14TBL0400	14	28	400	866	400
N14TBL0450	14	28	400	866	450
N14TBL0500	14	28	400	866	500
N14TBL0550	14	28	400	866	550
N14TBL0600	14	28	400	866	600
N14TBL0650	14	28	400	866	650
N14TBL0700	14	28	400	866	700
N14TBL0750	14	28	400	866	750
N14TBL0800	14	28	400	866	800
N14TBL0850	14	28	400	866	850
N14TBL0900	14	28	400	866	900
N14TBL1000	14	28	400	866	1000
N14TBL1050	14	28	400	866	1050
N14TBL1100	14	28	400	866	1100
N14TBL1150	14	28	400	866	1150
N14TBL1200	14	28	400	866	1200
N14TBL1250	14	28	400	866	1250
N14TBL1300	14	28	400	866	1300
N14TBL1350	14	28	400	866	1350
N14TBL1400	14	28	400	866	1400
N14TBL1450	14	28	400	866	1450
N14TBL1500	14	28	400	866	1500
N14TBL1550	14	28	400	866	1550
N14TBL1600	14	28	400	866	1600
N14TBL1650	14	28	400	866	1650
N14TBL1700	14	28	400	866	1700
N14TBL1750	14	28	400	866	1750
N14TBL1800	14	28	400	866	1800
N14TBL1850	14	28	400	866	1850

GAS STRUTS					N SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
N14TBL1900	14	28	400	866	1900
N14TBL1950	14	28	400	866	1950
N14TBL2000	14	28	400	866	2000
N14TBL2050	14	28	400	866	2050
N14TBL2100	14	28	400	866	2100
N14TBL2150	14	28	400	866	2150
N14TBL2200	14	28	400	866	2200
N14TBL2250	14	28	400	866	2250
N14TBL2300	14	28	400	866	2300
N14TBL2350	14	28	400	866	2350
N14TBL2400	14	28	400	866	2400
N14TBL2450	14	28	400	866	2450
N14TBL2500	14	28	400	866	2500
N14UBM0150	14	28	500	1066	150
N14UBM0200	14	28	500	1066	200
N14UBM0250	14	28	500	1066	250
N14UBM0300	14	28	500	1066	300
N14UBM0350	14	28	500	1066	350
N14UBM0400	14	28	500	1066	400
N14UBM0450	14	28	500	1066	450
N14UBM0500	14	28	500	1066	500
N14UBM0550	14	28	500	1066	550
N14UBM0600	14	28	500	1066	600
N14UBM0650	14	28	500	1066	650
N14UBM0700	14	28	500	1066	700
N14UBM0750	14	28	500	1066	750
N14UBM0800	14	28	500	1066	800
N14UBM0850	14	28	500	1066	850
N14UBM0900	14	28	500	1066	900
N14UBM1000	14	28	500	1066	1000
N14UBM1050	14	28	500	1066	1050
N14UBM1100	14	28	500	1066	1100
N14UBM1150	14	28	500	1066	1150
N14UBM1200	14	28	500	1066	1200
N14UBM1250	14	28	500	1066	1250
N14UBM1300	14	28	500	1066	1300
N14UBM1350	14	28	500	1066	1350
N14UBM1400	14	28	500	1066	1400
N14UBM1450	14	28	500	1066	1450
N14UBM1500	14	28	500	1066	1500
N14UBM1550	14	28	500	1066	1550
N14UBM1600	14	28	500	1066	1600
N14UBM1650	14	28	500	1066	1650
N14UBM1700	14	28	500	1066	1700
N14UBM1750	14	28	500	1066	1750
N14UBM1800	14	28	500	1066	1800
N14UBM1850	14	28	500	1066	1850
N14UBM1900	14	28	500	1066	1900
N14UBM1950	14	28	500	1066	1950
N14UBM2000	14	28	500	1066	2000
N14UBM2050	14	28	500	1066	2050
N14UBM2100	14	28	500	1066	2100
N14UBM2150	14	28	500	1066	2150
N14UBM2200	14	28	500	1066	2200
N14UBM2250	14	28	500	1066	2250
N14UBM2300	14	28	500	1066	2300
N14UBM2350	14	28	500	1066	2350
N14UBM2400	14	28	500	1066	2400
N14UBM2450	14	28	500	1066	2450
N14UBM2500	14	28	500	1066	2500

GAS STRUTS					S SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
S06AAA0050	6	15	50	154	50
S06AAA0100	6	15	50	154	100
S06AAA0150	6	15	50	154	150
S06AAA0200	6	15	50	154	200
S06AAA0250	6	15	50	154	250
S06AAA0300	6	15	50	154	300
S06AAA0350	6	15	50	154	350
S06AAA0400	6	15	50	154	400
S06BAB0050	6	15	60	160	50
S06BAB0100	6	15	60	160	100
S06BAB0150	6	15	60	160	150
S06BAB0200	6	15	60	160	200
S06BAB0250	6	15	60	160	250
S06BAB0300	6	15	60	160	300
S06BAB0350	6	15	60	160	350
S06BAB0400	6	15	60	160	400
S06VBN0050	6	15	73	183	50
S06VBN0100	6	15	73	183	100
S06VBN0150	6	15	73	183	150
S06VBN0200	6	15	73	183	200
S06VBN0250	6	15	73	183	250
S06VBN0300	6	15	73	183	300
S06VBN0350	6	15	73	183	350
S06VBN0400	6	15	73	183	400
S06CAF0050	6	15	75	214	50
S06CAF0100	6	15	75	214	100
S06CAF0150	6	15	75	214	150
S06CAF0200	6	15	75	214	200
S06CAF0250	6	15	75	214	250
S06CAF0300	6	15	75	214	300
S06CAF0350	6	15	75	214	350
S06CAF0400	6	15	75	214	400
S06DAD0050	6	15	80	200	50
S06DAD0100	6	15	80	200	100
S06DAD0150	6	15	80	200	150
S06DAD0200	6	15	80	200	200
S06DAD0250	6	15	80	200	250
S06DAD0300	6	15	80	200	300
S06DAD0350	6	15	80	200	350
S06DAD0400	6	15	80	200	400
S06EAL0050	6	15	90	269	50
S06EAL0100	6	15	90	269	100
S06EAL0150	6	15	90	269	150
S06EAL0200	6	15	90	269	200
S06EAL0250	6	15	90	269	250
S06EAL0300	6	15	90	269	300
S06EAL0350	6	15	90	269	350
S06EAL0400	6	15	90	269	400
S06FAG0050	6	15	100	240	50
S06FAG0100	6	15	100	240	100
S06FAG0150	6	15	100	240	150
S06FAG0200	6	15	100	240	200
S06FAG0250	6	15	100	240	250
S06FAG0300	6	15	100	240	300
S06FAG0350	6	15	100	240	350
S06FAG0400	6	15	100	240	400
S06GAM0050	6	15	120	280	50
S06GAM0100	6	15	120	280	100
S06GAM0150	6	15	120	280	150
S06GAM0200	6	15	120	280	200
S06GAM0250	6	15	120	280	250
S06GAM0300	6	15	120	280	300
S06GAM0350	6	15	120	280	350
S06GAM0400	6	15	120	280	400
S06HAQ0050	6	15	140	344	50
S06HAQ0100	6	15	140	344	100

GAS STRUTS					S SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
S06HAQ0150	6	15	140	344	150
S06HAQ0200	6	15	140	344	200
S06HAQ0250	6	15	140	344	250
S06HAQ0300	6	15	140	344	300
S06HAQ0350	6	15	140	344	350
S06HAQ0400	6	15	140	344	400
S06JAP0050	6	15	150	340	50
S06JAP0100	6	15	150	340	100
S06JAP0150	6	15	150	340	150
S06JAP0200	6	15	150	340	200
S06JAP0250	6	15	150	340	250
S06JAP0300	6	15	150	340	300
S06JAP0350	6	15	150	340	350
S06JAP0400	6	15	150	340	400
S06LAU0050	6	15	170	394	50
S06LAU0100	6	15	170	394	100
S06LAU0150	6	15	170	394	150
S06LAU0200	6	15	170	394	200
S06LAU0250	6	15	170	394	250
S06LAU0300	6	15	170	394	300
S06LAU0350	6	15	170	394	350
S06LAU0400	6	15	170	394	400
S06MAW0050	6	15	180	434	50
S06MAW0100	6	15	180	434	100
S06MAW0150	6	15	180	434	150
S06MAW0200	6	15	180	434	200
S06MAW0250	6	15	180	434	250
S06MAW0300	6	15	180	434	300
S06MAW0350	6	15	180	434	350
S06MAW0400	6	15	180	434	400
S06NAX0050	6	15	200	440	50
S06NAX0100	6	15	200	440	100
S06NAX0150	6	15	200	440	150
S06NAX0200	6	15	200	440	200
S06NAX0250	6	15	200	440	250
S06NAX0300	6	15	200	440	300
S06NAX0350	6	15	200	440	350
S06NAX0400	6	15	200	440	400
S06NBA0050	6	15	200	469	50
S06NBA0100	6	15	200	469	100
S06NBA0150	6	15	200	469	150
S06NBA0200	6	15	200	469	200
S06NBA0250	6	15	200	469	250
S06NBA0300	6	15	200	469	300
S06NBA0350	6	15	200	469	350
S06NBA0400	6	15	200	469	400
S08AAA0100	8	18	50	154	100
S08AAA0150	8	18	50	154	150
S08AAA0200	8	18	50	154	200
S08AAA0250	8	18	50	154	250
S08AAA0300	8	18	50	154	300
S08AAA0350	8	18	50	154	350
S08AAA0400	8	18	50	154	400
S08AAA0450	8	18	50	154	450
S08AAA0500	8	18	50	154	500
S08AAA0550	8	18	50	154	550
S08AAA0600	8	18	50	154	600
S08AAA0650	8	18	50	154	650
S08BAC0100	8	18	60	169	100
S08BAC0150	8	18	60	169	150
S08BAC0200	8	18	60	169	200
S08BAC0250	8	18	60	169	250
S08BAC0300	8	18	60	169	300
S08BAC0350	8	18	60	169	350
S08BAC0400	8	18	60	169	400
S08BAC0450	8	18	60	169	450



GAS STRUTS					S SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
S08BAC0500	8	18	60	169	500
S08BAC0550	8	18	60	169	550
S08BAC0600	8	18	60	169	600
S08BAC0650	8	18	60	169	650
S08CAF0100	8	18	75	214	100
S08CAF0150	8	18	75	214	150
S08CAF0200	8	18	75	214	200
S08CAF0250	8	18	75	214	250
S08CAF0300	8	18	75	214	300
S08CAF0350	8	18	75	214	350
S08CAF0400	8	18	75	214	400
S08CAF0450	8	18	75	214	450
S08CAF0500	8	18	75	214	500
S08CAF0550	8	18	75	214	550
S08CAF0600	8	18	75	214	600
S08CAF0650	8	18	75	214	650
S08DAE0100	8	18	80	209	100
S08DAE0150	8	18	80	209	150
S08DAE0200	8	18	80	209	200
S08DAE0250	8	18	80	209	250
S08DAE0300	8	18	80	209	300
S08DAE0350	8	18	80	209	350
S08DAE0400	8	18	80	209	400
S08DAE0450	8	18	80	209	450
S08DAE0500	8	18	80	209	500
S08DAE0550	8	18	80	209	550
S08DAE0600	8	18	80	209	600
S08DAE0650	8	18	80	209	650
S08EAJ0100	8	18	90	264	100
S08EAJ0150	8	18	90	264	150
S08EAJ0200	8	18	90	264	200
S08EAJ0250	8	18	90	264	250
S08EAJ0300	8	18	90	264	300
S08EAJ0350	8	18	90	264	350
S08EAJ0400	8	18	90	264	400
S08EAJ0450	8	18	90	264	450
S08EAJ0500	8	18	90	264	500
S08EAJ0550	8	18	90	264	550
S08EAJ0600	8	18	90	264	600
S08EAJ0650	8	18	90	264	650
S08EAL0100	8	18	90	269	100
S08EAL0150	8	18	90	269	150
S08EAL0200	8	18	90	269	200
S08EAL0250	8	18	90	269	250
S08EAL0300	8	18	90	269	300
S08EAL0350	8	18	90	269	350
S08EAL0400	8	18	90	269	400
S08EAL0450	8	18	90	269	450
S08EAL0500	8	18	90	269	500
S08EAL0550	8	18	90	269	550
S08EAL0600	8	18	90	269	600
S08EAL0650	8	18	90	269	650
S08WBO0100	8	18	95	274	100
S08WBO0150	8	18	95	274	150
S08WBO0200	8	18	95	274	200
S08WBO0250	8	18	95	274	250
S08WBO0300	8	18	95	274	300
S08WBO0350	8	18	95	274	350
S08WBO0400	8	18	95	274	400
S08WBO0450	8	18	95	274	450
S08WBO0500	8	18	95	274	500
S08WBO0550	8	18	95	274	550
S08WBO0600	8	18	95	274	600
S08WBO0650	8	18	95	274	650
S08FAH0100	8	18	100	249	100
S08FAH0150	8	18	100	249	150
S08FAH0200	8	18	100	249	200

GAS STRUTS					S SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
S08FAH0250	8	18	100	249	250
S08FAH0300	8	18	100	249	300
S08FAH0350	8	18	100	249	350
S08FAH0400	8	18	100	249	400
S08FAH0450	8	18	100	249	450
S08FAH0500	8	18	100	249	500
S08FAH0550	8	18	100	249	550
S08FAH0600	8	18	100	249	600
S08FAH0650	8	18	100	249	650
S08GAN0100	8	18	120	289	100
S08GAN0150	8	18	120	289	150
S08GAN0200	8	18	120	289	200
S08GAN0250	8	18	120	289	250
S08GAN0300	8	18	120	289	300
S08GAN0350	8	18	120	289	350
S08GAN0400	8	18	120	289	400
S08GAN0450	8	18	120	289	450
S08GAN0500	8	18	120	289	500
S08GAN0550	8	18	120	289	550
S08GAN0600	8	18	120	289	600
S08GAN0650	8	18	120	289	650
S08HAO0100	8	18	140	329	100
S08HAO0150	8	18	140	329	150
S08HAO0200	8	18	140	329	200
S08HAO0250	8	18	140	329	250
S08HAO0300	8	18	140	329	300
S08HAO0350	8	18	140	329	350
S08HAO0400	8	18	140	329	400
S08HAO0450	8	18	140	329	450
S08HAO0500	8	18	140	329	500
S08HAO0550	8	18	140	329	550
S08HAO0600	8	18	140	329	600
S08HAO0650	8	18	140	329	650
S08HAQ0100	8	18	140	344	100
S08HAQ0150	8	18	140	344	150
S08HAQ0200	8	18	140	344	200
S08HAQ0250	8	18	140	344	250
S08HAQ0300	8	18	140	344	300
S08HAQ0350	8	18	140	344	350
S08HAQ0400	8	18	140	344	400
S08HAQ0450	8	18	140	344	450
S08HAQ0500	8	18	140	344	500
S08HAQ0550	8	18	140	344	550
S08HAQ0600	8	18	140	344	600
S08HAQ0650	8	18	140	344	650
S08HAR0100	8	18	140	349	100
S08HAR0150	8	18	140	349	150
S08HAR0200	8	18	140	349	200
S08HAR0250	8	18	140	349	250
S08HAR0300	8	18	140	349	300
S08HAR0350	8	18	140	349	350
S08HAR0400	8	18	140	349	400
S08HAR0450	8	18	140	349	450
S08HAR0500	8	18	140	349	500
S08HAR0550	8	18	140	349	550
S08HAR0600	8	18	140	349	600
S08HAR0650	8	18	140	349	650
S08JAR0100	8	18	150	349	100
S08JAR0150	8	18	150	349	150
S08JAR0200	8	18	150	349	200
S08JAR0250	8	18	150	349	250
S08JAR0300	8	18	150	349	300
S08JAR0350	8	18	150	349	350
S08JAR0400	8	18	150	349	400
S08JAR0450	8	18	150	349	450
S08JAR0500	8	18	150	349	500
S08JAR0550	8	18	150	349	550

GAS STRUTS					S SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
S08JAR0600	8	18	150	349	600
S08JAR0650	8	18	150	349	650
S08JAU0100	8	18	150	394	100
S08JAU0150	8	18	150	394	150
S08JAU0200	8	18	150	394	200
S08JAU0250	8	18	150	394	250
S08JAU0300	8	18	150	394	300
S08JAU0350	8	18	150	394	350
S08JAU0400	8	18	150	394	400
S08JAU0450	8	18	150	394	450
S08JAU0500	8	18	150	394	500
S08JAU0550	8	18	150	394	550
S08JAU0600	8	18	150	394	600
S08JAU0650	8	18	150	394	650
S08KAT0100	8	18	160	369	100
S08KAT0150	8	18	160	369	150
S08KAT0200	8	18	160	369	200
S08KAT0250	8	18	160	369	250
S08KAT0300	8	18	160	369	300
S08KAT0350	8	18	160	369	350
S08KAT0400	8	18	160	369	400
S08KAT0450	8	18	160	369	450
S08KAT0500	8	18	160	369	500
S08KAT0550	8	18	160	369	550
S08KAT0600	8	18	160	369	600
S08KAT0650	8	18	160	369	650
S08LAU0100	8	18	170	394	100
S08LAU0150	8	18	170	394	150
S08LAU0200	8	18	170	394	200
S08LAU0250	8	18	170	394	250
S08LAU0300	8	18	170	394	300
S08LAU0350	8	18	170	394	350
S08LAU0400	8	18	170	394	400
S08LAU0450	8	18	170	394	450
S08LAU0500	8	18	170	394	500
S08LAU0550	8	18	170	394	550
S08LAU0600	8	18	170	394	600
S08LAU0650	8	18	170	394	650
S08MAV0100	8	18	180	409	100
S08MAV0150	8	18	180	409	150
S08MAV0200	8	18	180	409	200
S08MAV0250	8	18	180	409	250
S08MAV0300	8	18	180	409	300
S08MAV0350	8	18	180	409	350
S08MAV0400	8	18	180	409	400
S08MAV0450	8	18	180	409	450
S08MAV0500	8	18	180	409	500
S08MAV0550	8	18	180	409	550
S08MAV0600	8	18	180	409	600
S08MAV0650	8	18	180	409	650
S08MAW0100	8	18	180	434	100
S08MAW0150	8	18	180	434	150
S08MAW0200	8	18	180	434	200
S08MAW0250	8	18	180	434	250
S08MAW0300	8	18	180	434	300
S08MAW0350	8	18	180	434	350
S08MAW0400	8	18	180	434	400
S08MAW0450	8	18	180	434	450
S08MAW0500	8	18	180	434	500
S08MAW0550	8	18	180	434	550
S08MAW0600	8	18	180	434	600
S08MAW0650	8	18	180	434	650
S08NAY0100	8	18	200	449	100
S08NAY0150	8	18	200	449	150
S08NAY0200	8	18	200	449	200
S08NAY0250	8	18	200	449	250
S08NAY0300	8	18	200	449	300

GAS STRUTS					S SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
S08NAY0350	8	18	200	449	350
S08NAY0400	8	18	200	449	400
S08NAY0450	8	18	200	449	450
S08NAY0500	8	18	200	449	500
S08NAY0550	8	18	200	449	550
S08NAY0600	8	18	200	449	600
S08NAY0650	8	18	200	449	650
S08NBA0100	8	18	200	469	100
S08NBA0150	8	18	200	469	150
S08NBA0200	8	18	200	469	200
S08NBA0250	8	18	200	469	250
S08NBA0300	8	18	200	469	300
S08NBA0350	8	18	200	469	350
S08NBA0400	8	18	200	469	400
S08NBA0450	8	18	200	469	450
S08NBA0500	8	18	200	469	500
S08NBA0550	8	18	200	469	550
S08NBA0600	8	18	200	469	600
S08NBA0650	8	18	200	469	650
S08OBB0100	8	18	220	489	100
S08OBB0150	8	18	220	489	150
S08OBB0200	8	18	220	489	200
S08OBB0250	8	18	220	489	250
S08OBB0300	8	18	220	489	300
S08OBB0350	8	18	220	489	350
S08OBB0400	8	18	220	489	400
S08OBB0450	8	18	220	489	450
S08OBB0500	8	18	220	489	500
S08OBB0550	8	18	220	489	550
S08OBB0600	8	18	220	489	600
S08OBB0650	8	18	220	489	650
S08PBC0100	8	18	250	549	100
S08PBC0150	8	18	250	549	150
S08PBC0200	8	18	250	549	200
S08PBC0250	8	18	250	549	250
S08PBC0300	8	18	250	549	300
S08PBC0350	8	18	250	549	350
S08PBC0400	8	18	250	549	400
S08PBC0450	8	18	250	549	450
S08PBC0500	8	18	250	549	500
S08PBC0550	8	18	250	549	550
S08PBC0600	8	18	250	549	600
S08PBC0650	8	18	250	549	650
S10FAH0150	10	23	100	249	150
S10FAH0200	10	23	100	249	200
S10FAH0250	10	23	100	249	250
S10FAH0300	10	23	100	249	300
S10FAH0350	10	23	100	249	350
S10FAH0400	10	23	100	249	400
S10FAH0450	10	23	100	249	450
S10FAH0500	10	23	100	249	500
S10FAH0550	10	23	100	249	550
S10FAH0600	10	23	100	249	600
S10FAH0650	10	23	100	249	650
S10FAH0700	10	23	100	249	700
S10FAH0750	10	23	100	249	750
S10FAH0800	10	23	100	249	800
S10FAH0850	10	23	100	249	850
S10FAH0900	10	23	100	249	900
S10FAH0950	10	23	100	249	950
S10FAH1000	10	23	100	249	1000
S10FAH1050	10	23	100	249	1050
S10FAH1100	10	23	100	249	1100
S10FAH1150	10	23	100	249	1150
S10FAH1200	10	23	100	249	1200
S10JAR0150	10	23	150	349	150
S10JAR0200	10	23	150	349	200

GAS STRUTS					S SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
S10JAR0250	10	23	150	349	250
S10JAR0300	10	23	150	349	300
S10JAR0350	10	23	150	349	350
S10JAR0400	10	23	150	349	400
S10JAR0450	10	23	150	349	450
S10JAR0500	10	23	150	349	500
S10JAR0550	10	23	150	349	550
S10JAR0600	10	23	150	349	600
S10JAR0650	10	23	150	349	650
S10JAR0700	10	23	150	349	700
S10JAR0750	10	23	150	349	750
S10JAR0800	10	23	150	349	800
S10JAR0850	10	23	150	349	850
S10JAR0900	10	23	150	349	900
S10JAR0950	10	23	150	349	950
S10JAR1000	10	23	150	349	1000
S10JAR1050	10	23	150	349	1050
S10JAR1100	10	23	150	349	1100
S10JAR1150	10	23	150	349	1150
S10JAR1200	10	23	150	349	1200
S10NAY0150	10	23	200	449	150
S10NAY0200	10	23	200	449	200
S10NAY0250	10	23	200	449	250
S10NAY0300	10	23	200	449	300
S10NAY0350	10	23	200	449	350
S10NAY0400	10	23	200	449	400
S10NAY0450	10	23	200	449	450
S10NAY0500	10	23	200	449	500
S10NAY0550	10	23	200	449	550
S10NAY0600	10	23	200	449	600
S10NAY0650	10	23	200	449	650
S10NAY0700	10	23	200	449	700
S10NAY0750	10	23	200	449	750
S10NAY0800	10	23	200	449	800
S10NAY0850	10	23	200	449	850
S10NAY0900	10	23	200	449	900
S10NAY0950	10	23	200	449	950
S10NAY1000	10	23	200	449	1000
S10NAY1050	10	23	200	449	1050
S10NAY1100	10	23	200	449	1100
S10NAY1150	10	23	200	449	1150
S10NAY1200	10	23	200	449	1200
S10PBC0150	10	23	250	549	150
S10PBC0200	10	23	250	549	200
S10PBC0250	10	23	250	549	250
S10PBC0300	10	23	250	549	300
S10PBC0350	10	23	250	549	350
S10PBC0400	10	23	250	549	400
S10PBC0450	10	23	250	549	450
S10PBC0500	10	23	250	549	500
S10PBC0550	10	23	250	549	550
S10PBC0600	10	23	250	549	600
S10PBC0650	10	23	250	549	650
S10PBC0700	10	23	250	549	700
S10PBC0750	10	23	250	549	750
S10PBC0800	10	23	250	549	800
S10PBC0850	10	23	250	549	850
S10PBC0900	10	23	250	549	900
S10PBC0950	10	23	250	549	950
S10PBC1000	10	23	250	549	1000
S10PBC1050	10	23	250	549	1050
S10PBC1100	10	23	250	549	1100
S10PBC1150	10	23	250	549	1150
S10PBC1200	10	23	250	549	1200
S10QBF0150	10	23	290	650	150
S10QBF0200	10	23	290	650	200
S10QBF0250	10	23	290	650	250
S10QBF0300	10	23	290	650	300

GAS STRUTS					S SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
S10QBF0350	10	23	290	650	350
S10QBF0400	10	23	290	650	400
S10QBF0450	10	23	290	650	450
S10QBF0500	10	23	290	650	500
S10QBF0550	10	23	290	650	550
S10QBF0600	10	23	290	650	600
S10QBF0650	10	23	290	650	650
S10QBF0700	10	23	290	650	700
S10QBF0750	10	23	290	650	750
S10QBF0800	10	23	290	650	800
S10QBF0850	10	23	290	650	850
S10QBF0900	10	23	290	650	900
S10QBF0950	10	23	290	650	950
S10QBF1000	10	23	290	650	1000
S10QBF1050	10	23	290	650	1050
S10QBF1100	10	23	290	650	1100
S10QBF1150	10	23	290	650	1150
S10QBF1200	10	23	290	650	1200
S10RBE0150	10	23	300	649	150
S10RBE0200	10	23	300	649	200
S10RBE0250	10	23	300	649	250
S10RBE0300	10	23	300	649	300
S10RBE0350	10	23	300	649	350
S10RBE0400	10	23	300	649	400
S10RBE0450	10	23	300	649	450
S10RBE0500	10	23	300	649	500
S10RBE0550	10	23	300	649	550
S10RBE0600	10	23	300	649	600
S10RBE0650	10	23	300	649	650
S10RBE0700	10	23	300	649	700
S10RBE0750	10	23	300	649	750
S10RBE0800	10	23	300	649	800
S10RBE0850	10	23	300	649	850
S10RBE0900	10	23	300	649	900
S10RBE0950	10	23	300	649	950
S10RBE1000	10	23	300	649	1000
S10RBE1050	10	23	300	649	1050
S10RBE1100	10	23	300	649	1100
S10RBE1150	10	23	300	649	1150
S10RBE1200	10	23	300	649	1200
S10SBH0150	10	23	350	749	150
S10SBH0200	10	23	350	749	200
S10SBH0250	10	23	350	749	250
S10SBH0300	10	23	350	749	300
S10SBH0350	10	23	350	749	350
S10SBH0400	10	23	350	749	400
S10SBH0450	10	23	350	749	450
S10SBH0500	10	23	350	749	500
S10SBH0550	10	23	350	749	550
S10SBH0600	10	23	350	749	600
S10SBH0650	10	23	350	749	650
S10SBH0700	10	23	350	749	700
S10SBH0750	10	23	350	749	750
S10SBH0800	10	23	350	749	800
S10SBH0850	10	23	350	749	850
S10SBH0900	10	23	350	749	900
S10SBH0950	10	23	350	749	950
S10SBH1000	10	23	350	749	1000
S10SBH1050	10	23	350	749	1050
S10SBH1100	10	23	350	749	1100
S10SBH1150	10	23	350	749	1150
S10SBH1200	10	23	350	749	1200
S10TBK0150	10	23	400	849	150
S10TBK0200	10	23	400	849	200
S10TBK0250	10	23	400	849	250
S10TBK0300	10	23	400	849	300
S10TBK0350	10	23	400	849	350
S10TBK0400	10	23	400	849	400

