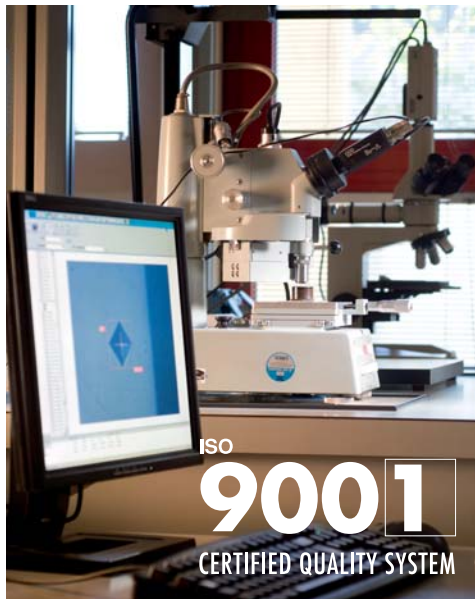




Molle per stampi
Die springs
Schraubendruckfedern
Ressorts de compression
Muelles para moldes
Molas para moldes

ISO 10243 : 2010



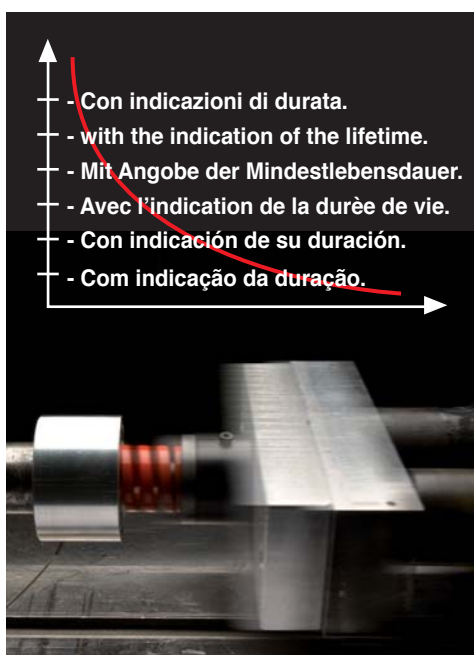


- IT** La continua attività di ricerca e sviluppo unitamente ai rigidi controlli di processo, secondo lo standard ISO 9001, garantiscono un prodotto con caratteristiche dimensionali, di durata e affidabilità superiori.
- EN** Ongoing research and development, along with strict quality assurance procedures in compliance with ISO 9001, ensure very high levels of dimensional accuracy, durability and reliability.
- DE** Ständige Forschung und Entwicklung, sowie strenge Kontrollen des Fertigungsprozesses nach dem Standard ISO 9001 garantieren ein Produkt mit her vorragenden Eigenschaften in Bezug auf Maßgenauigkeit, Haltbarkeit und Zuverlässigkeit.
- FR** L'activité permanente dans le domaine de la recherche et du développement, ainsi que des contrôles qualités du processus de fabrication selon la norme ISO 9001, garantissent l'obtention d'un produit ayant de meilleures caractéristiques dimensionnelles, de durée et de fiabilité.
- ES** La continuada actividad de investigación y desarrollo unida a los severos controles de proceso, según el estándar ISO 9001, garantizan un producto con características dimensionales, de duración y fiabilidad superiores.
- PT** A contínua atividade de pesquisa e desenvolvimento juntamente aos severos controles de processo, conforme o standard ISO 9001, garantem um produto com características dimensionais, de duração e confiabilidade superiores.

- IT** CAD SPRINGS, il primo e rivoluzionario software integrato di calcolo, selezione e generazione parametrica delle molle per stampi Special Springs, disponibile anche su partserver di CADenas.
- EN** CAD SPRINGS, the first and revolutionary integrated software to calculate, select and generate Special Springs' die springs, available also on CADenas Partserver library.
- DE** CAD SPRINGS, die erste revolutionäre Software zur Berechnung, Auswahl und Parametererzeugung von Federn für Formen von Special Springs, erhältlich auch auf Partserver von CADenas.
- FR** CAD SPRINGS, le premier logiciel révolutionnaire intégré de calcul, sélection et création paramétrique des ressorts pour moules Special Springs, également disponible sur partserver de CADenas.
- ES** CAD SPRINGS, el primer y revolucionario software integrado de cálculo, selección y creación paramétrica de los muelles para moldes Special Springs, disponible también sobre partserver de CADenas.
- PT** CAD SPRINGS, o primeiro e revolucionário software integrado de cálculo, seleção e geração paramétrica das molas para moldes Special Springs, disponível também em partserver de CADenas.

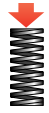







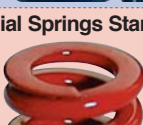
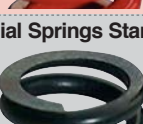



www.partserver.com



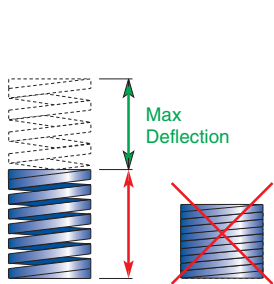
- IT** Continui tests interni di affidabilità hanno permesso di indicare dei valori di durata in funzione delle deflessioni e delle raccomandazioni di utilizzo. Questi valori non sono garantiti a causa dell'elevato numero di variabili nelle reali condizioni di lavoro.
- EN** Ongoing in-house reliability tests allow Special Springs to provide a service life values of springs in compliance of working deflections and recommendations. The stated service life values are not guaranteed due to the impossibility to consider all variables on the real working conditions of the springs.
- DE** Firmeninterne Testreihen zur Zuverlässigkeit haben die Angabe von Werten für die Lebensdauer in Abhängigkeit von Federweg und Gebrauchsempfehlungen ermöglicht. Für diese Werte kann aufgrund der zahlreichen Variablen unter realen Arbeitsbedingungen nicht garantiert werden.
- FR** Des tests internes continus de fiabilité ont permis d'indiquer des valeurs de durée en fonction des déflexions et des recommandations d'utilisation. Ces valeurs ne sont pas garanties à cause du grand nombre de variables dans les conditions réelles de travail.
- ES** Continuados tests internos de fiabilidad han permitido indicar valores de duración en función de las deflexiones y de las recomendaciones de uso. Estos valores no son garantizados debido al elevado número de variables en las reales condiciones de trabajo.
- PT** Contínuos testes internos de confiabilidade permitiram indicar valores de duração em função das deflexões e das recomendações de utilização. Estes valores não são garantidos por causa do elevado número de variáveis nas reais condições de trabalho.

range summary

Serie Series Série Série Série Série	Standard	Colore Color Kennfarbe Couleur Color Cor	Carico Load Belastung Charge Carga Carga	 + 3.000.000 cycles	 ~ 1.500.000 cycles	 300 - 500.000 cycles	 100 - 200.000 cycles
VL	Special Springs Standard 	Verde chiaro Light green Hellgrün Verte claire Verde claro Verde claro (RAL6019)	Extra-leggero Extra-light Leichte Extra-légère Extra-ligero Extra-leve	30 % L ₀	40% L ₀	45% L ₀	50% L ₀
V	ISO 10243: 2010 	Verde Green Grün Verte Verde Verde (RAL 6002)	Leggero Light Normale Légère Ligero Leve	25% L ₀	30% L ₀	35% L ₀	40% L ₀
B	ISO 10243: 2010 	Blu Blue Blau Bleu Azul marino Azul (RAL 5003)	Medio Medium Mittlere Moyenne Medio Médio	25% L ₀	30% L ₀	33.75% L ₀	37.5% L ₀
R	ISO 10243: 2010 	Rosso Red Rot Rouge Rojo Vermelho (RAL 3000)	Forte Strong Hohe Forte Fuerte Forte	20% L ₀	25% L ₀	27.5% L ₀	30% L ₀
G	ISO 10243: 2010 	Giallo Yellow Gelb Jaune Amarillo Amarelo (RAL 1004)	Extra-Forte Extra-Strong Höchste Extra-Forte Extra-fuerte Extra-forte	17% L ₀	20% L ₀	22.5% L ₀	25% L ₀
A	Special Springs Standard 	Argento Silver Silber Argent Plateado Prata (RAL 9006)	Ultra-Forte Ultra-Strong Ultra-Hohe Ultra-Forte Ultra-fuerte Ultra-forte	10% L ₀	12% L ₀	13.5% L ₀	15% L ₀
TV	Special Springs Standard 	Verde Green Grün Verte Verde Verde (RAL 6002)	Leggero Light Normale Légère Ligero Leve	25% L ₀	30% L ₀	35% L ₀	40% L ₀
TB	Special Springs Standard 	Blu Blue Blau Bleu Azul marino Azul (RAL 5003)	Medio Medium Mittlere Moyenne Medio Médio	25% L ₀	30% L ₀	33.75% L ₀	37.5% L ₀
TR	Special Springs Standard 	Rosso Red Rot Rouge Rojo Vermelho (RAL 3000)	Forte Strong Hohe Forte Fuerte Forte	20% L ₀	25% L ₀	27.5% L ₀	30% L ₀
L	Special Springs Standard 	Molle non colorate Not painted springs Unlackierte Federn Ressorts non-peints Muelles no pintados Molas não coloridas	-	16% L ₀	24% L ₀	-	32% L ₀
Peugeot - Citroën Standard 				Sistemi precompressi, carico medio e forte Precompressed unit, medium and strong load Mittlere und starke Vorspannsysteme Ensembles précomprimés, charge moyenne et forte Sistemas pre-tensados carga mediana y fuerte Sistemas pré-comprimidos carga média e forte			

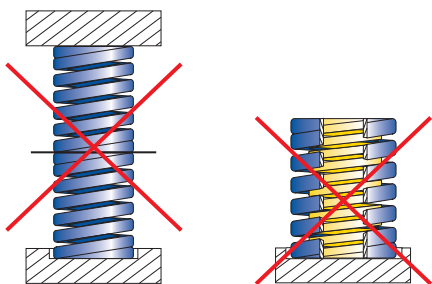
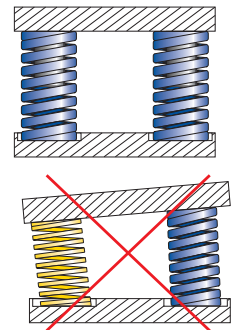
use recommendations

- IT** L' utilizzo corretto delle molle Special Springs assicura prestazioni ben superiori alle indicazioni di durata fornite. Prima di utilizzare le molle, leggere attentamente tutte le raccomandazioni. Usi scorretti riducono significativamente i valori di durata e sono causa di pericolo e danni.
- EN** The correct use of 'Special Springs' die springs assure performance levels well above the lifetime values indicated. Before using the springs, carefully read all the recommendations. Incorrect use can significantly reduce the expected lifetime and may cause damages or injury.
- DE** Der korrekte Gebrauch der Federn Special Springs garantiert für Leistungen, die deutlich über der angegebenen Lebensdauer liegen. Vor Gebrauch der Federn müssen die Gebrauchsempfehlungen aufmerksam gelesen werden. Ein nicht korrekter Gebrauch reduziert die Lebensdauer der Federn deutlich und kann zu Gefahren und Schäden führen.
- FR** L'utilisation correcte des ressorts Special Springs assure des performances bien supérieures aux indications de durée fournies. Avant d'utiliser les ressorts, lire attentivement toutes les recommandations. Des utilisations incorrectes réduisent significativement les valeurs de durée et sont la cause de danger et de dommages.
- ES** El uso correcto de los muelles Special Springs asegura prestaciones mucho más elevadas que las indicaciones de duración proporcionadas. Antes de utilizar los muelles, leer atentamente todas las recomendaciones. Usos incorrectos reducen significativamente los valores de duración y pueden provocar situaciones de peligro y daños.
- PT** A utilização correta das molas Special Springs assegura prestações bem superiores às indicações de duração fornecidas. Antes de utilizar as molas, ler atentamente todas as recomendações. Usos incorretos reduzem significativamente os valores de duração e são causa de perigo e danos.



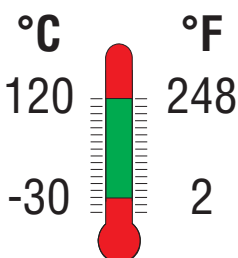
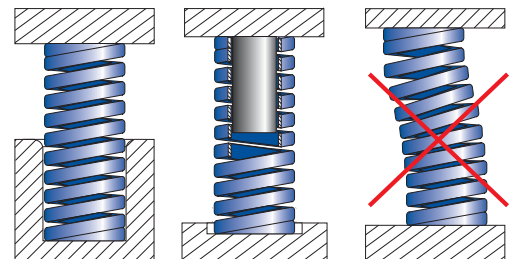
- IT** Non utilizzare le molle oltre la massima deflessione, si evitano così cedimenti improvvisi e danni allo stampo.
- EN** Do not exceed the maximum deflection as it may cause sudden failure of the springs and damages on the tool.
- DE** Do not store springs in compressed state for long time as it may cause abnormal fatigue to the springs.
- FR** Bei Gebrauch der Federn den maximalen Federweg nicht übersteigen, um das plötzliche Brechen und Schäden an der Form zu vermeiden. Die Federn nicht für lange Zeit in gespannter Position lagern, um anormale Belastungen und plötzlichen Bruch zu vermeiden.
- ES** No utilizar los muelles más allá de la máxima deflexión, de esa manera se evitan aflojamientos repentinos y daños al molde. No almacenar los muelles en posición comprimida durante mucho tiempo, de esa manera se evitan estrés anormales y aflojamientos repentinos.
- PT** Não utilizar as molas além da máxima deflexão, desta forma se evitam cedimentos repentinos danos no molde. Não armazenar as molas em posição comprimida por muito tempo, desta forma se evitam estresses normais e cedimentos repentinos.

- IT** Se utilizzate molle diverse simultaneamente, assicurarsi che le deflessioni e le forze siano bilanciate. Garantire la massima perpendicolarità ai piani di contatto per evitare prematuri cedimenti delle molle.
- EN** When using different type of springs in parallel simultaneously ensure that overall deflection and force guarantee a balanced load. When setting the springs ensure the best perpendicularity to the working surface to avoid early failure of the springs.
- DE** Wenn gleichzeitig mehrere Federn verwendet werden, muss sichergestellt werden, dass Federweg und Kräfte ausgeglichen sind. Es muss für eine perfekte Rechtwinkligkeit zu den Auflageflächen garantiert sein, um ein vorzeitiges Nachgeben der Federn zu vermeiden.
- FR** Eviter l'utilisation de ressorts superposés non-complètement guidés ou insérés les uns dans les autres. Danger de dommages aux personnes ou aux choses.
- ES** Si utilizan muelles diferentes simultáneamente, comprueben que las deflexiones y las fuerzas estén equilibradas. Garantizan la máxima perpendicularidad a los planos de contacto para evitar prematuros aflojamientos de los muelles.
- PT** Se molas diferentes forem utilizadas ao mesmo tempo, assegure-se que as deflexões e as forças sejam equilibradas. Garantir a máxima perpendicularidade aos planos de contato a fim de evitar prematuros cedimentos das molas.



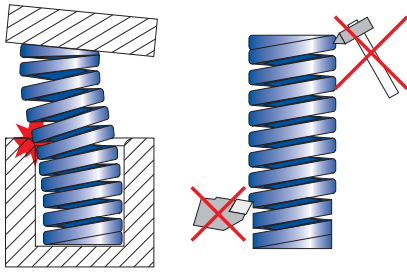
- IT** Evitare l'uso di molle sovrapposte non completamente guidate o inserite le une nelle altre. Pericolo di danni a persone o cose.
- EN** Avoid to using springs in vertical group not fully guided or using springs inserted in each other as it may cause serious damage or injury.
- DE** Die Federn nicht ohne vollständige Führung übereinander gesetzt oder ineinander gesetzt verwenden, da dies zu Sach- und Personenschäden führen kann!
- FR** Ne pas stocker les ressorts en position comprimée pendant longtemps, on évite ainsi des stress anormaux et des affaissements subits.
- ES** Evitar el uso de muelles superpuestas que no estén completamente guiados o insertados los unos en los otros. Peligro de daños a personas o cosas.
- PT** Evitar o uso de molas sobrepostas não completamente guiadas ou inseridas uma dentro da outra. Perigo de danos a pessoas ou objetos.

- IT** Maggiore è il guidaggio maggiore sarà la durata delle molle. È assolutamente necessario guidare tutte le molle con un rapporto lunghezza/diametro maggiore di 3,5.
- EN** The bigger the guide the longer the lifetime. It is essential to guide all springs with a free length /diameter ratio exceeding 3.5.
- DE** Je größer die Führung ist, desto länger ist die Lebensdauer der Federn. Alle Federn müssen mit einem Verhältnis von Länge zu Durchmesser von mehr als 3,5 geführt werden!
- FR** Plus le guidage est important et plus la durée des ressorts sera longue. Il est absolument nécessaire de guider tous les ressorts avec un rapport longueur/diamètre supérieur à 3,5.
- ES** Cuanto mayor sea el conjunto de dispositivos de guía, mayor será la duración de los muelles. Es absolutamente necesario guiar todos los muelles con una relación de longitud/diámetro mayor de 3,5.
- PT** Quanto maior será a guiação, maior a duração das molas. É absolutamente necessário guiar todas as molas com relação de comprimento/diâmetro maior que 3,5.



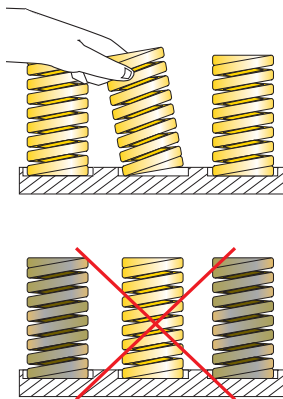
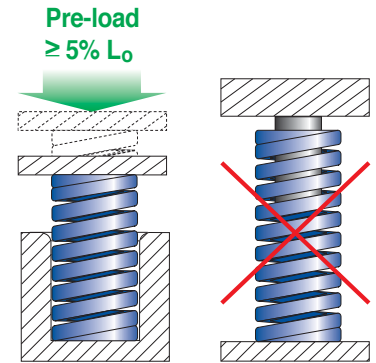
- IT** Temperatura di utilizzo - 30 °C e +120 °C. Oltre i 120 °C e fino ad un massimo di 250 °C considerare una perdita di carico del 1% circa ogni 40 °C.
- EN** Best working temperature - 30°C + 120°C. Over 120°C and up to 250°C should be considered an average loss of 1% on springs rate for every 40°C.
- DE** Betriebstemperatur -30°C bis +120°C. Bei Temperaturen von 120°C bis maximal 250°C muss ein Spannungsverlust von 1% ca. alle 40°C berücksichtigt werden.
- FR** Température d'utilisation - 30 °C e +120 °C. Au-delà de 120 °C et jusqu'à un maximum 250 °C il faut considérer une perte de charge de 1% environ tous les 40 °C.
- ES** Temperatura de utilización - 30 °C y +120 °C. Más allá de los 120 °C y hasta un máximo de 250 °C, hay que tener en cuenta una pérdida de carga del 1% aproximadamente cada 40 °C.
- PT** Temperatura de utilização - 30 °C e +120 °C. Além de 120 °C e até um máximo de 250 °C, considerar uma perda de carga de cerca 1% cada 40 °C.

use recommendations



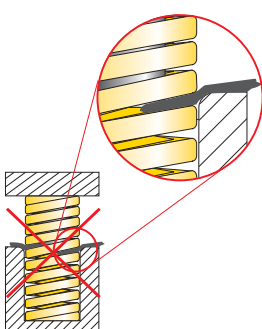
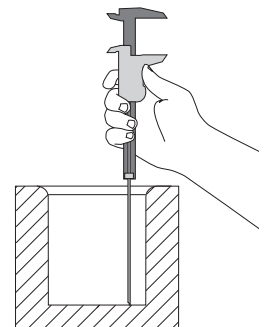
- IT** Qualsiasi danno sulla superficie delle molle (tagli, abrasioni, molature) può ridurre significativamente la durata attesa. Sostituire sempre le molle danneggiate.
- EN** Any alteration on the surface of the springs (cutting, grinding, scratches, etc.) may significantly reduce the expected lifetime. Always replace the damaged springs with new ones.
- DE** Schäden gleich welcher Art auf der Oberfläche der Federn (Schnitte, Abschürfungen, Abrieb) können die erwartete Lebensdauer deutlich reduzieren. Beschädigte Federn müssen ausgetauscht werden.
- FR** Tout dommage sur la surface des ressorts (coupures, abrasions, meulages) peut réduire significativement la durée prévue. Il faut toujours remplacer les ressorts endommagés.
- ES** Cualquier daño sobre la superficie de los muelles (cortes, abrasiones, amoladuras) puede reducir significativamente la esperada duración. Sustituir siempre los muelles dañados.
- PT** Qualquer dano na superfície das molas (cortes, abrasões, amoladuras) pode reduzir consideravelmente a duração esperada. Substituir sempre as molas danificadas.

- IT** A parità di deflessione totale, maggiore è il precarico, maggiore sarà la durata delle molle, quindi molle di lunghezza maggiore a parità di forza totale garantiscono maggiore durata. Si consiglia un precarico minimo del 5% della lunghezza libera.
- EN** The bigger the pre-load the longer the lifetime of the springs for the same total deflection (% of Lo). Thus longer springs with bigger pre-load will assure longer lifetime. It is recommended to apply a minimum pre-load of 5% of the free length.
- DE** Bei gleichem Gesamtfederweg gilt, dass die Lebensdauer der Federn umso höher ist, je größer die Vorspannung ist. Federn mit einer größeren Länge bei gleicher Gesamtkraft garantieren deshalb für eine längere Lebensdauer. Es wird zu einer Mindestvorspannung von 5% der freien Länge geraten.
- FR** A égalité de déflexion totale, plus la précharge est importante, et plus la durée des ressorts sera longue, donc des ressorts de longueur plus importante à égalité de force totale garantissent une plus longue durée. Nous conseillons une précharge minimum de 5% de la longueur libre.
- ES** A paridad de deflexión total, cuanto mayor es la precarga, mayor será la duración de los muelles, por lo tanto los muelles de mayor longitud a paridad de fuerza total garantizan una mayor duración. Aconsejamos una precarga mínima del 5% de la longitud libre.
- PT** Em igualdade de deflexão total, quanto maior será a pré-carga, maior será a duração das molas, portanto molas mais longas, em igualdade de força total, garantem maior duração. Aconselha-se uma pré-carga mínima de 5% do comprimento livre.



- IT** Una molla collassata crea uno sbilanciamento dei carichi con danni alle altre molle o allo stampo. Sostituire tutte le molle. Una sostituzione programmata delle molle in funzione della durata indicata nelle tabelle previene danni e riduce costi.
- EN** If one spring collapses, an imbalanced load will occur, possibly damaging the other springs. Replace all springs. An advance planned maintenance according to the indicated lifetime of the springs will benefit in avoiding damages and saving of money.
- DE** Durch eine defekte Feder entsteht ein Ungleichgewicht der Spannungen, durch das die anderen Federn oder die Form beschädigt werden. Es müssen immer alle Federn ausgetauscht werden. Ein geplantes Auswechseln der Federn anhand der in den Tabellen angegebenen Lebensdauer beugt Schäden vor und hilft dabei, Kosten zu senken.
- FR** Un ressort affaissé crée un déséquilibre des charges avec des dommages aux autres ressorts et au moule. Remplacer tous les ressorts. Un remplacement programmé des ressorts en fonction de la durée indiquée sur les tableaux évite des dommages et réduit les coûts.
- ES** Un muelle colapsado crea un desequilibrio de las cargas con daños a los demás muelles o al molde. Sustituir todos los muelles. Una sustitución programada de los muelles en función de la duración indicada en las tablas previene daños y reduce costes.
- PT** Uma mola que cedeu provoca um desequilíbrio das cargas provocando danos nas outras molas e no molde. Substituir todas as molas. A substituição programada das molas em função da duração indicada nas tabelas previne danos e reduz custos.

- IT** Le manutenzioni dello stampo possono modificare la deflessione di lavoro originale delle molle. controllare sempre le reali deflessioni per evitare prematuri cedimenti delle molle o danni allo stampo.
- EN** Tool maintenance can vary the original working deflection of the springs. Please always check the real working stroke of the springs to avoid early failure of the springs or damages in the tool.
- DE** Wartungseingriffe an der Form können den ursprünglichen Federweg der Federn ändern. Die tatsächlichen Federwege müssen immer kontrolliert werden, um einem vorzeitigen Nachgeben der Federn oder Schäden an der Form vorzubeugen.
- FR** Les entretiens du moule peuvent modifier la déflexion du travail original des ressorts. Il faut toujours contrôler les déflexions réelles pour éviter des affaissements prématurés des ressorts ou des dommages au moule.
- ES** Las mantenencias del molde pueden modificar la deflexión de trabajo original de los muelles. Controlar siempre las reales deflexiones para evitar prematuros aflojamientos de los muelles o daños al molde.
- PT** As manutenções do molde podem modificar a deflexão de trabalho original das molas. Verifique sempre as reais deflexões para evitar prematuros cedimentos das molas ou danos no molde.



- IT** La presenza di corpi estranei tra le spire delle molle causa riduzioni di corsa, sovraccarichi e rotture delle molle con danni allo stampo. Fare il possibile per evitarlo.
- EN** The presence of scraps or any solid piece between coils causes a reduction of springs deflection with overloads and early failure of the springs with damage in the tool. Take care to avoid that.
- DE** Das Vorhandensein von Fremdkörpern zwischen den Windungen der Federn führt zu einer Reduzierung vom Weg, zu Überlastungen und zum Bruch der Federn und damit zu Schäden an der Form und ist daher möglichst zu vermeiden.
- FR** La présence de corps étrangers entre les spires des ressorts provoque des réductions de course, des surcharges et des ruptures des ressorts avec des dommages au moule. Il faut faire le possible pour l'éviter.
- ES** La presencia de cuerpos extraños entre las espiras de los muelles provoca reducciones de carrera, sobrecargas y rupturas de los muelles con daños al molde. Hacer lo posible para evitarlo.
- PT** A presença de corpos estranhos entre as espiras das molas provoca reduções de curso, sobrecargas e rupturas das molas com danos no molde. Faça o possível para evitá-lo.

springs selection

IT
EN
DE
FR
ES
PT

Il seguente criterio permette una facile e rapida selezione delle molle. È sufficiente definire i seguenti parametri di progetto: durata (es. 3.000.000 cicli), diametro di alloggiamento (es. 16 mm), forza totale (es. 380 N) e deflessione totale di utilizzo con precarico (es. 5 mm).
The following selecting guide-line is essential for an easy and fast selection of the springs. Please specify the following working parameters: expected lifetime (ex.: 3.000.000 cycles), hole diameter (ex.: 16 mm), total spring force (ex.: 380 N) and total spring working deflection including pre-load (ex.: 5 mm).
Das Vorhandensein von Fremdkörpern zwischen den Windungen der Federn führt zu einer Reduzierung vom Weg, zu Überlastungen und zum Bruch der Federn und damit zu Schäden an der Form und ist daher möglichst zu vermeiden.
Le critère suivant permet une sélection facile et rapide des ressorts, il suffit de définir les paramètres de projet suivants: durée (ex. 3.000.000 cycles), diamètre de logement (ex. 16 mm), force totale (ex. 380 N) et déflexion totale de travail avec précharge (ex. 5 mm).
El criterio siguiente permite una fácil y rápida selección de los muelles: es suficiente definir los siguientes parámetros de proyecto: duración (ej. 3.000.000 ciclos), diámetro de alojamiento (ej. 16 mm), fuerza total (ej. 380 N) y deflexión total de uso con precarga (ej. 5 mm).
O seguinte critério permite uma fácil e rápida seleção das molas, basta definir os seguintes parâmetros de projeto: duração (ex. 3.000.000 ciclos), diâmetro de alojamento (ex. 16 mm), força total (ex. 380 N) e deflexão total de utilização com pré-carga (ex. 5 mm).

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Le tabelle a pagina 7 e 8 permettono di individuare il valore di durata (3.000.000) e diametro di alloggiamento (16 mm) richiesti.
Through the tabs on pages 7 and 8 cross the expected lifetime section (3.000.000 cycles) with the hole diameter required (16 mm). Anhand der Tabellen auf Seite 7 und 8 können die gewünschten Werte für die Lebensdauer (3.000.000) und den Sitz (16 mm) ermittelt werden.
Les tableaux des pages 7 et 8 permettent de repérer la valeur de durée (3.000.000) et le diamètre de logement (16 mm) nécessaires.
Las tablas de las páginas 7 y 8 permiten identificar el valor de duración (3.000.000) y diámetro de alojamiento (16 mm) requeridos.
As tabelas das páginas 7 e 8 permitem encontrar o valor de duração (3.000.000) e diâmetro de alojamento (16 mm) requeridos.

Estimated Life	Hole diameter (mm)							Series		
	10	12,5	16	20	25	32	40		50	63
+ 3.000.000 cycles	Load (N)									
	-	-	-	220	410	485	745	1560	-	VL
	70	130	185	315	860	830	1130	2320	3250	V
	110	190	330	525	845	1520	2030	3050	5310	B
	125	200	380	935	1560	2530	3270	4860	8440	R
145	230	455	1090	1760	2800	4770	6820	11890	G	
-	-	-	-	4090	6350	7700	12280	-	-	A

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Dall' intersezione del numero di cicli e diametro si ottengono una serie di forze. Scegliere la forza più vicina a quella richiesta arrotondando per eccesso se necessario.
The intersection of the expected lifetime with the hole diameter shows different forces. Select the one closest to your need.
Durch die Eingabe von Zyklenzahl und Durchmesser erhält man eine Reihe von Kräften. Daraus die Kraft auswählen, die der gewünschten am nächsten kommt, und dabei nach oben aufrunden, falls nötig.
De l'intersection du nombre de cycles et du diamètre on obtient une série de forces. Choisir la force la plus proche de celle qui est nécessaire en arrondissant par excès au besoin.
De la intersección del número de ciclos y diámetro se obtienen una serie de fuerzas. Elegir la fuerza más cercana a aquella requerida redondeando por exceso si fuese preciso.
Da interseção do número de ciclos e do diâmetro, obtém-se uma série de forças. Escolha a força mais perto da requerida, fazendo arredondamento por excesso, se necessário.

Estimated Life	Hole diameter (mm)							Series		
	10	12,5	16	20	25	32	40		50	63
+ 3.000.000 cycles	Load (N)									
	-	-	-	220	410	485	745	1560	-	VL
	70	130	185	315	560	830	1130	2320	3250	V
	110	190	330	525	845	1520	2030	3050	5310	B
	125	200	380	935	1560	2530	3270	4860	8440	R
145	230	455	1090	1760	2800	4770	6820	11890	G	
-	-	-	-	4090	6350	7700	12280	-	-	A

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Scelta la forza richiesta (380 N) si individua la corrispondente serie di molle (R - carico forte).
After selecting the proper force box (380 N) look to the corresponding load range of springs (R - heavy load).
Nachdem die gewünschte Kraft (380 N) ausgewählt worden ist, erhält man die entsprechende Federserie (R - starke Kraft).
Après avoir choisi la force nécessaire (380 N) on repère la série correspondante de ressorts (R - charge forte).
Una vez elegida la fuerza requerida (380 N) se identifica la correspondiente serie de muelles (R - carga fuerte).
Uma vez escolhida a força requerida (380 N), se encontra a série de molas correspondente (R - carga forte).

Estimated Life	Hole diameter (mm)							Series		
	10	12,5	16	20	25	32	40		50	63
+ 3.000.000 cycles	Load (N)									
	-	-	-	220	410	485	745	1560	-	VL
	70	130	185	315	560	830	1130	2320	3250	V
	110	190	330	525	845	1520	2030	3050	5310	B
	125	200	380	935	1560	2530	3270	4860	8440	R
145	230	455	1090	1760	2800	4770	6820	11890	G	
-	-	-	-	4090	6350	7700	12280	-	-	A

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Nelle pagine delle molle serie R, ed in corrispondenza della colonna A (3.000.000 cicli), si individua la deflessione richiesta.
Then go to the standard tabs on the column A corresponding to the expected lifetime of 3.000.000 cycles and select the required total spring deflection.
Auf den Seiten der Federn der Serie R kann in der Spalte A (3.000.000 Zyklen) der gewünschte Federweg ermittelt werden.
Sur les pages des ressorts série R, et en correspondance de la colonne A (3.000.000 cycles), on repère la déflexion nécessaire.
En las páginas de los muelles serie R, y en correspondencia de la columna A (3.000.000 ciclos), se identifica la deflexión requerida.
Nas páginas das molas série R e na coluna A (3.000.000 ciclos), encontra-se a deflexão requerida.

Code	D _H	D ₀	L ₀	R	A	B	C				
					20% L ₀	25% L ₀	27.5% L ₀				
	b x h			±10%	+ 3.000.000	~ 1.500.000	300-500.000				
R 16 - 025			25	75.7	5.0	379	6.3	477	6.9	520	7
R 16 - 032			32	52.8	6.4	338	8.0	422	8.8	465	9
R 16 - 038			38	48.5	7.6	369	9.5	461	10.5	507	11
R 16 - 044			44	42.8	8.8	377	11.0	471	12.1	518	11
R 16 - 051			51	37.1	10.2	378	12.8	475	14.0	520	11
R 16 - 064	16	8	64	30.3	12.8	388	16.0	485	17.6	533	11
R 16 - 076			76	25.7	15.2	391	19.0	488	20.9	537	2
R 16 - 089			89	21.7	17.8	386	22.3	484	24.5	531	2
R 16 - 102			102	19.3	20.4	394	25.5	492	28.1	541	3
R 16 - 115			115	15.7	23.0	361	28.8	452	31.6	497	3
R 16 - 305	3.1 x 2.5		305	7.1	61.0	433	76.3	542	83.9	596	9

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Scelta la deflessione di progetto (5 mm) si individua il codice della molla corrispondente (R16 - 025). A parità di deflessione totale (% di L₀), maggiore è il precarico, maggiore sarà la durata delle molle.
Once selected the total springs deflection (5 mm) select the corresponding spring code (R16 - 025). The bigger the pre-load the longer the lifetime of springs for the same total deflection (% of L₀).
Nachdem der gewünschte Federweg (5 mm) gewählt worden ist, kann der Code der entsprechenden Feder (R16 - 025) ermittelt werden. Bei gleichem Gesamtfederweg (% L₀) ist die Lebensdauer der Federn umso größer, je höher die Vorspannung ist.
Après avoir choisi la déflexion de projet (5 mm) on repère le code du ressort correspondant (R16 - 025). A égalité de déflexion totale (% de L₀), plus la précharge est importante et plus la durée des ressorts sera longue.
Una vez elegida la deflexión de proyecto (5 mm) se identifica el código del muelle correspondiente (R16 - 025). A paridad de deflexión total (% de L₀), cuanto mayor sea la precarga, mayor será la duración de los muelles.
Uma vez escolhida a deflexão de projeto (5 mm), encontra-se o código da mola correspondente (R16 - 025). Em igualdade de deflexão total (% de L₀), quanto maior é a pré-carga, maior será a duração das molas.

Code	D _H	D ₀	L ₀	R	A	B	C				
					20% L ₀	25% L ₀	27.5% L ₀				
	b x h			±10%	+ 3.000.000	~ 1.500.000	300-500.000				
R 16 - 025			25	75.7	5.0	379	6.3	477	6.9	520	7
R 16 - 032			32	52.8	6.4	338	8.0	422	8.8	465	9
R 16 - 038			38	48.5	7.6	369	9.5	461	10.5	507	11
R 16 - 044			44	42.8	8.8	377	11.0	471	12.1	518	11
R 16 - 051			51	37.1	10.2	378	12.8	475	14.0	520	11
R 16 - 064	16	8	64	30.3	12.8	388	16.0	485	17.6	533	11
R 16 - 076			76	25.7	15.2	391	19.0	488	20.9	537	2
R 16 - 089			89	21.7	17.8	386	22.3	484	24.5	531	2
R 16 - 102			102	19.3	20.4	394	25.5	492	28.1	541	3
R 16 - 115			115	15.7	23.0	361	28.8	452	31.6	497	3
R 16 - 305	3.1 x 2.5		305	7.1	61.0	433	76.3	542	83.9	596	9

springs selection

RECTANGULAR WIRE SECTION

Estimated Life	Hole diameter (mm)									Series
	10	12.5	16	20	25	32	40	50	63	
+ 3.000.000 cycles	Load (N)									
	-	-	-	220	410	485	745	1560	-	VL
	70	130	185	315	560	830	1130	2320	3250	V
	110	190	330	525	845	1520	2030	3050	5310	B
	125	200	380	935	1560	2530	3270	4860	8440	R
	145	230	455	1090	1760	2800	4770	6820	11890	G
-	-	-	-	4090	6350	7700	12280	-	A	
~ 1.500.000 cycles	Load (N)									
	-	-	-	290	540	650	1000	2120	-	VL
	80	150	220	380	675	990	1360	2780	3900	V
	130	230	400	625	1010	1830	2430	3660	6370	B
	155	250	480	1170	1950	3170	4090	6070	10560	R
	170	270	535	1280	2070	3290	5610	8030	13990	G
-	-	-	-	4910	7620	9240	14730	-	A	
300 -500.000 cycles	Load (N)									
	-	-	-	330	610	730	1120	2380	-	VL
	95	180	260	440	780	1160	1590	3240	4540	V
	150	255	450	705	1140	2060	2730	4120	7170	B
	170	275	525	1290	2140	3480	4490	6670	11610	R
	195	305	605	1440	2320	3700	6300	9020	15740	G
-	-	-	-	5530	8570	10400	16580	-	A	
100 -200.000 cycles	Load (N)									
	-	-	-	365	680	810	1250	2650	-	VL
	110	200	300	500	890	1320	1810	3710	5190	V
	170	280	500	780	1260	2280	3040	4580	7960	B
	185	300	570	1400	2340	3800	4900	7280	12660	R
	215	340	670	1605	2585	4120	7010	10040	17330	G
-	-	-	-	6140	9520	11550	18420	-	A	



IT

I valori di durata indicati nella tabella sono ottenuti da prove interne e non sono garantiti a causa dell'elevato numero di variabili nelle reali condizioni di lavoro. Il metodo indicato per la selezione delle molle è approssimativo, si consiglia sempre di fare riferimento alle tabelle per la selezione.

EN

The stated service life values are obtained from in-house reliability tests and are not guaranteed due to the impossibility to consider all variables on the real working conditions of the springs. The selecting guide-line is an approximate method of spring selection, it is always recommended to refer to the standard tabs before using the spring.

DE

Die in der Tabelle angegebenen Werte für die Lebensdauer wurden empirisch in firmeninternen Tests ermittelt und können aufgrund der hohen Anzahl an Variablen und tatsächlichen Arbeitsbedingungen nicht garantiert werden. Das angegebene Verfahren zur Auswahl der Federn dient nur als Anhaltswert. Es wird dazu geraten, die Auswahl immer anhand der Tabellen durchzuführen.