GAS STRUTS					S SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
S10TBK0450	10	23	400	849	450
S10TBK0500	10	23	400	849	500
S10TBK0550	10	23	400	849	550
S10TBK0600	10	23	400	849	600
S10TBK0650	10	23	400	849	650
S10TBK0700	10	23	400	849	700
S10TBK0750	10	23	400	849	750
S10TBK0800	10	23	400	849	800
S10TBK0850	10	23	400	849	850
S10TBK0900	10	23	400	849	900
S10TBK0950	10	23	400	849	950
S10TBK1000	10	23	400	849	1000
S10TBK1050	10	23	400	849	1050
S10TBK1100	10	23	400	849	1100
S10TBK1150	10	23	400	849	1150
S10TBK1200	10	23	400	849	1200
S14FAK0150	14	28	100	266	150
S14FAK0200	14	28	100	266	200
S14FAK0250	14	28	100	266	250
S14FAK0300	14	28	100	266	300
S14FAK0350	14	28	100	266	350
S14FAK0400	14	28	100	266	400
S14FAK0450	14	28	100	266	450
S14FAK0500	14	28	100	266	500
S14FAK0550	14	28	100	266	550
S14FAK0600	14	28	100	266	600
S14FAK0650	14	28	100	266	650
S14FAK0700	14	28	100	266	700
S14FAK0750	14	28	100	266	750
S14FAK0800	14	28	100	266	800
S14FAK0850	14	28	100	266	850
S14FAK0900	14	28	100	266	900
S14FAK1000	14	28	100	266	1000
S14FAK1050	14	28	100	266	1050
S14FAK1100	14	28	100	266	1100
S14FAK1150	14	28	100	266	1150
S14FAK1200	14	28	100	266	1200
S14FAK1250	14	28	100	266	1250
S14FAK1300	14	28	100	266	1300
S14FAK1350	14	28	100	266	1350
S14FAK1400	14	28	100	266	1400
S14FAK1450	14	28	100	266	1450
S14FAK1500	14	28	100	266	1500
S14FAK1550	14	28	100	266	1550
S14FAK1600	14	28	100	266	1600
S14FAK1650	14	28	100	266	1650
S14FAK1700	14	28	100	266	1700
S14FAK1750	14	28	100	266	1750
S14FAK1800	14	28	100	266	1800
S14FAK1850	14	28	100	266	1850
S14FAK1900	14	28	100	266	1900
S14FAK1950	14	28	100	266	1950
S14FAK2000	14	28	100	266	2000
S14FAK2050	14	28	100	266	2050
S14FAK2100	14	28	100	266	2100
S14FAK2150	14	28	100	266	2150
S14FAK2200	14	28	100	266	2200
S14FAK2250	14	28	100	266	2250
S14FAK2300	14	28	100	266	2300
S14FAK2350	14	28	100	266	2350
S14FAK2400	14	28	100	266	2400
S14FAK2450	14	28	100	266	2450
S14FAK2500	14	28	100	266	2500
S14JAS0150	14	28	150	366	150
S14JAS0200	14	28	150	366	200
S14JAS0250	14	28	150	366	250
S14JAS0300	14	28	150	366	300
S14JAS0350	14	28	150	366	350
S14JAS0400	14	28	150	366	400

GAS STRUTS					S SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
S14JAS0450	14	28	150	366	450
S14JAS0500	14	28	150	366	500
S14JAS0550	14	28	150	366	550
S14JAS0600	14	28	150	366	600
S14JAS0650	14	28	150	366	650
S14JAS0700	14	28	150	366	700
S14JAS0750	14	28	150	366	750
S14JAS0800	14	28	150	366	800
S14JAS0850	14	28	150	366	850
S14JAS0900	14	28	150	366	900
S14JAS1000	14	28	150	366	1000
S14JAS1050	14	28	150	366	1050
S14JAS1100	14	28	150	366	1100
S14JAS1150	14	28	150	366	1150
S14JAS1200	14	28	150	366	1200
S14JAS1250	14	28	150	366	1250
S14JAS1300	14	28	150	366	1300
S14JAS1350	14	28	150	366	1350
S14JAS1400	14	28	150	366	1400
S14JAS1450	14	28	150	366	1450
S14JAS1500	14	28	150	366	1500
S14JAS1550	14	28	150	366	1550
S14JAS1600	14	28	150	366	1600
S14JAS1650	14	28	150	366	1650
S14JAS1700	14	28	150	366	1700
S14JAS1750	14	28	150	366	1750
S14JAS1800	14	28	150	366	1800
S14JAS1850	14	28	150	366	1850
S14JAS1900	14	28	150	366	1900
S14JAS1950	14	28	150	366	1950
S14JAS2000	14	28	150	366	2000
S14JAS2050	14	28	150	366	2050
S14JAS2100	14	28	150	366	2100
S14JAS2150	14	28	150	366	2150
S14JAS2200	14	28	150	366	2200
S14JAS2250	14	28	150	366	2250
S14JAS2300	14	28	150	366	2300
S14JAS2350	14	28	150	366	2350
S14JAS2400	14	28	150	366	2400
S14JAS2450	14	28	150	366	2450
S14JAS2500	14	28	150	366	2500
S14NAZ0150	14	28	200	466	150
S14NAZ0200	14	28	200	466	200
S14NAZ0250	14	28	200	466	250
S14NAZ0300	14	28	200	466	300
S14NAZ0350	14	28	200	466	350
S14NAZ0400	14	28	200	466	400
S14NAZ0450	14	28	200	466	450
S14NAZ0500	14	28	200	466	500
S14NAZ0550	14	28	200	466	550
S14NAZ0600	14	28	200	466	600
S14NAZ0650	14	28	200	466	650
S14NAZ0700	14	28	200	466	700
S14NAZ0750	14	28	200	466	750
S14NAZ0800	14	28	200	466	800
S14NAZ0850	14	28	200	466	850
S14NAZ0900	14	28	200	466	900
S14NAZ1000	14	28	200	466	1000
S14NAZ1050	14	28	200	466	1050
S14NAZ1100	14	28	200	466	1100
S14NAZ1150	14	28	200	466	1150
S14NAZ1200	14	28	200	466	1200
S14NAZ1250	14	28	200	466	1250
S14NAZ1300	14	28	200	466	1300
S14NAZ1350	14	28	200	466	1350
S14NAZ1400	14	28	200	466	1400
S14NAZ1450	14	28	200	466	1450
S14NAZ1500	14	28	200	466	1500
S14NAZ1550	14	28	200	466	1550

GAS STRUTS					S SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
S14NAZ1600	14	28	200	466	1600
S14NAZ1650	14	28	200	466	1650
S14NAZ1700	14	28	200	466	1700
S14NAZ1750	14	28	200	466	1750
S14NAZ1800	14	28	200	466	1800
S14NAZ1850	14	28	200	466	1850
S14NAZ1900	14	28	200	466	1900
S14NAZ1950	14	28	200	466	1950
S14NAZ2000	14	28	200	466	2000
S14NAZ2050	14	28	200	466	2050
S14NAZ2100	14	28	200	466	2100
S14NAZ2150	14	28	200	466	2150
S14NAZ2200	14	28	200	466	2200
S14NAZ2250	14	28	200	466	2250
S14NAZ2300	14	28	200	466	2300
S14NAZ2350	14	28	200	466	2350
S14NAZ2400	14	28	200	466	2400
S14NAZ2450	14	28	200	466	2450
S14NAZ2500	14	28	200	466	2500
S14PBD0150	14	28	250	566	150
S14PBD0200	14	28	250	566	200
S14PBD0250	14	28	250	566	250
S14PBD0300	14	28	250	566	300
S14PBD0350	14	28	250	566	350
S14PBD0400	14	28	250	566	400
S14PBD0450	14	28	250	566	450
S14PBD0500	14	28	250	566	500
S14PBD0550	14	28	250	566	550
S14PBD0600	14	28	250	566	600
S14PBD0650	14	28	250	566	650
S14PBD0700	14	28	250	566	700
S14PBD0750	14	28	250	566	750
S14PBD0800	14	28	250	566	800
S14PBD0850	14	28	250	566	850
S14PBD0900	14	28	250	566	900
S14PBD1000	14	28	250	566	1000
S14PBD1050	14	28	250	566	1050
S14PBD1100	14	28	250	566	1100
S14PBD1150	14	28	250	566	1150
S14PBD1200	14	28	250	566	1200
S14PBD1250	14	28	250	566	1250
S14PBD1300	14	28	250	566	1300
S14PBD1350	14	28	250	566	1350
S14PBD1400	14	28	250	566	1400
S14PBD1450	14	28	250	566	1450
S14PBD1500	14	28	250	566	1500
S14PBD1550	14	28	250	566	1550
S14PBD1600	14	28	250	566	1600
S14PBD1650	14	28	250	566	1650
S14PBD1700	14	28	250	566	1700
S14PBD1750	14	28	250	566	1750
S14PBD1800	14	28	250	566	1800
S14PBD1850	14	28	250	566	1850
S14PBD1900	14	28	250	566	1900
S14PBD1950	14	28	250	566	1950
S14PBD2000	14	28	250	566	2000
S14PBD2050	14	28	250	566	2050
S14PBD2100	14	28	250	566	2100
S14PBD2150	14	28	250	566	2150
S14PBD2200	14	28	250	566	2200
S14PBD2250	14	28	250	566	2250
S14PBD2300	14	28	250	566	2300
S14PBD2350	14	28	250	566	2350
S14PBD2400	14	28	250	566	2400
S14PBD2450	14	28	250	566	2450
S14PBD2500	14	28	250	566	2500
S14RBG0150	14	28	300	666	150
S14RBG0200	14	28	300	666	200
S14RBG0250	14	28	300	666	250

GAS STRUTS					S SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
S14RBG0300	14	28	300	666	300
S14RBG0350	14	28	300	666	350
S14RBG0400	14	28	300	666	400
S14RBG0450	14	28	300	666	450
S14RBG0500	14	28	300	666	500
S14RBG0550	14	28	300	666	550
S14RBG0600	14	28	300	666	600
S14RBG0650	14	28	300	666	650
S14RBG0700	14	28	300	666	700
S14RBG0750	14	28	300	666	750
S14RBG0800	14	28	300	666	800
S14RBG0850	14	28	300	666	850
S14RBG0900	14	28	300	666	900
S14RBG1000	14	28	300	666	1000
S14RBG1050	14	28	300	666	1050
S14RBG1100	14	28	300	666	1100
S14RBG1150	14	28	300	666	1150
S14RBG1200	14	28	300	666	1200
S14RBG1250	14	28	300	666	1250
S14RBG1300	14	28	300	666	1300
S14RBG1350	14	28	300	666	1350
S14RBG1400	14	28	300	666	1400
S14RBG1450	14	28	300	666	1450
S14RBG1500	14	28	300	666	1500
S14RBG1550	14	28	300	666	1550
S14RBG1600	14	28	300	666	1600
S14RBG1650	14	28	300	666	1650
S14RBG1700	14	28	300	666	1700
S14RBG1750	14	28	300	666	1750
S14RBG1800	14	28	300	666	1800
S14RBG1850	14	28	300	666	1850
S14RBG1900	14	28	300	666	1900
S14RBG1950	14	28	300	666	1950
S14RBG2000	14	28	300	666	2000
S14RBG2050	14	28	300	666	2050
S14RBG2100	14	28	300	666	2100
S14RBG2150	14	28	300	666	2150
S14RBG2200	14	28	300	666	2200
S14RBG2250	14	28	300	666	2250
S14RBG2300	14	28	300	666	2300
S14RBG2350	14	28	300	666	2350
S14RBG2400	14	28	300	666	2400
S14RBG2450	14	28	300	666	2450
S14RBG2500	14	28	300	666	2500
S14SBJ0150	14	28	350	766	150
S14SBJ0200	14	28	350	766	200
S14SBJ0250	14	28	350	766	250
S14SBJ0300	14	28	350	766	300
S14SBJ0350	14	28	350	766	350
S14SBJ0400	14	28	350	766	400
S14SBJ0450	14	28	350	766	450
S14SBJ0500	14	28	350	766	500
S14SBJ0550	14	28	350	766	550
S14SBJ0600	14	28	350	766	600
S14SBJ0650	14	28	350	766	650
S14SBJ0700	14	28	350	766	700
S14SBJ0750	14	28	350	766	750
S14SBJ0800	14	28	350	766	800
S14SBJ0850	14	28	350	766	850
S14SBJ0900	14	28	350	766	900
S14SBJ1000	14	28	350	766	1000
S14SBJ1050	14	28	350	766	1050
S14SBJ1100	14	28	350	766	1100
S14SBJ1150	14	28	350	766	1150
S14SBJ1200	14	28	350	766	1200
S14SBJ1250	14	28	350	766	1250
S14SBJ1300	14	28	350	766	1300
S14SBJ1350	14	28	350	766	1350
S14SBJ1400	14	28	350	766	1400

GAS STRUTS					S SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
S14SBJ1450	14	28	350	766	1450
S14SBJ1500	14	28	350	766	1500
S14SBJ1550	14	28	350	766	1550
S14SBJ1600	14	28	350	766	1600
S14SBJ1650	14	28	350	766	1650
S14SBJ1700	14	28	350	766	1700
S14SBJ1750	14	28	350	766	1750
S14SBJ1800	14	28	350	766	1800
S14SBJ1850	14	28	350	766	1850
S14SBJ1900	14	28	350	766	1900
S14SBJ1950	14	28	350	766	1950
S14SBJ2000	14	28	350	766	2000
S14SBJ2050	14	28	350	766	2050
S14SBJ2100	14	28	350	766	2100
S14SBJ2150	14	28	350	766	2150
S14SBJ2200	14	28	350	766	2200
S14SBJ2250	14	28	350	766	2250
S14SBJ2300	14	28	350	766	2300
S14SBJ2350	14	28	350	766	2350
S14SBJ2400	14	28	350	766	2400
S14SBJ2450	14	28	350	766	2450
S14SBJ2500	14	28	350	766	2500

S14TBL0150	14	28	400	866	150
S14TBL0200	14	28	400	866	200
S14TBL0250	14	28	400	866	250
S14TBL0300	14	28	400	866	300
S14TBL0350	14	28	400	866	350
S14TBL0400	14	28	400	866	400
S14TBL0450	14	28	400	866	450
S14TBL0500	14	28	400	866	500
S14TBL0550	14	28	400	866	550
S14TBL0600	14	28	400	866	600
S14TBL0650	14	28	400	866	650
S14TBL0700	14	28	400	866	700
S14TBL0750	14	28	400	866	750
S14TBL0800	14	28	400	866	800
S14TBL0850	14	28	400	866	850
S14TBL0900	14	28	400	866	900
S14TBL1000	14	28	400	866	1000
S14TBL1050	14	28	400	866	1050
S14TBL1100	14	28	400	866	1100
S14TBL1150	14	28	400	866	1150
S14TBL1200	14	28	400	866	1200
S14TBL1250	14	28	400	866	1250
S14TBL1300	14	28	400	866	1300
S14TBL1350	14	28	400	866	1350
S14TBL1400	14	28	400	866	1400
S14TBL1450	14	28	400	866	1450
S14TBL1500	14	28	400	866	1500
S14TBL1550	14	28	400	866	1550
S14TBL1600	14	28	400	866	1600
S14TBL1650	14	28	400	866	1650
S14TBL1700	14	28	400	866	1700
S14TBL1750	14	28	400	866	1750
S14TBL1800	14	28	400	866	1800
S14TBL1850	14	28	400	866	1850
S14TBL1900	14	28	400	866	1900
S14TBL1950	14	28	400	866	1950
S14TBL2000	14	28	400	866	2000
S14TBL2050	14	28	400	866	2050
S14TBL2100	14	28	400	866	2100
S14TBL2150	14	28	400	866	2150
S14TBL2200	14	28	400	866	2200
S14TBL2250	14	28	400	866	2250
S14TBL2300	14	28	400	866	2300
S14TBL2350	14	28	400	866	2350
S14TBL2400	14	28	400	866	2400
S14TBL2450	14	28	400	866	2450
S14TBL2500	14	28	400	866	2500

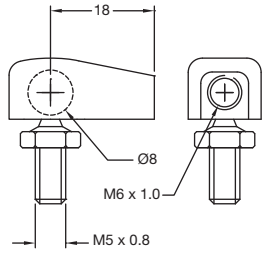
GAS STRUTS					S SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
S14UBM0150	14	28	500	1066	150
S14UBM0200	14	28	500	1066	200
S14UBM0250	14	28	500	1066	250
S14UBM0300	14	28	500	1066	300
S14UBM0350	14	28	500	1066	350
S14UBM0400	14	28	500	1066	400
S14UBM0450	14	28	500	1066	450
S14UBM0500	14	28	500	1066	500
S14UBM0550	14	28	500	1066	550
S14UBM0600	14	28	500	1066	600
S14UBM0650	14	28	500	1066	650
S14UBM0700	14	28	500	1066	700
S14UBM0750	14	28	500	1066	750
S14UBM0800	14	28	500	1066	800
S14UBM0850	14	28	500	1066	850
S14UBM0900	14	28	500	1066	900
S14UBM1000	14	28	500	1066	1000
S14UBM1050	14	28	500	1066	1050
S14UBM1100	14	28	500	1066	1100
S14UBM1150	14	28	500	1066	1150
S14UBM1200	14	28	500	1066	1200
S14UBM1250	14	28	500	1066	1250
S14UBM1300	14	28	500	1066	1300
S14UBM1350	14	28	500	1066	1350
S14UBM1400	14	28	500	1066	1400
S14UBM1450	14	28	500	1066	1450
S14UBM1500	14	28	500	1066	1500
S14UBM1550	14	28	500	1066	1550
S14UBM1600	14	28	500	1066	1600
S14UBM1650	14	28	500	1066	1650
S14UBM1700	14	28	500	1066	1700
S14UBM1750	14	28	500	1066	1750
S14UBM1800	14	28	500	1066	1800
S14UBM1850	14	28	500	1066	1850
S14UBM1900	14	28	500	1066	1900
S14UBM1950	14	28	500	1066	1950
S14UBM2000	14	28	500	1066	2000
S14UBM2050	14	28	500	1066	2050
S14UBM2100	14	28	500	1066	2100
S14UBM2150	14	28	500	1066	2150
S14UBM2200	14	28	500	1066	2200
S14UBM2250	14	28	500	1066	2250
S14UBM2300	14	28	500	1066	2300
S14UBM2350	14	28	500	1066	2350
S14UBM2400	14	28	500	1066	2400
S14UBM2450	14	28	500	1066	2450
S14UBM2500	14	28	500	1066	2500

GAS STRUTS					V SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
V06AAA0400	6	15	50	160	400
V06BAB0400	6	15	60	166	400
V06VBN0400	6	15	73	189	400
V06CAF0400	6	15	75	220	400
V06DAD0400	6	15	80	206	400
V06EAL0400	6	15	90	275	400
V06FAG0400	6	15	100	246	400
V06GAM0400	6	15	120	286	400
V06HAQ0400	6	15	140	350	400
V06JAP0400	6	15	150	346	400
V06LAU0400	6	15	170	400	400
V06MAW0400	6	15	180	440	400
V06NAX0400	6	15	200	446	400
V06NBA0400	6	15	200	475	400
V08AAA0650	8	18	50	160	650
V08BAC0650	8	18	60	175	650
V08CAF0650	8	18	75	220	650
V08DAE0650	8	18	80	215	650
V08EAJ0650	8	18	90	270	650
V08EAL0650	8	18	90	280	650
V08WBO0650	8	18	95	275	650
V08FAH0650	8	18	100	255	650
V08GAN0650	8	18	120	295	650
V08HAO0650	8	18	140	335	650
V08HAQ0650	8	18	140	350	650
V08HAR0650	8	18	140	355	650
V08JAR0650	8	18	150	355	650
V08JAU0650	8	18	150	394	650
V08KAT0650	8	18	160	375	650
V08LAU0650	8	18	170	400	650
V08MAV0650	8	18	180	415	650
V08MAW0650	8	18	180	440	650
V08NAY0650	8	18	200	455	650
V08NBA0650	8	18	200	475	650
V08OBB0650	8	18	220	495	650
V08PBC0650	8	18	250	555	650
V10FAH1200	10	23	100	255	1200
V10JAR1200	10	23	150	355	1200
V10NAY1200	10	23	200	455	1200
V10PBC1200	10	23	250	555	1200
V10QBF1200	10	23	290	656	1200
V10RBE1200	10	23	300	655	1200
V10SBH1200	10	23	350	755	1200
V10TBK1200	10	23	400	855	1200
V14FAK2500	14	28	100	272	2500
V14JAS2500	14	28	150	372	2500
V14NAZ2500	14	28	200	472	2500
V14PBD2500	14	28	250	572	2500
V14RBG2500	14	28	300	672	2500
V14SBJ2500	14	28	350	772	2500
V14TBL2500	14	28	400	872	2500
V14UBM2500	14	28	500	1072	2500

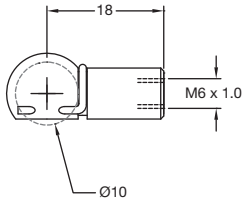
GAS STRUTS					X SERIES
Part Number	ØR (mm)	ØT (mm)	St (mm)	L (mm)	P_1 (N)
X06AAA0400	6	15	50	160	400
X06BAB0400	6	15	60	166	400
X06VBN0400	6	15	73	189	400
X06CAF0400	6	15	75	220	400
X06DAD0400	6	15	80	206	400
X06EAL0400	6	15	90	275	400
X06FAG0400	6	15	100	246	400
X06GAM0400	6	15	120	286	400
X06HAQ0400	6	15	140	350	400
X06JAP0400	6	15	150	346	400
X06LAU0400	6	15	170	400	400
X06MAW0400	6	15	180	440	400
X06NAX0400	6	15	200	446	400
X06NBA0400	6	15	200	475	400
X08AAA0650	8	18	50	160	650
X08BAC0650	8	18	60	175	650
X08CAF0650	8	18	75	220	650
X08DAE0650	8	18	80	215	650
X08EAJ0650	8	18	90	270	650
X08EAL0650	8	18	90	280	650
X08WBO0650	8	18	95	275	650
X08FAH0650	8	18	100	255	650
X08GAN0650	8	18	120	295	650
X08HAO0650	8	18	140	335	650
X08HAQ0650	8	18	140	350	650
X08HAR0650	8	18	140	355	650
X08JAR0650	8	18	150	355	650
X08JAU0650	8	18	150	394	650
X08KAT0650	8	18	160	375	650
X08LAU0650	8	18	170	400	650
X08MAV0650	8	18	180	415	650
X08MAW0650	8	18	180	440	650
X08NAY0650	8	18	200	455	650
X08NBA0650	8	18	200	475	650
X08OBB0650	8	18	220	495	650
X08PBC0650	8	18	250	555	650
X10FAH1200	10	23	100	255	1200
X10JAR1200	10	23	150	355	1200
X10NAY1200	10	23	200	455	1200
X10PBC1200	10	23	250	555	1200
X10QBF1200	10	23	290	656	1200
X10RBE1200	10	23	300	655	1200
X10SBH1200	10	23	350	755	1200
X10TBK1200	10	23	400	855	1200
X14FAK2000	14	28	100	272	2000
X14JAS2000	14	28	150	372	2000
X14NAZ2000	14	28	200	472	2000
X14PBD2000	14	28	250	572	2000
X14RBG2000	14	28	300	672	2000
X14SBJ1800	14	28	350	772	1800
X14TBL1500	14	28	400	872	1500
X14UBM1500	14	28	500	1072	1500

6mm - 8mm

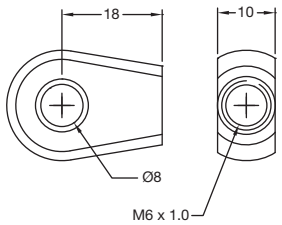
Part Number	
EF-BJ002PZ	Ball Joint Assembly: Plastic Socket with Zinc Plated 8mm Ball



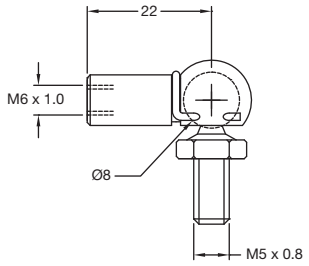
Part Number	
EF-BS002Z	Zinc Plated Socket with Stainless Steel Clip
EF-BS002S	Stainless Steel Socket with Clip



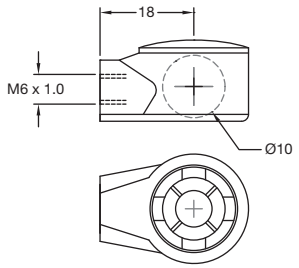
Part Number	
EF-E011Z	Zinc Diecast 8mm Eye



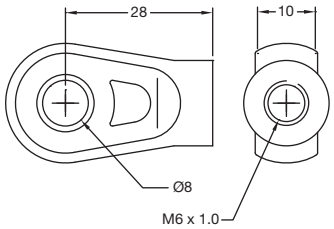
Part Number	
EF-BJ004S	Ball Joint Assembly: Stainless Steel



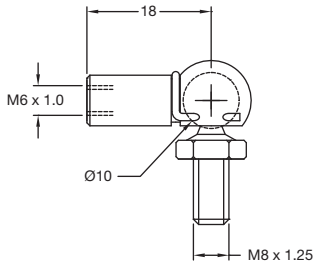
Part Number	
EF-BS004P	Plastic (Nylon) 10mm Socket



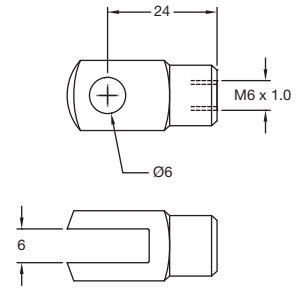
Part Number	
EF-E012P	Plastic (Nylon) 8mm Eye



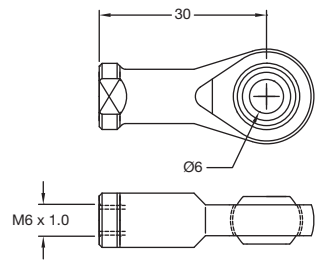
Part Number	
EF-BJ012Z	Ball Joint Assembly: Zinc Plated Socket and 10mm Ball



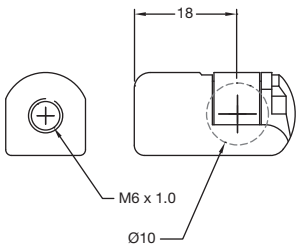
Part Number	
EF-C002Z	Zinc Plated Steel 6mm Clevis
EF-C002S	Stainless Steel 6mm Clevis



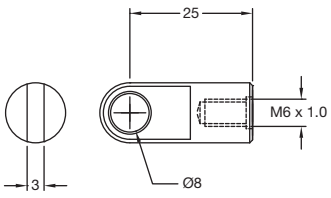
Part Number	
EF-REF002Z	Zinc Plated Steel 6mm Rod End Bearing