FR

Les valeurs de durée indiquées sur le tableau sont obtenues à partir de tests internes qui ne sont pas garantis à cause du grand nombre de variables dans les conditions de travail réelles. La méthode indiquée pour la sélection des ressorts est approximative, nous conseillons toujours de se référer aux tableaux pour la sélection.

ES

Los valores de duración indicados en la tabla se obtienen por pruebas internas y no son garantizados debido al elevado número de variables en las reales condiciones de trabajo. El método indicado para la selección de los muelles es aproximativo, por eso aconsejamos hacer siempre referencia a las tablas para la selección.

PT

Os valores de duração indicados na tabela são obtidos por testes internos e não são garantidos por causa do elevado número de variáveis nas reais condições de trabalho. O método indicado para seleção das molas é aproximativo, aconselha-se sempre ter como referência as tabelas para a seleção.

springs selection

ROUND WIRE SECTION

Estimated Life	Hole diameter (mm)									Series
	10	12.5	16	20	25	32	40	50	63	
+3.000.000 cycles	Load (N)									
	25	50	100	-	-	-	-	-	-	TV
	70	130	175	-	-	-	-	-	-	TB
	100	175	360	-	-	-	-	-	-	TR
~1.500.000 cycles	Load (N)									
	30	60	115	-	-	-	-	-	-	TV
	90	150	210	-	-	-	-	-	-	TB
	120	220	450	-	-	-	-	-	-	TR
300.000 500.000 cycles	Load (N)									
	35	70	135	-	-	-	-	-	-	TV
	100	170	240	-	-	-	-	-	-	TB
	135	240	500	-	-	-	-	-	-	TR
100.000 200.000 cycles	Load (N)									
	40	80	150	-	-	-	-	-	-	TV
	110	190	290	-	-	-	-	-	-	TB
	150	260	545	-	-	-	-	-	-	TR



IT I valori di durata indicati nella tabella sono ottenuti da prove interne e non sono garantiti a causa dell'elevato numero di variabili nelle reali condizioni di lavoro. Il metodo indicato per la selezione delle molle è approssimativo, si consiglia sempre di fare riferimento alle tabelle per la selezione.

EN The stated service life values are obtained from in-house reliability tests and are not guaranteed due to the impossibility to consider all variables on the real working conditions of the springs. The selecting guide-line is an approximate method of spring selection, it is always recommended to refer to the standard tabs before using the spring.

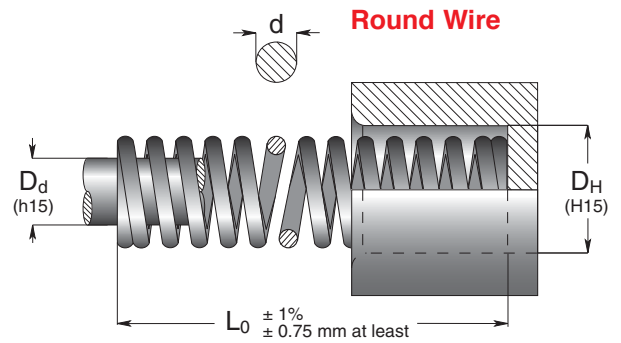
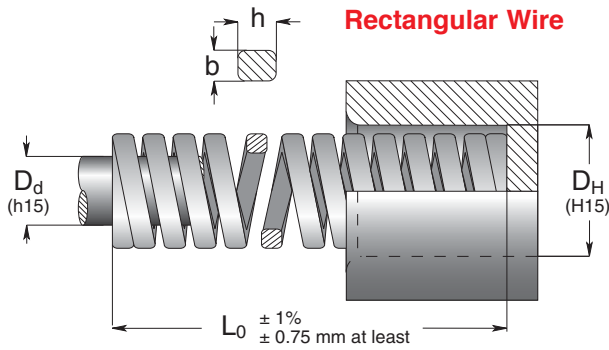
DE Die in der Tabelle angegebenen Werte für die Lebensdauer wurden empirisch in firmeninternen Tests ermittelt und können aufgrund der hohen Anzahl an Variablen und tatsächlichen Arbeitsbedingungen nicht garantiert werden. Das angegebene Verfahren zur Auswahl der Federn dient nur als Anhaltswert. Es wird dazu geraten, die Auswahl immer anhand der Tabellen durchzuführen.

FR Les valeurs de durée indiquées sur le tableau sont obtenues à partir de tests internes qui ne sont pas garantis à cause du grand nombre de variables dans les conditions de travail réelles. La méthode indiquée pour la sélection des ressorts est approximative, nous conseillons toujours de se référer aux tableaux pour la sélection.

ES Los valores de duración indicados en la tabla se obtienen por pruebas internas y no son garantizados debido al elevado número de variables en las reales condiciones de trabajo. El método indicado para la selección de los muelles es aproximativo, por eso aconsejamos hacer siempre referencia a las tablas para la selección.

PT Os valores de duração indicados na tabela são obtidos por testes internos e não são garantidos por causa do elevado número de variáveis nas reais condições de trabalho. O método indicado para seleção das molas é aproximativo, aconselha-se sempre ter como referência as tabelas para a seleção.

how to read



Code	D _H	D _d	L ₀	R	A	B	C	D	E	
	Hole Diameter	Rod Diameter	Free Length	Spring Constant	% L ₀	% L ₀	% L ₀	% L ₀	approx.	
	b x h, d			± 10%	+ 3.000.000	~ 1.500.000	300 - 500.000	100 - 200.000	do not use	Pcs
	mm	mm	mm	N/mm	mm	N	mm	N	mm	

D_H diametro del foro di alloggiamento.
hole diameter.
Außenführungsdurchmesser.
diamètre du trou de logement.
diámetro del agujero de alojamiento.
diâmetro do furo de alojamento.

D_d diametro della spina di guida.
rod diameter.
Innenführungsdurchmesser.
diamètre de l'arbre de guidage.
diámetro de la clavija de guía.
diâmetro da tomada de guia.

b x h sezione del profilo.
cross wire section.
d Profilquerschnitt.
section du profilé.
sección del perfil.
seção do perfil.

L₀ lunghezza libera della molla.
spring free length.
Länge der unbelasteten Feder.
longueur libre du ressort.
longitud libre del muelle.
comprimento livre da mola.

R carico (N) necessario per deflettere la molla di 1 millimetro.
spring rate (load required for 1mm deflection).
Federrate.
charge exigée pour comprimer le ressort 1mm.
carga (N) necesaria para desviar el muelle de 1 milímetro.
carga (N) necessária para defletir a mola de 1 milímetro.


A deflessione totale consigliata per una durata della molla maggiore a 3.000.000 di cicli.
advised working deflection for more than 3.000.000 cycles.
Empfohlener Gesamtfederweg für eine Lebensdauer der Feder von mehr als 3.000.000 Zyklen.
déflexion totale conseillée pour une durée du ressort supérieure à 3.000.000 de cycles.
deflexión total aconsejada para una duración del muelle superior a 3.000.000 de ciclos.
deflexão total aconselhada para duração da mola superior a 3.000.000 de ciclos.

B deflessione totale consigliata per una durata della molla di circa 1.500.000 di cicli.
advised working deflection for about 1.500.000 cycles.
Empfohlener Gesamtfederweg für eine Lebensdauer der Feder für eine durchschnittliche Lebensdauer von 1.500.000 Zyklen.
déflexion totale conseillée pour une durée du ressort d'environ 1.500.000 cycles.
deflexión total aconsejada para una duración del muelle de aproximadamente 1.500.000 de ciclos.
deflexão total aconselhada para duração da mola de cerca 1.500.000 de ciclos.

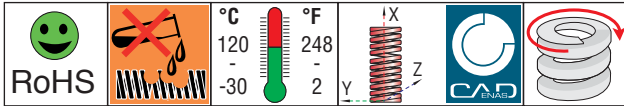
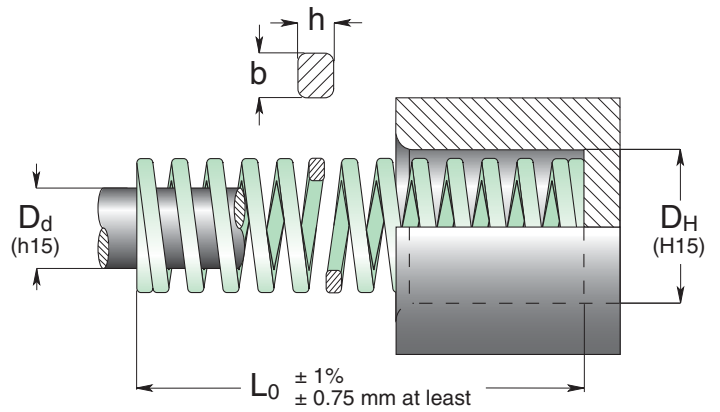
C deflessione totale consigliata per una durata della molla di circa 300.000 - 500.000 cicli.
advised working deflection for about 300.000 - 500.000 cycles.
Empfohlener Gesamtfederweg für eine Lebensdauer der Feder von ca. 300.000 bis 500.000 Zyklen.
déflexion totale conseillée pour une durée du ressort d'environ 300.000 - 500.000 cycles.
deflexión total aconsejada para una duración del muelle de aproximadamente 300.000 - 500.000 ciclos.
deflexão total aconselhada para duração da mola de cerca 300.000 - 500.000 ciclos.

D deflessione totale massima per una durata della molla di circa 100.000 - 200.000 cicli.
advised working deflection for about 100.000 - 200.000 cycles.
Maximaler Gesamtfederweg für eine Lebensdauer der Feder von ca. 100.000 bis 200.000 Zyklen.
déflexion totale maximum pour une durée du ressort d'environ 100.000 - 200.000 cycles.
deflexión total máxima para una duración del muelle de aproximadamente 100.000 - 200.000 ciclos.
deflexão total máxima para duração da mola de cerca 100.000 - 200.000 ciclos.

E deflessione approssimativa per molla a blocco.
solid deflection (approximate value).
Näherungswert Federweg für Blockfeder.
approx. déflexion approximative pour ressort à bloc.
deflexión aproximada por muelle a bloque.
deflexão aproximativa por mola a bloco.

 numero di pezzi per confezione.
quantity for standard packaging.
Stück pro Packung.
nombre de pièces par boîte.
número de piezas por confección.
número de peças por embalagem.

- IT** Molle carico extra-leggero
- EN** Extra-light load springs
- DE** Federn für leichte Spannung
- FR** Ressorts charge extra-légère
- ES** Muelles carga extra-ligera
- PT** Molas carga extra-leve



Code	D _H D _d		L ₀	R	A	B	C	D	E	Pcs				
	Hole Diameter	Rod Diameter												
	b x h		Free Length	Spring Constant	30% L ₀	40% L ₀	45% L ₀	50% L ₀	approx.					
	mm	mm	mm	± 10% N/mm	+ 3.000.000 mm N	~ 1.500.000 mm N	300 - 500.000 mm N	100 - 200.000 mm N	do not use					
VL 20 - 025	20	10	25	29.4	7.5	221	10.0	294	11.3	331	12.5	368	13.9	50
VL 20 - 032			32	22.6	9.6	217	12.8	289	14.4	325	16.0	362	18.2	50
VL 20 - 038			38	18.6	11.4	212	15.2	283	17.1	318	19.0	353	22.0	25
VL 20 - 044			44	15.7	13.2	207	17.6	276	19.8	311	22.0	345	25.8	25
VL 20 - 051			51	13.7	15.3	210	20.4	279	23.0	314	25.5	349	30.3	25
VL 20 - 064			64	11.3	19.2	217	25.6	289	28.8	325	32.0	362	38.9	25
VL 20 - 076			76	9.8	22.8	223	30.4	298	34.2	335	38.0	372	47.0	25
VL 20 - 089			89	8.3	26.7	222	35.6	295	40.1	332	44.5	369	55.7	20
VL 20 - 102			102	7.4	30.6	226	40.8	302	45.9	340	51.0	377	64.2	20
VL 20 - 115			115	6.4	34.5	221	46.0	294	51.8	331	57.5	368	72.9	10
VL 20 - 127			127	5.9	38.1	225	50.8	300	57.2	337	63.5	375	80.7	10
VL 20 - 139			139	5.4	41.7	225	55.6	300	62.6	338	69.5	375	88.4	10
VL 20 - 152	152	4.9	45.6	223	60.8	298	68.4	335	76.0	372	96.7	10		
VL 20 - 305	4.3 x 1.7		305	2.5	91.5	229	122	305	137	343	153	381	196	10
VL 25 - 025	25	12.5	25	53.9	7.5	404	10.0	539	11.3	606	12.5	674	12.9	50
VL 25 - 032			32	42.2	9.6	405	12.8	540	14.4	608	16.0	675	17.2	25
VL 25 - 038			38	35.8	11.4	408	15.2	544	17.1	612	19.0	680	20.7	25
VL 25 - 044			44	31.4	13.2	414	17.6	553	19.8	622	22.0	691	24.4	25
VL 25 - 051			51	27.0	15.3	413	20.4	551	23.0	620	25.5	689	28.5	25
VL 25 - 064			64	21.6	19.2	415	25.6	553	28.8	622	32.0	691	36.5	25
VL 25 - 076			76	18.1	22.8	413	30.4	550	34.2	619	38.0	688	43.9	20
VL 25 - 089			89	15.2	26.7	406	35.6	541	40.1	609	44.5	676	51.4	20
VL 25 - 102			102	13.2	30.6	404	40.8	539	45.9	606	51.0	673	59.3	20
VL 25 - 115			115	11.8	34.5	407	46.0	543	51.8	611	57.5	679	67.2	10
VL 25 - 127			127	10.6	38.1	404	50.8	538	57.2	606	63.5	673	74.4	10
VL 25 - 139			139	9.6	41.7	400	55.6	534	62.6	600	69.5	667	81.6	10
VL 25 - 152	152	8.8	45.6	401	60.8	535	68.4	602	76.0	669	89.5	10		
VL 25 - 178	178	7.6	53.4	406	71.2	541	80.1	609	89.0	676	105	10		
VL 25 - 203	203	6.7	60.9	408	81.2	544	91.4	612	102	680	121	10		
VL 25 - 305	5.4 x 2.2		305	4.4	91.5	403	122	537	137	604	153	671	182	5
VL 32 - 038	32	16	38	43.1	11.4	491	15.2	655	17.1	737	19.0	819	19.9	20
VL 32 - 044			44	37.3	13.2	492	17.6	656	19.8	739	22.0	821	23.5	20
VL 32 - 051			51	32.4	15.3	496	20.4	661	23.0	744	25.5	826	27.6	20
VL 32 - 064			64	25.5	19.2	490	25.6	653	28.8	734	32.0	816	35.2	20
VL 32 - 076			76	21.6	22.8	492	30.4	657	34.2	739	38.0	821	42.4	20
VL 32 - 089			89	18.1	26.7	483	35.6	644	40.1	725	44.5	805	50.0	10
VL 32 - 102			102	15.7	30.6	480	40.8	641	45.9	721	51.0	801	57.6	10
VL 32 - 115			115	14.2	34.5	490	46.0	653	51.8	735	57.5	817	65.5	10
VL 32 - 127			127	12.7	38.1	484	50.8	645	57.2	726	63.5	806	72.5	10
VL 32 - 139			139	11.6	41.7	484	55.6	645	62.6	726	69.5	806	79.4	10
VL 32 - 152			152	10.6	45.6	483	60.8	644	68.4	725	76.0	806	87.3	10
VL 32 - 178			178	9.0	53.4	481	71.2	641	80.1	721	89.0	801	103	5
VL 32 - 203	203	7.8	60.9	475	81.2	633	91.4	713	102	792	118	5		
VL 32 - 254	254	6.4	76.2	488	102	650	114	732	127	813	148	5		
VL 32 - 305	6.5 x 2.6		305	5.3	91.5	485	122	647	137	727	153	808	178	5



Special Springs Standard

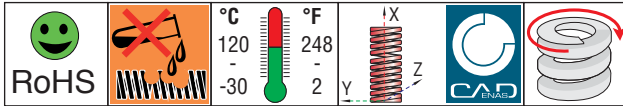
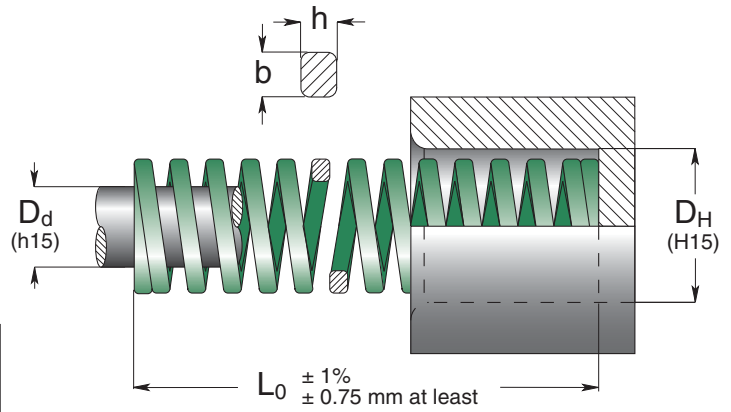
SERIES VL

Code	D _H Hole Diameter	D _d Rod Diameter	L ₀ Free Length	R Spring Constant	A 30% L ₀		B 40% L ₀		C 45% L ₀		D 50% L ₀		E do not use approx.	Pcs
					± 10%	+ 3.000.000	~ 1.500.000	300 - 500.000	100 - 200.000	mm	N			
	b x h		mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm	
	mm	mm												
VL 40 - 051	40	20	51	48.1	± 10%	+ 3.000.000	20.4	981	23.0	1104	25.5	1227	28.0	20
VL 40 - 064			64	39.2	± 10%	+ 3.000.000	25.6	1004	28.8	1129	32.0	1254	36.2	10
VL 40 - 076			76	33.3	± 10%	+ 3.000.000	30.4	1012	34.2	1139	38.0	1265	43.7	10
VL 40 - 089			89	28.4	± 10%	+ 3.000.000	35.6	1011	40.1	1137	44.5	1264	51.7	10
VL 40 - 102			102	24.5	± 10%	+ 3.000.000	40.8	1000	45.9	1125	51.0	1250	59.8	10
VL 40 - 115			115	22.1	± 10%	+ 3.000.000	46.0	1017	51.8	1144	57.5	1271	67.9	10
VL 40 - 127			127	19.6	± 10%	+ 3.000.000	50.8	996	57.2	1120	63.5	1245	75.2	5
VL 40 - 139			139	17.7	± 10%	+ 3.000.000	55.6	984	62.6	1107	69.5	1230	82.4	5
VL 40 - 152			152	16.2	± 10%	+ 3.000.000	60.8	985	68.4	1108	76.0	1231	90.6	5
VL 40 - 178			178	13.7	± 10%	+ 3.000.000	71.2	975	80.1	1097	89.0	1219	106	5
VL 40 - 203			203	12.3	± 10%	+ 3.000.000	81.2	999	91.4	1124	101	1248	122	5
VL 40 - 254			254	9.8	± 10%	+ 3.000.000	102	996	114	1120	127	1245	154	2
VL 40 - 305			305	8.3	± 10%	+ 3.000.000	122	1013	137	1139	152	1266	185	2
VL 50 - 064	50	25	64	86.3	± 10%	+ 3.000.000	25.6	2209	28.8	2485	32.0	2762	35.1	5
VL 50 - 076			76	70.6	± 10%	+ 3.000.000	30.4	2146	34.2	2415	38.0	2683	42.2	5
VL 50 - 089			89	59.8	± 10%	+ 3.000.000	35.6	2129	40.1	2395	44.5	2661	50.3	5
VL 50 - 102			102	52.0	± 10%	+ 3.000.000	40.8	2122	45.9	2387	51.0	2652	58.4	5
VL 50 - 115			115	46.1	± 10%	+ 3.000.000	46.0	2121	51.8	2386	57.5	2651	66.1	5
VL 50 - 127			127	42.2	± 10%	+ 3.000.000	50.8	2144	57.2	2412	63.5	2680	73.8	5
VL 50 - 139			139	38.2	± 10%	+ 3.000.000	55.6	2124	62.6	2389	69.5	2655	80.9	5
VL 50 - 152			152	34.3	± 10%	+ 3.000.000	60.8	2085	68.4	2346	76.0	2607	89.0	2
VL 50 - 178			178	29.4	± 10%	+ 3.000.000	71.2	2093	80.1	2355	89.0	2617	105	2
VL 50 - 203			203	25.5	± 10%	+ 3.000.000	81.2	2071	91.4	2329	101	2588	121	2
VL 50 - 254			254	20.6	± 10%	+ 3.000.000	102	2093	114	2355	127	2616	152	2
VL 50 - 305			305	17.2	± 10%	+ 3.000.000	122	2098	137	2361	152	2623	184	2

VL



- IT** Molle carico leggero
- EN** Light load springs
- DE** Federn für normale Spannung
- FR** Ressorts charge légère
- ES** Muelles carga ligera
- PT** Molas carga leve



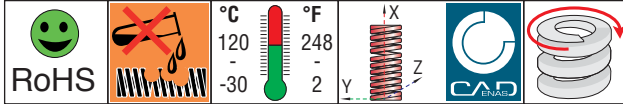
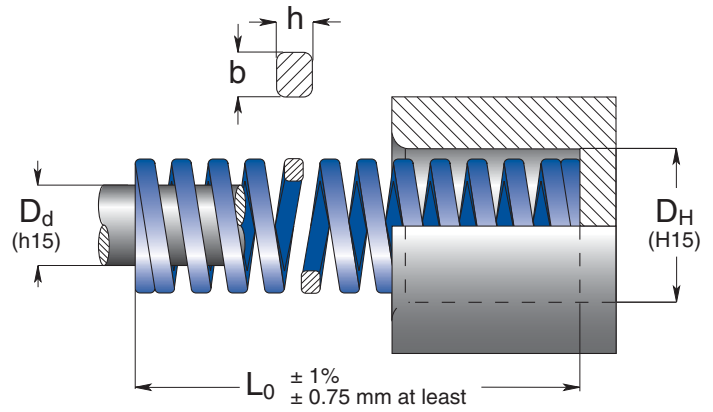
Code	D _H		L ₀	R	A	B	C	D	E	Pcs				
	b x h													
	mm	mm												
			Free Length	Spring Constant	25% L ₀	30% L ₀	35% L ₀	40% L ₀	approx. do not use					
			mm	N/mm	mm	mm	mm	mm	mm					
				± 10%	+ 3.000.000	~ 1.500.000	300 - 500.000	100 - 200.000						
					N	N	N	N						
V 10 - 025	10	5	25	10	6.3	63	7.5	75	8.8	88	10.0	100	13.5	50
V 10 - 032			32	8.5	8.0	68	9.6	82	11.2	95	12.8	109	17.5	50
V 10 - 038			38	6.8	9.5	65	11.4	78	13.3	90	15.2	103	20.8	50
V 10 - 044			44	6.0	11.0	66	13.2	79	15.4	92	17.6	106	23.9	50
V 10 - 051			51	5.0	12.8	64	15.3	77	17.9	89	20.4	102	28.9	25
V 10 - 064			64	4.3	16.0	69	19.2	83	22.4	96	25.6	110	36.1	25
V 10 - 076			76	3.2	19.0	61	22.8	73	26.6	85	30.4	97	43.2	25
V 10 - 305	1.7 x 1.1		305	1.1	76.3	84	91.5	101	107	117	122	134	178	10
V 13 - 025	12.5	6.3	25	17.9	6.3	113	7.5	134	8.8	157	10.0	179	13.2	50
V 13 - 032			32	16.4	8.0	131	9.6	157	11.2	184	12.8	210	18.0	50
V 13 - 038			38	13.6	9.5	129	11.4	155	13.3	181	15.2	207	21.0	50
V 13 - 044			44	12.1	11.0	133	13.2	160	15.4	186	17.6	213	24.0	25
V 13 - 051			51	11.4	12.8	146	15.3	174	17.9	203	20.4	233	28.7	25
V 13 - 064			64	9.3	16.0	149	19.2	179	22.4	208	25.6	238	35.8	25
V 13 - 076			76	7.1	19.0	135	22.8	162	26.6	189	30.4	216	42.7	25
V 13 - 089	89	5.4	22.3	120	26.7	144	31.2	168	35.6	192	50.4	20		
V 13 - 102	102	4.1	25.5	105	30.6	125	35.7	146	40.8	167	58.4	10		
V 13 - 305	2.4 x 1.4		305	1.4	76.3	107	91.5	128	107	149	122	171	172	10
V 16 - 025	16	8	25	23.4	6.3	147	7.5	176	8.8	205	10.0	234	12.6	50
V 16 - 032			32	22.9	8.0	183	9.6	220	11.2	256	12.8	293	16.4	50
V 16 - 038			38	19.3	9.5	183	11.4	220	13.3	257	15.2	293	19.7	25
V 16 - 044			44	17.1	11.0	188	13.2	226	15.4	263	17.6	301	22.5	25
V 16 - 051			51	15.7	12.8	201	15.3	240	17.9	280	20.4	320	26.3	25
V 16 - 064			64	10.7	16.0	171	19.2	205	22.4	240	25.6	274	33.3	25
V 16 - 076			76	10.0	19.0	190	22.8	228	26.6	266	30.4	304	40.2	20
V 16 - 089	89	8.6	22.3	192	26.7	230	31.2	268	35.6	306	47.6	20		
V 16 - 102	102	7.8	25.5	199	30.6	239	35.7	278	40.8	318	55.4	20		
V 16 - 115	115	6.6	28.8	190	34.5	228	40.3	266	46.0	304	60.8	10		
V 16 - 305	3.2 x 1.5		305	2.5	76.3	191	91.5	229	107	267	122	305	165	10
V 20 - 025	20	10	25	55.8	6.3	352	7.5	419	8.8	488	10.0	558	12.1	50
V 20 - 032			32	45.0	8.0	360	9.6	432	11.2	504	12.8	576	15.3	50
V 20 - 038			38	33.3	9.5	316	11.4	380	13.3	443	15.2	506	18.9	25
V 20 - 044			44	30.0	11.0	330	13.2	396	15.4	462	17.6	528	21.5	25
V 20 - 051			51	24.5	12.8	314	15.3	375	17.9	437	20.4	500	25.0	25
V 20 - 064			64	20.0	16.0	320	19.2	384	22.4	448	25.6	512	31.1	25
V 20 - 076			76	16.0	19.0	304	22.8	365	26.6	426	30.4	486	37.3	25
V 20 - 089	89	14.0	22.3	312	26.7	374	31.2	436	35.6	498	44.5	20		
V 20 - 102	102	12.0	25.5	306	30.6	367	35.7	428	40.8	490	51.1	20		
V 20 - 115	115	10.9	28.8	314	34.5	376	40.3	439	46.0	501	58.2	10		
V 20 - 127	127	9.5	31.8	302	38.1	362	44.5	422	50.8	483	64.9	10		
V 20 - 139	139	8.4	35.0	294	42.0	353	48.7	409	56.0	470	71.5	10		
V 20 - 152	152	7.5	38.0	285	45.6	342	53.2	399	60.8	456	78.8	10		
V 20 - 305	4.0 x 2.1		305	4.0	76.3	305	91.5	366	107	427	122	488	157	10

Code	D _H	D _d	L ₀	R	A		B		C		D		E	Pcs		
	Hole Diameter	Rod Diameter	Free Length	Spring Constant	25% L ₀		30% L ₀		35% L ₀		40% L ₀		approx.			
	b x h		± 10%	± 3.000.000	~ 1.500.000		300 - 500.000		100 - 200.000		do not use					
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm			
V 25 - 025	25	12.5	25	100	6.3	630	7.5	750	8.8	875	10.0	1000	11.9	50		
V 25 - 032			32	80.3	8.0	642	9.6	771	11.2	899	12.8	1028	16.0	25		
V 25 - 038			38	62.0	9.5	589	11.4	707	13.3	825	15.2	942	18.3	25		
V 25 - 044			44	52.9	11.0	582	13.2	698	15.4	815	17.6	931	21.4	25		
V 25 - 051			51	44.0	12.8	563	15.3	673	17.9	785	20.4	898	24.9	25		
V 25 - 064			64	35.2	16.0	563	19.2	676	22.4	788	25.6	901	31.4	25		
V 25 - 076			76	28.0	19.0	532	22.8	638	26.6	745	30.4	851	37.5	20		
V 25 - 089			89	24.0	22.3	535	26.7	641	31.2	748	35.6	854	43.5	20		
V 25 - 102			102	21.1	25.5	538	30.6	646	35.7	753	40.8	861	51.1	20		
V 25 - 115			115	18.7	28.8	539	34.5	645	40.3	753	46.0	860	58.1	10		
V 25 - 127			127	16.7	31.8	531	38.1	636	44.5	742	50.8	848	64.1	10		
V 25 - 139			139	15.3	35.0	536	42.0	643	48.7	744	56.0	857	70.4	10		
V 25 - 152			152	14.0	38.0	532	45.6	638	53.2	745	60.8	851	77.1	10		
V 25 - 178			178	12.5	44.5	556	53.4	668	62.3	779	71.2	890	93.1	10		
V 25 - 203			203	10.4	50.8	528	60.9	633	71.1	739	81.2	844	103	10		
V 25 - 305	5.4 x 2.7	305	7.0	76.3	534	91.5	641	107	747	122	854	156	5			
V 32 - 038	32	16	38	94.0	9.5	893	11.4	1072	13.3	1250	15.2	1429	18.3	20		
V 32 - 044			44	79.5	11.0	875	13.2	1049	15.4	1224	17.6	1399	21.5	20		
V 32 - 051			51	67.0	12.8	858	15.3	1025	17.9	1196	20.4	1367	25.5	20		
V 32 - 064			64	53.0	16.0	848	19.2	1018	22.4	1187	25.6	1357	31.9	20		
V 32 - 076			76	44.0	19.0	836	22.8	1003	26.6	1170	30.4	1338	38.6	20		
V 32 - 089			89	37.2	22.3	830	26.7	993	31.2	1159	35.6	1324	46.5	10		
V 32 - 102			102	32.0	25.5	816	30.6	979	35.7	1142	40.8	1306	53.2	10		
V 32 - 115			115	29.0	28.8	835	34.5	1001	40.3	1167	46.0	1334	60.0	10		
V 32 - 127			127	25.0	31.8	795	38.1	953	44.5	1111	50.8	1270	66.7	10		
V 32 - 139			139	23.0	35.0	805	42.0	966	48.7	1119	56.0	1288	71.8	10		
V 32 - 152			152	21.5	38.0	817	45.6	980	53.2	1144	60.8	1307	78.5	10		
V 32 - 178			178	18.2	44.5	810	53.4	972	62.3	1134	71.2	1296	94.4	5		
V 32 - 203			203	15.8	50.8	803	60.9	962	71.1	1123	81.2	1283	107	5		
V 32 - 254			254	12.5	63.5	794	76.2	953	88.9	1111	102	1270	136	5		
V 32 - 305			6.8 x 3.3	305	10.3	76.3	786	91.5	942	107	1100	122	1257	163	5	
V 40 - 051	40	20	51	92.0	12.8	1178	15.3	1408	17.9	1642	20.4	1877	25.5	20		
V 40 - 064			64	73.0	16.0	1168	19.2	1402	22.4	1635	25.6	1869	31.4	10		
V 40 - 076			76	63.0	19.0	1197	22.8	1436	26.6	1676	30.4	1915	37.8	10		
V 40 - 089			89	51.0	22.3	1137	26.7	1362	31.2	1589	35.6	1816	44.3	10		
V 40 - 102			102	43.0	25.5	1097	30.6	1316	35.7	1535	40.8	1754	50.7	10		
V 40 - 115			115	39.6	28.8	1140	34.5	1366	40.3	1594	46.0	1822	58.1	10		
V 40 - 127			127	37.0	31.8	1177	38.1	1410	44.5	1645	50.8	1880	64.6	5		
V 40 - 139			139	32.0	35.0	1120	42.0	1344	48.7	1557	56.0	1792	70.1	5		
V 40 - 152			152	28.0	38.0	1064	45.6	1277	53.2	1490	60.8	1702	76.6	5		
V 40 - 178			178	25.2	44.5	1121	53.4	1346	62.3	1570	71.2	1794	90.4	5		
V 40 - 203			203	22.7	50.8	1153	60.9	1382	71.1	1613	81.2	1843	102	5		
V 40 - 254			254	17.0	63.5	1080	76.2	1295	88.9	1511	102	1727	129	2		
V 40 - 305			8.1 x 4.0	305	14.8	76.3	1129	91.5	1354	107	1580	122	1806	156	2	
V 50 - 064			50	25	64	156	16.0	2496	19.2	2995	22.4	3494	25.6	3994	31.0	5
V 50 - 076					76	125	19.0	2375	22.8	2850	26.6	3325	30.4	3800	37.2	5
V 50 - 089	89	109			22.3	2431	26.7	2910	31.2	3395	35.6	3880	43.6	5		
V 50 - 102	102	94.0			25.5	2397	30.6	2876	35.7	3356	40.8	3835	50.3	5		
V 50 - 115	115	81.0			28.8	2333	34.5	2795	40.3	3260	46.0	3726	58.1	5		
V 50 - 127	127	71.0			31.8	2258	38.1	2705	44.5	3156	50.8	3607	63.7	5		
V 50 - 139	139	66.5			35.0	2328	42.0	2793	48.7	3235	56.0	3724	69.5	5		
V 50 - 152	152	60.0			38.0	2280	45.6	2736	53.2	3192	60.8	3648	76.5	2		
V 50 - 178	178	52.0			44.5	2314	53.4	2777	62.3	3240	71.2	3702	91.9	2		
V 50 - 203	203	44.0			50.8	2235	60.9	2680	71.1	3126	81.2	3573	105	2		
V 50 - 254	254	35.0			63.5	2223	76.2	2667	88.9	3112	102	3556	131	2		
V 50 - 305	10.9 x 5.3	305			28.5	76.3	2175	91.5	2608	107	3042	122	3477	155	2	
V 63 - 076	63	38			76	189	19.0	3591	22.8	4309	26.6	5027	30.4	5746	36.5	5
V 63 - 089					89	158	22.3	3523	26.7	4219	31.2	4922	35.6	5625	43.4	5
V 63 - 102					102	131	25.5	3341	30.6	4009	35.7	4677	40.8	5345	49.7	5
V 63 - 115			115	116	28.8	3341	34.5	4002	40.3	4669	46.0	5336	55.6	5		
V 63 - 127			127	103	31.8	3275	38.1	3924	44.5	4578	50.8	5232	62.7	2		
V 63 - 152			152	84.3	38.0	3203	45.6	3844	53.2	4485	60.8	5125	77.1	2		
V 63 - 178			178	71.5	44.5	3182	53.4	3818	62.3	4454	71.2	5091	92.2	2		
V 63 - 203			203	61.7	50.8	3134	60.9	3758	71.1	4384	81.2	5010	103	2		
V 63 - 254			254	47.0	63.5	2985	76.2	3581	88.9	4178	102	4775	130	2		
V 63 - 305			11.0 x 7.8	305	38.2	76.3	2915	91.5	3495	107	4078	122	4660	157	2	

V



- IT** Molle carico medio
- EN** Medium load springs
- DE** Federn für mittlere Spannung
- FR** Ressorts charge moyenne
- ES** Muelles carga mediana
- PT** Molas carga média



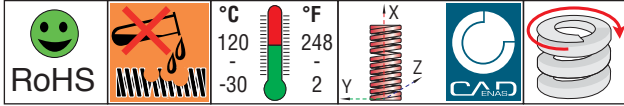
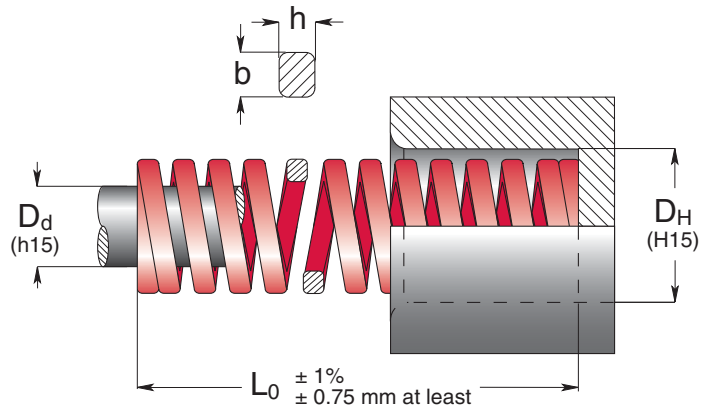
Code	D _H		D _d	L ₀	R	A		B		C		D		E	Pcs
	Hole Diameter					Spring Constant	25% L ₀	30% L ₀	33.75% L ₀	37.5% L ₀	do not use				
	b x h			± 10%	+ 3.000.000	~ 1.500.000	300 - 500.000	100 - 200.000	approx.		do not use				
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm	mm	
B 10 - 025	10	5	25	16.0	6.3	101	7.5	120	8.4	135	9.4	150	10.2	50	
B 10 - 032			32	13.0	8.0	104	9.6	125	10.8	140	12.0	156	14.2	50	
B 10 - 038			38	11.9	9.5	113	11.4	136	12.8	153	14.3	170	16.8	50	
B 10 - 044			44	10.3	11.0	113	13.2	136	14.9	153	16.5	170	19.4	50	
B 10 - 051			51	8.9	12.8	114	15.3	136	17.2	153	19.1	170	23.4	25	
B 10 - 064			64	7.5	16.0	120	19.2	144	21.6	162	24.0	180	28.2	25	
B 10 - 076			76	5.3	19.0	101	22.8	121	25.7	136	28.5	151	34.2	25	
B 10 - 305	1.9 x 1.3		305	1.6	76.3	122	91.5	146	103	165	114	183	134	10	
B 13 - 025	12.5	6.3	25	30.0	6.3	189	7.5	225	8.4	253	9.4	282	11.9	50	
B 13 - 032			32	24.8	8.0	198	9.6	238	10.8	268	12.0	298	16.2	50	
B 13 - 038			38	21.4	9.5	203	11.4	244	12.8	274	14.3	306	18.7	50	
B 13 - 044			44	18.5	11.0	204	13.2	244	14.9	275	16.5	305	21.3	25	
B 13 - 051			51	15.5	12.8	198	15.3	237	17.2	267	19.1	296	25.6	25	
B 13 - 064			64	12.1	16.0	194	19.2	232	21.6	261	24.0	290	32.4	25	
B 13 - 076			76	10.2	19.0	194	22.8	233	25.7	262	28.5	291	39.0	25	
B 13 - 089			89	8.4	22.3	187	26.7	224	30.0	252	33.4	281	45.9	20	
B 13 - 102			102	6.3	25.5	161	30.6	193	34.4	217	38.3	241	52.3	10	
B 13 - 305	2.5 x 1.5		305	2.1	76.3	160	91.5	192	103	216	114	240	153	10	
B 16 - 025	16	8	25	49.4	6.3	311	7.5	371	8.4	417	9.4	464	10.5	50	
B 16 - 032			32	37.1	8.0	297	9.6	356	10.8	401	12.0	445	13.2	50	
B 16 - 038			38	33.9	9.5	322	11.4	386	12.8	435	14.3	485	17.2	25	
B 16 - 044			44	30.0	11.0	330	13.2	396	14.9	446	16.5	495	19.4	25	
B 16 - 051			51	26.4	12.8	338	15.3	404	17.2	454	19.1	504	24.2	25	
B 16 - 064			64	20.5	16.0	328	19.2	394	21.6	443	24.0	492	29.2	25	
B 16 - 076			76	17.8	19.0	338	22.8	406	25.7	457	28.5	507	36.3	20	
B 16 - 089			89	15.2	22.3	339	26.7	406	30.0	457	33.4	508	41.7	20	
B 16 - 102			102	13.5	25.5	344	30.6	413	34.4	465	38.3	517	48.9	20	
B 16 - 115			115	11.8	28.8	340	34.5	407	38.8	458	43.1	509	53.1	10	
B 16 - 305			3.2 x 2.0		305	4.8	76.3	366	91.5	439	103	494	114	549	142
B 20 - 025	20	10	25	98.0	6.3	617	7.5	735	8.4	827	9.4	921	10.5	50	
B 20 - 032			32	72.6	8.0	581	9.6	697	10.8	784	12.0	871	13.9	50	
B 20 - 038			38	56.0	9.5	532	11.4	638	12.8	718	14.3	801	16.6	25	
B 20 - 044			44	47.5	11.0	523	13.2	627	14.9	705	16.5	784	18.8	25	
B 20 - 051			51	41.7	12.8	534	15.3	638	17.2	718	19.1	796	23.1	25	
B 20 - 064			64	32.3	16.0	517	19.2	620	21.6	698	24.0	775	27.5	25	
B 20 - 076			76	25.1	19.0	477	22.8	572	25.7	644	28.5	715	33.8	25	
B 20 - 089			89	22.0	22.3	491	26.7	587	30.0	661	33.4	735	39.7	20	
B 20 - 102			102	19.8	25.5	505	30.6	606	34.4	682	38.3	758	47.3	20	
B 20 - 115			115	18.1	28.8	521	34.5	624	38.8	703	43.1	780	52.5	10	
B 20 - 127			127	16.6	31.8	528	38.1	632	42.9	712	47.6	790	56.9	10	
B 20 - 139			139	15.1	35.0	529	42.0	634	46.9	708	52.5	793	62.1	10	
B 20 - 152			152	13.2	38.0	500	45.6	600	51.3	677	57.0	750	67.6	10	
B 20 - 305			4.1 x 2.4		305	6.1	76.3	465	91.5	558	103	628	114	698	143