Part Number	
EF-BS001PN	Plastic Socket with Nitrided Clip

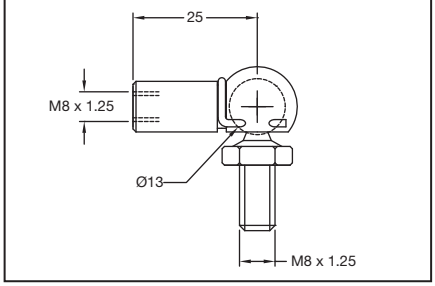


Part Number	
EF-E009S	Stainless Steel 8mm Eye

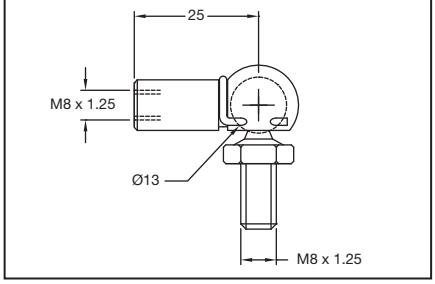


10mm

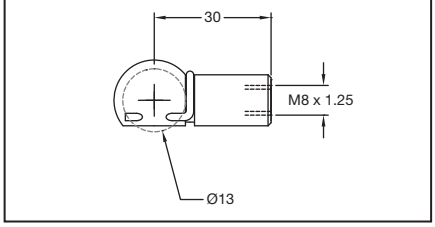
Part Number	
EF-BJ006Z	Ball Joint Assembly: ZincPlated Socket and 13mm Ball



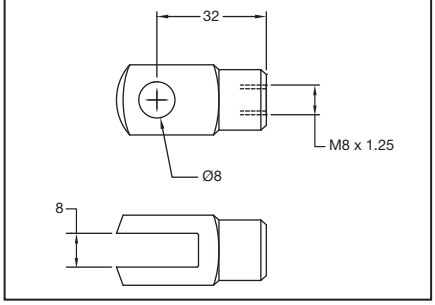
Part Number	
EF-BJ008S	Ball Joint Assembly: Stainless Steel



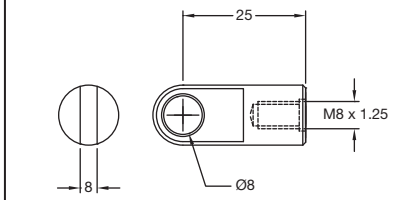
Part Number	
EF-BS005Z	Zinc Plated Socket with Stainless Steel Clip
EF-BS005S	Stainless Steel Socket with Clip



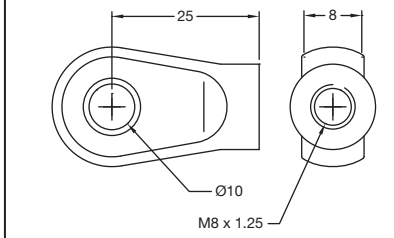
Part Number	
EF-C003Z	Zinc Plated Steel 8mm Clevis
EF-C003S	Stainless Steel 8mm Clevis



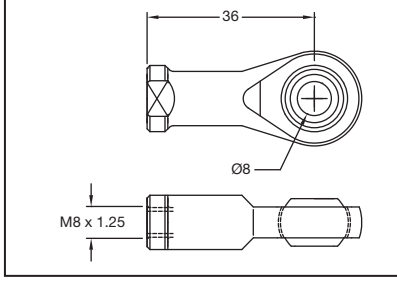
Part Number	
EF-E010S	Stainless Steel 8mm Eye



Part Number	
EF-E016Z	Zinc Diecast 10mm Eye

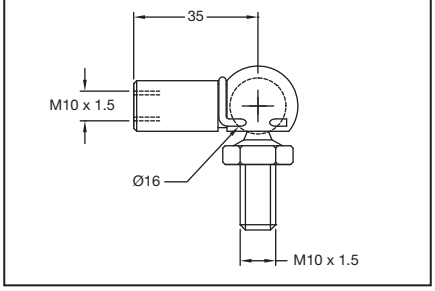


Part Number	
EF-REF003Z	Zinc Plated Steel 8mm Rod End Bearing

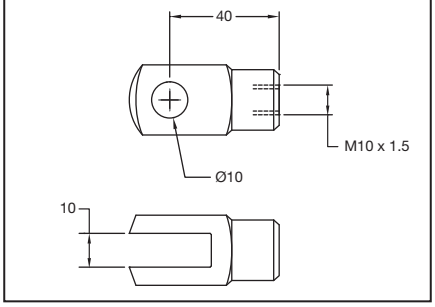


14mm

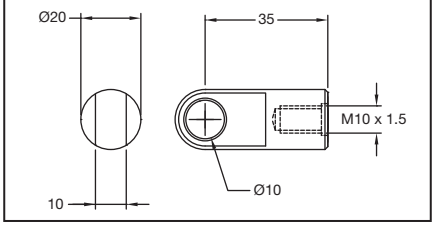
Part Number	
EF-BJ010Z	Ball Joint Assembly: ZincPlated Socket and 16mm Ball
EF-BJ010S	Ball Joint Assembly: Stainless Steel



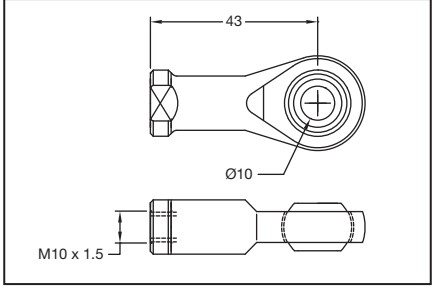
Part Number	
EF-C004Z	Zinc Plated Steel 10mm Clevis
EF-C004S	Stainless Steel 10mm Clevis



Part Number	
EF-E015A	Aluminium 10mm Eye
EF-E015S	Stainless Steel 10mm Eye

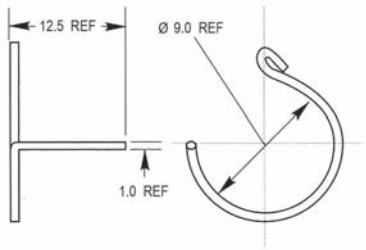


Part Number	
EF-REF004Z	Zinc Plated Steel 10mm Rod End Bearing



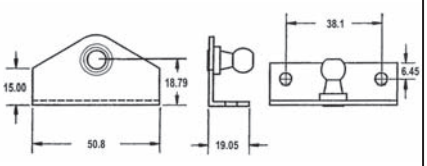
Part Number	Material
EF-SC001S	Stainless Steel

Must be used with 10mm Socket



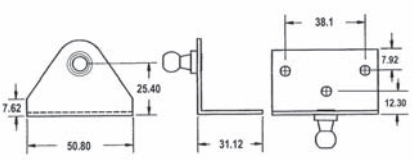
Part Number	Material
EF-BR01Z	Steel Zinc Plate
EF-BR01S	All Stainless Steel

*2mm thick material *10mm ball stud



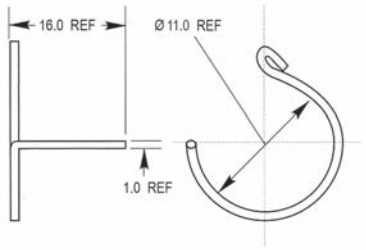
Part Number	Material
EF-BR06Z	Steel Zinc Plate
EF-BR06S	All Stainless Steel

*3mm thick material *10mm ball stud



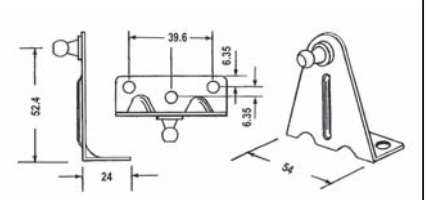
Part Number	Material
EF-SC002S	Stainless Steel

Must be used with 13mm Socket



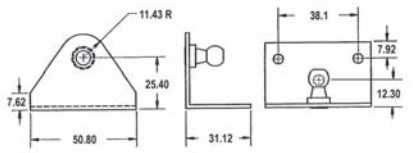
Part Number	Material
EF-BR02Z	Steel Zinc Plate
EF-BR02S	All Stainless Steel

*3mm thick material *10mm ball stud

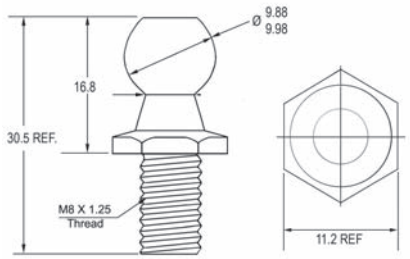


Part Number	Material
EF-BR07Z	Steel Zinc Plate
EF-BR07S	All Stainless Steel

*3mm thick material *10mm ball stud

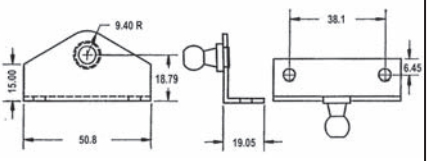


Part Number	Material
EF-B001Z	Steel Zinc Yellow Plate



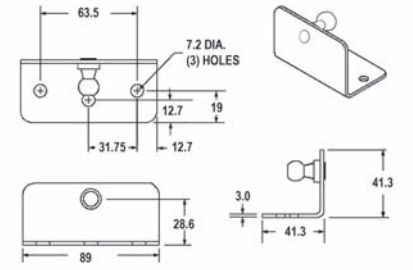
Part Number	Material
EF-BR03Z	Steel Zinc Plate
EF-BR03S	All Stainless Steel

*2mm thick material *10mm ball stud

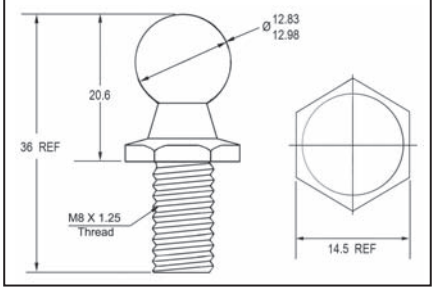


Part Number	Material
EF-BR16Z	Steel Zinc Plate
EF-BR16S	All Stainless Steel

*3mm thick material *13mm ball stud

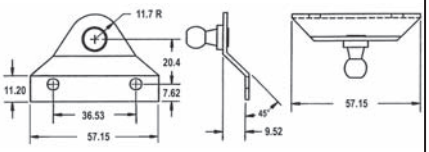


Part Number	Material
EF-B003Z	Steel Zinc Dichromate



Part Number	Material
EF-BR05Z	Steel Zinc Plate

*2.5mm thick material *10mm ball stud



UK

MECHANICAL STRUTS

A proprietary line of mechanical coil spring struts. We designed our struts to meet demanding, maintenance free applications where conventional gas struts fail. Made of corrosion-resistant stainless steel, and unlike gas and pneumatic models, our struts have no internal gases or seals to fail.

Typical Applications:
Food Preparation & Processing
Heating, Ventilation and Aeration
Motion Control & Dampening
Clean Room

Typical Industries:
Automotive
Medical, Pharmaceutical and Chemical
Marine
Defence
Nuclear
Agriculture and Construction

Whether it is resistance against environmental contamination, high temperature (400°F/205°C+), high humidity, corrosion, or simply life cycle, our struts offer unmatched performance.

Two separate lines are currently offered, with various load and stroke options:

- Standard Mechanical Spring Struts : Stainless steel construction, stainless steel springs, and M6 threaded ends
- High Load Mechanical Spring Struts: Stainless steel construction, carbon steel springs, and M8 threaded ends.

Under development is a full line of Extension and Dampening models (available now as custom-built samples).

All of our models are available with various end configurations.

KEY TO DIMENSIONS
ØR = Rod diameter
ØT = Tube diameter
L = Extended length
St = Stroke
P_1 = Initial force (N)
Pf = Final force (N)

F

VERINS MECANIQUES A RESSORTS

Gamme exclusive de Vérins mécaniques à ressorts. Nous les avons conçus pour répondre aux besoins grandissants des applications où les vérins à gaz cassent. Fabriqués en acier Inoxydable, contrairement aux vérins à gaz, ces vérins ne contiennent pas de gaz et ne peuvent donc pas fuir.

Applications Typiques :
Industrie Agro-alimentaire
Chauffage, Ventilation et Aération.
Contrôle de Mouvement et Amortissement.
Salles Propres.

Industries Typiques :
Automobile.
Médical, Pharmaceutique et Chimique.
Marine.
Défense.
Nucléaire.
Agriculture et Construction.

Que l'on recherche une résistance aux contaminations environnementales, aux fortes températures (+205°C), à l'humidité, la corrosion ou à de nombreux cycles de travail, nos vérins offrent des performances inégalées.

Deux gammes distinctes sont disponibles, avec différentes options de courses et de charges.

- Vérins Mécaniques Standards : corps et composants Inox, extrémités filetées M6.
- Vérins Mécaniques Fortes Charges : Corps et tige Inox, ressorts en acier au carbone, extrémités filetées M8.

Une gamme complète de Vérins de traction ou d'amortissement est en développement (disponibles sur mesure).

Tous nos modèles sont disponibles avec différents types d'attaches.

INDEX DES MESURES
ØR = Diamètre de la tige
ØT = Longueur déployée
L = Longueur déployée
St = Course
P_1 = Force initiale (N)
Pf = Force finale (N)

E

AMORTIGUADORES MECÁNICOS

Una línea de producto patentada de amortiguadores mecánicos con muelle. Diseñamos nuestros amortiguadores para hacer libres de mantenimiento a las exigentes condiciones de trabajo donde los amortiguadores convencionales de gas fallar. Fabricados en acero inoxidable y, frente a los amortiguadores neumáticos y de gas, sin gas ni juntas en su interior que puedan fallar.

Aplicaciones típicas:
Preparación y procesamiento de alimentos.
Calefacciones, aire acondicionado y ventilación.
Control de movimientos y amortiguación.
Cámaras estériles.

Industrias típicas:
Automóvil
Medicina, farmacéutica y química.
Marina
Militar
Nuclear
Agrícola y construcción

Bien por su resistencia a ambientes de trabajo agresivos o contaminados, altas temperaturas (400°F/205°C+), alta humedad, corrosión o ciclos, nuestros amortiguadores ofrecen un rendimiento incomparable.

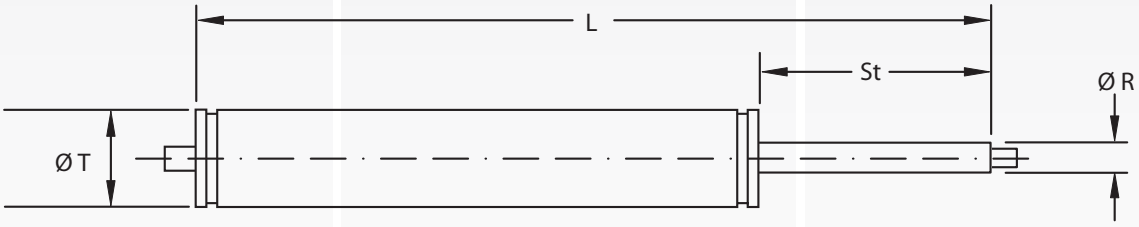
Se dispone de dos líneas de producto con varias cargas y carreras de trabajo:

- Amortiguadores mecánicos standard: Con piezas en acero inoxidable, muelles en acero inoxidable y roscas M6.
- Amortiguadores mecánicos de alta fuerza: Con piezas en acero inoxidable, muelles en acero al carbono y roscas M8.

Se está trabajando en una nueva línea de amortiguadores de tracción y con regulación de velocidad (disponibles actualmente bajo pedido).

Todos nuestros modelos disponen de varios tipos de amarres.

CLAVES DE DIMENSIONES
ØR = Diámetro vástago
ØT = Diámetro tubo
L = Longitud extendida
St = Carrera
P_1 = Fuerza inicial (N)
Pf = Fuerza final (N)



D

MECHANISCHER ZYLINDER

Eine patentrechtlich geschützte mechanischer Zylinder mit eingewindeten Federn. Wir entwarfen unseren Zylinder um eine optimale und wartungsfreie Lösung bei Anwendungen wo Gasdruckfedern versagen anzubieten. Gefertig aus korrosion-widerstandsfähigen rostfreien Stahl und, im Vergleich mit pneumatischen und Gasfedern, haben unsere mechanische Zylindern keine inneren Gase oder Dichtungen , die versagen könnten.

Typische Anwendungen:
Lebensmittelvorbereitung und die Verarbeitung
Heizung und Lüftung
Bewegungskontrolle und Dämpfung
Sauberes Zimmer

Typische Industrien:
Automobil
Medizinisch, Pharmazeutisch und Chemisch
Schiffbau
Militär
Kern-
Landwirtschaft und Bauindustrie

Ob es Widerstand gegen die Umweltverunreinigung, hohe Temperatur (400°F/205°C), hohe Feuchtigkeit, Korrosion, oder einfach Zyklen ist, bieten unsere Zylindern unvergleichliche Leistung an.

Zwei unterschiedliche Produktlinien sind zurzeit mit verschiedenen Kräften und Hub verfügbar:

- Standard mechanischer Zylindern: Aus rostfreien Stahl Teile, rostfreie Druckfedern und M6 Gewinde
- Hohe Kraft mechanischer Zylindern: Aus rostfreien Stahl Teile, Kohlenstoffstahl Druckfedern und M8 Gewinde.

Unter Entwicklung ist eine neue Reihe von Zug und Dämpfung Modelle (jetzt nach Kundenwunsch gefertigt).

Alle unsere Modelle sind mit verschiedenen Anschlussteile verfügbar.

KENNZEICHNEN DER ABMESSUNGEN
ØR = Dorndurchmesser
ØT = Rohrdurchmesser
L = Erweiterte Länge
St = Hub
P_1 = Anfangskraft (N)
Pf = Endkraft (N)

I

CILINDRI MECCANICI

Progettiamo i nostri cilindri per venire incontro alla richiesta per non modificare le applicazioni dove le normali molle a gas falliscono. Sono costruiti in materiale resistente alla corrosione e, al contrario dei modelli pneumatici, questi cilindri non hanno gas interni o valvole che si possono rompere.

Applicazioni
Preparazione e processazione di alimenti
Riscaldamento, ventilazione e areazione
Controllo del movimento e ammortizzamento
Camere sterili

Industrie
Automazione
Medicina, farmaceutica e Chimica
Marina
Difesa
Nucleare
Settore agricolo

Dove sono presenti condizioni critiche ambientali quali alta temperatura (400°F/205°C+), elevata umidità e corrosione, ma anche in condizioni normali, i nostri cilindri offrono ineguagliate prestazioni.

Attualmente proponiamo due linee differenti con vari carichi e corse:

- Cilindri Meccanici Standard: costruiti interamente in acciaio inox, molla all'interno compresa, filetto M6 alle estremità.
- Cilindri Meccanici per carichi elevati: costruiti in acciaio inox, molla all'interno in acciaio al carbonio, filetto M8 alle estremità.

Sono fornibili su richiesta anche cilindri meccanici a trazione

Tutti i modelli sono disponibili con varie tipologie di estremità.

LEGENDA
ØR = Diametro stelo
ØT = Diametro corpo
L = Lunghezza estesa
St = Corsa
P_1 = Forza iniziale
Pf = Forza finale

P

BRAÇOS MECÂNICOS

Desenhados para durar sob altas cargas , os braços mecanicos com molas de compressão , são a escolha ideal onde amortecedores a gás não podem ser usados. Nossos braços mecânicos são oferecidos numa vasta variedade de tamanhos e peças, apresentando molas em aço carbono ou inox no seu interior.

Aplicabilidade :
Processo e preparação de alimentos
Aquecimento , Ventilação e Aeração
Movimentos de Cargas

Aplicabilidade Industrial :
Automotiva e Maritima
Farmacêutica e Química
Recreativa
Defensiva e Nuclear
Contrução
Agro Industria

Em qualquer lugar que tenha resistência a altas temperatura (205º C). Alta umidade, corrosão, ou simplesmente alta durabilidade , nossos braços mecânicos são ideais.

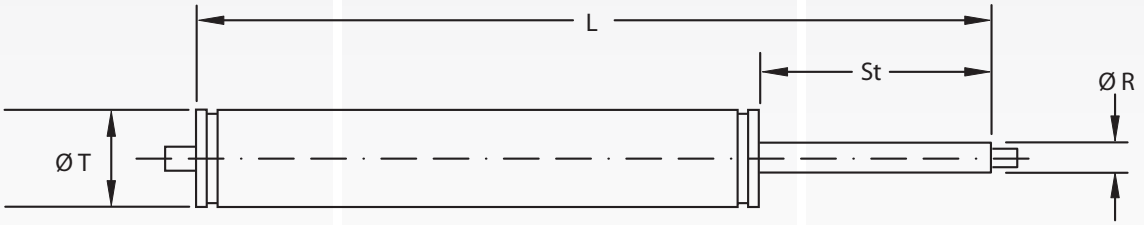
Oferemos duas linha distintas:

- Braços Mecânicos Padronizados : corpo e molas em aço inox – extremidades M6
- Braços Mecânicos para Cargas Elevadas : corpo em aço inox e molas em aço carbono Extremidades M8

Estamos desenvolvendo uma nova linha de braços mecânicos de amortecedores
(amostras disponíveis de acordo com o uso do cliente)

Todos os modelos são disponíveis com extremidades diferenciadas.

LEGENDA
ØR = Diametro da Haste
ØT = Diametro do Corpo
L = Comprimento Total
St = Comprimento de Trabalho
P_1 = Força Inicial
Pf = Força Final



MechanischerZylinderMechanischerZylinderMecha
CilindriMeccaniciCilindriMeccaniciCilindriMeccani
BraçosMecânicosBraçosMecânicosBraçosMecânic

STANDARD MECHANICAL SPRING STRUTS (Stainless Steel Construction – Stainless Steel Springs – M6 Ends)						
Part Number	**ØR (mm)**	**ØT (mm)**	**L (mm)**	**St (mm)**	**P_1(N)**	**Pf (N)**
MSBD-051-0076	9.53	31.75	176.53	50.80	35	76
MSBD-051-0116	9.53	31.75	214.38	50.80	85	116
MSBD-051-0173	9.53	31.75	253.75	50.80	133	173
MSBD-051-0280	9.53	31.75	294.89	50.80	200	280
MSBD-076-0102	9.53	31.75	242.82	76.20	44	102
MSBD-076-0156	9.53	31.75	261.62	76.20	67	156
MSBD-076-0262	9.53	31.75	311.40	76.20	133	262
MSBD-127-0133	9.53	31.75	432.31	127.00	80	133
MSBD-127-0173	9.53	31.75	474.22	127.00	111	173
MSBD-127-0222	9.53	31.75	481.58	127.00	133	222
MSBD-127-0271	9.53	31.75	505.71	127.00	156	271

HIGH LOAD MECHANICAL SPRING STRUTS (Stainless Steel Construction – Carbon Steel Springs – M8 Ends)						
Part Number	**ØR (mm)**	**ØT (mm)**	**L (mm)**	**St (mm)**	**P_1(N)**	**Pf (N)**
MSCD-026-1057	12.7	31.75	188.98	26.42	782	1057
MSCD-026-1240	12.7	31.75	151.13	26.42	369	1240
MSCD-033-1069	12.7	31.75	158.75	33.27	446	1069
MSCD-039-1072	12.7	31.75	166.37	39.62	236	1072
MSCD-039-1111	12.7	31.75	201.68	39.12	622	1111
MSCD-041-2354	12.7	31.75	345.95	41.40	1075	2354
MSCD-043-2187	12.7	31.75	246.13	43.18	417	2187
MSCD-055-1170	12.7	31.75	258.83	55.63	181	1170
MSCD-077-1150	12.7	31.75	384.05	77.98	355	1150
MSCD-078-1111	12.7	31.75	281.69	78.74	127	1111
MSCD-117-1067	12.7	31.75	422.15	117.60	244	1067

UK

CIRCLIPS TO DIN 471/472

For shafts and bores are the most universally applicable retaining systems. These series offer a favourable solution with regard to thickness and radial width. They transfer large axial forces from the located component onto the groove wall. The external rings can also be used for very high speeds.

Applications:
Mechanical, automotive and electrical engineering. Gear systems, precision mechanics and apparatus engineering.

Material:
Spring Steel

Hardness:
d1: 3 - 48 = 47-54 HRC
d1: 50 - 200 = 44-51 HRC
d1: 202 - 300 = 40-47 HRC
d1: 305 - 1000 = 38-43 HRC

Surface Protection:
Phosphated and oiled

Special options - please enquire:

Self-finished and oiled
Zinc plated
Bronze CuSn8
Corrosion resistant steels

**Rings in excess of 650mm nominal diameter are manufactured as concentric circlips.

KEY TO DIMENSIONS
L = Lug dimension
h = Hole dimension
b = Beam dimension
D1 = Internal diameter (DIN 471)
D2 = Outside diameter (DIN 472)
t = thickness
S = Shaft diameter
B = Bore diameter
n = Shoulder dimension
W = Groove width
G = Groove diameter
Fr = Load bearing capacity of Circlip
Fn = Load bearing capacity of groove

F

CIRCLIPS SELON LA DIN 471/472

Pour des axes et des alésages sont les systèmes de conservation le plus universellement applicables. Ces séries offrent une solution favorable en ce qui concerne l'épaisseur et la largeur radiale. Elles transfèrent les forces axiales importantes à partir du composant localisé sur le mur de cannelure. Les anneaux externes peuvent également être employés pour très des vitesses.

Applications:
Électrotechnique mécanique, des véhicules à moteur et. Embrayez les systèmes, la mécanique de précision et la technologie d'appareil.

Matériel:
Acier de ressort

Dureté:
d1: 3 - 48 = 47-54 HRC
d1: 50 - 200 = 44-51 HRC
d1: 202 - 300 = 40-47 HRC
d1: 305 - 1000 = 38-43 HRC

Protection extérieure:
Phosphaté et huilé

Options spéciales - enquérez-vous svp :

Individu-de finition et huilé
Zinguee
Bronze CuSn8
Aciers résistants à la corrosion

** Les anneaux dont le diamètre extérieur nominal excède 650mm sont fabriqués comme des anneaux d'arrêt concentriques.

ABBREVIATIONS UTILISEES
L = Taille de l'oreille
h = Taille du trou
b = Hauteur radiale
D1 = Diamètre Intérieur (DIN 471)
D2 = Diamètre Extérieur (DIN 471)
t = Epaisseur
S = Diamètre d'arbre
B = Diamètre d'alésage
n = Longueur cisaillée à fond de gorge
W = Largeur de gorge
G = Diamètre de gorge
Fr = Capacité de charge du segment
Fn = Capacité de charge de la gorge

E

LOS ANILLOS DE RETENCIÓN AL ESTRUENDO 471/472

Para los ejes y los alesajes son los sistemas de retención lo más universal posible aplicables. Estas series ofrecen una solución favorable con respecto a grueso y a anchura radial. Transfieren fuerzas axiales grandes del componente localizado sobre la pared del surco. Los anillos externos se pueden también utilizar para mismo las velocidades.

Usos:
Ingeniería mecánica, automotora y eléctrica. Engrane los sistemas, los mecánicos de la precisión y la ingeniería del aparato.

Material:
Acero del resorte

Dureza
d1: 3 - 48 = 47-54 HRC
d1: 50 - 200 = 44-51 HRC
d1: 202 - 300 = 40-47 HRC
d1: 305 - 1000 = 38-43 HRC

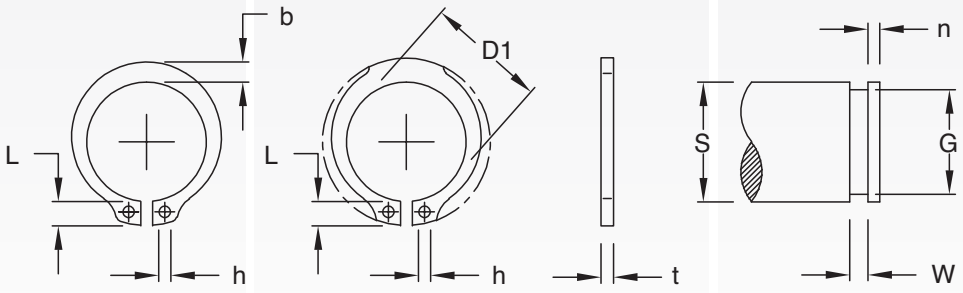
Protección superficial:
Fosfatado y engrasado

Opciones especiales - investigue por favor:

Uno mismo-acabado y engrasado
Cinc plateado
Bronce CuSn8
Aceros resistentes a la corrosión

**Los anillos con un diámetro nominal mayor a 650 mm se fabrican como anillos de retención al estruendo concéntricos

CLAVES DE DIMENSIONES
L = Dimensión de la oreja
h = Dimensión del agujero
b = Altura radial
D1 = Diámetro interior (DIN 471)
D2 = Diámetro exterior (DIN 471)
t = Espesor
S = Diámetro del eje
B = Diámetro del rodamiento
n = Dimensión de la espalda
W = Anchura de la ranura
G = Diámetro de la ranura
Fr = Capacidad de carga del segmento
Fn = Capacidad de carga de la ranura



DIN 471

D

SEEGERRINGE ZUM LÄRM 471/472

Für Wellen und Ausbohrungen sind die allgemeinhin anwendbaren Haltesysteme. Diese Reihen bieten eine vorteilhafte Lösung hinsichtlich der Stärke und der Radialbreite an. Sie bringen große axiale Kräfte vom lokalisierten Bestandteil auf die Nutwand. Die externen Ringe können für große Geschwindigkeiten auch sehr benutzt werden.