Code	D _H	D _d	L ₀	R	A		B		C		D		E	Pcs		
	Hole Diameter	Rod Diameter	Free Length	Spring Constant	25% L ₀		30% L ₀		33.75% L ₀		37.5% L ₀		approx.			
	b x h		± 10%	± 10%	+ 3.000.000	~ 1.500.000		300 - 500.000		100 - 200.000		do not use				
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm			
B 25 - 025	25	12.5	25	147	6.3	926	7.5	1103	8.4	1240	9.4	1382	10.2	50		
B 25 - 032			32	118	8.0	944	9.6	1133	10.8	1274	12.0	1416	13.7	25		
B 25 - 038			38	93.0	9.5	884	11.4	1060	12.8	1193	14.3	1330	15.7	25		
B 25 - 044			44	80.8	11.0	889	13.2	1067	14.9	1200	16.5	1333	18.2	25		
B 25 - 051			51	68.6	12.8	878	15.3	1050	17.2	1181	19.1	1310	21.7	25		
B 25 - 064			64	53.0	16.0	848	19.2	1018	21.6	1145	24.0	1272	26.0	25		
B 25 - 076			76	43.2	19.0	821	22.8	985	25.7	1108	28.5	1231	32.3	20		
B 25 - 089			89	38.2	22.3	852	26.7	1020	30.0	1147	33.4	1276	38.0	20		
B 25 - 102			102	33.0	25.5	842	30.6	1010	34.4	1136	38.3	1264	43.0	20		
B 25 - 115			115	28.0	28.8	806	34.5	966	38.8	1087	43.1	1207	48.6	10		
B 25 - 127			127	25.9	31.8	824	38.1	987	42.9	1110	47.6	1233	53.7	10		
B 25 - 139			139	23.2	35.0	812	42.0	974	46.9	1088	52.5	1218	59.4	10		
B 25 - 152			152	20.8	38.0	790	45.6	948	51.3	1067	57.0	1186	63.8	10		
B 25 - 178			178	17.8	44.5	792	53.4	951	60.1	1069	66.8	1189	76.6	10		
B 25 - 203			203	15.8	50.8	803	60.9	962	68.5	1082	76.1	1202	88.4	10		
B 25 - 305	5.4 x 3.3	305	10.2	76.3	778	91.5	933	103	1050	114	1167	135	5			
B 32 - 038	32	16	38	185	9.5	1758	11.4	2109	12.8	2373	14.3	2646	16.3	20		
B 32 - 044			44	158	11.0	1738	13.2	2086	14.9	2346	16.5	2607	18.9	20		
B 32 - 051			51	134	12.8	1715	15.3	2050	17.2	2306	19.1	2559	23.1	20		
B 32 - 064			64	99.0	16.0	1584	19.2	1901	21.6	2138	24.0	2376	28.5	20		
B 32 - 076			76	108	19.0	1530	22.8	1835	25.7	2065	28.5	2294	34.2	20		
B 32 - 089			89	69.1	22.3	1541	26.7	1845	30.0	2076	33.4	2308	40.4	10		
B 32 - 102			102	58.8	25.5	1499	30.6	1799	34.4	2024	38.3	2252	48.0	10		
B 32 - 115			115	51.5	28.8	1483	34.5	1777	38.8	1999	43.1	2220	54.3	10		
B 32 - 127			127	44.8	31.8	1425	38.1	1707	42.9	1920	47.6	2132	59.2	10		
B 32 - 139			139	42.3	35.0	1481	42.0	1777	46.9	1984	52.5	2221	65.3	10		
B 32 - 152			152	37.8	38.0	1436	45.6	1724	51.3	1939	57.0	2155	73.0	10		
B 32 - 178			178	32.5	44.5	1446	53.4	1736	60.1	1952	66.8	2171	84.5	5		
B 32 - 203			203	28.9	50.8	1468	60.9	1760	68.5	1980	76.1	2199	96.9	5		
B 32 - 254			254	21.4	63.5	1359	76.2	1631	85.7	1835	95.3	2039	121	5		
B 32 - 305			6.8 x 4.0	305	18.3	76.3	1396	91.5	1674	103	1884	114	2094	147	5	
B 40 - 051	40	20	51	182	12.8	2330	15.3	2785	17.2	3130	19.1	3476	21.4	20		
B 40 - 064			64	140	16.0	2240	19.2	2688	21.6	3024	24.0	3360	26.8	10		
B 40 - 076			76	108	19.0	2052	22.8	2462	25.7	2770	28.5	3078	32.7	10		
B 40 - 089			89	90.7	22.3	2023	26.7	2422	30.0	2724	33.4	3029	39.0	10		
B 40 - 102			102	81.0	25.5	2066	30.6	2479	34.4	2788	38.3	3102	44.1	10		
B 40 - 115			115	71.8	28.8	2068	34.5	2477	38.8	2787	43.1	3095	50.6	10		
B 40 - 127			127	62.7	31.8	1994	38.1	2389	42.9	2687	47.6	2985	55.9	5		
B 40 - 139			139	57.5	35.0	2013	42.0	2415	46.9	2697	52.5	3019	61.8	5		
B 40 - 152			152	51.6	38.0	1961	45.6	2353	51.3	2647	57.0	2941	67.5	5		
B 40 - 178			178	44.1	44.5	1962	53.4	2355	60.1	2649	66.8	2946	77.2	5		
B 40 - 203			203	36.7	50.8	1864	60.9	2235	68.5	2514	76.1	2793	91.8	5		
B 40 - 254			254	30.1	63.5	1911	76.2	2294	85.7	2580	95.3	2869	113	2		
B 40 - 305			8.2 x 4.7	305	24.6	76.3	1877	91.5	2251	103	2532	114	2814	138	2	
B 50 - 064			50	25	64	209	16.0	3344	19.2	4013	21.6	4514	24.0	5016	28.2	5
B 50 - 076					76	168	19.0	3192	22.8	3830	25.7	4309	28.5	4788	34.9	5
B 50 - 089	89	140			22.3	3122	26.7	3738	30.0	4205	33.4	4676	39.2	5		
B 50 - 102	102	119			25.5	3035	30.6	3641	34.4	4097	38.3	4558	47.3	5		
B 50 - 115	115	106			28.8	3053	34.5	3657	38.8	4114	43.1	4569	52.6	5		
B 50 - 127	127	97.0			31.8	3085	38.1	3696	42.9	4158	47.6	4617	59.8	5		
B 50 - 139	139	87.0			35.0	3045	42.0	3654	46.9	4081	52.5	4568	65.1	5		
B 50 - 152	152	80.0			38.0	3040	45.6	3648	51.3	4104	57.0	4560	70.8	2		
B 50 - 178	178	69.5			44.5	3093	53.4	3711	60.1	4175	66.8	4643	84.2	2		
B 50 - 203	203	59.8			50.8	3038	60.9	3642	68.5	4097	76.1	4551	96.5	2		
B 50 - 229	229	50.9			57.3	2917	68.7	3497	77.3	3934	85.9	4372	108	2		
B 50 - 254	254	43.9			63.5	2788	76.2	3345	85.7	3763	95.3	4184	122	2		
B 50 - 305	11.1 x 5.8	305			38.6	76.3	2945	91.5	3532	103	3973	114	4416	147	2	
B 63 - 076	63	38			76	312	19.0	5928	22.8	7114	25.7	8003	28.5	8892	30.7	5
B 63 - 089					89	260	22.3	5798	26.7	6942	30.0	7810	33.4	8684	36.5	5
B 63 - 102			102	221	25.5	5636	30.6	6763	34.4	7608	38.3	8464	43.6	5		
B 63 - 115			115	187	28.8	5386	34.5	6452	38.8	7258	43.1	8060	48.9	5		
B 63 - 127			127	168	31.8	5342	38.1	6401	42.9	7201	47.6	7997	54.2	2		
B 63 - 152			152	136	38.0	5168	45.6	6202	51.3	6977	57.0	7752	65.7	2		
B 63 - 178			178	114	44.5	5073	53.4	6088	60.1	6849	66.8	7615	76.5	2		
B 63 - 203			203	100	50.8	5080	60.9	6090	68.5	6851	76.1	7610	88.0	2		
B 63 - 229			229	89.2	57.3	5111	68.7	6128	77.3	6894	85.9	7662	104	2		
B 63 - 254			254	78.4	63.5	4978	76.2	5974	85.7	6721	95.3	7472	112	2		
B 63 - 305			11.5 x 9.1	305	64.7	76.3	4937	91.5	5920	103	6660	114	7402	134	2	

B



- IT** Molle carico forte
- EN** Strong load springs
- DE** Federn für hohe Spannung
- FR** Ressorts charge forte
- ES** Muelles carga fuerte
- PT** Molas carga forte



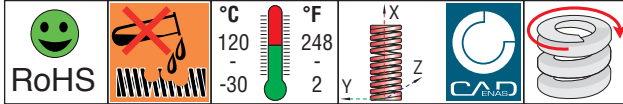
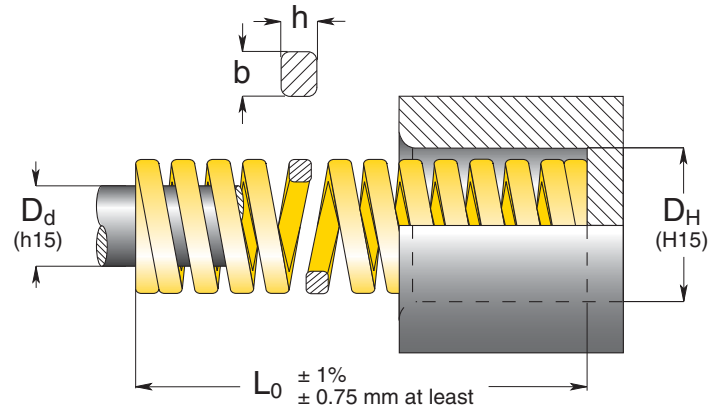
Code	D _H	D _d	L ₀	R	A	B	C	D	E	Pcs				
											Hole Diameter	Rod Diameter	Free Length	Spring Constant
b x h				± 10%	+ 3.000.000	~ 1.500.000	300 - 500.000	100 - 200.000	do not use					
mm mm		mm mm		N/mm	mm N	mm N	mm N	mm N	mm					
R 10 - 025	10	5	25	22.1	5.0	111	6.3	139	6.9	152	7.5	166	9.2	50
R 10 - 032			32	17.5	6.4	112	8.0	140	8.8	154	9.6	168	12.1	50
R 10 - 038			38	17.1	7.6	130	9.5	162	10.5	179	11.4	195	13.2	50
R 10 - 044			44	15.0	8.8	132	11.0	165	12.1	182	13.2	198	15.1	50
R 10 - 051			51	12.8	10.2	131	12.8	164	14.0	180	15.3	196	19.5	25
R 10 - 064			64	10.7	12.8	137	16.0	171	17.6	188	19.2	205	21.8	25
R 10 - 076			76	7.5	15.2	114	19.0	143	20.9	157	22.8	171	27.9	25
R 10 - 305	1.9 x 1.5		305	2.1	61.0	128	76.3	160	83.9	176	91.5	192	127	10
R 13 - 025	12.5	6.3	25	42.1	5.0	211	6.3	265	6.9	289	7.5	316	9.8	50
R 13 - 032			32	33.2	6.4	212	8.0	266	8.8	292	9.6	319	13.6	50
R 13 - 038			38	29.3	7.6	223	9.5	278	10.5	306	11.4	334	14.6	50
R 13 - 044			44	24.6	8.8	216	11.0	271	12.1	298	13.2	325	18.1	25
R 13 - 051			51	19.6	10.2	200	12.8	251	14.0	275	15.3	300	22.3	25
R 13 - 064			64	15.0	12.8	192	16.0	240	17.6	264	19.2	288	27.3	25
R 13 - 076			76	13.2	15.2	201	19.0	251	20.9	276	22.8	301	33.1	25
R 13 - 089	89	11.4	17.8	203	22.3	254	24.5	279	26.7	304	38.9	20		
R 13 - 102	102	8.4	20.4	171	25.5	214	28.1	236	30.6	257	43.8	10		
R 13 - 305	2.4 x 1.9		305	2.8	61.0	171	76.3	214	83.9	235	91.5	256	140	10
R 16 - 025	16	8	25	75.7	5.0	379	6.3	477	6.9	520	7.5	568	8.4	50
R 16 - 032			32	52.8	6.4	338	8.0	422	8.8	465	9.6	507	10.5	50
R 16 - 038			38	48.5	7.6	369	9.5	461	10.5	507	11.4	553	13.6	25
R 16 - 044			44	42.8	8.8	377	11.0	471	12.1	518	13.2	565	15.9	25
R 16 - 051			51	37.1	10.2	378	12.8	475	14.0	520	15.3	568	18.9	25
R 16 - 064			64	30.3	12.8	388	16.0	485	17.6	533	19.2	582	24.9	25
R 16 - 076			76	25.7	15.2	391	19.0	488	20.9	537	22.8	586	29.2	20
R 16 - 089	89	21.7	17.8	386	22.3	484	24.5	531	26.7	579	34.5	20		
R 16 - 102	102	19.3	20.4	394	25.5	492	28.1	541	30.6	591	39.1	20		
R 16 - 115	115	15.7	23.0	361	28.8	452	31.6	497	34.5	542	44.0	10		
R 16 - 305	3.1 x 2.5		305	7.1	61.0	433	76.3	542	83.9	596	91.5	650	104	10
R 20 - 025	20	10	25	216	5.0	1080	6.3	1361	6.9	1485	7.5	1620	8.3	50
R 20 - 032			32	168	6.4	1075	8.0	1344	8.8	1478	9.6	1613	10.9	50
R 20 - 038			38	129	7.6	980	9.5	1226	10.5	1348	11.4	1471	12.5	25
R 20 - 044			44	112	8.8	986	11.0	1232	12.1	1355	13.2	1478	15.0	25
R 20 - 051			51	94.0	10.2	959	12.8	1203	14.0	1318	15.3	1438	17.6	25
R 20 - 064			64	72.1	12.8	923	16.0	1154	17.6	1269	19.2	1384	22.6	25
R 20 - 076			76	59.7	15.2	907	19.0	1134	20.9	1248	22.8	1361	27.5	25
R 20 - 089	89	50.5	17.8	899	22.3	1126	24.5	1236	26.7	1348	31.7	20		
R 20 - 102	102	44.2	20.4	902	25.5	1127	28.1	1240	30.6	1353	37.5	20		
R 20 - 115	115	38.4	23.0	883	28.8	1106	31.6	1214	34.5	1325	42.6	10		
R 20 - 127	127	34.1	25.4	866	31.8	1084	34.9	1191	38.1	1299	45.5	10		
R 20 - 139	139	31.0	28.0	868	35.0	1085	38.2	1185	42.0	1302	50.1	10		
R 20 - 152	152	28.2	30.4	857	38.0	1072	41.8	1179	45.6	1286	55.8	10		
R 20 - 305	4.0 x 3.3		305	15.0	61.0	915	76.3	1145	83.9	1258	91.5	1373	114	10