Anwendung:
Mechanische, Automobil- und Elektrotechnik. Übersetzen Sie Systeme, Präzisionsmechaniker und Apparatetechnik.

Werkstoff:
Federstahl

Härte:
d1: 3 - 48 = 47-54 HRC
d1: 50 - 200 = 44-51 HRC
d1: 202 - 300 = 40-47 HRC
d1: 305 - 1000 = 38-43 HRC

Oberflächenschutz:
Phosphatiert und geölt

Spezielle Wahlen - erkundigen Sie bitte sich:

Selbst-fertig und geölt
Verzinkt
Bronze CuSn8
Korrosionsbeständige Stahle

**Ringe mit einem Nenndurchmesser von über 650mm werden als konzentrische Sicherungsringe hergestellt.

KENNZEICHNEN DER ABMESSUNGEN
L = Ansatz
h = Öffnung
b = Balken
D1 = Innendurchmesser (DIN 471)
D2 = Außendurchmesser (DIN 472)
t = Dicke
S = Wellendurchmesser
B = Bohrungsdurchmesser
n = Schulter
W = Nutbreite
G = Nutdurchmesser
Fr = Belastbarkeit von Circlip
Fn = Belastbarkeit von Nut

I

ANELLO DIN 471/472

Per i pozzi e fori sono i sistemi di conservazione il più universalmente applicabili. Queste serie offrono una soluzione favorevole riguardo a spessore ed alla larghezza radiale. Trasferiscono le grandi forze assiali dalla componente individuata sulla parete della scanalatura. Gli anelli esterni possono anche essere usati per molto le alte velocità.

Applicazioni:
Ingegneria elettrica meccanica, automobilistica e. Innesti i sistemi, i meccanici di precisione e l'ingegneria dell'apparecchio.

Materiale:
Acciaio della molla

Durezza
d1: 3 - 48 = 47-54 HRC
d1: 50 - 200 = 44-51 HRC
d1: 202 - 300 = 40-47 HRC
d1: 305 - 1000 = 38-43 HRC

Protezione di superficie:
Fosfatizzato e lubrificato

Scelte particolari - domandi prego:

Auto-rifinito e lubrificato
Zinco placcato
Bronzo CuSn8
Acciai resistenti alla corrosione

**Gli anelli con un diametro esterno nominale superiore a 650mm sono costruiti come anelli concentrici.

LEGENDA
L = Dimensioni aletta
h = Dimensioni del foro
b = Vedi disegno
D1 = Diametro interno (DIN 471)
D2 = Diametro esterno (DIN 472)
t = Spessore
S = Diametro del perno
B = Diametro della sede
n = Dimensioni spalla
W = Larghezza scanalatura
G = Diametro scanalatura
Fr = Capacità di carico dell'anello
Fn = Capacità di carico della sede

P

OS GRAMPOS DE RETENÇÃO AO RUÍDO 471/472

Para eixos e furos são os sistemas de retenção o mais universal aplicáveis. Estas séries oferecem uma solução favorável no que diz respeito à espessura e à largura radial. Transferem grandes forças axiais do componente encontrado na parede do sulco. Os anéis externos podem igualmente ser usados para muito altas velocidades.

Aplicações:
Engenharia mecânica, automotriz e elétrica. Engrene sistemas, mecânicos da precisão e engenharia do instrumento.

Material:
Aço da mola

Dureza
d1: 3 - 48 = 47-54 HRC
d1: 50 - 200 = 44-51 HRC
d1: 202 - 300 = 40-47 HRC
d1: 305 - 1000 = 38-43 HRC

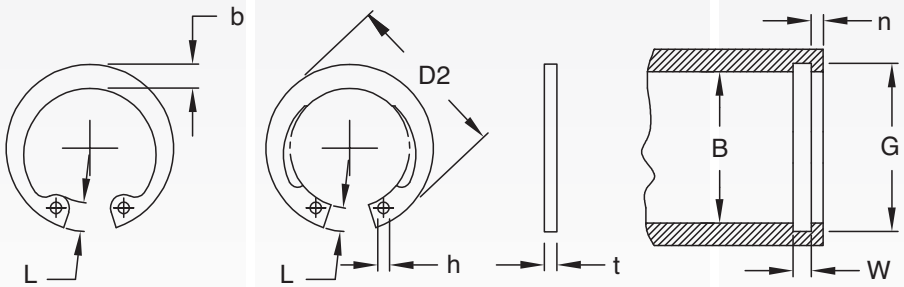
Proteção de superfície:
Fosfatado e oleado

Opções especiais - inquira por favor:

Auto-terminado e oleado
Zinco chapeado
Bronze CuSn8
Aços resistentes à corrosão

**Anéis com mais de 650mm de diametro nominal são manufaturados com anéis concentricos.

LEGENDA
L = Lobulo
h = Furo
b = Trava
D1 = Diametro Interno (Din 471)
D2 = Diametro Externo (Din 4720
t = Espessura
S = Diametro do eixo
B = Diametro do furo
n = Suporte
W = Largura do encaixe
G = Diametro do encaixe
Fr = Capacidade de carga
Fn = Encaixe



DIN 472

STANDARD EXTERNAL CIRCLIPS – DIN 471

A 3 – A 1000

Part No.	S	t	Tol	D1	Tol	L	b	h	Fr	G	Tol	W	n	Fn
	mm	mm	mm	mm	mm	mm	mm	mm	kN	mm	mm	mm	mm	kN
A 3	3	0,40	–0,05	2,7	+0,04 –0,15	1,9	0,8	1,0	0,47	2,8	–0,04	0,50	0,3	0,1
A 4	4	0,40	–0,05	3,7	+0,04 –0,15	2,2	0,9	1,0	0,50	3,8	–0,04	0,50	0,3	0,2
A 5	5	0,60	–0,05	4,7	+0,04 –0,15	2,5	1,1	1,0	1,00	4,8	–0,04	0,70	0,3	0,2
A 6	6	0,70	–0,05	5,6	+0,04 –0,15	2,7	1,3	1,2	1,45	5,7	–0,04	0,80	0,5	0,4
A 7	7	0,80	–0,05	6,5	+0,06 –0,18	3,1	1,4	1,2	2,60	6,7	–0,06	0,90	0,5	0,5
A 8	8	0,80	–0,05	7,4	+0,06 –0,18	3,2	1,5	1,2	3,00	7,6	–0,06	0,90	0,6	0,8
A 9	9	1,00	–0,06	8,4	+0,06 –0,18	3,3	1,7	1,2	3,50	8,6	–0,06	1,10	0,6	0,9
A 10	10	1,00	–0,06	9,3	+0,10 –0,36	3,3	1,8	1,5	4,00	9,6	–0,11	1,10	0,6	1,0
A 11	11	1,00	–0,06	10,2	+0,10 –0,36	3,3	1,8	1,5	4,50	10,5	–0,11	1,10	0,8	1,4
A 12	12	1,00	–0,06	11,0	+0,10 –0,36	3,3	1,8	1,7	5,00	11,5	–0,11	1,10	0,8	1,5
A 13	13	1,00	–0,06	11,9	+0,10 –0,36	3,4	2,0	1,7	5,80	12,4	–0,11	1,10	0,9	2,0
A 14	14	1,00	–0,06	12,9	+0,10 –0,36	3,5	2,1	1,7	6,40	13,4	–0,11	1,10	0,9	2,1
A 15	15	1,00	–0,06	13,8	+0,10 –0,36	3,6	2,2	1,7	6,90	14,3	–0,11	1,10	1,1	2,6
A 16	16	1,00	–0,06	14,7	+0,10 –0,36	3,7	2,2	1,7	7,40	15,2	–0,11	1,10	1,2	3,2
A 17	17	1,00	–0,06	15,7	+0,10 –0,36	3,8	2,3	1,7	8,00	16,2	–0,11	1,10	1,2	3,4
A 18	18	1,20	–0,06	16,5	+0,10 –0,36	3,9	2,4	2,0	17,00	17,0	–0,11	1,30	1,5	4,5
A 19	19	1,20	–0,06	17,5	+0,10 –0,36	3,9	2,5	2,0	17,00	18,0	–0,11	1,30	1,5	4,8
A 20	20	1,20	–0,06	18,5	+0,13 –0,42	4,0	2,6	2,0	17,10	19,0	–0,13	1,30	1,5	5,0
A 21	21	1,20	–0,06	19,5	+0,13 –0,42	4,1	2,7	2,0	16,80	20,0	–0,13	1,30	1,5	5,3
A 22	22	1,20	–0,06	20,5	+0,13 –0,42	4,2	2,8	2,0	16,90	21,0	–0,13	1,30	1,5	5,6
A 23	23	1,20	–0,06	21,5	+0,13 –0,42	4,3	2,9	2,0	16,60	22,0	–0,15	1,30	1,5	5,9
A 24	24	1,20	–0,06	22,2	+0,21 –0,42	4,4	3,0	2,0	16,10	22,9	–0,21	1,30	1,7	6,7
A 25	25	1,20	–0,06	23,2	+0,21 –0,42	4,4	3,0	2,0	16,20	23,9	–0,21	1,30	1,7	7,0
A 26	26	1,20	–0,06	24,2	+0,21 –0,42	4,5	3,1	2,0	16,10	24,9	–0,21	1,30	1,7	7,3
A 27	27	1,20	–0,06	24,9	+0,21 –0,42	4,6	3,1	2,0	16,40	25,6	–0,21	1,30	2,1	9,6
A 28	28	1,50	–0,06	25,9	+0,21 –0,42	4,7	3,2	2,0	32,10	26,6	–0,21	1,60	2,1	10,0
A 29	29	1,50	–0,06	26,9	+0,21 –0,42	4,8	3,4	2,0	31,80	27,6	–0,21	1,60	2,1	10,3
A 30	30	1,50	–0,06	27,9	+0,21 –0,42	5,0	3,5	2,0	32,10	28,6	–0,21	1,60	2,1	10,7
A 31	31	1,50	–0,06	28,6	+0,21 –0,42	5,1	3,5	2,5	31,50	29,3	–0,21	1,60	2,6	13,4
A 32	32	1,50	–0,06	29,6	+0,21 –0,42	5,2	3,6	2,5	31,20	30,3	–0,25	1,60	2,6	13,8
A 33	33	1,50	–0,06	30,5	+0,25 –0,50	5,2	3,7	2,5	31,60	31,3	–0,25	1,60	2,6	14,3
A 34	34	1,50	–0,06	31,5	+0,25 –0,50	5,4	3,8	2,5	31,30	32,3	–0,25	1,60	2,6	14,7
A 35	35	1,50	–0,06	32,2	+0,25 –0,50	5,6	3,9	2,5	30,80	33,0	–0,25	1,60	3,0	17,8
A 36	36	1,75	–0,06	33,2	+0,25 –0,50	5,6	4,0	2,5	49,40	34,0	–0,25	1,85	3,0	18,3
A 37	37	1,75	–0,06	34,2	+0,25 –0,50	5,7	4,1	2,5	50,00	35,0	–0,25	1,85	3,0	18,8
A 38	38	1,75	–0,06	35,2	+0,25 –0,50	5,8	4,2	2,5	49,50	36,0	–0,25	1,85	3,0	19,3
A 39	39	1,75	–0,06	36,0	+0,25 –0,50	5,9	4,3	2,5	49,80	37,0	–0,25	1,85	3,0	19,9
A 40	40	1,75	–0,06	36,5	+0,39 –0,90	6,0	4,4	2,5	51,00	37,5	–0,25	1,85	3,8	25,3
A 41	41	1,75	–0,06	37,5	+0,39 –0,90	6,2	4,5	2,5	50,10	38,5	–0,25	1,85	3,8	26,0
A 42	42	1,75	–0,06	38,5	+0,39 –0,90	6,5	4,5	2,5	50,00	39,5	–0,25	1,85	3,8	26,7
A 44	44	1,75	–0,06	40,5	+0,39 –0,90	6,6	4,6	2,5	48,50	41,5	–0,25	1,85	3,8	28,0
A 45	45	1,75	–0,06	41,5	+0,39 –0,90	6,7	4,7	2,5	49,00	42,5	–0,25	1,85	3,8	28,6
A 46	46	1,75	–0,06	42,5	+0,39 –0,90	6,7	4,8	2,5	48,90	43,5	–0,25	1,85	3,8	29,4
A 47	47	1,75	–0,06	43,5	+0,39 –0,90	6,8	4,9	2,5	49,50	44,5	–0,25	1,85	3,8	30,0
A 48	48	1,75	–0,06	44,5	+0,39 –0,90	6,9	5,0	2,5	49,40	45,5	–0,25	1,85	3,8	30,7
A 50	50	2,00	–0,07	45,8	+0,39 –0,90	6,9	5,1	2,5	73,30	47,0	–0,25	2,15	4,5	38,0
A 52	52	2,00	–0,07	47,8	+0,39 –0,90	7,0	5,2	2,5	73,10	49,0	–0,25	2,15	4,5	39,7
A 54	54	2,00	–0,07	49,8	+0,39 –0,90	7,1	5,3	2,5	71,20	51,0	–0,30	2,15	4,5	41,2
A 55	55	2,00	–0,07	50,8	+0,46 –1,10	7,2	5,4	2,5	71,40	52,0	–0,30	2,15	4,5	42,0
A 56	56	2,00	–0,07	51,8	+0,46 –1,10	7,3	5,5	2,5	70,80	53,0	–0,30	2,15	4,5	42,8
A 57	57	2,00	–0,07	52,8	+0,46 –1,10	7,3	5,5	2,5	70,90	54,0	–0,30	2,15	4,5	43,7
A 58	58	2,00	–0,07	53,8	+0,46 –1,10	7,3	5,6	2,5	71,10	55,0	–0,30	2,15	4,5	44,3
A 60	60	2,00	–0,07	55,8	+0,46 –1,10	7,4	5,8	2,5	69,20	57,0	–0,30	2,15	4,5	46,0
A 62	62	2,00	–0,07	57,8	+0,46 –1,10	7,5	6,0	2,5	69,30	59,0	–0,30	2,15	4,5	47,5
A 63	63	2,00	–0,07	58,8	+0,46 –1,10	7,6	6,2	2,5	70,20	60,0	–0,30	2,15	4,5	48,3
A 65	65	2,50	–0,07	60,8	+0,46 –1,10	7,8	6,3	3,0	135,00	62,0	–0,30	2,65	4,5	49,8
A 67	67	2,50	–0,07	62,5	+0,46 –1,10	7,9	6,4	3,0	136,00	64,0	–0,30	2,65	4,5	51,3
A 68	68	2,50	–0,07	63,5	+0,46 –1,10	8,0	6,5	3,0	135,00	65,0	–0,30	2,65	4,5	52,2
A 70	70	2,50	–0,07	65,5	+0,46 –1,10	8,1	6,6	3,0	134,00	67,0	–0,30	2,65	4,5	53,8
A 72	72	2,50	–0,07	67,5	+0,46 –1,10	8,2	6,8	3,0	131,00	69,0	–0,30	2,65	4,5	55,3
A 75	75	2,50	–0,07	70,5	+0,46 –1,10	8,4	7,0	3,0	130,00	72,0	–0,30	2,65	4,5	57,6
A 77	77	2,50	–0,07	72,5	+0,46 –1,10	8,5	7,2	3,0	131,00	74,0	–0,30	2,65	4,5	59,3
A 78	78	2,50	–0,07	73,5	+0,46 –1,10	8,6	7,3	3,0	131,00	75,0	–0,30	2,65	4,5	60,0
A 80	80	2,50	–0,07	74,5	+0,46 –1,10	8,6	7,4	3,0	128,00	76,5	–0,30	2,65	5,3	71,6
A 82	82	2,50	–0,07	76,5	+0,46 –1,10	8,7	7,6	3,0	128,00	78,5	–0,30	2,65	5,3	73,5
A 85	85	3,00	–0,08	79,5	+0,46 –1,10	8,7	7,8	3,5	215,00	81,5	–0,35	3,15	5,3	76,2
A 87	87	3,00	–0,08	81,5	+0,54 –1,30	8,8	7,9	3,5	222,00	83,5	–0,35	3,15	5,3	78,2
A 88	88	3,00	–0,08	82,5	+0,54 –1,30	8,8	8,0	3,5	221,00	84,5	–0,35	3,15	5,3	79,0
A 90	90	3,00	–0,08	84,5	+0,54 –1,30	8,8	8,2	3,5	217,00	86,5	–0,35	3,15	5,3	80,0

STANDARD EXTERNAL CIRCLIPS – DIN 471

A 3 – A 1000

Part No.	S	t	Tol	D1	Tol	L	b	h	Fr	G	Tol	W	n	Fn
	mm	mm	mm	mm	mm	mm	mm	mm	kN	mm	mm	mm	mm	kN
A 92	92	3,00	–0,08	86,5	+0,54 –1,30	9,0	8,4	3,5	217,00	88,5	–0,35	3,15	5,3	82,0
A 95	95	3,00	–0,08	89,5	+0,54 –1,30	9,4	8,6	3,5	212,00	91,5	–0,35	3,15	5,3	85,0
A 97	97	3,00	–0,08	91,5	+0,54 –1,30	9,4	8,8	3,5	211,00	93,5	–0,35	3,15	5,3	87,0
A 98	98	3,00	–0,08	91,5	+0,54 –1,30	9,4	8,8	3,5	208,00	94,5	–0,35	3,15	5,3	88,0
A 100	100	3,00	–0,08	94,5	+0,54 –1,30	9,6	9,0	3,5	206,00	96,5	–0,35	3,15	5,3	90,0
A 102	102	4,00	–0,10	95,0	+0,54 –1,30	9,7	9,2	3,5	482,00	98,0	–0,54	4,15	6,0	104,0
A 105	105	4,00	–0,10	98,0	+0,54 –1,30	9,9	9,3	3,5	471,00	101,0	–0,54	4,15	6,0	107,0
A 107	107	4,00	–0,10	100,0	+0,54 –1,30	10,0	9,5	3,5	465,00	103,0	–0,54	4,15	6,0	110,0
A 108	108	4,00	–0,10	100,0	+0,54 –1,30	10,0	9,5	3,5	459,00	104,0	–0,54	4,15	6,0	111,0
A 110	110	4,00	–0,10	103,0	+0,54 –1,30	10,1	9,6	3,5	457,00	106,0	–0,54	4,15	6,0	113,0
A 112	112	4,00	–0,10	105,0	+0,54 –1,30	10,3	9,7	3,5	451,00	108,0	–0,54	4,15	6,0	115,0
A 115	115	4,00	–0,10	108,0	+0,54 –1,30	10,6	9,8	3,5	438,00	111,0	–0,54	4,15	6,0	118,0
A 117	117	4,00	–0,10	110,0	+0,54 –1,30	10,8	10,0	3,5	437,00	113,0	–0,54	4,15	6,0	120,0
A 118	118	4,00	–0,10	110,0	+0,54 –1,30	10,8	10,0	3,5	430,00	114,0	–0,54	4,15	6,0	121,0
A 120	120	4,00	–0,10	113,0	+0,54 –1,30	11,0	10,2	3,5	424,00	116,0	–0,54	4,15	6,0	123,0
A 122	122	4,00	–0,10	115,0	+0,54 –1,30	11,2	10,3	4,0	418,00	118,0	–0,54	4,15	6,0	125,0
A 125	125	4,00	–0,10	118,0	+0,54 –1,30	11,4	10,4	4,0	411,00	121,0	–0,63	4,15	6,0	128,0
A 127	127	4,00	–0,10	120,0	+0,54 –1,30	11,4	10,5	4,0	407,00	123,0	–0,63	4,15	6,0	130,0
A 128	128	4,00	–0,10	120,0	+0,54 –1,30	11,4	10,5	4,0	401,00	124,0	–0,63	4,15	6,0	131,0
A 130	130	4,00	–0,10	123,0	+0,63 –1,50	11,6	10,7	4,0	395,00	126,0	–0,63	4,15	6,0	134,0
A 132	132	4,00	–0,10	125,0	+0,63 –1,50	11,7	10,8	4,0	396,00	128,0	–0,63	4,15	6,0	136,0
A 135	135	4,00	–0,10	128,0	+0,63 –1,50	11,8	11,0	4,0	389,00	131,0	–0,63	4,15	6,0	139,0
A 137	137	4,00	–0,10	130,0	+0,63 –1,50	11,9	11,0	4,0	380,00	133,0	–0,63	4,15	6,0	141,0
A 138	138	4,00	–0,10	130,0	+0,63 –1,50	11,9	11,0	4,0	381,00	134,0	–0,63	4,15	6,0	142,0
A 140	140	4,00	–0,10	133,0	+0,63 –1,50	12,0	11,2	4,0	376,00	136,0	–0,63	4,15	6,0	144,0
A 142	142	4,00	–0,10	135,0	+0,63 –1,50	12,1	11,3	4,0	370,00	138,0	–0,63	4,15	6,0	146,0
A 145	145	4,00	–0,10	138,0	+0,63 –1,50	12,2	11,5	4,0	367,00	141,0	–0,63	4,15	6,0	149,0
A 147	147	4,00	–0,10	140,0	+0,63 –1,50	12,3	11,6	4,0	361,00	143,0	–0,63	4,15	6,0	151,0
A 148	148	4,00	–0,10	140,0	+0,63 –1,50	12,3	11,6	4,0	357,00	144,0	–0,63	4,15	6,0	152,0
A 150	150	4,00	–0,10	142,0	+0,63 –1,50	13,0	11,8	4,0	357,00	145,0	–0,63	4,15	7,5	193,0
A 152	152	4,00	–0,10	143,0	+0,63 –1,50	13,0	11,9	4,0	356,00	147,0	–0,63	4,15	7,5	195,0
A 155	155	4,00	–0,10	146,0	+0,63 –1,50	13,0	12,0	4,0	352,00	150,0	–0,63	4,15	7,5	199,0
A 157	157	4,00	–0,10	148,0	+0,63 –1,50	13,1	12,0	4,0	352,00	152,0	–0,63	4,15	7,5	202,0
A 158	158	4,00	–0,10	148,0	+0,63 –1,50	13,1	12,0	4,0	353,00	153,0	–0,63	4,15	7,5	203,0
A 160	160	4,00	–0,10	151,0	+0,63 –1,50	13,3	12,2	4,0	349,00	155,0	–0,63	4,15	7,5	206,0
A 162	162	4,00	–0,10	152,5	+0,63 –1,50	13,3	12,3	4,0	348,00	157,0	–0,63	4,15	7,5	208,0
A 165	165	4,00	–0,10	155,5	+0,63 –1,50	13,5	12,5	4,0	345,00	160,0	–0,63	4,15	7,5	212,0
A 167	167	4,00	–0,10	157,5	+0,63 –1,50	13,5	12,9	4,0	354,00	162,0	–0,63	4,15	7,5	215,0
A 168	168	4,00	–0,10	157,5	+0,63 –1,50	13,5	12,9	4,0	353,00	163,0	–0,63	4,15	7,5	216,0
A 170	170	4,00	–0,10	160,5	+0,63 –1,50	13,5	12,9	4,0	349,00	165,0	–0,63	4,15	7,5	219,0
A 172	172	4,00	–0,10	160,5	+0,63 –1,50	13,5	12,9	4,0	344,00	167,0	–0,63	4,15	7,5	221,0
A 175	175	4,00	–0,10	165,5	+0,63 –1,50	13,5	12,9	4,0	340,00	170,0	–0,63	4,15	7,5	225,0
A 177	177	4,00	–0,10	167,5	+0,63 –1,50	14,2	13,5	4,0	335,00	172,0	–0,63	4,15	7,5	228,0
A 178	178	4,00	–0,10	167,5	+0,63 –1,50	14,2	13,5	4,0	349,00	173,0	–0,63	4,15	7,5	229,0
A 180	180	4,00	–0,10	170,5	+0,63 –1,50	14,2	13,5	4,0	345,00	175,0	–0,63	4,15	7,5	232,0
A 182	182	4,00	–0,10	170,5	+0,63 –1,50	14,2	13,5	4,0	341,00	177,0	–0,63	4,15	7,5	235,0
A 185	185	4,00	–0,10	175,5	+0,63 –1,50	14,2	13,5	4,0	336,00	180,0	–0,63	4,15	7,5	238,0
A 187	187	4,00	–0,10	177,5	+0,63 –1,50	14,2	14,0	4,0	338,00	182,0	–0,72	4,15	7,5	241,0
A 188	188	4,00	–0,10	177,5	+0,63 –1,50	14,2	14,0	4,0	337,00	183,0	–0,72	4,15	7,5	242,0
A 190	190	4,00	–0,10	180,5	+0,72 –1,70	14,2	14,0	4,0	333,00	185,0	–0,72	4,15	7,5	245,0
A 192	192	4,00	–0,10	180,5	+0,72 –1,70	14,2	14,0	4,0	330,00	187,0	–0,72	4,15	7,5	248,0
A 195	195	4,00	–0,10	185,5	+0,72 –1,70	14,2	14,0	4,0	325,00	190,0	–0,72	4,15	7,5	251,0
A 197	197	4,00	–0,10	187,5	+0,72 –1,70	14,2	14,0	4,0	322,00	192,0	–0,72	4,15	7,5	254,0
A 198	198	4,00	–0,10	187,5	+0,72 –1,70	14,2	14,0	4,0	322,00	193,0	–0,72	4,15	7,5	255,0
A 200	200	4,00	–0,10	190,5	+0,72 –1,70	14,2	14,0	4,0	319,00	195,0	–0,72	4,15	7,5	258,0
A 202	202	5,00	–0,12	190,0	+0,72 –1,70	14,2	14,0	4,0	624,00	196,0	–0,72	5,15	9,0	312,0
A 205	205	5,00	–0,12	193,0	+0,72 –1,70	14,2	14,0	4,0	611,00	199,0	–0,72	5,15	9,0	317,0
A 207	207	5,00	–0,12	193,0	+0,72 –1,70	14,2	14,0	4,0	608,00	201,0	–0,72	5,15	9,0	320,0
A 208	208	5,00	–0,12	193,0	+0,72 –1,70	14,2	14,0	4,0	605,00	202,0	–0,72	5,15	9,0	321,0
A 210	210	5,00	–0,12	198,0	+0,72 –1,70	14,2	14,0	4,0	598,00	204,0	–0,72	5,15	9,0	325,0
A 212	212	5,00	–0,12	198,0	+0,72 –1,70	14,2	14,0	4,0	593,00	206,0	–0,72	5,15	9,0	328,0
A 215	215	5,00	–0,12	203,0	+0,72 –1,70	14,2	14,0	4,0	585,00	209,0	–0,72	5,15	9,0	332,0
A 217	217	5,00	–0,12	203,0	+0,72 –1,70	14,2	14,0	4,0	580,00	211,0	–0,72	5,15	9,0	336,0
A 218	218	5,00	–0,12	203,0	+0,72 –1,70	14,2	14,0	4,0	577,00	212,0	–0,72	5,15	9,0	337,0
A 220	220	5,00	–0,12	208,0	+0,72 –1,70	14,2	14,0	4,0	572,00	214,0	–0,72	5,15	9,0	340,0
A 222	222	5,00	–0,12	208,0	+0,72 –1,70	14,2	14,0	4,0	567,00	216,0	–0,72	5,15	9,0	343,0
A 225	225	5,00	–0,12	213,0	+0,72 –1,70	14,2	14,0	4,0	559,00	219,0	–0,72	5,15	9,0	349,0
A 227	227	5,00	–0,12	213,0	+0,72 –1,70	14,2	14,0	4,0	555,00	221,0	–0,72	5,15	9,0	351,0
A 228	228	5,00	–0,12	213,0	+0,72 –1,70	14,2	14,0	4,0	552,00	222,0	–0,72	5,15	9,0	353,0

STANDARD EXTERNAL CIRCLIPS – DIN 471

A 3 – A 1000

Part No.	S	t	Tol	D1	Tol	L	b	h	Fr	G	Tol	W	n	Fn
	mm	mm	mm	mm	mm	mm	mm	mm	kN	mm	mm	mm	mm	kN
A 230	230	5,00	–0,12	218,0	+0,72 –1,70	14,2	14,0	4,0	548,00	224,0	–0,72	5,15	9,0	356,0
A 232	232	5,00	–0,12	218,0	+0,72 –1,70	14,2	14,0	4,0	543,00	226,0	–0,72	5,15	9,0	359,0
A 235	235	5,00	–0,12	223,0	+0,72 –1,70	14,2	14,0	4,0	537,00	229,0	–0,72	5,15	9,0	364,0
A 237	237	5,00	–0,12	223,0	+0,72 –1,70	14,2	14,0	4,0	532,00	231,0	–0,72	5,15	9,0	367,0
A 238	238	5,00	–0,12	223,0	+0,72 –1,70	14,2	14,0	4,0	530,00	232,0	–0,72	5,15	9,0	369,0
A 240	240	5,00	–0,12	228,0	+0,72 –1,70	14,2	14,0	4,0	530,00	234,0	–0,72	5,15	9,0	372,0
A 242	242	5,00	–0,12	228,0	+0,72 –1,70	14,2	14,0	4,0	520,00	236,0	–0,72	5,15	9,0	375,0
A 245	245	5,00	–0,12	233,0	+0,72 –1,70	14,2	14,0	4,0	515,00	239,0	–0,72	5,15	9,0	380,0
A 247	247	5,00	–0,12	233,0	+0,72 –1,70	14,2	14,0	4,0	511,00	241,0	–0,72	5,15	9,0	383,0
A 248	248	5,00	–0,12	233,0	+0,72 –1,70	14,2	14,0	4,0	508,00	242,0	–0,72	5,15	9,0	385,0
A 250	250	5,00	–0,12	238,0	+0,72 –1,70	14,2	14,0	4,0	504,00	244,0	–0,72	5,15	9,0	388,0
A 252	252	5,00	–0,12	238,0	+0,72 –1,70	16,2	16,0	5,0	563,00	244,0	–0,72	5,15	12,0	519,0
A 255	255	5,00	–0,12	240,0	+0,72 –1,70	16,2	16,0	5,0	557,00	247,0	–0,72	5,15	12,0	525,0
A 257	257	5,00	–0,12	240,0	+0,72 –1,70	16,2	16,0	5,0	551,00	249,0	–0,72	5,15	12,0	529,0
A 258	258	5,00	–0,12	240,0	+0,72 –1,70	16,2	16,0	5,0	550,00	250,0	–0,72	5,15	12,0	531,0
A 260	260	5,00	–0,12	245,0	+0,72 –1,70	16,2	16,0	5,0	540,00	252,0	–0,81	5,15	12,0	535,0
A 262	262	5,00	–0,12	245,0	+0,72 –1,70	16,2	16,0	5,0	542,00	254,0	–0,81	5,15	12,0	540,0
A 265	265	5,00	–0,12	250,0	+0,72 –1,70	16,2	16,0	5,0	536,00	257,0	–0,81	5,15	12,0	546,0
A 267	267	5,00	–0,12	250,0	+0,72 –1,70	16,2	16,0	5,0	532,00	259,0	–0,81	5,15	12,0	550,0
A 268	268	5,00	–0,12	250,0	+0,72 –1,70	16,2	16,0	5,0	529,00	260,0	–0,81	5,15	12,0	553,0
A 270	270	5,00	–0,12	255,0	+0,81 –2,00	16,2	16,0	5,0	525,00	262,0	–0,81	5,15	12,0	556,0
A 272	272	5,00	–0,12	255,0	+0,81 –2,00	16,2	16,0	5,0	522,00	264,0	–0,81	5,15	12,0	560,0
A 275	275	5,00	–0,12	260,0	+0,81 –2,00	16,2	16,0	5,0	516,00	267,0	–0,81	5,15	12,0	566,0
A 277	277	5,00	–0,12	260,0	+0,81 –2,00	16,2	16,0	5,0	513,00	269,0	–0,81	5,15	12,0	571,0
A 278	278	5,00	–0,12	260,0	+0,81 –2,00	16,2	16,0	5,0	510,00	270,0	–0,81	5,15	12,0	574,0
A 280	280	5,00	–0,12	265,0	+0,81 –2,00	16,2	16,0	5,0	508,00	272,0	–0,81	5,15	12,0	576,0
A 282	282	5,00	–0,12	265,0	+0,81 –2,00	16,2	16,0	5,0	503,00	274,0	–0,81	5,15	12,0	580,0
A 285	285	5,00	–0,12	270,0	+0,81 –2,00	16,2	16,0	5,0	499,00	277,0	–0,81	5,15	12,0	587,0
A 287	287	5,00	–0,12	270,0	+0,81 –2,00	16,2	16,0	5,0	494,00	279,0	–0,81	5,15	12,0	591,0
A 288	288	5,00	–0,12	270,0	+0,81 –2,00	16,2	16,0	5,0	493,00	280,0	–0,81	5,15	12,0	594,0
A 290	290	5,00	–0,12	275,0	+0,81 –2,00	16,2	16,0	5,0	490,00	282,0	–0,81	5,15	12,0	599,0
A 292	292	5,00	–0,12	275,0	+0,81 –2,00	16,2	16,0	5,0	487,00	284,0	–0,81	5,15	12,0	603,0
A 295	295	5,00	–0,12	280,0	+0,81 –2,00	16,2	16,0	5,0	481,00	287,0	–0,81	5,15	12,0	609,0
A 297	297	5,00	–0,12	280,0	+0,81 –2,00	16,2	16,0	5,0	479,00	289,0	–0,81	5,15	12,0	613,0
A 298	298	5,00	–0,12	280,0	+0,81 –2,00	16,2	16,0	5,0	476,00	290,0	–0,81	5,15	12,0	615,0
A 300	300	5,00	–0,12	285,0	+0,81 –2,00	16,2	16,0	5,0	475,00	292,0	–0,81	5,15	12,0	619,0
A 305	305	6,00	–0,15	288,0	+0,81 –2,00		20,0	6,0	1036,00	295,0	–0,81	6,20	15,0	785,0
A 310	310	6,00	–0,15	293,0	+0,81 –2,00		20,0	6,0	1016,00	300,0	–0,81	6,20	15,0	796,0
A 315	315	6,00	–0,15	298,0	+0,81 –2,00		20,0	6,0	1007,00	305,0	–0,81	6,20	15,0	811,0
A 320	320	6,00	–0,15	303,0	+0,81 –2,00		20,0	6,0	988,00	310,0	–0,81	6,20	15,0	825,0
A 325	325	6,00	–0,15	308,0	+0,81 –2,00		20,0	6,0	975,00	315,0	–0,81	6,20	15,0	837,0
A 330	330	6,00	–0,15	313,0	+0,81 –2,00		20,0	6,0	958,00	320,0	–0,89	6,20	15,0	850,0
A 335	335	6,00	–0,15	318,0	+0,90 –2,00		20,0	6,0	945,00	325,0	–0,89	6,20	15,0	864,0
A 340	340	6,00	–0,15	323,0	+0,90 –2,00		20,0	6,0	932,00	330,0	–0,89	6,20	15,0	876,0
A 345	345	6,00	–0,15	328,0	+0,90 –2,00		20,0	6,0	917,00	335,0	–0,89	6,20	15,0	890,0
A 350	350	6,00	–0,15	333,0	+0,90 –2,00		20,0	6,0	906,00	340,0	–0,89	6,20	15,0	903,0
A 355	355	6,00	–0,15	338,0	+0,90 –2,00		20,0	6,0	894,00	345,0	–0,89	6,20	15,0	916,0
A 360	360	6,00	–0,15	343,0	+0,90 –2,00		20,0	6,0	880,00	350,0	–0,89	6,20	15,0	928,0
A 365	365	6,00	–0,15	348,0	+0,90 –2,00		20,0	6,0	868,00	355,0	–0,89	6,20	15,0	942,0
A 370	370	6,00	–0,15	353,0	+0,90 –2,00		20,0	6,0	856,00	360,0	–0,89	6,20	15,0	955,0
A 375	375	6,00	–0,15	358,0	+0,90 –2,00		20,0	6,0	847,00	365,0	–0,89	6,20	15,0	968,0
A 380	380	6,00	–0,15	363,0	+0,90 –2,00		20,0	6,0	833,00	370,0	–0,89	6,20	15,0	980,0
A 385	385	6,00	–0,15	368,0	+0,90 –2,00		20,0	6,0	823,00	375,0	–0,89	6,20	15,0	994,0
A 390	390	6,00	–0,15	373,0	+0,90 –2,00		20,0	6,0	814,00	380,0	–0,89	6,20	15,0	1008,0
A 395	395	6,00	–0,15	378,0	+0,90 –2,00		20,0	6,0	803,00	385,0	–0,89	6,20	15,0	1021,0
A 400	400	6,00	–0,15	383,0	+0,90 –2,00		20,0	6,0	793,00	390,0	–0,89	6,20	15,0	1033,0
A 410	410	7,00	–0,15	390,0	+0,90 –2,00		26,0	6,0	1616,00	398,0	–0,89	7,20	18,0	1269,0
A 420	420	7,00	–0,15	400,0	+0,90 –2,00		26,0	6,0	1569,00	408,0	–1,00	7,20	18,0	1300,0
A 430	430	7,00	–0,15	410,0	+1,00 –2,00		26,0	6,0	1540,00	418,0	–1,00	7,20	18,0	1332,0
A 440	440	7,00	–0,15	420,0	+1,00 –2,00		26,0	6,0	1500,00	428,0	–1,00	7,20	18,0	1363,0
A 450	450	7,00	–0,15	430,0	+1,00 –2,00		26,0	6,0	1472,00	438,0	–1,00	7,20	18,0	1393,0
A 460	460	7,00	–0,15	440,0	+1,00 –2,00		26,0	6,0	1443,00	448,0	–1,00	7,20	18,0	1426,0
A 470	470	7,00	–0,15	450,0	+1,00 –2,00		26,0	6,0	1413,00	458,0	–1,00	7,20	18,0	1457,0
A 480	480	7,00	–0,15	460,0	+1,00 –2,00		26,0	6,0	1383,00	468,0	–1,00	7,20	18,0	1489,0
A 490	490	7,00	–0,15	470,0	+1,00 –2,00		26,0	6,0	1355,00	478,0	–1,00	7,20	18,0	1520,0
A 500	500	7,00	–0,15	480,0	+1,00 –2,00		26,0	6,0	1329,00	488,0	–1,00	7,20	18,0	1550,0
A 510	510	8,00	–0,15	485,0	+1,00 –2,00		26,0	6,0	1952,00	496,0	–1,00	8,20	21,0	1843,0
A 520	520	8,00	–0,15	495,0	+1,00 –2,00		26,0	6,0	1910,00	506,0	–1,00	8,20	21,0	1880,0
A 530	530	8,00	–0,15	505,0	+1,50 –3,00		26,0	6,0	1878,00	516,0	–1,00	8,20	21,0	1916,0

STANDARD EXTERNAL CIRCLIPS – DIN 471														A 3 – A 1000
Part No.	S	t	Tol	D1	Tol	L	b	h	Fr	G	Tol	W	n	Fn
	mm	mm	mm	mm	mm	mm	mm	mm	kN	mm	mm	mm	mm	kN
A 540	540	8,00	–0,15	515,0	+1,50 –3,00		26,0	6,0	1846,00	526,0	–1,00	8,20	21,0	1953,0
A 550	550	8,00	–0,15	525,0	+1,50 –3,00		26,0	6,0	1812,00	536,0	–1,00	8,20	21,0	1986,0
A 560	560	8,00	–0,15	535,0	+1,50 –3,00		26,0	6,0	1777,00	546,0	–1,00	8,20	21,0	2026,0
A 570	570	8,00	–0,15	545,0	+1,50 –3,00		26,0	6,0	1750,00	556,0	–1,00	8,20	21,0	2063,0
A 580	580	8,00	–0,15	555,0	+1,50 –3,00		26,0	6,0	1718,00	566,0	–1,00	8,20	21,0	2100,0
A 590	590	8,00	–0,15	565,0	+1,50 –3,00		26,0	6,0	1689,00	576,0	–1,00	8,20	21,0	2136,0
A 600	600	8,00	–0,15	575,0	+1,50 –3,00		26,0	6,0	1600,00	586,0	–1,00	8,20	21,0	2170,0
A 650	650	9,00	–0,20	620,0	+1,50 –3,00		34,0	6,0	2810,00	634,0	–1,00	9,30	24,0	2640,0
A 700**	700	9,00	–0,20	670,0	+1,50 –3,00		34,0	6,0	2615,00	384,0	–1,00	9,30	24,0	2890,0
A 750**	750	9,00	–0,20	715,0	+1,50 –3,00		34,0	9,0	2450,00	732,0	–1,00	9,30	27,0	3490,0
A 800**	800	9,00	–0,20	765,0	+1,50 –3,00		34,0	9,0	2299,00	782,0	–1,00	9,30	27,0	3730,0
A 850**	850	9,00	–0,20	810,0	+2,00 –4,00		34,0	9,0	2166,00	830,0	–1,00	9,30	30,0	4400,0
A 900**	900	9,00	–0,20	860,0	+2,00 –4,00		34,0	9,0	2047,00	880,0	–1,00	9,30	30,0	4650,0
A 950**	950	9,00	–0,20	900,0	+2,00 –4,00		34,0	9,0	1945,00	928,0	–1,00	9,30	33,0	5400,0
A 1000**	1000	9,00	–0,20	950,0	+2,00 –4,00		34,0	9,0	1851,00	978,0	–1,00	9,30	33,0	5700,0

Part No.	B	t	Tol	D2	Tol	L	b	h	Fr	G	Tol	W	n	Fn
	mm	mm	mm	mm	mm	mm	mm	mm	kN	mm	mm	mm	mm	kN
J 8	8	0,80	–0,05	8,7	+0,36 –0,10	2,4	1,1	1,0	2,0	8,4	+0,09	0,90	0,6	0,86
J 9	9	0,80	–0,05	9,8	+0,36 –0,10	2,5	1,3	1,0	2,0	9,4	+0,09	0,90	0,6	0,96
J 10	10	1,00	–0,06	10,8	+0,36 –0,10	3,2	1,4	1,2	4,0	10,4	+0,11	1,10	0,6	1,08
J 11	11	1,00	–0,06	11,8	+0,36 –0,10	3,3	1,5	1,2	4,0	11,4	+0,11	1,10	0,6	1,17
J 12	12	1,00	–0,06	13,0	+0,36 –0,10	3,4	1,7	1,5	4,0	12,5	+0,11	1,10	0,8	1,60
J 13	13	1,00	–0,06	14,1	+0,36 –0,10	3,6	1,8	1,5	4,2	13,6	+0,11	1,10	0,9	2,10
J 14	14	1,00	–0,06	15,1	+0,36 –0,10	3,7	1,8	1,7	4,5	14,6	+0,11	1,10	0,9	2,25
J 15	15	1,00	–0,06	16,2	+0,36 –0,10	3,7	2,0	1,7	5,0	15,7	+0,11	1,10	1,1	2,80
J 16	16	1,00	–0,06	17,3	+0,36 –0,10	3,8	2,0	1,7	5,5	16,8	+0,11	1,10	1,2	3,40
J 17	17	1,00	–0,06	18,3	+0,42 –0,13	3,9	2,1	1,7	6,0	17,8	+0,11	1,10	1,2	3,60
J 18	18	1,00	–0,06	19,5	+0,42 –0,13	4,1	2,2	2,0	6,5	19,0	+0,13	1,10	1,5	4,80
J 19	19	1,00	–0,06	20,5	+0,42 –0,13	4,1	2,2	2,0	6,8	20,0	+0,13	1,10	1,5	5,10
J 20	20	1,00	–0,06	21,5	+0,42 –0,13	4,1	2,3	2,0	7,2	21,0	+0,13	1,10	1,5	5,40
J 21	21	1,00	–0,06	22,5	+0,42 –0,13	4,2	2,4	2,0	7,6	22,0	+0,13	1,10	1,5	5,70
J 22	22	1,00	–0,06	23,5	+0,42 –0,13	4,2	2,5	2,0	8,0	23,0	+0,13	1,10	1,5	5,90
J 23	23	1,20	–0,06	24,6	+0,42 –0,13	4,2	2,5	2,0	8,0	24,1	+0,13	1,30	1,7	6,80
J 24	24	1,20	–0,06	25,9	+0,42 –0,21	4,3	2,6	2,0	13,9	25,2	+0,21	1,30	1,8	7,70
J 25	25	1,20	–0,06	26,9	+0,42 –0,21	4,5	2,7	2,0	14,6	26,2	+0,21	1,30	1,8	8,00
J 26	26	1,20	–0,06	27,9	+0,42 –0,21	4,7	2,8	2,0	13,8	27,2	+0,21	1,30	1,8	8,40
J 27	27	1,20	–0,06	29,1	+0,42 –0,21	4,7	2,9	2,0	13,3	28,4	+0,21	1,30	2,1	10,10
J 28	28	1,20	–0,06	30,1	+0,50 –0,25	4,8	2,9	2,0	13,3	29,4	+0,21	1,30	2,1	10,50
J 29	29	1,20	–0,06	31,1	+0,50 –0,25	4,8	3,0	2,0	13,6	30,4	+0,25	1,30	2,1	10,90
J 30	30	1,20	–0,06	32,1	+0,50 –0,25	4,8	3,0	2,0	13,7	31,4	+0,25	1,30	2,1	11,30
J 31	31	1,20	–0,06	33,4	+0,50 –0,25	5,2	3,1	2,5	13,8	32,7	+0,25	1,30	2,6	14,10
J 32	32	1,20	–0,06	34,4	+0,50 –0,25	5,4	3,2	2,5	13,8	33,7	+0,25	1,30	2,6	14,60
J 33	33	1,20	–0,06	35,5	+0,50 –0,25	5,4	3,3	2,5	14,3	34,7	+0,25	1,30	2,6	15,00
J 34	34	1,50	–0,06	36,5	+0,50 –0,25	5,4	3,3	2,5	26,2	35,7	+0,25	1,60	2,6	15,40
J 35	35	1,50	–0,06	37,8	+0,50 –0,25	5,4	3,4	2,5	26,9	37,0	+0,25	1,60	3,0	18,80
J 36	36	1,50	–0,06	38,8	+0,50 –0,25	5,4	3,5	2,5	26,4	38,0	+0,25	1,60	3,0	19,40
J 37	37	1,50	–0,06	39,8	+0,50 –0,25	5,5	3,6	2,5	27,1	39,0	+0,25	1,60	3,0	19,80
J 38	38	1,50	–0,06	40,8	+0,50 –0,25	5,5	3,7	2,5	28,2	40,0	+0,25	1,60	3,0	22,50
J 39	39	1,50	–0,06	42,0	+0,90 –0,39	5,6	3,8	2,5	28,8	41,0	+0,25	1,60	3,0	26,00
J 40	40	1,75	–0,06	43,5	+0,90 –0,39	5,8	3,9	2,5	44,6	42,5	+0,25	1,85	3,8	27,00
J 41	41	1,75	–0,06	44,5	+0,90 –0,39	5,9	4,0	2,5	45,0	43,5	+0,25	1,85	3,8	27,60
J 42	42	1,75	–0,06	45,5	+0,90 –0,39	5,9	4,1	2,5	44,7	44,5	+0,25	1,85	3,8	28,40
J 43	43	1,75	–0,06	46,5	+0,90 –0,39	5,9	4,2	2,5	44,5	45,5	+0,25	1,85	3,8	28,80
J 44	44	1,75	–0,06	47,5	+0,90 –0,39	6,0	4,2	2,5	43,3	46,5	+0,25	1,85	3,8	29,50
J 45	45	1,75	–0,06	48,5	+0,90 –0,39	6,2	4,3	2,5	43,1	47,5	+0,25	1,85	3,8	30,20
J 46	46	1,75	–0,06	49,5	+0,90 –0,39	6,3	4,4	2,5	42,9	48,5	+0,25	1,85	3,8	30,80
J 47	47	1,75	–0,06	50,5	+1,10 –0,46	6,4	4,4	2,5	43,5	49,5	+0,25	1,85	3,8	31,40
J 48	48	1,75	–0,06	51,5	+1,10 –0,46	6,4	4,5	2,5	43,2	50,5	+0,30	1,85	3,8	32,00
J 50	50	2,00	–0,07	54,2	+1,10 –0,46	6,5	4,6	2,5	60,8	53,0	+0,30	2,15	4,5	40,50
J 51	51	2,00	–0,07	55,2	+1,10 –0,46	6,5	4,7	2,5	60,2	54,0	+0,30	2,15	4,5	41,20
J 52	52	2,00	–0,07	56,2	+1,10 –0,46	6,7	4,7	2,5	60,2	55,0	+0,30	2,15	4,5	42,00
J 53	53	2,00	–0,07	57,2	+1,10 –0,46	6,7	4,9	2,5	60,7	56,0	+0,30	2,15	4,5	42,90
J 54	54	2,00	–0,07	58,2	+1,10 –0,46	6,7	5,0	2,5	60,4	57,0	+0,30	2,15	4,5	43,60
J 55	55	2,00	–0,07	59,2	+1,10 –0,46	6,8	5,0	2,5	60,3	58,0	+0,30	2,15	4,5	44,40
J 56	56	2,00	–0,07	60,2	+1,10 –0,46	6,8	5,1	2,5	60,3	59,0	+0,30	2,15	4,5	45,20
J 57	57	2,00	–0,07	61,2	+1,10 –0,46	6,8	5,1	2,5	60,8	60,0	+0,30	2,15	4,5	46,00
J 58	58	2,00	–0,07	62,2	+1,10 –0,46	6,9	5,2	2,5	60,8	61,0	+0,30	2,15	4,5	46,70
J 60	60	2,00	–0,07	64,2	+1,10 –0,46	7,3	5,4	2,5	61,0	63,0	+0,30	2,15	4,5	48,30
J 62	62	2,00	–0,07	66,2	+1,10 –0,46	7,3	5,5	2,5	60,9	65,0	+0,30	2,15	4,5	49,80
J 63	63	2,00	–0,07	67,2	+1,10 –0,46	7,3	5,6	2,5	60,8	66,0	+0,30	2,15	4,5	50,60
J 64	64	2,00	–0,07	68,2	+1,10 –0,46	7,4	5,7	2,5	60,6	67,0	+0,30	2,15	4,5	51,40
J 65	65	2,50	–0,07	69,2	+1,10 –0,46	7,6	5,8	3,0	121,0	68,0	+0,30	2,65	4,5	51,80
J 67	67	2,50	–0,07	71,5	+1,10 –0,46	7,7	6,0	3,0	121,0	70,0	+0,30	2,65	4,5	53,80
J 68	68	2,50	–0,07	72,5	+1,10 –0,46	7,8	6,1	3,0	119,0	71,0	+0,30	2,65	4,5	56,20
J 70	70	2,50	–0,07	74,5	+1,10 –0,46	7,8	6,2	3,0	119,0	73,0	+0,30	2,65	4,5	56,20
J 72	72	2,50	–0,07	76,5	+1,10 –0,46	7,8	6,4	3,0	119,0	75,0	+0,30	2,65	4,5	58,00
J 75	75	2,50	–0,07	79,5	+1,10 –0,46	7,8	6,6	3,0	118,0	78,0	+0,30	2,65	4,5	60,00
J 77	77	2,50	–0,07	82,5	+1,30 –0,54	8,5	6,8	3,0	121,0	80,0	+0,30	2,65	4,5	61,60
J 78	78	2,50	–0,07	82,5	+1,30 –0,54	8,5	6,8	3,0	122,0	81,0	+0,35	2,65	4,5	62,30
J 80	80	2,50	–0,07	85,5	+1,30 –0,54	8,5	7,0	3,0	120,0	83,5	+0,35	2,65	5,3	74,60
J 81	81	2,50	–0,07	86,5	+1,30 –0,54	8,5	7,0	3,0	119,0	84,5	+0,35	2,65	5,3	75,80
J 82	82	2,50	–0,07	87,5	+1,30 –0,54	8,5	7,0	3,0	119,0	85,5	+0,35	2,65	5,3	76,60
J 83	83	2,50	–0,07	88,5	+1,30 –0,54	8,5	7,0	3,0	118,0	86,5	+0,35	2,65	5,3	77,50
J 85	85	3,00	–0,08	90,5	+1,30 –0,54	8,6	7,2	3,5	201,0	88,5	+0,35	3,15	5,3	79,50
J 87	87	3,00	–0,08	93,5	+1,30 –0,54	8,6	7,4	3,5	204,0	90,5	+0,35	3,15	5,3	81,30
J 88	88	3,00	–0,08	93,5	+1,30 –0,54	8,6	7,4	3,5	209,0	91,5	+0,35	3,15	5,3	82,00