Code	D _H	D _d	L ₀	R	A	B	C	D	E	Pcs						
	Hole Diameter	Rod Diameter	Free Length	Spring Constant	20% L ₀	25% L ₀	27.5% L ₀	30% L ₀	approx.							
	b x h		± 10%	+ 3.000.000	~ 1.500.000	300 - 500.000	100 - 200.000	do not use								
	mm	mm	mm	N/mm	mm	N	mm	N	mm	mm						
R 25 - 025	25	12.5	25	375	5.0	1875	6.3	2363	6.9	2578	7.5	2813	8.5	50		
R 25 - 032			32	297	6.4	1901	8.0	2376	8.8	2614	9.6	2851	11.0	25		
R 25 - 038			38	219	7.6	1664	9.5	2081	10.5	2289	11.4	2497	12.6	25		
R 25 - 044			44	187	8.8	1646	11.0	2057	12.1	2263	13.2	2468	14.8	25		
R 25 - 051			51	156	10.2	1591	12.8	1997	14.0	2188	15.3	2387	17.9	25		
R 25 - 064			64	123	12.8	1574	16.0	1968	17.6	2165	19.2	2362	23.1	25		
R 25 - 076			76	99.0	15.2	1505	19.0	1881	20.9	2069	22.8	2257	26.3	20		
R 25 - 089			89	84.0	17.8	1495	22.3	1873	24.5	2056	26.7	2243	30.5	20		
R 25 - 102			102	73.0	20.4	1489	25.5	1862	28.1	2048	30.6	2234	37.3	20		
R 25 - 115			115	65.0	23.0	1495	28.8	1872	31.6	2056	34.5	2243	41.9	10		
R 25 - 127			127	57.7	25.4	1466	31.8	1835	34.9	2015	38.1	2198	46.2	10		
R 25 - 139			139	52.7	28.0	1476	35.0	1845	38.2	2014	42.0	2213	49.3	10		
R 25 - 152			152	47.8	30.4	1453	38.0	1816	41.8	1998	45.6	2180	55.7	10		
R 25 - 178			178	41.0	35.6	1460	44.5	1825	49.0	2007	53.4	2189	65.1	10		
R 25 - 203			203	35.8	40.6	1453	50.8	1819	55.8	1999	60.9	2180	74.5	10		
R 25 - 305	5.5 x 4.2	305	22.9	61.0	1397	76.3	1747	83.9	1921	91.5	2095	110	5			
R 32 - 038	32	16	38	388	7.6	2949	9.5	3686	10.5	4055	11.4	4423	12.5	20		
R 32 - 044			44	324	8.8	2851	11.0	3564	12.1	3920	13.2	4277	14.9	20		
R 32 - 051			51	272	10.2	2774	12.8	3482	14.0	3815	15.3	4162	17.8	20		
R 32 - 064			64	212	12.8	2714	16.0	3392	17.6	3731	19.2	4070	22.4	20		
R 32 - 076			76	172	15.2	2614	19.0	3268	20.9	3595	22.8	3922	26.1	20		
R 32 - 089			89	141	17.8	2510	22.3	3144	24.5	3451	26.7	3765	30.8	10		
R 32 - 102			102	122	20.4	2489	25.5	3111	28.1	3422	30.6	3733	36.8	10		
R 32 - 115			115	107	23.0	2461	28.8	3082	31.6	3384	34.5	3692	41.4	10		
R 32 - 127			127	93.0	25.4	2362	31.8	2957	34.9	3248	38.1	3543	44.4	10		
R 32 - 139			139	86.0	28.0	2408	35.0	3010	38.2	3287	42.0	3612	48.5	10		
R 32 - 152			152	78.0	30.4	2371	38.0	2964	41.8	3260	45.6	3557	54.8	10		
R 32 - 178			178	67.2	35.6	2392	44.5	2990	49.0	3289	53.4	3588	63.6	5		
R 32 - 203			203	59.1	40.6	2399	50.8	3002	55.8	3299	60.9	3599	72.5	5		
R 32 - 254			254	46.4	50.8	2357	63.5	2946	69.9	3241	76.2	3536	92.8	5		
R 32 - 305			7.1 x 5.4	305	38.0	61.0	2318	76.3	2899	83.9	3187	91.5	3477	112	5	
R 40 - 051	40	20	51	350	10.2	3570	12.8	4480	14.0	4909	15.3	5355	17.0	20		
R 40 - 064			64	269	12.8	3443	16.0	4304	17.6	4734	19.2	5165	21.9	10		
R 40 - 076			76	219	15.2	3329	19.0	4161	20.9	4577	22.8	4993	26.7	10		
R 40 - 089			89	190	17.8	3382	22.3	4237	24.5	4650	26.7	5073	31.3	10		
R 40 - 102			102	163	20.4	3325	25.5	4157	28.1	4572	30.6	4988	37.1	10		
R 40 - 115			115	142	23.0	3266	28.8	4090	31.6	4491	34.5	4899	41.0	10		
R 40 - 127			127	128	25.4	3251	31.8	4070	34.9	4470	38.1	4877	46.5	5		
R 40 - 139			139	115	28.0	3220	35.0	4025	38.2	4396	42.0	4830	53.1	5		
R 40 - 152			152	105	30.4	3192	38.0	3990	41.8	4389	45.6	4788	56.1	5		
R 40 - 178			178	89	35.6	3168	44.5	3961	49.0	4357	53.4	4753	67.4	5		
R 40 - 203			203	77	40.6	3126	50.8	3912	55.8	4299	60.9	4689	76.2	5		
R 40 - 254			254	61	50.8	3099	63.5	3874	69.9	4261	76.2	4648	96.2	2		
R 40 - 305			8.4 x 6.2	305	51	61.0	3111	76.3	3891	83.9	4278	91.5	4667	115	2	
R 50 - 064			50	25	64	413	12.8	5286	16.0	6608	17.6	7269	19.2	7930	22.4	5
R 50 - 076					76	339	15.2	5153	19.0	6441	20.9	7085	22.8	7729	26.5	5
R 50 - 089	89	288			17.8	5126	22.3	6422	24.5	7049	26.7	7690	31.5	5		
R 50 - 102	102	245			20.4	4998	25.5	6248	28.1	6872	30.6	7497	37.6	5		
R 50 - 115	115	215			23.0	4945	28.8	6192	31.6	6799	34.5	7418	42.7	5		
R 50 - 127	127	192			25.4	4877	31.8	6106	34.9	6706	38.1	7315	47.5	5		
R 50 - 139	139	168			28.0	4704	35.0	5880	38.2	6422	42.0	7056	51.8	5		
R 50 - 152	152	154			30.4	4682	38.0	5852	41.8	6437	45.6	7022	57.8	2		
R 50 - 178	178	134			35.6	4770	44.5	5963	49.0	6559	53.4	7156	68.5	2		
R 50 - 203	203	117			40.6	4750	50.8	5944	55.8	6532	60.9	7125	77.6	2		
R 50 - 254	254	89			50.8	4521	63.5	5652	69.9	6217	76.2	6782	97.9	2		
R 50 - 305	11.1 x 7.6	305			73	61.0	4453	76.3	5570	83.9	6123	91.5	6680	121	2	
R 63 - 076	63	38			76	618	15.2	9394	19.0	11742	20.9	12916	22.8	14090	24.7	5
R 63 - 089					89	515	17.8	9167	22.3	11485	24.5	12605	26.7	13751	30.0	5
R 63 - 102					102	438	20.4	8935	25.5	11169	28.1	12286	30.6	13403	35.1	5
R 63 - 115			115	370	23.0	8510	28.8	10656	31.6	11701	34.5	12765	37.5	5		
R 63 - 127			127	333	25.4	8458	31.8	10589	34.9	11630	38.1	12687	45.9	2		
R 63 - 152			152	269	30.4	8178	38.0	10222	41.8	11244	45.6	12266	56.5	2		
R 63 - 178			178	226	35.6	8046	44.5	10057	49.0	11063	53.4	12068	66.8	2		
R 63 - 203			203	198	40.6	8039	50.8	10058	55.8	11053	60.9	12058	78.8	2		
R 63 - 254			254	155	50.8	7874	63.5	9843	69.9	10827	76.2	11811	102	2		
R 63 - 305			11.6 x 12.3	305	128	61.0	7808	76.3	9766	83.9	10736	91.5	11712	122	2	

Estimated life 100.000 cycles



- IT** Molle carico extra-forte
- EN** Extra-strong load springs
- DE** Federn für höchste Spannung
- FR** Ressorts charge extra-forte
- ES** Muelles carga extra-fuerte
- PT** Molas carga extra-forte

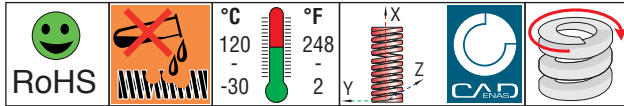
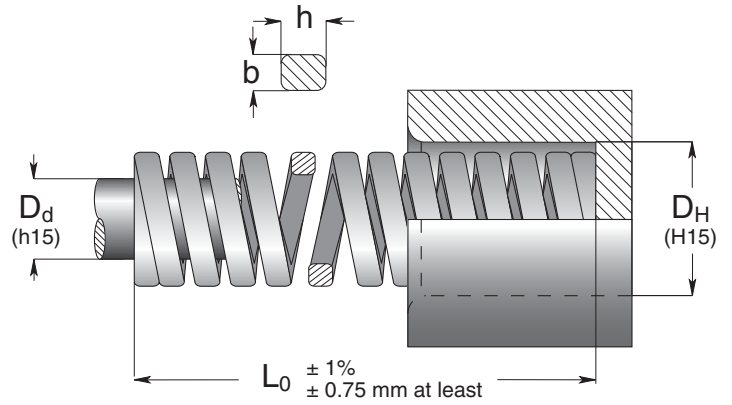


Code	D _H D _d		L ₀	R	A	B	C	D	E	Pcs				
	Hole Diameter	Rod Diameter												
	b x h		Free Length	Spring Constant	17% L ₀	20% L ₀	22.5% L ₀	25% L ₀	approx.					
	mm	mm	mm	± 10% N/mm	+ 3.000.000 mm N	~ 1.500.000 mm N	300 - 500.000 mm N	100 - 200.000 mm N	do not use					
G 10 - 025	10	5	25	36.8	4.3	158	5.0	184	5.6	207	6.3	232	7.7	50
G 10 - 032			32	27.9	5.4	151	6.4	179	7.2	201	8.0	223	10.6	50
G 10 - 038			38	23.7	6.5	154	7.6	180	8.6	203	9.5	225	12.6	50
G 10 - 044			44	19.2	7.5	144	8.8	169	9.9	190	11.0	211	13.8	50
G 10 - 051			51	16.5	8.7	144	10.2	168	11.5	189	12.8	211	16.2	25
G 10 - 064			64	13.2	10.9	144	12.8	169	14.4	190	16.0	211	20.4	25
G 10 - 076			76	10.9	12.9	141	15.2	166	17.1	186	19.0	207	25.2	25
G 10 - 305	1.9 x 1.6		305	2.6	51.9	135	61.0	159	68.6	178	76.3	198	111	10
G 13 - 025	12.5	6.3	25	58.5	4.3	252	5.0	293	5.6	329	6.3	369	8.1	50
G 13 - 032			32	43.9	5.4	237	6.4	281	7.2	316	8.0	351	9.9	50
G 13 - 038			38	36.0	6.5	234	7.6	274	8.6	308	9.5	342	12.9	50
G 13 - 044			44	30.3	7.5	227	8.8	267	9.9	300	11.0	333	14.1	25
G 13 - 051			51	26.2	8.7	228	10.2	267	11.5	301	12.8	335	17.4	25
G 13 - 064			64	21.2	10.9	231	12.8	271	14.4	305	16.0	339	21.0	25
G 13 - 076			76	17.1	12.9	221	15.2	260	17.1	292	19.0	325	26.4	25
G 13 - 089	89	14.5	15.1	219	17.8	258	20.0	290	22.3	323	31.5	20		
G 13 - 102	102	12.7	17.3	220	20.4	259	23.0	291	25.5	324	36.0	10		
G 13 - 305	2.6 x 2.0		305	4.3	51.9	223	61.0	262	68.6	295	76.3	328	111	10
G 16 - 025	16	8	25	118	4.3	507	5.0	590	5.6	664	6.3	743	8.5	50
G 16 - 032			32	89.0	5.4	481	6.4	570	7.2	641	8.0	712	11.0	50
G 16 - 038			38	72.1	6.5	469	7.6	548	8.6	616	9.5	685	13.2	25
G 16 - 044			44	60.9	7.5	457	8.8	536	9.9	603	11.0	670	14.7	25
G 16 - 051			51	52.3	8.7	455	10.2	533	11.5	600	12.8	669	17.7	25
G 16 - 064			64	41.2	10.9	449	12.8	527	14.4	593	16.0	659	21.9	25
G 16 - 076			76	34.1	12.9	440	15.2	518	17.1	583	19.0	648	27.8	20
G 16 - 089	89	29.5	15.1	445	17.8	525	20.0	591	22.3	658	31.2	20		
G 16 - 102	102	25.6	17.3	443	20.4	522	23.0	588	25.5	653	37.9	20		
G 16 - 115	115	22.4	19.6	439	23.0	515	25.9	580	28.8	645	44.5	10		
G 16 - 305	3.2 x 2.9		305	8.4	51.9	436	61.0	512	68.6	576	76.3	641	113	10
G 20 - 025	20	10	25	293	4.3	1260	5.0	1465	5.6	1648	6.3	1846	6.9	50
G 20 - 032			32	224	5.4	1210	6.4	1434	7.2	1613	8.0	1792	9.4	50
G 20 - 038			38	177	6.5	1151	7.6	1345	8.6	1513	9.5	1682	12.0	25
G 20 - 044			44	149	7.5	1118	8.8	1311	9.9	1475	11.0	1639	13.5	25
G 20 - 051			51	128	8.7	1114	10.2	1306	11.5	1469	12.8	1638	16.2	25
G 20 - 064			64	99.0	10.9	1079	12.8	1267	14.4	1426	16.0	1584	21.2	25
G 20 - 076			76	81.7	12.9	1054	15.2	1242	17.1	1397	19.0	1552	24.7	25
G 20 - 089	89	69.5	15.1	1049	17.8	1237	20.0	1392	22.3	1550	28.8	20		
G 20 - 102	102	60.6	17.3	1048	20.4	1236	23.0	1391	25.5	1545	34.8	20		
G 20 - 115	115	53.0	19.6	1039	23.0	1219	25.9	1371	28.8	1526	39.0	10		
G 20 - 127	127	47.5	21.6	1026	25.4	1207	28.6	1357	31.8	1511	43.0	10		
G 20 - 139	139	43.0	23.8	1023	28.0	1204	31.3	1345	35.0	1505	45.3	10		
G 20 - 152	152	39.0	25.8	1006	30.4	1186	34.2	1334	38.0	1482	50.4	10		
G 20 - 305	4.1 x 3.8		305	21.2	51.9	1100	61.0	1293	68.6	1455	76.3	1618	103	10

Code	D _H	D _d	L ₀	R	A		B		C		D		E	Pcs		
	Hole Diameter	Rod Diameter	Free Length	Spring Constant	17% L ₀		20% L ₀		22.5% L ₀		25% L ₀		approx.			
	b x h		± 10%	± 3.000.000	~ 1.500.000		300 - 500.000		100 - 200.000		do not use					
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm			
G 25 - 025	25	12.5	25	459	4.3	1974	5.0	2295	5.6	2582	6.3	2892	7.3	50		
G 25 - 032			32	374	5.4	2020	6.4	2394	7.2	2693	8.0	2992	10.7	25		
G 25 - 038			38	300	6.5	1950	7.6	2280	8.6	2580	9.5	2850	12.0	25		
G 25 - 044			44	244	7.5	1830	8.8	2147	9.9	2416	11.0	2684	14.4	25		
G 25 - 051			51	208	8.7	1810	10.2	2122	11.5	2392	12.8	2662	17.4	25		
G 25 - 064			64	161	10.9	1755	12.8	2061	14.4	2318	16.0	2576	21.4	25		
G 25 - 076			76	131	12.9	1690	15.2	1991	17.1	2240	19.0	2489	26.9	20		
G 25 - 089			89	111	15.1	1676	17.8	1976	20.0	2220	22.3	2475	30.9	20		
G 25 - 102			102	96.3	17.3	1666	20.4	1965	23.0	2210	25.5	2456	36.7	20		
G 25 - 115			115	85.7	19.6	1680	23.0	1971	25.9	2217	28.8	2468	40.3	10		
G 25 - 127			127	76.3	21.6	1648	25.4	1938	28.6	2180	31.8	2426	45.1	10		
G 25 - 139			139	66.0	23.8	1571	28.0	1848	31.3	2066	35.0	2310	47.6	10		
G 25 - 152			152	63.5	25.8	1638	30.4	1930	34.2	2172	38.0	2413	53.5	10		
G 25 - 178			178	53.9	30.3	1633	35.6	1919	40.1	2159	44.5	2399	63.9	10		
G 25 - 203	203	47.0	34.5	1622	40.6	1908	45.7	2147	50.8	2388	70.2	10				
G 25 - 305	5.4 x 4.6	305	30.9	51.9	1604	61.0	1885	68.6	2121	76.3	2358	110	5			
G 32 - 038	32	16	38	480	6.5	3120	7.6	3648	8.6	4128	9.5	4560	11.4	20		
G 32 - 044			44	390	7.5	2925	8.8	3432	9.9	3861	11.0	4290	13.7	20		
G 32 - 051			51	320	8.7	2784	10.2	3264	11.5	3680	12.8	4096	15.6	20		
G 32 - 064			64	269	10.9	2934	12.8	3446	14.4	3876	16.0	4307	20.0	20		
G 32 - 076			76	219	12.9	2825	15.2	3329	17.1	3745	19.0	4161	24.4	20		
G 32 - 089			89	180	15.1	2723	17.8	3209	20.0	3611	22.3	4021	29.7	10		
G 32 - 102			102	155	17.3	2682	20.4	3162	23.0	3557	25.5	3953	35.1	10		
G 32 - 115			115	140	19.6	2744	23.0	3220	25.9	3623	28.8	4032	39.0	10		
G 32 - 127			127	124	21.6	2678	25.4	3150	28.6	3543	31.8	3943	42.8	10		
G 32 - 139			139	112	23.8	2673	28.0	3144	31.3	3512	35.0	3931	48.6	10		
G 32 - 152			152	102	25.8	2632	30.4	3101	34.2	3488	38.0	3876	52.4	10		
G 32 - 178			178	88.2	30.3	2672	35.6	3140	40.1	3532	44.5	3925	60.9	5		
G 32 - 203			203	76.0	34.5	2622	40.6	3086	45.7	3471	50.8	3861	69.2	5		
G 32 - 254			254	60.8	43.2	2627	50.8	3089	57.2	3475	63.5	3861	88.1	5		
G 32 - 305	7.3 x 5.9	305	49.0	51.9	2543	61.0	2989	68.6	3363	76.3	3739	104	5			
G 40 - 051	40	20	51	628	8.7	5464	10.2	6406	11.5	7206	12.8	8038	15.0	20		
G 40 - 064			64	487	10.9	5308	12.8	6234	14.4	7013	16.0	7792	19.5	10		
G 40 - 076			76	379	12.9	4889	15.2	5761	17.1	6481	19.0	7201	23.3	10		
G 40 - 089			89	321	15.1	4847	17.8	5714	20.0	6428	22.3	7158	26.7	10		
G 40 - 102			102	281	17.3	4861	20.4	5732	23.0	6449	25.5	7166	33.8	10		
G 40 - 115			115	245	19.6	4802	23.0	5635	25.9	6339	28.8	7056	36.2	10		
G 40 - 127			127	221	21.6	4774	25.4	5613	28.6	6315	31.8	7028	40.7	5		
G 40 - 139			139	190	23.8	4522	28.0	5320	31.3	5942	35.0	6650	44.5	5		
G 40 - 152			152	168	25.8	4334	30.4	5107	34.2	5746	38.0	6384	49.6	5		
G 40 - 178			178	146	30.3	4424	35.6	5198	40.1	5847	44.5	6497	59.9	5		
G 40 - 203			203	132	34.5	4554	40.6	5359	45.7	6029	50.8	6706	67.1	5		
G 40 - 254			254	107	43.2	4622	50.8	5436	57.2	6115	63.5	6795	86.3	2		
G 40 - 305			8.4 x 7.5	305	87.8	51.9	4557	61.0	5356	68.6	6025	76.3	6699	104	2	
G 50 - 064			50	25	64	709	10.9	7728	12.8	9075	14.4	10210	16.0	11344	19.3	5
G 50 - 076	76	572			12.9	7379	15.2	8694	17.1	9781	19.0	10868	24.2	5		
G 50 - 089	89	475			15.1	7173	17.8	8455	20.0	9512	22.3	10593	28.0	5		
G 50 - 102	102	405			17.3	7007	20.4	8262	23.0	9295	25.5	10328	33.5	5		
G 50 - 115	115	352			19.6	6899	23.0	8096	25.9	9108	28.8	10138	38.6	5		
G 50 - 127	127	316			21.6	6826	25.4	8026	28.6	9030	31.8	10049	41.4	5		
G 50 - 139	139	289			23.8	6878	28.0	8092	31.3	9046	35.0	10115	47.3	5		
G 50 - 152	152	239			25.8	6166	30.4	7266	34.2	8174	38.0	9082	50.2	2		
G 50 - 178	178	215			30.3	6515	35.6	7654	40.1	8611	44.5	9568	61.1	2		
G 50 - 203	203	187			34.5	6452	40.6	7592	45.7	8541	50.8	9500	67.7	2		
G 50 - 254	254	153			43.2	6610	50.8	7772	57.2	8744	63.5	9716	87.0	2		
G 50 - 305	11.5 x 9.0	305			127	51.9	6591	61.0	7747	68.6	8715	76.3	9690	104	2	
G 63 - 076	63	38			76	952	12.9	12280	15.2	14470	-	-	-	-	15.5	5
G 63 - 089					89	819	15.1	12360	17.8	14580	-	-	-	-	-	20.0
G 63 - 102			102	700	17.3	12110	20.4	14280	23.0	16065	25.5	17850	30.7	5		
G 63 - 115			115	620	19.6	12152	23.0	14260	25.9	16043	28.8	17860	34.9	5		
G 63 - 127			127	565	21.6	12204	25.4	14351	28.6	16145	31.8	17967	38.0	2		
G 63 - 152			152	458	25.8	11816	30.4	13923	34.2	15664	38.0	17404	47.2	2		
G 63 - 178			178	384	30.3	11635	35.6	13670	40.1	15379	44.5	17088	55.8	2		
G 63 - 203			203	337	34.5	11627	40.6	13682	45.7	15392	50.8	17120	64.8	2		
G 63 - 254			254	263	43.2	11362	50.8	13360	57.2	15030	63.5	16701	86.7	2		
G 63 - 305			11.6 x 14.9	305	218	51.9	11314	61.0	13298	68.6	14960	76.3	16633	106	2	