Part No.	B	t	Tol	D2	Tol	L	b	h	Fr	G	Tol	W	n	Fn
	mm	mm	mm	mm	mm	mm	mm	mm	kN	mm	mm	mm	mm	kN
J 90	90	3,00	–0,08	95,5	+1,30 –0,54	8,6	7,6	3,5	199,0	93,5	+0,35	3,15	5,3	84,00
J 92	92	3,00	–0,08	97,5	+1,30 –0,54	8,7	7,8	3,5	201,0	95,5	+0,35	3,15	5,3	85,00
J 95	95	3,00	–0,08	100,5	+1,30 –0,54	8,8	8,1	3,5	195,0	98,5	+0,35	3,15	5,3	88,00
J 97	97	3,00	–0,08	103,5	+1,30 –0,54	9,0	8,3	3,5	193,0	100,5	+0,35	3,15	5,3	90,00
J 98	98	3,00	–0,08	103,5	+1,30 –0,54	9,0	8,3	3,5	191,0	101,5	+0,35	3,15	5,3	91,00
J 100	100	3,00	–0,08	105,5	+1,30 –0,54	9,2	8,4	3,5	188,0	103,5	+0,35	3,15	5,3	93,00
J 102	102	4,00	–0,10	108,0	+1,30 –0,54	9,5	8,5	3,5	439,0	106,0	+0,54	4,15	6,0	108,00
J 105	105	4,00	–0,10	112,0	+1,30 –0,54	9,5	8,7	3,5	436,0	109,0	+0,54	4,15	6,0	112,00
J 107	107	4,00	–0,10	115,0	+1,30 –0,54	9,5	8,9	3,5	425,0	111,0	+0,54	4,15	6,0	114,00
J 108	108	4,00	–0,10	115,0	+1,30 –0,54	9,5	8,9	3,5	419,0	112,0	+0,54	4,15	6,0	115,00
J 110	110	4,00	–0,10	117,0	+1,30 –0,54	10,4	9,0	3,5	415,0	114,0	+0,54	4,15	6,0	117,00
J 112	112	4,00	–0,10	119,0	+1,30 –0,54	10,5	9,1	3,5	418,0	116,0	+0,54	4,15	6,0	119,00
J 115	115	4,00	–0,10	122,0	+1,50 –0,63	10,5	9,3	3,5	409,0	119,0	+0,54	4,15	6,0	122,00
J 117	117	4,00	–0,10	125,0	+1,50 –0,63	10,7	9,6	3,5	399,0	121,0	+0,63	4,15	6,0	124,00
J 118	118	4,00	–0,10	125,0	+1,50 –0,63	10,7	9,6	3,5	394,0	122,0	+0,63	4,15	6,0	125,00
J 120	120	4,00	–0,10	127,0	+1,50 –0,63	11,0	9,7	3,5	396,0	124,0	+0,63	4,15	6,0	127,00
J 122	122	4,00	–0,10	129,0	+1,50 –0,63	11,0	9,8	4,0	399,0	126,0	+0,63	4,15	6,0	129,00
J 125	125	4,00	–0,10	132,0	+1,50 –0,63	11,0	10,0	4,0	385,0	129,0	+0,63	4,15	6,0	132,00
J 127	127	4,00	–0,10	135,0	+1,50 –0,63	11,0	10,0	4,0	383,0	131,0	+0,63	4,15	6,0	135,00
J 128	128	4,00	–0,10	135,0	+1,50 –0,63	11,0	10,2	4,0	378,0	132,0	+0,63	4,15	6,0	136,00
J 130	130	4,00	–0,10	137,0	+1,50 –0,63	11,0	10,2	4,0	374,0	134,0	+0,63	4,15	6,0	138,00
J 132	132	4,00	–0,10	139,0	+1,50 –0,63	11,0	10,3	4,0	366,0	136,0	+0,63	4,15	6,0	140,00
J 135	135	4,00	–0,10	142,0	+1,50 –0,63	11,2	10,5	4,0	358,0	139,0	+0,63	4,15	6,0	143,00
J 137	137	4,00	–0,10	145,0	+1,50 –0,63	11,2	10,6	4,0	356,0	141,0	+0,63	4,15	6,0	145,00
J 138	138	4,00	–0,10	145,0	+1,50 –0,63	11,2	10,6	4,0	352,0	142,0	+0,63	4,15	6,0	146,00
J 140	140	4,00	–0,10	147,0	+1,50 –0,63	11,2	10,7	4,0	350,0	144,0	+0,63	4,15	6,0	148,00
J 142	142	4,00	–0,10	149,0	+1,50 –0,63	11,3	10,8	4,0	342,0	146,0	+0,63	4,15	6,0	150,00
J 145	145	4,00	–0,10	152,0	+1,50 –0,63	11,4	10,9	4,0	336,0	149,0	+0,63	4,15	6,0	153,00
J 147	147	4,00	–0,10	155,0	+1,50 –0,63	11,8	11,1	4,0	336,0	151,0	+0,63	4,15	6,0	156,00
J 148	148	4,00	–0,10	155,0	+1,50 –0,63	11,8	11,1	4,0	331,0	152,0	+0,63	4,15	6,0	157,00
J 150	150	4,00	–0,10	158,0	+1,50 –0,63	12,0	11,2	4,0	326,0	155,0	+0,63	4,15	7,5	191,00
J 152	152	4,00	–0,10	161,0	+1,50 –0,63	12,0	11,3	4,0	326,0	157,0	+0,63	4,15	7,5	202,00
J 155	155	4,00	–0,10	164,0	+1,50 –0,63	12,0	11,4	4,0	324,0	160,0	+0,63	4,15	7,5	206,00
J 157	157	4,00	–0,10	167,0	+1,50 –0,63	12,3	11,5	4,0	328,0	162,0	+0,63	4,15	7,5	208,00
J 158	158	4,00	–0,10	167,0	+1,50 –0,63	12,3	11,5	4,0	326,0	163,0	+0,63	4,15	7,5	210,00
J 160	160	4,00	–0,10	169,0	+1,50 –0,63	13,0	11,6	4,0	321,0	165,0	+0,63	4,15	7,5	212,00
J 162	162	4,00	–0,10	171,5	+1,50 –0,63	13,0	11,7	4,0	321,0	167,0	+0,63	4,15	7,5	215,00
J 165	165	4,00	–0,10	174,5	+1,50 –0,63	13,0	11,8	4,0	319,0	170,0	+0,63	4,15	7,5	219,00
J 167	167	4,00	–0,10	177,5	+1,50 –0,63	13,5	12,1	4,0	355,0	172,0	+0,63	4,15	7,5	221,00
J 168	168	4,00	–0,10	177,5	+1,50 –0,63	13,5	12,1	4,0	353,0	173,0	+0,63	4,15	7,5	223,00
J 170	170	4,00	–0,10	179,5	+1,50 –0,63	13,5	12,2	4,0	349,0	175,0	+0,63	4,15	7,5	225,00
J 172	172	4,00	–0,10	181,5	+1,70 –0,72	13,5	12,5	4,0	357,0	177,0	+0,63	4,15	7,5	228,00
J 175	175	4,00	–0,10	184,5	+1,70 –0,72	13,5	12,7	4,0	351,0	180,0	+0,63	4,15	7,5	232,00
J 177	177	4,00	–0,10	187,5	+1,70 –0,72	14,2	12,9	4,0	346,0	182,0	+0,72	4,15	7,5	235,00
J 178	178	4,00	–0,10	187,5	+1,70 –0,72	14,2	12,9	4,0	344,0	183,0	+0,72	4,15	7,5	236,00
J 180	180	4,00	–0,10	189,5	+1,70 –0,72	14,2	13,2	4,0	347,0	185,0	+0,72	4,15	7,5	238,00
J 182	182	4,00	–0,10	191,5	+1,70 –0,72	14,2	13,5	4,0	355,0	187,0	+0,72	4,15	7,5	241,00
J 185	185	4,00	–0,10	194,5	+1,70 –0,72	14,2	13,7	4,0	349,0	190,0	+0,72	4,15	7,5	245,00
J 187	187	4,00	–0,10	197,5	+1,70 –0,72	14,2	13,8	4,0	345,0	192,0	+0,72	4,15	7,5	248,00
J 188	188	4,00	–0,10	197,5	+1,70 –0,72	14,2	13,8	4,0	343,0	193,0	+0,72	4,15	7,5	249,00
J 190	190	4,00	–0,10	199,5	+1,70 –0,72	14,2	13,8	4,0	340,0	195,0	+0,72	4,15	7,5	251,00
J 192	192	4,00	–0,10	201,5	+1,70 –0,72	14,2	13,8	4,0	336,0	197,0	+0,72	4,15	7,5	254,00
J 195	195	4,00	–0,10	204,5	+1,70 –0,72	14,2	13,8	4,0	330,0	200,0	+0,72	4,15	7,5	258,00
J 197	197	4,00	–0,10	207,5	+1,70 –0,72	14,2	14,0	4,0	330,0	202,0	+0,72	4,15	7,5	260,00
J 198	198	4,00	–0,10	207,5	+1,70 –0,72	14,2	14,0	4,0	329,0	203,0	+0,72	4,15	7,5	262,00
J 200	200	4,00	–0,10	209,5	+1,70 –0,72	14,2	14,0	4,0	325,0	205,0	+0,72	4,15	7,5	265,00
J 202	202	5,00	–0,12	214,0	+1,70 –0,72	14,2	14,0	4,0	625,0	208,0	+0,72	5,15	9,0	321,00
J 205	205	5,00	–0,12	217,0	+1,70 –0,72	14,2	14,0	4,0	616,0	211,0	+0,72	5,15	9,0	326,00
J 207	207	5,00	–0,12	217,0	+1,70 –0,72	14,2	14,0	4,0	610,0	213,0	+0,72	5,15	9,0	329,00
J 208	208	5,00	–0,12	222,0	+1,70 –0,72	14,2	14,0	4,0	607,0	214,0	+0,72	5,15	9,0	331,00
J 210	210	5,00	–0,12	222,0	+1,70 –0,72	14,2	14,0	4,0	601,0	216,0	+0,72	5,15	9,0	333,00
J 212	212	5,00	–0,12	222,0	+1,70 –0,72	14,2	14,0	4,0	596,0	218,0	+0,72	5,15	9,0	337,00
J 215	215	5,00	–0,12	227,0	+1,70 –0,72	14,2	14,0	4,0	586,0	221,0	+0,72	5,15	9,0	341,00
J 217	217	5,00	–0,12	227,0	+1,70 –0,72	14,2	14,0	4,0	581,0	223,0	+0,72	5,15	9,0	345,00
J 218	218	5,00	–0,12	232,0	+1,70 –0,72	14,2	14,0	4,0	580,0	224,0	+0,72	5,15	9,0	346,00
J 220	220	5,00	–0,12	232,0	+1,70 –0,72	14,2	14,0	4,0	574,0	226,0	+0,72	5,15	9,0	349,00
J 222	222	5,00	–0,12	232,0	+1,70 –0,72	14,2	14,0	4,0	568,0	228,0	+0,72	5,15	9,0	353,00
J 225	225	5,00	–0,12	237,0	+1,70 –0,72	14,2	14,0	4,0	560,0	231,0	+0,72	5,15	9,0	357,00
J 227	227	5,00	–0,12	237,0	+1,70 –0,72	14,2	14,0	4,0	555,0	233,0	+0,72	5,15	9,0	361,00

STANDARD INTERNAL CIRCLIPS – DIN 472

J 8 – J 1000

Part No.	B	t	Tol	D2	Tol	L	b	h	Fr	G	Tol	W	n	Fn
	mm	mm	mm	mm	mm	mm	mm	mm	kN	mm	mm	mm	mm	kN
J 228	228	5,00	–0,12	242,0	+1,70 –0,72	14,2	14,0	4,0	554,0	234,0	+0,72	5,15	9,0	362,00
J 230	230	5,00	–0,12	242,0	+1,70 –0,72	14,2	14,0	4,0	549,0	236,0	+0,72	5,15	9,0	365,00
J 232	232	5,00	–0,12	242,0	+2,00 –0,81	14,2	14,0	4,0	544,0	238,0	+0,72	5,15	9,0	369,00
J 235	235	5,00	–0,12	247,0	+2,00 –0,81	14,2	14,0	4,0	536,0	241,0	+0,72	5,15	9,0	373,00
J 237	237	5,00	–0,12	247,0	+2,00 –0,81	14,2	14,0	4,0	531,0	243,0	+0,72	5,15	9,0	376,00
J 238	238	5,00	–0,12	252,0	+2,00 –0,81	14,2	14,0	4,0	530,0	244,0	+0,72	5,15	9,0	378,00
J 240	240	5,00	–0,12	252,0	+2,00 –0,81	14,2	14,0	4,0	525,0	246,0	+0,72	5,15	9,0	380,00
J 242	242	5,00	–0,12	252,0	+2,00 –0,81	14,2	14,0	4,0	521,0	248,0	+0,81	5,15	9,0	385,00
J 245	245	5,00	–0,12	257,0	+2,00 –0,81	14,2	14,0	4,0	514,0	251,0	+0,81	5,15	9,0	389,00
J 247	247	5,00	–0,12	257,0	+2,00 –0,81	14,2	14,0	4,0	509,0	253,0	+0,81	5,15	9,0	392,00
J 248	248	5,00	–0,12	262,0	+2,00 –0,81	14,2	14,0	4,0	507,0	254,0	+0,81	5,15	9,0	394,00
J 250	250	5,00	–0,12	262,0	+2,00 –0,81	14,2	14,0	4,0	504,0	256,0	+0,81	5,15	9,0	396,00
J 252	252	5,00	–0,12	262,0	+2,00 –0,81	14,2	16,0	5,0	557,0	260,0	+0,81	5,15	12,0	535,00
J 255	255	5,00	–0,12	270,0	+2,00 –0,81	16,2	16,0	5,0	549,0	263,0	+0,81	5,15	12,0	541,00
J 257	257	5,00	–0,12	270,0	+2,00 –0,81	16,2	16,0	5,0	545,0	265,0	+0,81	5,15	12,0	546,00
J 258	258	5,00	–0,12	275,0	+2,00 –0,81	16,2	16,0	5,0	543,0	266,0	+0,81	5,15	12,0	548,00
J 260	260	5,00	–0,12	275,0	+2,00 –0,81	16,2	16,0	5,0	538,0	268,0	+0,81	5,15	12,0	553,00
J 262	262	5,00	–0,12	275,0	+2,00 –0,81	16,2	16,0	5,0	535,0	270,0	+0,81	5,15	12,0	556,00
J 265	265	5,00	–0,12	280,0	+2,00 –0,81	16,2	16,0	5,0	528,0	273,0	+0,81	5,15	12,0	563,00
J 267	267	5,00	–0,12	280,0	+2,00 –0,81	16,2	16,0	5,0	524,0	275,0	+0,81	5,15	12,0	566,00
J 268	268	5,00	–0,12	285,0	+2,00 –0,81	16,2	16,0	5,0	522,0	276,0	+0,81	5,15	12,0	570,00
J 270	270	5,00	–0,12	285,0	+2,00 –0,81	16,2	16,0	5,0	518,0	278,0	+0,81	5,15	12,0	573,00
J 272	272	5,00	–0,12	285,0	+2,00 –0,81	16,2	16,0	5,0	515,0	280,0	+0,81	5,15	12,0	577,00
J 275	275	5,00	–0,12	290,0	+2,00 –0,81	16,2	16,0	5,0	509,0	283,0	+0,81	5,15	12,0	585,00
J 277	277	5,00	–0,12	290,0	+2,00 –0,81	16,2	16,0	5,0	505,0	285,0	+0,81	5,15	12,0	587,00
J 278	278	5,00	–0,12	295,0	+2,00 –0,81	16,2	16,0	5,0	504,0	286,0	+0,81	5,15	12,0	590,00
J 280	280	5,00	–0,12	295,0	+2,00 –0,81	16,2	16,0	5,0	499,0	288,0	+0,81	5,15	12,0	593,00
J 282	282	5,00	–0,12	295,0	+2,00 –0,81	16,2	16,0	5,0	497,0	290,0	+0,81	5,15	12,0	599,00
J 285	285	5,00	–0,12	300,0	+2,00 –0,81	16,2	16,0	5,0	491,0	293,0	+0,81	5,15	12,0	605,00
J 287	287	5,00	–0,12	300,0	+2,00 –0,81	16,2	16,0	5,0	487,0	295,0	+0,81	5,15	12,0	610,00
J 288	288	5,00	–0,12	305,0	+2,00 –0,81	16,2	16,0	5,0	485,0	296,0	+0,81	5,15	12,0	611,00
J 290	290	5,00	–0,12	305,0	+2,00 –0,81	16,2	16,0	5,0	482,0	298,0	+0,81	5,15	12,0	615,00
J 292	292	5,00	–0,12	305,0	+2,00 –0,81	16,2	16,0	5,0	479,0	300,0	+0,81	5,15	12,0	620,00
J 295	295	5,00	–0,12	310,0	+2,00 –0,81	16,2	16,0	5,0	474,0	303,0	+0,81	5,15	12,0	625,00
J 297	297	5,00	–0,12	310,0	+2,00 –0,81	16,2	16,0	5,0	471,0	305,0	+0,81	5,15	12,0	630,00
J 298	298	5,00	–0,12	315,0	+2,00 –0,81	16,2	16,0	5,0	469,0	306,0	+0,81	5,15	12,0	631,00
J 300	300	5,00	–0,12	315,0	+2,00 –0,81	16,2	16,0	5,0	466,0	308,0	+0,81	5,15	12,0	636,00
J 305	305	6,00	–0,15	322,0	+2,00 –0,90		20,0	6,0	961,0	315,0	+0,81	6,20	15,0	810,00
J 310	310	6,00	–0,15	327,0	+2,00 –0,90		20,0	6,0	947,0	320,0	+0,89	6,20	15,0	823,00
J 315	315	6,00	–0,15	332,0	+2,00 –0,90		20,0	6,0	934,0	325,0	+0,89	6,20	15,0	837,00
J 320	320	6,00	–0,15	337,0	+2,00 –0,90		20,0	6,0	919,0	330,0	+0,89	6,20	15,0	850,00
J 325	325	6,00	–0,15	342,0	+2,00 –0,90		20,0	6,0	906,0	335,0	+0,89	6,20	15,0	864,00
J 330	330	6,00	–0,15	347,0	+2,00 –0,90		20,0	6,0	894,0	340,0	+0,89	6,20	15,0	876,00
J 335	335	6,00	–0,15	352,0	+2,00 –0,90		20,0	6,0	880,0	345,0	+0,89	6,20	15,0	890,00
J 340	340	6,00	–0,15	357,0	+2,00 –0,90		20,0	6,0	869,0	350,0	+0,89	6,20	15,0	903,00
J 345	345	6,00	–0,15	362,0	+2,00 –0,90		20,0	6,0	857,0	355,0	+0,89	6,20	15,0	916,00
J 350	350	6,00	–0,15	367,0	+2,00 –0,90		20,0	6,0	846,0	360,0	+0,89	6,20	15,0	929,00
J 355	355	6,00	–0,15	372,0	+2,00 –0,90		20,0	6,0	834,0	365,0	+0,89	6,20	15,0	942,00
J 360	360	6,00	–0,15	377,0	+2,00 –0,90		20,0	6,0	823,0	370,0	+0,89	6,20	15,0	955,00
J 365	365	6,00	–0,15	382,0	+2,00 –0,90		20,0	6,0	813,0	375,0	+0,89	6,20	15,0	968,00
J 370	370	6,00	–0,15	387,0	+2,00 –0,90		20,0	6,0	803,0	380,0	+0,89	6,20	15,0	981,00
J 375	375	6,00	–0,15	392,0	+2,00 –0,90		20,0	6,0	793,0	385,0	+0,89	6,20	15,0	994,00
J 380	380	6,00	–0,15	397,0	+2,00 –0,90		20,0	6,0	784,0	390,0	+0,89	6,20	15,0	1008,00
J 385	385	6,00	–0,15	402,0	+2,00 –1,00		20,0	6,0	774,0	395,0	+0,89	6,20	15,0	1021,00
J 390	390	6,00	–0,15	407,0	+2,00 –1,00		20,0	6,0	764,0	400,0	+0,89	6,20	15,0	1033,00
J 395	395	6,00	–0,15	412,0	+2,00 –1,00		20,0	6,0	756,0	405,0	+1,00	6,20	15,0	1047,00
J 400	400	6,00	–0,15	417,0	+2,00 –1,00		20,0	6,0	746,0	410,0	+1,00	6,20	15,0	1060,00
J 410	410	7,00	–0,15	430,0	+2,00 –1,00		26,0	6,0	1512,0	422,0	+1,00	7,20	18,0	1307,00
J 420	420	7,00	–0,15	440,0	+2,00 –1,00		26,0	6,0	1480,0	432,0	+1,00	7,20	18,0	1338,00
J 430	430	7,00	–0,15	450,0	+2,00 –1,00		26,0	6,0	1446,0	442,0	+1,00	7,20	18,0	1369,00
J 440	440	7,00	–0,15	460,0	+2,00 –1,00		26,0	6,0	1418,0	452,0	+1,00	7,20	18,0	1401,00
J 450	450	7,00	–0,15	470,0	+2,00 –1,00		26,0	6,0	1388,0	462,0	+1,00	7,20	18,0	1431,00
J 460	460	7,00	–0,15	480,0	+2,00 –1,00		26,0	6,0	1360,0	472,0	+1,00	7,20	18,0	1464,00
J 470	470	7,00	–0,15	490,0	+2,00 –1,00		26,0	6,0	1330,0	482,0	+1,00	7,20	18,0	1495,00
J 480	480	7,00	–0,15	500,0	+2,00 –1,00		26,0	6,0	1306,0	492,0	+1,00	7,20	18,0	1526,00
J 490	490	7,00	–0,15	510,0	+3,00 –1,50		26,0	6,0	1280,0	502,0	+1,00	7,20	18,0	1558,00
J 500	500	7,00	–0,15	520,0	+3,00 –1,50		26,0	6,0	1256,0	512,0	+1,00	7,20	18,0	1588,00
J 510	510	8,00	–0,15	535,0	+3,00 –1,50		26,0	6,0	1834,0	524,0	+1,00	8,20	21,0	1894,00
J 520	520	8,00	–0,15	545,0	+3,00 –1,50		26,0	6,0	1802,0	534,0	+1,00	8,20	21,0	1931,00

STANDARD INTERNAL CIRCLIPS – DIN 472														J 8 – J 1000
Part No.	B	t	Tol	D2	Tol	L	b	h	Fr	G	Tol	W	n	Fn
	mm	mm	mm	mm	mm	mm	mm	mm	kN	mm	mm	mm	mm	kN
J 530	530	8,00	–0,15	555,0	+3,00 –1,50		26,0	6,0	1768,0	544,0	+1,00	8,20	21,0	1968,00
J 540	540	8,00	–0,15	565,0	+3,00 –1,50		26,0	6,0	1738,0	554,0	+1,00	8,20	21,0	2004,00
J 550	550	8,00	–0,15	575,0	+3,00 –1,50		26,0	6,0	1711,0	564,0	+1,00	8,20	21,0	2041,00
J 560	560	8,00	–0,15	585,0	+3,00 –1,50		26,0	6,0	1682,0	574,0	+1,00	8,20	21,0	2078,00
J 570	570	8,00	–0,15	595,0	+3,00 –1,50		26,0	6,0	1650,0	584,0	+1,00	8,20	21,0	2114,00
J 580	580	8,00	–0,15	605,0	+3,00 –1,50		26,0	6,0	1627,0	594,0	+1,00	8,20	21,0	2151,00
J 590	590	8,00	–0,15	615,0	+3,00 –1,50		26,0	6,0	1601,0	604,0	+1,00	8,20	21,0	2188,00
J 600	600	8,00	–0,15	625,0	+3,00 –1,50		26,0	6,0	1571,0	614,0	+1,00	8,20	21,0	2221,00
J 650	650	9,00	–0,20	680,0	+3,00 –1,50		34,0	6,0	2654,0	666,0	+1,00	9,30	24,0	2753,00
J 700**	700	9,00	–0,20	730,0	+4,00 –2,00		34,0	6,0	2471,0	716,0	+1,00	9,30	24,0	2966,00
J 750**	750	9,00	–0,20	785,0	+4,00 –2,00		34,0	9,0	2310,0	768,0	+1,00	9,30	27,0	3566,00
J 800**	800	9,00	–0,20	835,0	+4,00 –2,00		34,0	9,0	2176,0	818,0	+1,00	9,30	27,0	3800,00
J 850**	850	9,00	–0,20	890,0	+4,00 –2,00		34,0	9,0	2045,0	870,0	+1,00	9,30	30,0	4500,00
J 900**	900	9,00	–0,20	940,0	+4,00 –2,00		34,0	9,0	1938,0	920,0	+1,00	9,30	30,0	4766,00
J 950**	950	9,00	–0,20	1000,0	+4,00 –2,00		34,0	9,0	1840,0	972,0	+1,00	9,30	33,0	5608,00
J 1000**	1000	9,00	–0,20	1050,0	+4,00 –2,00		34,0	9,0	1752,0	1022,0	+1,00	9,30	33,0	5825,00

UK

E TYPE RETAINER TO DIN 6799

Radially installed retaining ring for shafts. Widely used in a diverse range of applications including; Automotive and electrical engineering, office machines and precision mechanics.

Material:
Spring Steel

Surface Protection:
Phosphated and oiled

Special options - please enquire:

Self-finished and oiled
Zinc plated
Bronze CuSn8
Corrosion resistant steels

KEY TO DIMENSIONS
D = Outside diameter
g = Gap dimension
b = Beam dimension
d3 = Expanded diameter
t = thickness
d1 = Shaft diameter
W = Groove width
d2 = Groove diameter
n = Shoulder length
Fr = Load bearing capacity of ring
Fn = Load bearing capacity of groove

F

ANNEAUX D'ARRET TYPE "E" - DIN 6799

Circlip radialement installé pour des axes. Employé couramment dans une étendue des applications diverse comprenant ; Électrotechnique des véhicules à moteur et, équipements de bureau et mécanique de précision.

Matériel:
Acier de ressort

Protection extérieure:
Phosphaté et huilé

Options spéciales - enquérez-vous svp :

Individu-de finition et huilé
Zinguee
Bronze CuSn8
Aciers résistants à la corrosion

ABBREVIATIONS UTILISEES
D = Diamètre extérieur
g = Ouverture
b = Hauteur radiale
d3 = Diamètre extérieur en place
t = Epaisseur
d1 = Diamètre d'arbre
W = Largeur de gorge
d2 = Diamètre de gorge
n = Longueur cisaillée à fond de gorge
Fr = Capacité de charge du segment
Fn = Capacité de charge de la gorgew

E

TIPO DETENEDOR DE E AL DIN 6799

Anillo de retención radialmente instalado para los ejes. Ampliamente utilizado en una gama de usos diversa incluyendo; Ingeniería automotora y eléctrica, máquinas de oficina y mecánicos de la precisión.

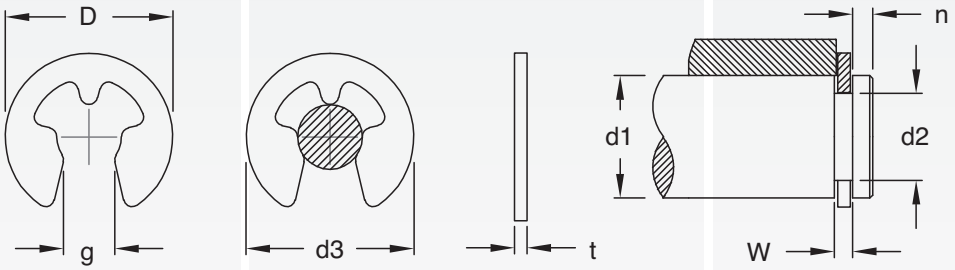
Material:
Acero del resorte

Protección superficial:
Fosfatado y engrasado

Opciones especiales - investigue por favor:

Uno mismo-acabado y engrasado
Cinc plateado
Bronce CuSn8
Aceros resistentes a la corrosión

CLAVES DE DIMENSIONES
D = Diámetro exterior
g = Obertura
b = Altura radial
d3 = Diámetro exterior expandido
t = Espesor
d1 = Diámetro del eje
W = Largura del eje
d2 = Diámetro de la ranura
n = argura de la espalda
Fr = Capacidad de carga del segmento
Fn = Capacidad de carga de la ranura



D

E-ART HALTER ZUM DIN 6799

Radial angebrachter Seegerring für Wellen. Am meisten benutzt in einer verschiedenen Benutzungsmöglichkeit einschließlich; Automobil- und Elektrotechnik, Büromaschinen und Präzisionsmechaniker.

Werkstoff:
Federstahl

Oberflächenschutz:
Phosphatiert und geölt

Spezielle Wahlen - erkundigen Sie bitte sich:

Selbst-fertig und geölt
Verzinkt
Bronze CuSn8
Korrosionsbeständige Stahle

KENNZEICHNEN DER ABMESSUNGEN
D = Außendurchmesser
g = Abstand
g = Balken
d3 = Erweiterter Durchmesser
t = Dicke
d1 = Wellendurchmesser
W = Nutbreite
d2 = Nutdurchmesser
n = Schulterlänge
Fr = Belastbarkeit des Rings
Fn = Belastbarkeit der Nut

I

ANELLO D'ARRESTO DIN 6799

Anello di conservazione radialmente installato per i pozzi. Ampiamente usato in una gamma delle applicazioni varia compreso; Ingegneria elettrica automobilistica e, macchine di ufficio e meccanici di precisione.

Materiale:
Acciaio della molla

Protezione di superficie:
Fosfatizzato e lubrificato

Scelte particolari - domandi prego:

Auto-rifinito e lubrificato
Zinco placcato
Bronzo CuSn8
Acciai resistenti alla corrosione

LEGENDA
D = Diametro esterno
g = Dimensione apertura
cVedi Disegno
d3 = Diametro esterno ad anello assemblato
t = Spessore
d1 = Diametro del perno
W = Larghezza scanalatura
d2 = Diametro scanalatura
n = Lunghezza della spalla
Fr = Capacità di carico dell'anello
Fn = Capacità di carico della sede

P

TIPO RETENTOR DE E AO DIN 6799

Anel de retenção radial instalado para eixos. Amplamente utilizado em uma escala diversa de incluir das aplicações; Engenharia automotriz e elétrica, máquinas de escritório e mecânicos da precisão.

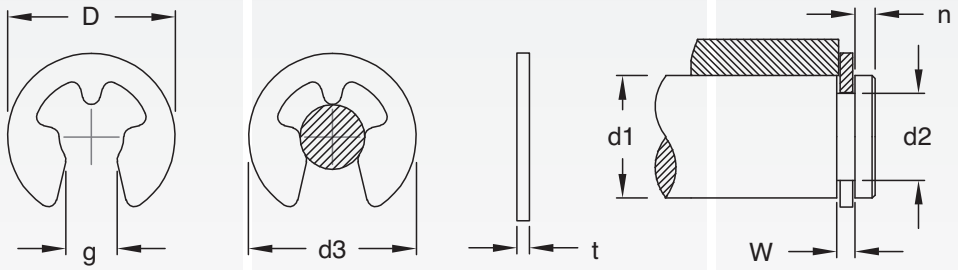
Material:
Aço da mola

Proteção de superfície:
Fosfatado e oleado

Opções especiais - inquira por favor:

Auto-terminado e oleado
Zinco chapeado
Bronze CuSn8
Aços resistentes à corrosão

LEGENDA
D = Diametro Externo
g = Abertura
b = Trava
d3 = Diametro expandido
t = Espessura
d1 = Diametro do eixo]
W = Largura do encaixe
d2 = Diametro do encaixe
n = Comprimento do suporte
Fr = Capacidade de carga do anel
Fn = Capacidae de carga do encaixe



3

E-ArtHalterZumDIN6799E-ArtHalterZumDIN6799E-A
AnelloD'arrestoDIN6799AnelloD'arrestoDIN6799An
TipoFetentorDeEAoDIN6799TipoFetentorDeEAoDIN6

STANDARD 'E' TYPE RETAINING RINGS – DIN 6799															RA 1,2 – RA 24,0
Part No.	d2	d1		t	Tol	D	g	Tol	d3	Fr	d2	Tol	W	n	Fn
	mm	Min - mm	Max - mm	mm	mm	max	mm	mm	mm	kN	mm	mm	mm	mm	kN
RA 1,2	1,2	1,4	2,0	0,30	± 0,02	2,90	1,01	± 0,040	3,0	0,12	1,2	–0,060	0,34	0,6	0,04
RA 1,5	1,5	2,0	2,5	0,40	± 0,02	3,90	1,28	± 0,040	4,0	0,22	1,5	–0,060	0,44	0,8	0,07
RA 1,9	1,9	2,5	3,0	0,50	± 0,02	4,40	1,61	± 0,040	4,5	0,35	1,9	–0,060	0,54	1,0	0,10
RA 2,3	2,3	3,0	4,0	0,60	± 0,02	5,90	1,94	± 0,040	6,0	0,50	2,3	–0,060	0,64	1,0	0,15
RA 3,2	3,2	4,0	5,0	0,60	± 0,02	6,90	2,70	± 0,040	7,0	0,65	3,2	–0,075	0,64	1,0	0,22
RA 4,0	4,0	5,0	7,0	0,70	± 0,02	8,85	3,34	± 0,048	9,0	0,95	4,0	–0,075	0,74	1,2	0,25
RA 5,0	5,0	6,0	8,0	0,70	± 0,02	10,85	4,11	± 0,048	11,0	1,15	5,0	–0,075	0,74	1,2	0,90
RA 6,0	6,0	7,0	9,0	0,70	± 0,02	11,80	5,26	± 0,058	12,0	1,35	6,0	–0,075	0,74	1,2	1,10
RA 7,0	7,0	8,0	11,0	0,90	± 0,02	13,80	5,84	± 0,058	14,0	1,80	7,0	–0,090	0,94	1,5	1,25
RA 8,0	8,0	9,0	12,0	1,00	± 0,03	15,75	6,52	± 0,058	16,0	2,50	8,0	–0,090	1,05	1,8	1,42
RA 9,0	9,0	10,0	14,0	1,10	± 0,03	18,20	7,63	± 0,058	18,5	3,00	9,0	–0,090	1,15	2,0	1,60
RA 10,0	10,0	11,0	15,0	1,20	± 0,03	19,70	8,32	± 0,058	20,0	3,50	10,0	–0,090	1,25	2,0	1,70
RA 12,0	12,0	13,0	18,0	1,30	± 0,03	22,70	10,45	± 0,070	23,0	4,70	12,0	–0,110	1,35	2,5	3,10
RA 15,0	15,0	16,0	24,0	1,50	± 0,03	28,70	12,61	± 0,070	29,0	7,80	15,0	–0,110	1,55	3,0	7,00
RA 19,0	19,0	20,0	31,0	1,75	± 0,03	36,50	15,92	± 0,084	37,0	11,00	19,0	–0,130	1,80	3,5	10,00
RA 24,0	24,0	25,0	38,0	2,00	± 0,03	43,50	21,88	± 0,084	44,0	15,00	24,0	–0,130	2,05	4,0	13,00

UK

ALMEN STRIPS

Associated Spring-Raymond's Almen strips and supplies are built for high quality and long service. All of our Almen strips are certified to SAE J442 standard for use in the automotive or aerospace industries, as well as in any shot peening process.

Immediate delivery is available for N and A type strips in 50-count packaging and C type Almen strips in 25-count packages. Bulk packaging is also available.

Premium Grade Almen Strips (per SAE J442)

Part Number	Strip Type	Thickness (mm)	Flatness* (mm)	Hardness
AS-N-PREM	N	.79 ± .025	±0.025	HRA 72.5-76
AS-A-PREM	A	1.30 ± .025	±0.025	HRC 44-50
AS-C-PREM	C	2.39 ± .025	±0.025	HRC 44-50

*as measured with Almen #2 gauge

- Material: SAE/AISI 1070 cold rolled steel
- Length: 3.00" ±0.015" (76.2 ±0.38mm)
- Width: 0.745"-0.750" (18.92-19.05mm)

Almen Strip Holders and Socket Head Cap Screws

Part Number	Product
AS-HOLD-14	Almen strip holder per SAE J442
495029	Socket head cap screws for holder

Our socket head cap screws are 15 percent stronger than the industry standard. In addition, they offer

- 213 ksi (1470 Mpa) minimum tensile strength
- 191 ksi (1317 Mpa) minimum yield strength
- 40 HRC minimum hardness

Almen Strip Test Gauges

Part Number	Product
AS-GAUGE-1	Almen strip gauge – standard
AS-CALIB-F	Test gauge calibration block – flat
AS-CALIB-C	Test gauge calibration block – curved

F

EPROUVETTES ALMEN

Les éprouvettes ALMEN Ressorts SPEC et leurs accessoires sont des produits durables et de haute qualité. Toutes nos éprouvettes ALMEN sont conformes au standard SAE J442 et utilisables dans les industries automobile ou aéronautique ainsi que pour des applications de grenaillage.

Les séries N et A sont disponibles sur stock en paquets de 50, la série C en paquets de 25. Des conditionnements de plus grandes quantités sont possibles.

Eprouvettes ALMEN de Qualité Supérieure (selon SAE J442)

Référence	Type d'Eprouvette	Epaisseur (mm)	Planéité* (mm)	Dureté
AS-N-PREM	N	.79 ± .025	±0.025	HRA 72.5-76
AS-A-PREM	A	1.30 ± .025	±0.025	HRC 44-50
AS-C-PREM	C	2.39 ± .025	±0.025	HRC 44-50

*telle que mesurée avec le calibre Almen #2

- Matériau : Acier enroulé à froid SAE/AISI 1070
- Longueur : 76.2 ±0.38mm (3.00" ±0.015")
- Largeur : 18.92 – 19.05mm (0.745" – 0.750")

Support Pour Eprouvettes ALMEN et Vis 6 Pans Creux

Référence	Description
AS-HOLD-14	Support pour éprouvette ALMEN selon SAE J442
495029	Vis 6 pans creux pour le support

Nos vis 6 pans creux sont 15% plus solides que le standard industriel. De plus, elles offrent

- une résistance à la tension minimum de 1470 MPa (213 ksi)
- une limite d'élasticité minimum de 1317 MPa (191ksi)
- une dureté minimum de 40HRC

Calibres de Test Pour Eprouvettes ALMEN

Référence	Description
AS-GAUGE-1	Jauge Almen – Standard
AS-CALIB-F	Bloc de test de calibration – Plat
AS-CALIB-C	Bloc de test de calibration – Incurvé

E

TIRAS ALMEN

Las tiras Almen que ofrece Barnes Group ofrecen un servicio de alta calidad y de larga duración. Todas nuestras tiras Almen están certificadas SAE J442 para su uso en la industria automovilística y aeroespacial, así como en los procesos de granallado.

Podemos suministrarles rápidamente las tiras Almen tipo N y A en paquetes de 50 unidades y las de tipo C en paquetes en paquetes de 25 unidades. También es posible suministrarlas en grandes cantidades.

Tiras Almen de Primera Calidad (según SAE J442)

Referencia	Tipo de tira	Grosor (mm)	Llanura* (mm)	Dureza
AS-N-PREM	N	.79 ± .025	±0.025	HRA 72.5-76
AS-A-PREM	A	1.30 ± .025	±0.025	HRC 44-50
AS-C-PREM	C	2.39 ± .025	±0.025	HRC 44-50

*medido con calibrador Almen

- Material: SAE/AISI 1070 cold rolled steel
- Largura: 3.00" ±0.015" (76.2 ±0.38mm)
- Anchura: 0.745"-0.750" (18.92-19.05mm)

Plataforma y tornillos de sujeción para tiras Almen

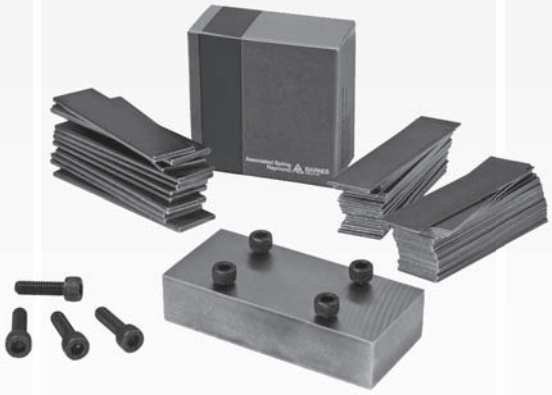
Referencia	Producto
AS-HOLD-14	Plataforma sujeción tira Almen SAE J442
495029	Tornillos para sujeción

Nuestros tornillos de sujeción son 15% más fuertes que lo estándar en la industria. Aparte de eso, ofrecen

- 213 ksi (1470 Mpa) mínima fuerza de extensión
- 191 ksi (1317 Mpa) mínima fuerza de producción
- 40 HRC dureza mínima

Calibradores de tiras Almen

Referencia	Producto
AS-GAUGE-1	Calibrador de tiras Almen – estándar
AS-CALIB-F	Bloque de calibración – plano
AS-CALIB-C	Bloque de calibración – plano



AlmenStripsAlmenStripsAlmenStripsAlmenStripsAlm
EprouvettesAlmenEprouvettesAlmenEprouvettesAlme
TirasAlmenTirasAlmenTirasAlmenTirasAlmenTirasAl

D

ALMEN-STREIFEN

Die Almen-Streifen und Zubehörartikel von Associated Spring-Raymond zeichnen sich durch eine hohe Qualität und lange Lebensdauer aus. Alle unsere Almen-Streifen sind nach der SAE J442 Norm zur Benutzung in der Automobil- und Luftfahrtindustrie sowohl bei Kugelstrahlprozessen zertifiziert.

Eine sofortige Lieferung ist für Almen-Streifen des Typs N und A in 50-Stück-Packungen und des Typs C in 25-Stück-Packungen möglich. Großpackungen sind ebenfalls erhältlich.

Almen-Streifen Premiumklasse (nach SAE J442)

Teilenummer	Streif-enart	Dicke (mm)	Planheit* (mm)	Härte
AS-N-PREM	N	.79 ± .025	±0.025	HRA 72.5-76
AS-A-PREM	A	1.30 ± .025	±0.025	HRC 44-50
AS-C-PREM	C	2.39 ± .025	±0.025	HRC 44-50

*mit Almen Messgerät #2 gemessen

- Material: SAE/AISI 1070 kaltgewalzter Stahl
- Länge: 3.00” ±0.015” (76.2 ±0.38mm)
- Breite: 0.745”-0.750” (18.92-19.05mm)

Almen-Streifen-Halter und Inbusschrauben

Teilenummer	Produkt
AS-HOLD-14	Almen-Streifen-Halter nach SAE J442
495029	Inbusschrauben für Halter

Unsere Inbusschrauben sind 15 Prozent starker als der Industriestandard. Darüber hinaus haben sie eine min. Zugefestigkeit von 213 ksi (1470 Mpa), eine min. Streckfestigkeit von 191 ksi (1317 Mpa) und eine Mindesthärte von 40 HRC.

Almen-Streifen - Testvorrichtungen

Teilenummer	Produkt
AS-GAUGE-1	Almen-Streifen Messvorrichtung – Standard
AS-CALIB-F	Testvorrichtung - Kalibrierungsblock – flach
AS-CALIB-C	estvorrichtung - Kalibrierungsblock – gewölbt

I

ALMEN STRIPS

Le Almen Strips Raymond sono prodotte per l’alta qualità e la lunga durata. Tutte le nostre Almen Strips sono certificate secondo le norme standard SAE J442 per l’utilizzo nell’industria automobilistica e aerospaziale, così come nel processo di pallinatura.

Per il tipo N e A è possibile la consegna immediata in blocchi da 50 pezzi, mentre per il tipo C in blocchi da 25 pezzi. E’ anche disponibile l’imballaggio in grandi contenitori.

Almen Strips Premium (secondo SAE J442)

Codice	Tipo	Spessore (mm)	Uniformità/ planarità* (mm)	Durezza
AS-N-PREM	N	.79 ± .025	±0.025	HRA 72.5-76
AS-A-PREM	A	1.30 ± .025	±0.025	HRC 44-50
AS-C-PREM	C	2.39 ± .025	±0.025	HRC 44-50

*come misurato con grado Almen#2

- Materiale: SAE/AISI 1070 acciaio laminato a freddo
- Lunghezza: 3.00” ± 0.015” (76.2 ± 0.38 mm)
- Larghezza: 0.745” – 0.750” (18.92 – 19.05 mm)

Supporto per Almen strip e viti a testa cava

Codice	Prodotto
AS-HOLD-14	Supporto per Almen Strip SAE J442
495029	Vite a testa cava per supporto

Le nostre viti a testa cava sono il 15% più robuste di quelle standard industriali. Inoltre, offrono:

- 213 ksi (1470 Mpa) forza elastica minima
- 191 ksi (1317 Mpa) forza minima di rendimento
- 40 HRC Durezza minima

Almen Strip calibrate per controllo

Codice	Prodotto
AS-GAUGE-1	Almen strip calibrate standard
AS-CALIB-F	Blocchetti calibrati di controllo – piani
AS-CALIB-C	Blocchetti calibrati di controllo – curvati

P

FITAS NIVELADORAS

As fitas niveladoras da Raymond e seus acessórios são construídas com qualidade e para terem uma vida longa. Nossas fitas niveladoras são certificadas SAE J442 para uso nas indústrias automobilísticas, aeronáuticas e para tamboreamento de peças.

Entrega imediata para pacotes de 50 peças nos tipos N e A e tipo C em pacotes de 25. Engradados fechados também estão disponíveis.

Fitas Niveladoras Premium

Numero de catalgo	Tipo de Fita	Espessura (mm)	Nivelamento* (mm)	Dureza
AS-N-PREM	N	.79 ± .025	±0.025	HRA 72.5-76
AS-A-PREM	A	1.30 ± .025	±0.025	HRC 44-50
AS-C-PREM	C	2.39 ± .025	±0.025	HRC 44-50

*Medida com calibrador numero 2

- Material: SAE/AISI 1070 fita de aço fria
- Comprimento: 3.00” ± 0.015” (76.2 ± 0.38 mm)
- Largura: 0.745” – 0.750” (18.92 – 19.05 mm)

Fixadores de Fitas Niveladoras com Parafusos Tipo Allen

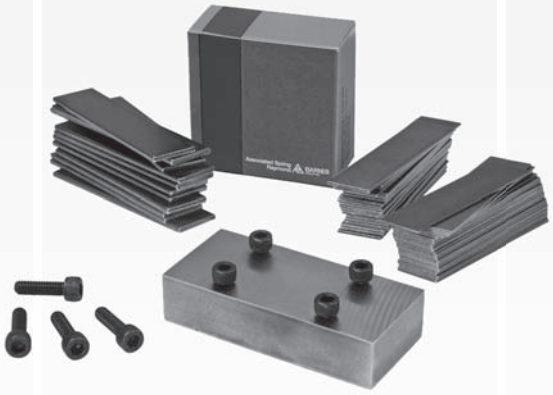
Numero de catalgo	Produto
AS-HOLD-14	Fixador de fita SAE J442
495029	Parafuso Tipo Allen p/ fixador

Nossos parafusos tipo Allen são 15% mais fortes do padrão. Eles também oferecem:

- 213 ksi (1470 Mpa) tensão mínima
- 191 ksi (1317 Mpa) rendimento mínimo
- 40 HRC dureza mínima

Calibradore para Fitas Niveladoras

Numero de catalgo	Produto
AS-GAUGE-1	Calibrador Padrão
AS-CALIB-F	Bloco Calibrador Plano
AS-CALIB-C	Bloco Calibrador Curvo



AlmenStreifenAlmenStreifenAlmenStreifenAlmenStr
AlmenStripsAlmenStripsAlmenStripsAlmenStripsAlm
FitasNiveladorasFitasNiveladorasFitasNiveladorasFi

UK

SPRING PINS

A spring pin is a very reliable low cost fastening system, which is particularly suitable for large volume production.

It is used in huge quantities, in countless applications, and in widely ranging industries from automobile production to electronics.

A slotted spring pin is a cylin-drical slotted pin of hardened spring steel which is accurately made to a diameter greater than the drilled hole into which it is pressed. It is simply driven in and retained by continuous outward spring pressure throughout the full length of the hole. The purpose of the slot in the pin is to allow compression when inserted in the hole.

The outward spring forces act positively in preventing loosening by vibration. The forces required to dislodge a pin from an assembly are great, and there is little danger of vibration shifting the pin. Due to the flexibility in the spring design,
spring pins are excellent in shockload situations, and avoid the problems of solid pins which may fracture or cause damage to the other components of an assembly through their rigidity. Spring pins are very light and exceptionally strong due to the material and heat treatment used.

Apart from the low basic cost, spring pins offer vastly reduced assembly times. Only a plain drilled hole is required to normal drilling tolerances. There is no need for any reaming, threading or counter-boring. The pins are easy to insert, either by hand or by automated assembly. No special skills are required, assembly can be carried out quite safely with unskilled labour. Spring pins can be removed using a driver, however they should preferably be fitted in to a through hole, it is very difficult to remove spring pins from a blind hole.

MATERIALS
Carbon Steel – BS1449 CS70 Austempered – Oiled Finish
Stainless Steel – AISI 302/304

KEY TO DIMENSIONS
d = Nominal diameter
L = Pin Length

F

GOUPILLES ELASTIQUES

Une goupille élastique est un système de fixation très fiable et de faible coût, particulièrement adapté à la production en grandes quantités.

Ce type de goupille est utilisée en très grandes quantités dans d'innombrables applications, dans des domaines très variés allant de la production automobile à l'électronique.

Une goupille élastique fendue est une goupille cylindrique en acier à ressort trempé, dont le diamètre est supérieur à celui du trou percé dans lequel elle est enfoncée. Elle est simplement enfoncée au marteau et maintenue par la pression élastique vers l'extérieur sur toute la longueur du trou. Le rôle de la fente est de permettre la compression quand la goupille est introduite dans le trou.

Les forces élastiques vers l'extérieur ont une action positive pour prévenir le desserrage pour cause de vibration. Les forces nécessaires pour déloger une goupille d'un assemblage sont grandes et il y a peu de risque que la goupille soit déplacée par vibration. Grâce à la flexibilité de la conception, les goupilles élastiques sont excellentes dans les situations de charges de choc et évitent les problèmes présentés par les goupilles pleines qui peuvent se casser ou endommager les autres composants d'un ensemble en raison de leur rigidité. Les goupilles élastiques sont très légères et sont exceptionnellement résistantes en raison du matériau et du traitement thermique utilisé.

Outre le faible coût de base, les goupilles élastiques permettent de réduire considérablement les temps de montage. Il suffit de percer un trou ordinaire aux tolérances de perçage habituelles, sans alésage, filetage ou contre-alésage. Les goupilles s'introduisent aisément, soit à la main soit par assemblage automatique. Aucune compétence particulière n'est requise et l'assemblage peut être exécuté sans risque par du personnel non spécialisé. Les goupilles élastiques peuvent être enlevées avec un chasse-goupille, mais il est préférable de les installer dans un trou débouchant, car elles sont très difficiles à retirer d'un trou borgne.

MATÉRIAUX
Acier au Carbone recuit en Austénitique – BS1449 CS70
Acier Inoxydable – AISI 302/304

INDEX DES MESURES
d = Diamètre nominal
L = Longueur

E

PASADOR MUELLE/RESORTE

Un pasador muelle/resorte es un sistema de sujeción de gran fiabilidad y bajo coste, el cual es especialmente adecuado para volúmenes de producción altos.

Se usan en grandes cantidades, en incontables aplicaciones, y en un amplio abanico de industrias desde la industria fabricante de automóviles hasta la industria electrónica.

Un pasador muelle/resorte con ranura es un pasador cilíndrico con ranura hecho de acero de muelle/resorte templado fabricado con precisión con un diámetro mayor al del agujero taladrado en el que va a ser encajado. Simplemente se encaja en el agujero y se mantiene dentro por su capacidad de expansión de muelle/resorte a lo largo de toda la pared del agujero. El propósito de la ranura en el pasador es la de permitir una compresión a la hora de encajar el travesaño en el agujero.

La capacidad de expansión del muelle/resorte actúa positivamente a la hora de evitar que se salgan debido a las vibraciones. Las fuerzas que se requieren para sacar un pasador de este tipo son muy grandes y se corre el ligero riesgo de descolocar el pasador. Debido a la flexibilidad en el diseño del muelle/resorte, los pasadores muelle/resorte son ideales en aplicaciones de amortiguación, y evitan los problemas de los pasadores macizos que pueden llegar a dañar las piezas en contacto debido a su rigidez intrínseca. Los pasadores muelle son muy ligeros y tremendamente fuertes debido al material y tratamientos usados.

Aparte del bajo costo estos pasadores ofrecen unos tiempos de montaje muy reducidos. Unicamente se requiere un simple agujero taladrado con las tolerancias normales de un taladro. No hay necesidad de repasar el agujero, hacer una entrada al agujero o roscar el propio agujero. Los pasadores son fáciles de montar con la mano o con cualquier sistema automático. No se necesita ningún tipo de preparación y puede ser llevado a cabo por mano de obra no especializada. Los pasadores se pueden sacar usando un tope, sin embargo, es preferible que se encajen en agujeros pasantes ya que son muy difíciles de extraer de agujeros ciegos.

MATERIALES
Acero al carbón – BS1449 CS70 - Austemperizado – Acabado en aceite
Acero inoxidable – AISI 302/304

CLAVES DE DIMENSIONES
d = Diámetro nominal
L = Longitud del pasador

D

FEDERSTIFTE

Ein Federstift ist ein sehr zuverlässiges, kostengünstiges Befestigungssystem, welches besonders für die Großserienproduktion geeignet ist.

Federstifte werden in großen Mengen und in zahlreichen Anwendungen in den unterschiedlichsten Industrien von der Autoherstellung bis zur Elektronik eingesetzt.

Ein gekerbter Federstift ist ein zylindrischer Kerbstift aus gehärtetem Federstahl, der akkurat für einen Durchmesser hergestellt wird, welcher größer ist als die Bohrung, in die er eingeführt wird. Der Stift wird einfach in die Öffnung getrieben und durch einen kontinuierlichen Federdruck entlang der gesamten Länge der Öffnung festgehalten. Der Schlitz im Stift hat die Aufgabe, das Zusammendrücken beim Einführen in die Öffnung zu ermöglichen.

Die äußeren Federkräfte verhindern eine durch Schwingungen verursachte Lockerung. Zum Entfernen eines Stiftes aus einer Baugruppe sind große Kräfte erforderlich, und es besteht kein großes Risiko, dass der Stift durch Schwingungen bewegt wird. Auf Grund der Flexibilität im Federdesign eignen sich Federstifte hervorragend für Stoßbelastungssituationen und vermeiden dass Problem fester Stifte, die zerbrechen oder durch ihre Steifigkeit andere Bauteile einer Baugruppe beschädigen können.

Auf Grund der verwendeten Materialien und ihrer Wärmebehandlung sind Federstifte sehr leicht und außergewöhnlich stark. Außer den geringen Grundkosten sorgen Federstifte für erheblich reduzierte Montagezeiten. Es ist nur eine einfache Bohrung und kein Nachbohren, Gewindeschneiden oder Gegenbohren erforderlich.
Die Stifte sind leicht einzusetzen, entweder per Hand oder in der automatisierten Montage. Es sind keine Spezialfähigkeiten erforderlich. Die Montage kann sicher von ungeschulten Arbeitskräften ausgeführt werden. Federstifte können mit einem Schraubenzieher entfernt werden. Sie sollten jedoch möglichst in eine Durchgangsbohrung eingesetzt werden, da es sehr schwierig ist, Federstifte aus einer Blindbohrung zu entfernen.

MATERIALIEN
Kohlenstoffstahl - BS1449 CS70 Ausgetempert - Geöltes Finish

Edelstahl - AISI 302/304

ABMESSUNGEN
d = Nenndurchmesser
L = Stiftlänge

I

SPINE ELASTICHE

La spina elastica è un sistema di fissaggio molto affidabile e di basso costo, particolarmente adatto alla produzione in grandi quantità.

Viene utilizzato in grandi quantità in innumerevoli applicazioni, in svariati campi che vanno dalla produzione automobilistica a quella elettronica.

La spina elastica con fessura è una spina cilindrica, in acciaio per molle temprato, in cui il diametro è superiore a quello del foro perforato entro cui è infilato. Viene semplicemente infilato col martello e tenuto in posizione dalla pressione elastica verso l'esterno su tutta la lunghezza del foro. Il ruolo della fessura è di permettere la compressione quando il perno viene infilato nel foro.

Le forze elastiche verso l'esterno hanno un'azione positiva per prevenire una fuoriuscita a causa di vibrazioni.
Le forze necessarie per estrarre una spina elastica da un assemblaggio sono grandi e vi è scarso pericolo che il perno venga spostato per vibrazione. Grazie alla flessibilità della concezione le spine elastiche sono eccellenti nelle situazioni di carichi di shock ed evitano i problemi che presentano i perni pieni, che a causa della loro rigidità si possono rompere o possono danneggiare gli altri componenti di un montaggio. Le spine elastiche sono molto leggere e sono eccezionalmente resistenti in ragione del materiale e del trattamento termico utilizzato.