Estimated life 100.000 cycles

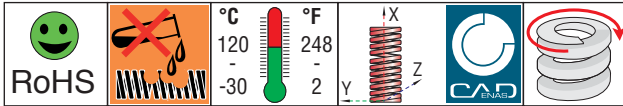
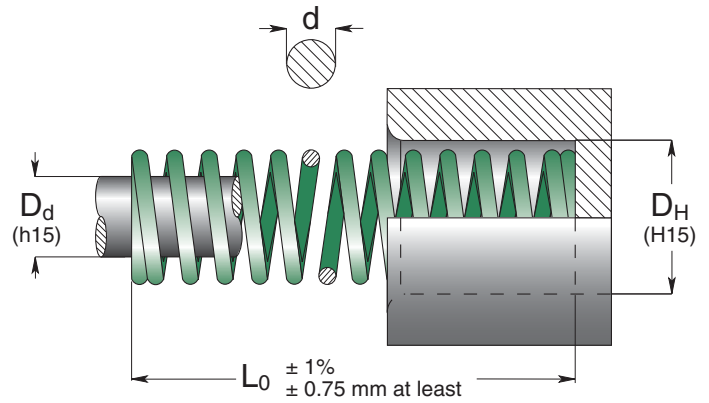
- IT** Molle carico ultra-forte
- EN** Ultra-strong load springs
- DE** Federn für ultra-hohe Spannung
- FR** Ressorts charge ultra-forte
- ES** Muelles carga ultra-fuerte
- PT** Molas carga ultra-forte



Code	D _H		L ₀	R	A	B	C	D	E	Pcs				
	Hole Diameter	Rod Diameter												
	b x h		Free Length	Spring Constant	10% L ₀	12% L ₀	13.5% L ₀	15% L ₀	approx. do not use					
	mm	mm	mm	± 10% N/mm	+ 3.000.000 mm N	~ 1.500.000 mm N	300 - 500.000 mm N	100 - 200.000 mm N	mm					
A 25 - 064	25	12.5	64	644	6.4	4122	7.7	4959	8.6	5564	9.6	6182	13	25
A 25 - 076			76	556	7.6	4226	9.1	5060	10.3	5705	11.4	6338	16	20
A 25 - 089			89	462	8.9	4112	10.7	4943	12.0	5551	13.4	6168	20	20
A 25 - 102			102	390	10.2	3978	12.2	4758	13.8	5370	15.3	5967	23	20
A 25 - 115			115	360	11.5	4140	13.8	4968	15.5	5589	17.3	6210	26	10
A 25 - 127			127	326	12.7	4140	15.2	4955	17.1	5589	19.1	6210	28	10
A 25 - 152			152	255	15.2	3876	18.2	4641	20.5	5233	22.8	5814	34	10
A 25 - 178			178	230	17.8	4094	21.4	4922	24.0	5527	26.7	6141	39	10
A 25 - 203			203	202	20.3	4101	24.4	4929	27.4	5536	30.5	6151	45	10
A 25 - 305	5.6 x 7.5		305	136	30.5	4148	36.6	4978	41.2	5600	45.8	6222	63	5
A 32 - 064	32	16	64	1077	6.4	6892	7.7	8270	8.6	9305	9.6	10337	13	20
A 32 - 076			76	874	7.6	6642	9.1	7971	10.3	8967	11.4	9964	16	20
A 32 - 089			89	721	8.9	6419	11	7702	12.0	8663	13.3	9628	20	10
A 32 - 102			102	620	10	6324	12	7589	13.8	8537	15.3	9486	23	10
A 32 - 115			115	560	12	6440	14	7728	15.5	8694	17.2	9660	26	10
A 32 - 127			127	496	13	6299	15	7559	17.1	8504	19.0	9449	28	10
A 32 - 152			152	408	15	6202	18	7442	20.5	8372	22.8	9302	34	10
A 32 - 178			178	353	18	6280	21	7536	24.0	8483	26.7	9420	39	5
A 32 - 203			203	304	20	6171	24	7405	27.4	8331	30.4	9257	45	5
A 32 - 254	254	243	25	6177	30	7413	34.3	8332	38.1	9266	62	5		
A 32 - 305	7.5 x 9.2		305	196	31	5978	37	7174	41.2	8070	45.7	8967	75	5
A 40 - 089	40	20	89	880	8.9	7832	10.7	9416	12.0	10573	13.4	11748	20	10
A 40 - 102			102	762	10.2	7772	12.2	9296	13.8	10493	15.3	11659	23	10
A 40 - 115			115	679	11.5	7809	13.8	9370	15.5	10541	17.3	11713	26	10
A 40 - 127			127	622	12.7	7899	15.2	9454	17.1	10664	19.1	11849	28	5
A 40 - 152			152	509	22.8	7737	18.2	9264	20.5	10445	22.8	11605	36	5
A 40 - 178			178	429	17.8	7636	21.4	9181	24.0	10309	26.7	11454	43	5
A 40 - 203			203	374	20.3	7592	24.4	9126	27.4	10249	30.5	11388	49	5
A 40 - 254			254	296	25.4	7518	30.5	9028	34.3	10150	38.1	11278	62	2
A 40 - 305			8.5 x 11.0		305	246	30.5	7530	36.6	9004	41.2	10129	45.8	11255
A 50 - 089	50	25	89	1410	8.9	12549	10.7	15087	12.0	16941	13.4	18824	19	5
A 50 - 102			102	1215	10.2	12393	12.2	14823	13.8	16731	15.3	18590	22	5
A 50 - 115			115	1076	11.5	12374	13.8	14849	15.5	16705	17.3	18561	25	5
A 50 - 127			127	968	12.7	12294	15.2	14714	17.1	16596	19.1	18440	28	5
A 50 - 152			152	806	15.2	12251	18.2	14669	20.5	16539	22.8	18377	34	2
A 50 - 178			178	698	17.8	12424	21.4	14937	24.0	16773	26.7	18637	40	2
A 50 - 203			203	612	20.3	12424	24.4	14933	27.4	16772	30.5	18635	45	2
A 50 - 254			254	472	25.4	11989	30.5	14396	34.3	16185	38.1	17983	58	2
A 50 - 305			11.8 x 13.5		305	388	30.5	11834	36.6	14201	41.2	15976	45.8	17751

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- IT** Molle carico leggero
- EN** Light load springs
- DE** Federn für normale Spannung
- FR** Ressorts charge légère
- ES** Muelles carga ligera
- PT** Molas carga leve

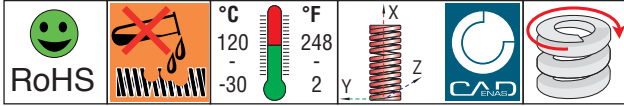
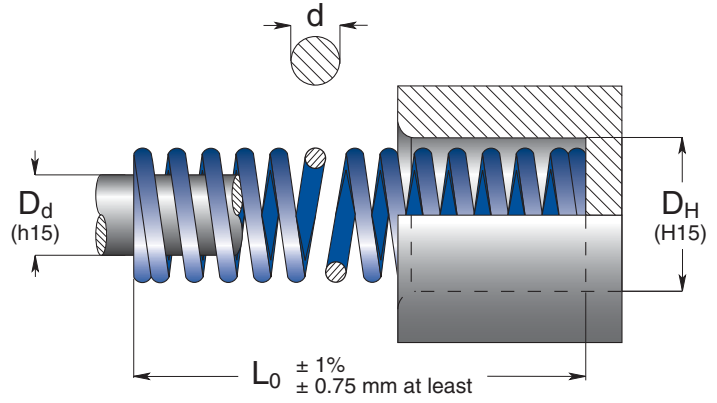


Code	D _H		D _d	L ₀	R	A		B		C		D		E	Pcs
	Hole Diameter	Rod Diameter				Free Length	Spring Constant	25% L ₀	30% L ₀	35% L ₀	40% L ₀	do not use			
		d			± 10%	+ 3.000.000	~ 1.500.000	300 - 500.000	100 - 200.000			approx.			
		mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm	
TV 10 - 025	10	5	5	25	4.4	6.3	28	7.5	33	8.8	39	10.0	44	13.2	50
TV 10 - 032				32	3.4	8.0	27	9.6	33	11.2	38	12.8	44	16.5	50
TV 10 - 038				38	2.8	9.5	26	11.4	32	13.3	37	15.2	42	19.8	50
TV 10 - 044				44	2.4	11.0	26	13.2	31	15.4	37	17.6	42	23.1	50
TV 10 - 051				51	2.1	12.8	27	15.3	32	17.9	37	20.4	43	26.9	25
TV 10 - 064				64	1.6	16.0	26	19.2	31	22.4	36	25.6	42	33.3	25
TV 10 - 076				76	1.3	19.0	25	22.8	30	26.6	35	30.4	40	39.6	25
TV 10 - 305	1.1	305	0.3	76.3	24	91.5	29	107	32	122	38	157	10		
TV 13 - 025	12.5	6.3	6.3	25	8.5	6.3	53	7.5	64	8.8	74	10.0	85	13.5	50
TV 13 - 032				32	6.5	8.0	52	9.6	62	11.2	73	12.8	83	16.8	50
TV 13 - 038				38	5.3	9.5	51	11.4	61	13.3	70	15.2	81	20.3	50
TV 13 - 044				44	4.4	11.0	49	13.2	59	15.4	68	17.6	78	23.9	25
TV 13 - 051				51	3.8	12.8	48	15.3	58	17.9	68	20.4	78	26.9	25
TV 13 - 064				64	2.9	16.0	47	19.2	56	22.4	65	25.6	75	33.3	25
TV 13 - 076				76	2.5	19.0	48	22.8	57	26.6	67	30.4	76	41.1	25
TV 13 - 089	89	2.1	22.3	48	26.7	57	31.2	65	35.6	76	48.3	20			
TV 13 - 305	1.5	305	0.6	76.3	45	91.5	54	107	64	122	73	163	10		
TV 16 - 025	16	8	8	25	17.9	6.3	112	7.5	134	8.8	157	10.0	179	14.7	50
TV 16 - 032				32	13.5	8.0	108	9.6	129	11.2	151	12.8	173	18.5	50
TV 16 - 038				38	10.5	9.5	100	11.4	120	13.3	140	15.2	160	22.4	25
TV 16 - 044				44	8.8	11.0	96	13.2	116	15.4	136	17.6	154	25.9	25
TV 16 - 051				51	7.6	12.8	97	15.3	116	17.9	136	20.4	155	30.0	25
TV 16 - 064				64	5.9	16.0	95	19.2	114	22.4	132	25.6	152	37.8	25
TV 16 - 076				76	4.8	19.0	91	22.8	109	26.6	128	30.4	145	45.2	20
TV 16 - 089	89	4.0	22.3	90	26.7	108	31.2	125	35.6	144	52.8	20			
TV 16 - 102	102	3.5	25.5	90	30.6	108	35.7	125	40.8	144	60.7	20			
TV 16 - 305	2	305	1.1	76.3	85	91.5	103	107	117	122	137	184	10		

Round Wire

SERIES TB

- IT** Molle carico medio
- EN** Medium load springs
- DE** Federn für mittlere Spannung
- FR** Ressorts charge moyenne
- ES** Muelles carga mediana
- PT** Molas carga média



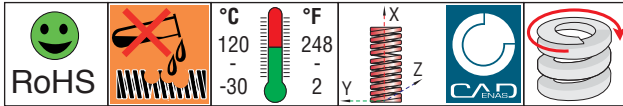
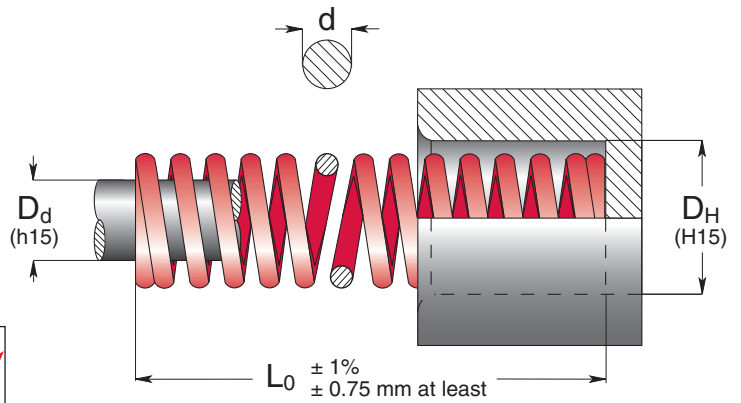
Code	D _H Hole Diameter	D _d Rod Diameter	L ₀ Free Length	R Spring Constant	A 25% L ₀		B 30% L ₀		C 33.75% L ₀		D 37.5% L ₀		E do not use approx.	Pcs
					mm	N	mm	N	mm	N	mm	N		
	d			± 10%	+ 3.000.000	~ 1.500.000	300 - 500.000	100 - 200.000						
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm	Pcs
TB 10 - 025	10	5	25	12.3	6.3	77	7.5	92	8.4	104	9.4	115	10.4	50
TB 10 - 032			32	9.5	8.0	76	9.6	91	10.8	103	12.0	113	13.2	50
TB 10 - 038			38	7.8	9.5	74	11.4	88	12.8	100	14.3	111	16.0	50
TB 10 - 044			44	6.5	11.0	72	13.2	86	14.9	97	16.5	108	18.5	50
TB 10 - 051			51	5.6	12.8	72	15.3	86	17.2	96	19.1	108	21.1	25
TB 10 - 064			64	4.5	16.0	71	19.2	86	21.6	97	24.0	107	26.4	25
TB 10 - 076			76	3.7	19.0	70	22.8	84	25.7	95	28.5	105	31.8	25
TB 10 - 305			305	1.5	305	0.9	76.3	68	91.5	82	103	93	114	102
TB 13 - 025	12.5	6.3	25	21.7	6.3	136	7.5	163	8.4	183	9.4	204	11.2	50
TB 13 - 032			32	16.8	8.0	134	9.6	161	10.8	181	12.0	202	14.0	50
TB 13 - 038			38	13.8	9.5	131	11.4	158	12.8	177	14.3	197	17.3	50
TB 13 - 044			44	11.6	11.0	127	13.2	153	14.9	172	16.5	191	19.8	25
TB 13 - 051			51	10.0	12.8	127	15.3	153	17.2	172	19.1	191	22.9	25
TB 13 - 064			64	7.8	16.0	125	19.2	150	21.6	168	24.0	187	28.4	25
TB 13 - 076			76	6.4	19.0	122	22.8	146	25.7	164	28.5	183	34.3	25
TB 13 - 089			89	5.6	22.3	125	26.7	150	30.0	168	33.4	188	41.4	20
TB 13 - 305	305	1.8	305	1.5	76.3	118	91.5	141	103	154	114	176	139	10
TB 16 - 025	16	8	25	31.9	6.3	199	7.5	239	8.4	269	9.4	299	10.9	50
TB 16 - 032			32	24.0	8.0	192	9.6	230	10.8	259	12.0	288	13.7	50
TB 16 - 038			38	19.4	9.5	185	11.4	222	12.8	249	14.3	277	16.5	25
TB 16 - 044			44	16.1	11.0	177	13.2	213	14.9	239	16.5	266	19.3	25
TB 16 - 051			51	13.8	12.8	176	15.3	212	17.2	238	19.1	265	22.1	25
TB 16 - 064			64	10.7	16.0	171	19.2	205	21.6	231	24.0	256	27.4	25
TB 16 - 076			76	8.8	19.0	166	22.8	200	25.7	226	28.5	250	33.0	20
TB 16 - 089			89	7.5	22.3	167	26.7	200	30.0	225	33.4	250	38.6	20
TB 16 - 102	102	6.5	25.5	167	30.6	200	34.4	224	38.3	250	44.5	20		
TB 16 - 305	305	2.2	305	2.1	76.3	159	91.5	191	103	216	114	238	134	10

TV

TB



- IT** Molle carico forte
- EN** Strong load springs
- DE** Federn für hohe Spannung
- FR** Ressorts charge forte
- ES** Muelles carga fuerte
- PT** Molas carga forte

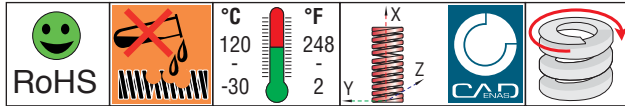
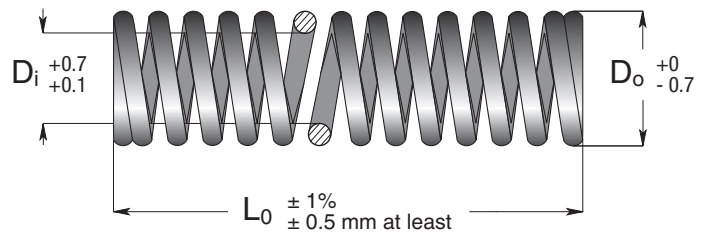
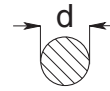


Code	D _H Hole Diameter	D _d Rod Diameter	L ₀ Free Length	R Spring Constant	A 20% L ₀	B 25% L ₀	C 27.5% L ₀	D 30% L ₀	E approx. do not use	Pcs				
											d mm	± 10% N/mm	+ 3.000.000 mm	~ 1.500.000 mm
TR 10 - 025	10	5	25	20.7	5.0	103	6.3	129	6.9	142	7.5	155	8.6	50
TR 10 - 032			32	16.1	6.4	103	8.0	129	8.8	142	9.6	155	10.9	50
TR 10 - 038			38	13.0	7.6	98	9.5	123	10.5	136	11.4	148	13.2	50
TR 10 - 044			44	10.9	8.8	96	11.0	119	12.1	132	13.2	143	14.7	50
TR 10 - 051			51	9.6	10.2	98	12.8	123	14.0	135	15.3	147	17.8	25
TR 10 - 064			64	7.7	12.8	98	16.0	123	17.6	136	19.2	147	22.9	25
TR 10 - 076			76	6.3	15.2	96	19.0	119	20.9	132	22.8	143	26.9	25
TR 10 - 305	1.6	305	1.5	61.0	93	76.3	116	83.9	126	91.5	139	110	10	
TR 13 - 025	12.5	6.3	25	37.5	5.0	187	6.3	234	6.9	258	7.5	281	8.9	50
TR 13 - 032			32	28.9	6.4	185	8.0	231	8.8	254	9.6	277	11.2	50
TR 13 - 038			38	23.5	7.6	178	9.5	223	10.5	246	11.4	268	13.7	50
TR 13 - 044			44	19.6	8.8	173	11.0	216	12.1	237	13.2	259	15.7	25
TR 13 - 051			51	17.3	10.2	177	12.8	221	14.0	243	15.3	265	18.8	25
TR 13 - 064			64	13.5	12.8	173	16.0	216	17.6	238	19.2	259	23.6	25
TR 13 - 076			76	11.2	15.2	170	19.0	213	20.9	234	22.8	256	28.4	25
TR 13 - 089	89	9.5	17.8	168	22.3	210	24.5	233	26.7	252	33.0	20		
TR 13 - 305	2.2	305	2.7	61.0	162	76.3	203	83.9	226	91.5	244	114	10	
TR 16 - 025	16	8	25	81.6	5.0	408	6.3	510	6.9	561	7.5	612	9.1	50
TR 16 - 032			32	61.3	6.4	392	8.0	490	8.8	539	9.6	588	11.4	50
TR 16 - 038			38	49.9	7.6	379	9.5	474	10.5	521	11.4	569	14.2	25
TR 16 - 044			44	40.8	8.8	359	11.0	449	12.1	494	13.2	539	16.3	25
TR 16 - 051			51	35.6	10.2	363	12.8	453	14.0	499	15.3	544	18.8	25
TR 16 - 064			64	27.8	12.8	356	16.0	446	17.6	489	19.2	535	23.9	25
TR 16 - 076			76	22.8	15.2	346	19.0	433	20.9	477	22.8	519	29.0	20
TR 16 - 089	89	19.6	17.8	349	22.3	436	24.5	480	26.7	524	34.3	20		
TR 16 - 102	102	17.0	20.4	347	25.5	433	28.1	477	30.6	520	39.4	20		
TR 16 - 305	2.8	305	5.4	61.0	330	76.3	413	83.9	453	91.5	495	119	10	

Round Wire

SERIES L

- IT** Molle non colorate con oliatura antiruggine.
- EN** Not painted with anti-rust lubricant.
- DE** Unlackierte Federn mit Rostschutzölung.
- FR** Ressorts non-peints avec huilage antirouille.
- ES** Muelles no pintados con lubricación antióxido.
- PT** Molas não coloridas com oleamento anti-ferrugem.