Oltre al basso costo di base, le spine elastiche permettono di ridurre considerevolmente i tempi di montaggio. E' sufficiente praticare un foro normale alle tolleranze di perforazione abituali, senza alesatura, filettatura o contro alesaggio. Le spine si introducono facilmente, sia a mano che automaticamente.
Non è richiesta nessuna competenza particolare e l'assemblaggio può essere condotto senza rischio da personale non specializzato. Le spine elastiche possono essere estratte con un estrattore (caccia - perni) ma è preferibile installarli in un foro con uscita, perché sono molto difficili da estrarre da un foro cieco.

MATERIALE
Acciaio al carbonio - BS1449 CS70 Austempered - rivestimento lubrificato

Acciaio inossidabile - AISI 302/304

LEGENDA
d = Diametro nominale
L = Lunghezza spina

P

PINOS DE MOLA

O pino de mola é um sistema de fixação bastante econômico e confiável. E é bem ajustável a um grande numero de produtos.
Desde a indústria automobilística até a indústria eletrônica. Eles têm uma ranhura, são de formato cônico e são feitos em aço.
Eles são feitos com a abertura ligeiramente mais estreita para encaixar nos pinos através de pressão.

A parte externa do pino mola tem uma função ativa positiva evitando a perda por vibração.
Devido à flexibilidade do desenho os pinos de mola são excelentes em situações de impacto, prevenindo o desgaste das peças.
Os pinos de mola são extremamente leves e fortes devido ao material e tratamento térmico.

Alem dos preços econômicos, os pinos de mola proporcionam um tempo de montagem mais curto. Um simples buraco é suficiente
Para a montagem, não precisando nenhum acabamento extra. Eles são fáceis de montar manualmente ou em linha de montagem.

Não requerem nenhum treinamento especial e são bem seguros. A desmontagem também é bastante simples não requerendo nenhuma ferramenta especial.

MATERIAL
Aço Carbono BS1449 CS70 – Tempera de grau elevado / Oleada

Aço Inox AISI 392/304

LEGENDA
d = Diâmetro nominal
L = Comprimento do pino

FederstifteFederstifteFederstifteFederstifteFederstift
SpineElastiche SpineElastiche SpineElastiche SpineE
PinosDeMola PinosDeMola PinosDeMola PinosDeMol

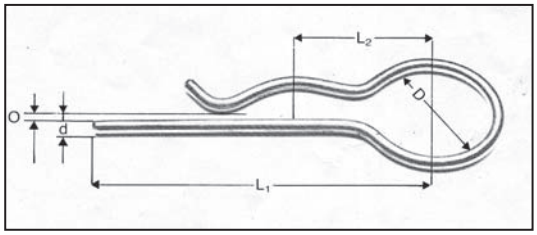
SPRING PINS

Part Number	d (mm)	L (mm)
BP 1.5 x 10		10
BP 1.5 x 12		12
BP 1.5 x 14	1.5	14
BP 1.5 x 16		16
BP 1.5 x 18		18
BP 1.5 x 20		20
BP 2.0 x 10		10
BP 2.0 x 12		12
BP 2.0 x 14		14
BP 2.0 x 16		16
BP 2.0 x 18		18
BP 2.0 x 20	2.0	20
BP 2.0 x 22		22
BP 2.0 x 24		24
BP 2.0 x 26		26
BP 2.0 x 28		28
BP 2.0 x 30		30
BP 2.5 x 10		10
BP 2.5 x 12		12
BP 2.5 x 14		14
BP 2.5 x 16		16
BP 2.5 x 18		18
BP 2.5 x 20	2.5	20
BP 2.5 x 22		22
BP 2.5 x 24		24
BP 2.5 x 26		26
BP 2.5 x 28		28
BP 2.5 x 30		30
BP 3.0 x 10		10
BP 3.0 x 12		12
BP 3.0 x 14		14
BP 3.0 x 16		16
BP 3.0 x 18		18
BP 3.0 x 20		20
BP 3.0 x 22		22
BP 3.0 x 24	3.0	24
BP 3.0 x 26		26
BP 3.0 x 28		28
BP 3.0 x 30		30
BP 3.0 x 32		32
BP 3.0 x 35		35
BP 3.0 x 40		40
BP 4.0 x 10		10
BP 4.0 x 12		12
BP 4.0 x 14		14
BP 4.0 x 16		16
BP 4.0 x 18	4.0	18
BP 4.0 x 20		20
BP 4.0 x 22		22
BP 4.0 x 24		24
BP 4.0 x 26		26
BP 4.0 x 28		28

Part Number	d (mm)	L (mm)
BP 4.0 x 30		30
BP 4.0 x 32		32
BP 4.0 x 35	4.0	35
BP 4.0 x 40		40
BP 4.0 x 45		45
BP 4.0 x 50		50
BP 5.0 x 10		10
BP 5.0 x 12		12
BP 5.0 x 14		14
BP5.0 x 16		16
BP 5.0 x 18		18
BP 5.0 x 20		20
BP 5.0 x 22		22
BP 5.0 x 24		24
BP 5.0 x 26		26
BP 5.0 x 28		28
BP 5.0 x 30	5.0	30
BP 5.0 x 32		32
BP 5.0 x 35		35
BP 5.0 x 40		40
BP 5.0 x 45		45
BP 5.0 x 50		50
BP 5.0 x 55		55
BP 5.0 x 60		60
BP 5.0 x 65		65
BP 5.0 x 70		70
BP 5.0 x 75		75
BP 5.0 x 80		80
BP 6.0 x 10		10
BP 6.0 x 12		12
BP 6.0 x 14		14
BP 6.0 x 16		16
BP 6.0 x 18		18
BP 6.0 x 20		20
BP 6.0 x 22		22
BP 6.0 x 24		24
BP 6.0 x 26		26
BP 6.0 x 28		28
BP 6.0 x 30		30
BP 6.0 x 32		32
BP 6.0 x 35		35
BP 6.0 x 40	6.0	40
BP 6.0 x 45		45
BP 6.0 x 50		50
BP 6.0 x 55		55
BP 6.0 x 60		60
BP 6.0 x 65		65
BP 6.0 x 70		70
BP 6.0 x 75		75
BP 6.0 x 80		80
BP 6.0 x 85		85
BP 6.0 x 90		90

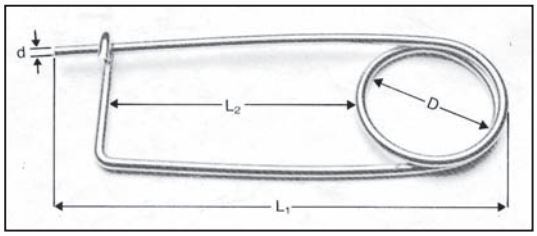
Part Number	d (mm)	L (mm)
BP 6.0 x 95	6.0	95
BP 6.0 x 100		100
BP 8.0 x 10		10
BP 8.0 x 12		12
BP 8.0 x 14		14
BP 8.0 x 16		16
BP 8.0 x 18		18
BP 8.0 x 20		20
BP 8.0 x 22		22
BP 8.0 x 24		24
BP 8.0 x 26		26
BP 8.0 x 28		28
BP 8.0 x 30		30
BP 8.0 x 32	8.0	32
BP 8.0 x 35		35
BP 8.0 x 40		40
BP 8.0 x 45		45
BP 8.0 x 50		50
BP 8.0 x 55		55
BP 8.0 x 60		60
BP 8.0 x 65		65
BP 8.0 x 70		70
BP 8.0 x 75		75
BP 8.0 x 80		80
BP 8.0 x 85		85
BP 8.0 x 90		90
BP 8.0 x 95		95
BP 8.0 x 100		100
BP 10.0 x 16		16
BP 10.0 x 18		18
BP 10.0 x 20		20
BP 10.0 x 22		22
BP 10.0 x 24		24
BP 10.0 x 26		26
BP 10.0 x 28		28
BP 10.0 x 30		30
BP 10.0 x 32		32
BP 10.0 x 35		35
BP 10.0 x 40		40
BP 10.0 x 45	10.0	45
BP 10.0 x 50		50
BP 10.0 x 55		55
BP 10.0 x 60		60
BP 10.0 x 65		65
BP 10.0 x 70		70
BP 10.0 x 75		75
BP 10.0 x 80		80
BP 10.0 x 85		85
BP 10.0 x 90		90
BP 10.0 x 95		95
BP 10.0 x 100		100

RETAINING PINS



Finish Zinc Plate (closed type)						
Part No.	L_1	L_2	D	d	O	Grip Rod
	mm	mm	mm	mm	mm	mm
89.100	43	18	10	2	0	9 - 14
89.101	45	18	10	2.5	0	9 - 14
89.102	54	23	13	3	0	10 - 16
89.103	75	29	19	4	0	16 - 20
89.104	107	43	27	5	0	20 - 28
89.105	117	50	31	6	0	28 - 40
89.106	145	75	38	7	0	25 - 38

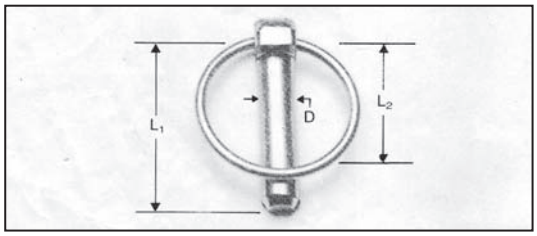
SAFETY PINS



Finishes available: Self Finish, Zinc Plate, Stainless Steel				
Part No.	L_1	L_2	D	d
	mm	mm	mm	mm
89.300	70	42	14	1.63
89.301	76	42	22	2.03
89.302	98	57	24	2.95
89.303	122	63	32	2.95
89.304	140	76	35	3.65
89.305	165	95	38	4.47
89.306	206	127	48	4.88

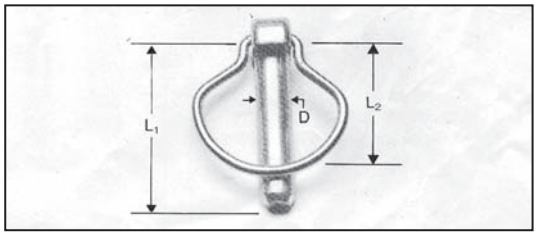
LINCH PINS

Apple Keep



Finish Zinc Plate				
Part No.	D	L_1	L_2	Normal Size
	mm	mm	mm	mm
89.400	4.5	35	28	4.7
89.401	6	44.5	36.5	6.4
89.402	8	44.5	36.5	7.9
89.403	9	44.5	36.5	9.0
89.404	9.5	44.5	36	9.5
89.405	10.5	44.5	36	10.5
89.406	11	44.5	36	11.1
89.407	11	51	36.5	11.1

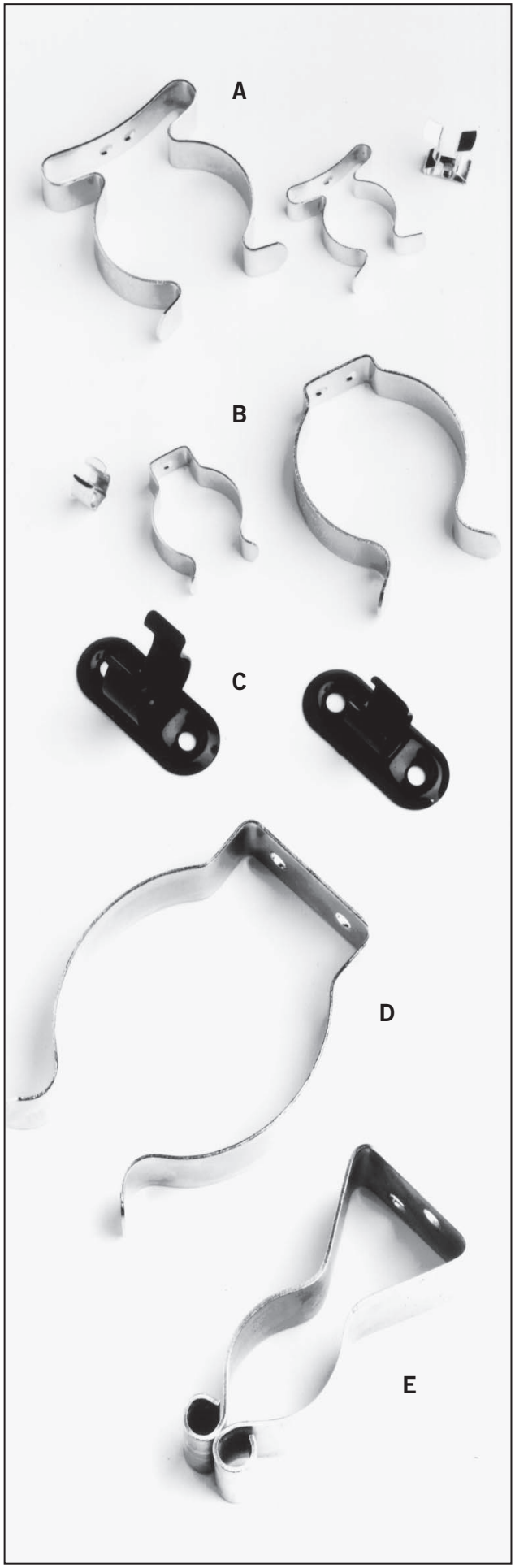
Pear Keep



Finish Zinc Plate				
Part No.	D	L_1	L_2	Normal Size
	mm	mm	mm	mm
89.500	6	44.5	36.5	6.4
89.501	8	44.5	36.5	7.9
89.502	9	44.5	36.5	9.0
89.503	9.5	44.5	36.5	9.5
89.504	10.5	44.5	36	10.5
89.505	11	44.5	36	11.1

SPLIT RINGS

Nickel Plated or Bright Self Finish				
Part No.	Do		Part No.	Do
	mm			mm
79.022	5.5		79.095	24
79.028	7.0		79.100	25
79.030	8.0		79.112	28
79.037	9.5		79.118	30
79.050	13.0		79.125	32
79.062	16.0		79.150	38
79.075	20.0		79.200	51



A. Tool Clip - Type No. 80		
To Grip dia.	**Zinc Plated**	
6mm	80.025	PVC Coated Black or White When ordering use Code No. and appropriate suffix Black - BP White - WP Other colours are available on request
10mm	80.037	
13mm	80.050	
16mm	80.062	
19mm	80.075	
25mm	80.100	
28mm	80.112	
32mm	80.125	
38mm	80.150	
51mm	80.200	

B. Tool Clip - Type No. 81		
To Grip dia.	**Zinc Plated**	
6mm	81.025	PVC Coated Black or White When ordering use Code No. and appropriate suffix Black - BP White - WP Other colours are available on request
10mm	81.037	
13mm	81.050	
16mm	81.062	
19mm	81.075	
25mm	81.100	
28mm	81.112	
32mm	81.125	
38mm	81.150	
51mm	81.200	

C. Clip with back plate- Type No. 82 (Black Finish)		
To Grip dia.	**Black Finish**	
10mm	82.037	
13mm	82.050	
16mm	82.062	
19mm	82.075	
22mm	82.087	
25mm	82.100	
28mm	82.112	
32mm	82.125	
38mm	82.150	

D. Super Clip- Type No. 83		
To Grip dia.	**Black Finish**	**White PVC**
44mm	83.175	83.175 WP
64mm	83.250	83.250 WP
76mm	83.300	83.300 WP
89mm	83.350	83.350 WP
102mm	83.400	83.400 WP
114mm	83.450	83.450 WP

E. Broom Clip - Code No. 87.655 zinc plated
-75 mm high to grip, 3mm to 38mm dia.

F. Mini Clip - Code No. 87.656 zinc plated
-To grip 4mm to 6.5mm

BOXED ASSORTMENTS

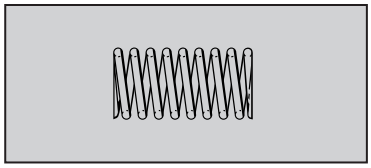
Selections of SPEC springs and washers

For experimental, development, prototype and maintenance work.

Engineers, designers and specifiers of coiled springs and spring washers find these packaged assortments of Associated Spring SPEC items especially convenient in their work. Repair and maintenance personnel also, use these assortments for hundreds of day to day requirements to keep production equipment running.

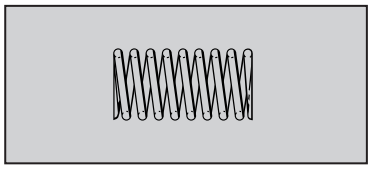
Assortments are packaged in boxes individually identified to enable easy identification and re-order.

IMPORTANT Specify S/S INOX or M/W.



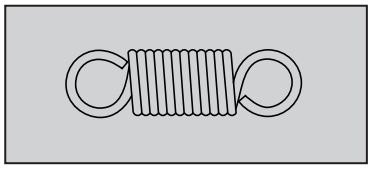
COMPRESSION D

Part Number	Wire Diameter (mm)	Total Number of Parts	Total Number of Springs
A53000	0.40 to 1	30	300
A53020	0.63 to 1.6	12	120
A53040	0.50 to 2	21	200



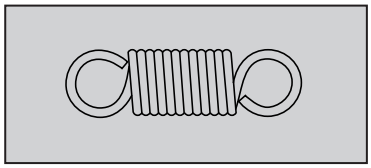
COMPRESSION C

Part Number	Wire Diameter (mm)	Total Number of Parts	Total Number of Springs
C102AL	0.41 to 1.07	84	168
C102AM	0.66 to 1.6	84	168
C102AH	0.7 to 3.18	61	122



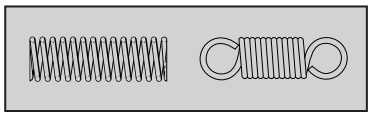
EXTENSION T

Part Number	Wire Diameter (mm)	Total Number of Parts	Total Number of Springs
A53010	0.40 to 1	30	300
A53030	0.63 to 1.6	12	120
A53050	0.50 to 2	24	200



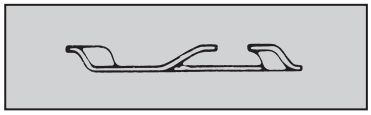
EXTENSION E

Part Number	Wire Diameter (mm)	Total Number of Parts	Total Number of Springs
E202AL	0.56 to 1.40	56	112
E202AM	0.94 to 1.91	43	86
E202AH	0.40 to 2.92	28	56



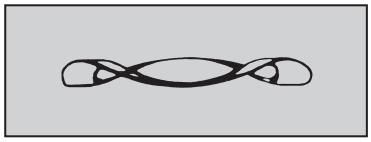
COMPRESSION / EXTENSION

Part Number	Wire Diameter (mm)	Total Number of Parts	Total Number of Springs
A53060	0.50 to 2	42	200



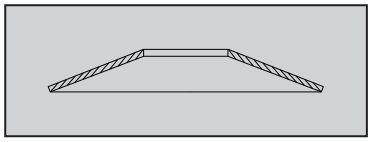
FINGER SPRING WASHERS — High Carbon Steel to ASTM-A684

Part Number	Outside Diameter (mm)	Total Number of Parts	Total Number of Springs
F502A	15.11 to 51.36	20	40



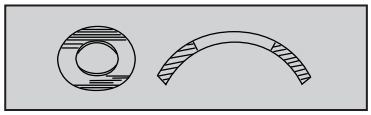
WAVE SPRING WASHERS — High Carbon Steel to ASTM-A684 Stainless Steel to 302

Part Number	Outside Diameter (mm)	Total Number of Parts	Total Number of Springs
W602AS	4.65 to 84.53	35	70
W602AH	89.38 to 186.06	11	22



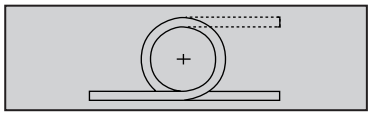
BELLEVILLE WASHERS — High Carbon Steel to ASTM-A684 Stainless Steel

Part Number	Outside Diameter (mm)	Total Number of Parts	Total Number of Springs
B402AS	4.75 to 28.58	75	150
B401AH	31.75 to 76.20	49	98



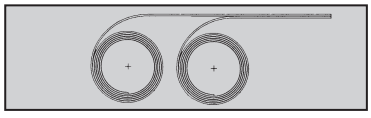
CURVED SPRING WASHERS — High Carbon Steel to ASTM-A684 Stainless Steel to 301

Part Number	Outside Diameter (mm)	Total Number of Parts	Total Number of Springs
U701A	5.46 to 28.02	65	130



TORSION SPRINGS — Stainless Steel to 302

Part Number	Wire Diameter (mm)	Total Number of Parts	Total Number of Springs
T301A	0.30 to 1.98	82	164



CONSTANT FORCE SPRINGS — Stainless Steel to 301

Part Number	Length (mm)	Total Number of Parts	Total Number of Springs
CF110A	381 to 1219	14	28

GENERAL TERMS OF SALE

1. With respect to goods purchased by Buyer from Seller ("Goods"), no contract exists until Buyer places order for delivery and such order is accepted by Seller's acknowledging receipt of the order, by Seller's commencement of work on the Goods ordered, or by Seller's shipment of the Goods, whichever occurs first. Any acceptance will be limited to the express terms contained on the face hereof. Additional or different terms in Buyer's form or any attempt by Buyer to vary in any degree any of the terms of this of this quotation shall be deemed material and are objected to and rejected, but this shall not prevent the formation of a contract between Buyer and Seller unless such variances are in the terms of the description, quantity, price or delivery schedule of the goods, and the order shall be deemed accepted by Seller without said additional or different terms.

2. All agreements are contingent upon strikes, accidents and other reasons for delay beyond Seller's control.

3. Where a separate charge is made for specially designed tools and dies, Seller will maintain such tools and dies without further cost to Buyer for the life of such tool or die so long as the part remains active and the design is not changed and Seller will not use such tools and dies for others without Buyer's permission, but Buyer acquires no right to remove any such tools or dies from Seller's factory.

4. Seller warrants to Buyer that the Goods purchased by Buyer from Seller shall be free from defects in material and workmanship. This warranty is the only warranty applicable to the Goods. THERE ARE NO OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE HEREBY DISCLAIMED.

5. All Goods shall be inspected by Buyer when received and Seller shall not be liable for any defect unless notified in writing within 60 days after delivery.

6. Seller's liability for breach of warranty shall be limited solely and exclusively to repairing or replacing, at Seller's option, the defective Goods. In no event shall the liability of Seller for breach of any contractual provision relating to the Goods exceed the purchase price of the Goods quoted herein. In no event shall Seller be liable for any special, incidental or consequential damages arising out of Buyer's use or sale of the Goods or Seller's breach of any contractual provisions relating to the Goods, including but not limited to any loss of profits or production by Buyer. Any action resulting from any breach by Seller must be commenced within one year after the cause of action accrued.

7. Except to the extent caused by Seller's breach of warranty, Buyer shall indemnify and hold harmless Seller, its employees, officers and directors, and their respective successors and assigns, (collectively, "Indemnities") from and against any and all liability, damages, claims, causes of action, losses, costs and expenses (including attorneys' fees) of any kind (collectively, "Damages") arising out of injuries to any person (including death) or damage to any property caused by or related to the Goods or any negligent act or omission of Buyer, its employees or agents. Buyer shall indemnify and hold harmless each of the Indemnities from and against any and all Damages, royalties and license fees arising from or for infringement of any patent by reason of any sale or use of the Goods or the manufacture of the Goods to Buyer's specifications or sample. Upon the tendering of any of the foregoing suits or claims to Buyer, Buyer shall defend the same at Buyer's expense. The foregoing obligations of Buyer shall apply whether Seller or Buyer defends such suits or claim.

8. Seller reserves the right to over and under ship by not more than 10% of specified quantity.

9. Small quantities are considered prototype quantities and cannot be returned since the cost of re-inspecting and handling them is generally higher than the value of the parts. Larger quantities may not be returnable depending on the ability to re-sell these parts within a reasonable time period. Special runs are not returnable. All returns must be authorized and an Authorization Number is required. Please contact our Customer Service. Unauthorized returns will be returned at customer's expense. All authorized returns must be in their original packaging and labelling to insure lot control integrity. Parts cannot be altered or used in any fashion. Parts from separate lots cannot be mixed. A restocking fee will be charged to authorized returns. Additional charges may be required for re-inspection, cleaning and repackaging. Credit for damaged parts will not be issued. All returns will be shipped to the authorized return centre pre-paid by sender. Actual credit issued will be for the quantity of acceptable parts at the original piece price, less the restocking charge, less the original freight and any other charges that are necessary to return the parts to a saleable condition.

The product data reported in this catalogue represents typical values and is not intended to duplicate any specific customers test results. For product-specific AQL's, contact your sales representative, as indicated tolerances may not apply. The catalogue data presented is intended to be used as a guide only. It is not intended to be used to determine the suitability of the product for any specific customer application. Barnes Group strongly suggests that each customer thoroughly test the product to determine the actual suitability of the product in their specific application. The customer is responsible for determining the suitability of products in their applications. For more detailed information about these catalogue products please contact your sales representative.

Note: Please contact your local office for Terms of Sale that are applicable to individual countries.

Note: Veuillez contacter votre bureau local pour connaître les Conditions de Ventes applicables à votre pays.

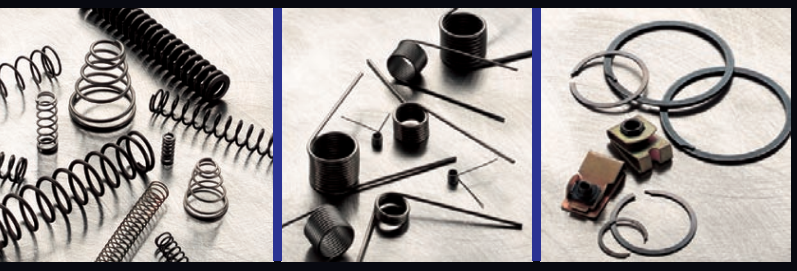
Nota: Contacte con el distribuidor en su país para conocer las condiciones de venta que le podrían afectar.

Anmerkung: Bitte wenden Sie sich an uns für weitere Verkaufbedingungen in unsere Land.

Nota: Prego contattare il proprio distributore per le condizioni di vendita in vigore nella zona di competenza.

Nota: Por favor contate nosso escritório local para Termos de Vendas que é aplicavel ao seu país local.

SPEC World-wide Solutions...



United Kingdom www.assocspring.co.uk

Associated Spring SPEC
European Headquarters
Unit 4 Grosvenor Business Centre
Vale Park, Evesham
Worcestershire WR11 1GS
Tel: (44) 1386 443366
Fax: (44) 1386 446669
E-mail: sales@assocspring.co.uk

France www.ressortsspec.com

Ressorts SPEC
Bâtiment HERMES 2
ZA de Pissaloup
4 rue Edouard Branly
78190 TRAPPES
Tel: (33) 01 30 68 6363
Fax: (33) 01 30 68 4050
E-mail: info@ressortsspec.com

Spain www.bgespana.com

Barnes Group Spain, S.R.L.
La Peña 6 - Pab. 5
01013 Vitoria-Gasteiz
Tel: (34) 945 147542
Fax: (34) 945 137655
E-mail: ventas@bgespana.com

Mexico www.asraymond.com

Raymond Distribution - Mexico SA de CV
Blvd. Rogelio Gonzalez Caballero No 500
Parque Industrial Stiva Aeropuerto
Apodaca
Nuevo Leon
C.P. 66600
Tel: 52 (81) 81 45 0680
Fax: 52 (81) 81 45 0679
E-mail: ventas@asraymond.com

Brazil www.asbg-spec.com.br

Associated Spring Raymond
Rua Wallace Barnes 301A
Distrito Industrial
Caixa Postal 1288
Campinas, SP Brazil
CEP 13054-701
Tel: (55) 193 725 1083
Fax: (55) 193 725 1084
E-mail: cfranco@asbg.com.br

Europe. www.barnesgroupeurope.com