D_o diametro esterno della molla.
spring outside diameter.
Außendurchmesser Feder.
diamètre extérieur du ressort.
diámetro externo del muelle.
diâmetro exterior da mola.

D_i diametro interno della molla.
spring inside diameter.
Innendurchmesser Feder.
diamètre intérieur du ressort.
diámetro interior del muelle.
diâmetro interno da mola.

d diametro del filo.
wire diameter.
Drahtdurchmesser.
diamètre du fil.
diámetro del hilo.
diâmetro de fio.

L₀ lunghezza libera della molla.
spring free length.
Länge der unbelasteten Feder.
longueur libre du ressort.
longitud libre del muelle.
comprimento livre da mola.

R carico (N) necessario per deflettere la molla di 1 mm.
spring rate, load (N) required for 1 mm deflection.
Federrate, erforderliche Spannung für 1 mm Federweg.
charge (N) exigée pour comprimer le ressort 1mm.
carga (N) necesaria para desviar el muelle de 1 milímetro.
carga (N) necessária para defletir a mola de 1 milímetro.

A deflessione consigliata per una lunga durata della molla.
advised working deflection for long spring life.
Empfohlener Federweg für eine lange Lebensdauer der Feder.
course conseillée pour une longue durée du ressort.
deflexión aconsejada para una larga duración del muelle.
deflexão recomendado para uma longa duração da mola.

B deflessione consigliata per una media durata della molla.
advised working deflection for medium spring life.
Empfohlener Federweg für eine mittlere Lebensdauer der Feder.
course conseillée pour durée moyenne du ressort.
deflexión aconsejada para una media duración del muelle.
deflexão recomendado para uma média duração da mola.

C deflessione massima consentita.
maximum operating deflection.
Maximaler Federweg.
course maximale pour le fonctionnement.
deflexión máxima permitida.
deflexão máxima.

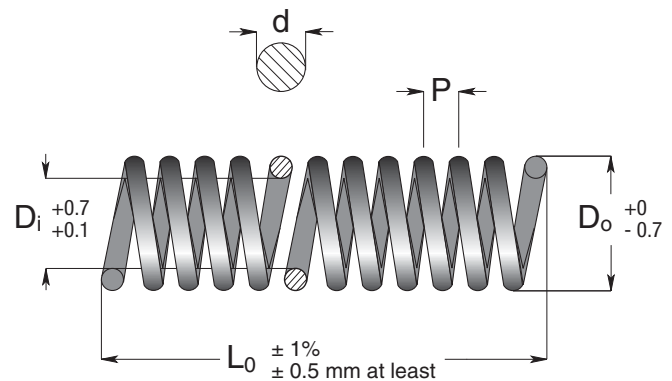
Code	D _o D _i		L ₀	R	A		B		C	
	Outside Diameter	Inside Diameter			Free Length	Spring Constant	16% L ₀	24% L ₀	32% L ₀	100 - 200.000
	d			± 10%	mm	N	mm	N	mm	N
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N
L 3 - 010			10	2.94	1.6	4.4	2.4	6.62	3.2	8.8
L 3 - 015	3	2	15	1.96	2.4	4.4	3.6	6.62	4.8	8.8
L 3 - 020			20	0.98	3.2	4.4	4.8	6.62	6.4	8.8
L 3 - 025		0.4	25	0.98	4.0	4.4	6.0	6.62	8.0	8.8
L 4 - 010			10	4.9	1.6	7.8	2.4	11.6	3.2	15.7
L 4 - 015	4	2.6	15	2.94	2.4	7.8	3.6	11.6	4.8	15.7
L 4 - 020			20	2.94	3.2	7.8	4.8	11.6	6.4	15.7
L 4 - 025			25	1.96	4.0	7.8	6.0	11.6	8.0	15.7
L 4 - 030		0.6	30	1.96	4.8	7.8	7.2	11.6	9.6	15.7
L 6 - 015			15	7.85	2.4	17.7	3.6	26.5	4.8	35.5
L 6 - 020	6	4	20	5.88	3.2	17.7	4.8	26.5	6.4	35.5
L 6 - 025			25	4.90	4.0	17.7	6.0	26.5	8.0	35.5
L 6 - 030			30	3.92	4.8	17.7	7.2	26.5	9.6	35.5
L 6 - 035		0.9	35	2.94	5.6	17.7	8.4	26.5	11.2	35.5



Code	D _o	D _i	L ₀	R	A		B		C		
	Outside Diameter	Inside Diameter	Free Length	Spring Constant	16% L ₀		24% L ₀		32% L ₀		
	d		mm	± 10% N/mm	+ 3.000.000		~ 1.500.000		100 - 200.000		
mm	mm	mm			N	mm	N	mm	N		
L 8 - 015	8	5.4	15	12.75	2.4	31.4	3.6	47.1	4.8	62.8	
L 8 - 020			20	9.81	3.2	31.4	4.8	47.1	6.4	62.8	
L 8 - 025			25	7.85	4.0	31.4	6.0	47.1	8.0	62.8	
L 8 - 030			30	6.86	4.8	31.4	7.2	47.1	9.6	62.8	
L 8 - 035			35	5.88	5.6	31.4	8.4	47.1	11.2	62.8	
L 8 - 040	1.2	40	4.90	6.4	31.4	9.6	47.1	12.8	62.8		
L 10 - 025	10	6.5	25	12.75	4.0	49.0	6.0	73.6	8.0	98	
L 10 - 030			30	9.81	4.8	49.0	7.2	73.6	9.6	98	
L 10 - 035			35	8.83	5.6	49.0	8.4	73.6	11.2	98	
L 10 - 040			40	7.85	6.4	49.0	9.6	73.6	12.8	98	
L 10 - 045			45	6.86	7.2	49.0	10.8	73.6	14.4	98	
L 10 - 050	1.5	50	5.88	8.0	49.0	12.0	73.6	16.0	98		
L 12 - 025	12	8	25	17.65	4.0	70.6	6.0	106.9	8.0	141.2	
L 12 - 030			30	14.71	4.8	70.6	7.2	106.9	9.6	141.2	
L 12 - 035			35	12.75	5.6	70.6	8.4	106.9	11.2	141.2	
L 12 - 040			40	10.79	6.4	70.6	9.6	106.9	12.8	141.2	
L 12 - 045			45	9.81	7.2	70.6	10.8	106.9	14.4	141.2	
L 12 - 050	1.8	50	8.83	8.0	70.6	12.0	106.9	16.0	141.2		
L 12 - 055		55	7.85	8.8	70.6	13.2	106.9	17.6	141.2		
L 12 - 060		60	7.85	9.6	70.6	14.4	106.9	19.2	141.2		
L 14 - 025		14	9.3	25	24.52	4.0	96.1	6.0	144.2	8.0	192.2
L 14 - 030				30	19.61	4.8	96.1	7.2	144.2	9.4	192.2
L 14 - 035	35			17.65	5.6	96.1	8.4	144.2	11.2	192.2	
L 14 - 040	40			14.71	6.4	96.1	9.6	144.2	12.8	192.2	
L 14 - 045	45			13.73	7.2	96.1	10.8	144.2	14.4	192.2	
L 14 - 050	2.2	50	11.77	8.0	96.1	12.0	144.2	16.0	192.2		
L 14 - 055		55	10.79	8.8	96.1	13.2	144.2	17.6	192.2		
L 14 - 060		60	9.81	9.6	96.1	14.4	144.2	19.2	192.2		
L 14 - 065		65	8.83	10.4	96.1	15.6	144.2	20.8	192.2		
L 14 - 070		70	8.83	11.2	96.1	16.8	144.2	22.4	192.2		
L 16 - 025	16	10.7	25	31.38	4.0	125.5	6.0	188.3	8.0	251.1	
L 16 - 030			30	26.48	4.8	125.5	7.2	188.3	9.4	251.1	
L 16 - 035			35	22.56	5.6	125.5	8.4	188.3	11.2	251.1	
L 16 - 040			40	19.61	6.4	125.5	9.6	188.3	12.8	251.1	
L 16 - 045			45	17.65	7.2	125.5	10.8	188.3	14.4	251.1	
L 16 - 050	2.4	50	15.69	8.0	125.5	12.0	188.3	16.0	251.1		
L 16 - 055		55	14.71	8.8	125.5	13.2	188.3	17.6	251.1		
L 16 - 060		60	12.75	9.6	125.5	14.4	188.3	19.2	251.1		
L 16 - 065		65	11.77	10.4	125.5	15.6	188.3	20.8	251.1		
L 16 - 070		70	10.79	11.2	125.5	16.8	188.3	22.4	251.1		
L 16 - 075	2.8	75	10.79	12.0	125.5	18.0	188.3	24.0	251.1		
L 16 - 080		80	9.81	12.8	125.5	19.2	188.3	25.6	251.1		
L 18 - 025		18	12	25	40.21	4.0	158.9	6.0	238.3	8.0	317.7
L 18 - 030				30	33.34	4.8	158.9	7.2	238.3	9.4	317.7
L 18 - 035				35	28.44	5.6	158.9	8.4	238.3	11.2	317.7
L 18 - 040	40			24.52	6.4	158.9	9.6	238.3	12.8	317.7	
L 18 - 045	45			22.56	7.2	158.9	10.8	238.3	14.4	317.7	
L 18 - 050	2.8	50	19.61	8.0	158.9	12.0	238.3	16.0	317.7		
L 18 - 055		55	17.65	8.8	158.9	13.2	238.3	17.6	317.7		
L 18 - 060		60	16.67	9.6	158.9	14.4	238.3	19.2	317.7		
L 18 - 065		65	15.69	10.4	158.9	15.6	238.3	20.8	317.7		
L 18 - 070		70	14.71	11.2	158.9	16.8	238.3	22.4	317.7		
L 18 - 075	3	75	13.73	12.0	158.9	18.0	238.3	24.0	317.7		
L 18 - 080		80	12.75	12.8	158.9	19.2	238.3	25.6	317.7		
L 18 - 090		90	10.79	14.4	158.9	21.6	238.3	28.8	317.7		
L 20 - 025		20	13.5	25	49.03	4.0	196.1	6.0	294.2	8.0	392.3
L 20 - 030				30	41.19	4.8	196.1	7.2	294.2	9.4	392.3
L 20 - 035	35			35.30	5.6	196.1	8.4	294.2	11.2	392.3	
L 20 - 040	40			30.40	6.4	196.1	9.6	294.2	12.8	392.3	
L 20 - 045	45			27.46	7.2	196.1	10.8	294.2	14.4	392.3	
L 20 - 050	3	50	24.52	8.0	196.1	12.0	294.2	16.0	392.3		
L 20 - 055		55	22.56	8.8	196.1	13.2	294.2	17.6	392.3		
L 20 - 060		60	20.59	9.6	196.1	14.4	294.2	19.2	392.3		
L 20 - 065		65	18.63	10.4	196.1	15.6	294.2	20.8	392.3		
L 20 - 070		70	17.65	11.2	196.1	16.8	294.2	22.4	392.3		
L 20 - 075	3	75	16.67	12.0	196.1	18.0	294.2	24.0	392.3		
L 20 - 080		80	15.69	12.8	196.1	19.2	294.2	25.6	392.3		
L 20 - 090		90	13.73	14.4	196.1	21.6	294.2	28.8	392.3		
L 20 - 100		100	12.75	16.0	196.1	24.0	294.2	32.0	392.3		

Code	D _o Outside Diameter	D _i Inside Diameter	L ₀ Free Length	R Spring Constant	A 16% L ₀		B 24% L ₀		C 32% L ₀	
					± 10% + 3.000.000		~ 1.500.000		100 - 200.000	
					mm	N	mm	N	mm	N
L 22 - 025	22	14.7	25	59.82	4.0	237.3	6.0	356	8.0	474.6
L 22 - 030			30	49.03	4.8	237.3	7.2	356	9.4	474.6
L 22 - 035			35	42.17	5.6	237.3	8.4	356	11.2	474.6
L 22 - 040			40	37.27	6.4	237.3	9.6	356	12.8	474.6
L 22 - 045			45	33.34	7.2	237.3	10.8	356	14.4	474.6
L 22 - 050			50	29.42	8.0	237.3	12.0	356	16.0	474.6
L 22 - 055			55	27.46	8.8	237.3	13.2	356	17.6	474.6
L 22 - 060			60	24.52	9.6	237.3	14.4	356	19.2	474.6
L 22 - 065			65	22.56	10.4	237.3	15.6	356	20.8	474.6
L 22 - 070			70	21.57	11.2	237.3	16.8	356	22.4	474.6
L 22 - 075	75	19.61	12.0	237.3	18.0	356	24.0	474.6		
L 22 - 080	80	18.63	12.8	237.3	19.2	356	25.6	474.6		
L 22 - 090	90	16.67	14.4	237.3	21.6	356	28.8	474.6		
L 22 - 100	3.4	100	14.71	16.0	237.3	24.0	356	32.0	474.6	
L 25 - 025	25	17	25	76.49	4.0	307	6.0	459.9	8.0	613.9
L 25 - 030			30	63.74	4.8	307	7.2	459.9	9.6	613.9
L 25 - 035			35	54.92	5.6	307	8.4	459.9	11.2	613.9
L 25 - 040			40	48.05	6.4	307	9.6	459.9	12.8	613.9
L 25 - 045			45	42.17	7.2	307	10.8	459.9	14.4	613.9
L 25 - 050			50	38.25	8.0	307	12.0	459.9	16.0	613.9
L 25 - 055			55	35.30	8.8	307	13.2	459.9	17.6	613.9
L 25 - 060			60	32.36	9.6	307	14.4	459.9	19.2	613.9
L 25 - 065			65	29.42	10.4	307	15.6	459.9	20.8	613.9
L 25 - 070			70	27.46	11.2	307	16.8	459.9	22.4	613.9
L 25 - 075	75	25.50	12.0	307	18.0	459.9	24.0	613.9		
L 25 - 080	80	23.54	12.8	307	19.2	459.9	25.6	613.9		
L 25 - 090	90	21.57	14.4	307	21.6	459.9	28.8	613.9		
L 25 - 100	3.8	100	19.61	16.0	307	24.0	459.9	32.0	613.9	
L 30 - 050	30	20	50	51.94	8.0	414	12.0	621	16.0	828
L 30 - 060			60	44.10	9.6	414	14.4	621	19.2	828
L 30 - 070			70	37.24	11.2	414	16.8	621	22.4	828
L 30 - 080			80	32.34	12.8	414	19.2	621	25.6	828
L 30 - 090			90	28.42	14.4	414	21.6	621	28.8	828
L 30 - 100	100	25.48	16.0	414	24.0	621	32.0	828		
L 30 - 125	4.5	125	20.58	20.0	414	30.0	621	40.0	828	

- IT** Spezzoni con terminali aperti
- EN** Long size open ends
- DE** Meterware
- FR** Ressorts avec longueur ébauché
- ES** Piezas desmochadas con terminales abiertos
- PT** Pontas de refugo com terminais abertos



RoHS

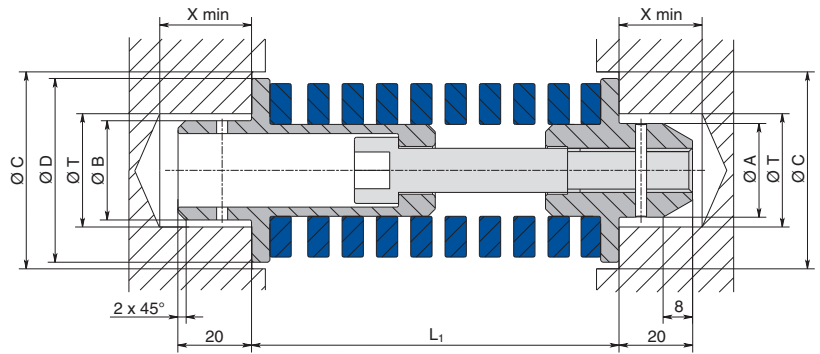
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Code	D _o Outside Diameter	D _i Inside Diameter	d Wire Diameter	L ₀ Free Length	P Pitch
	mm	mm	mm	mm	mm
L 03 - 300	3	2.0	0.4	300	1.04
L 04 - 300	4	2.6	0.6	300	1.50
L 06 - 300	6	4.0	0.9	300	2.00
L 08 - 300	8	5.4	1.2	300	2.80
L 10 - 300	10	6.5	1.5	300	3.50
L 12 - 300	12	8.0	1.8	300	4.30
L 14 - 300	14	9.3	2.2	300	4.80
L 16 - 300	16	10.7	2.4	300	5.50
L 18 - 300	18	12.0	2.8	300	5.30
L 20 - 300	20	13.5	3.0	300	6.80
L 22 - 300	22	14.7	3.4	300	6.70
L 25 - 300	25	17.0	3.8	300	8.20

Precompressed Unit

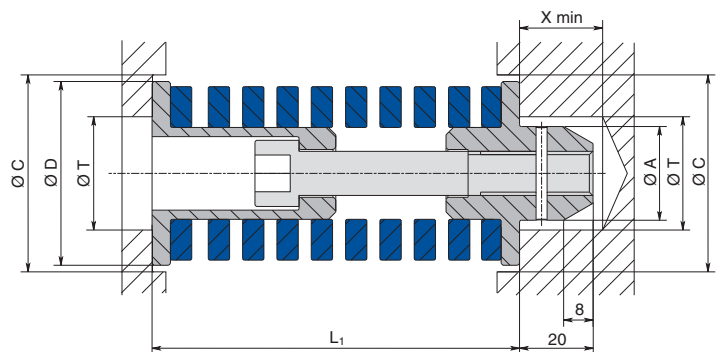
Peugeot - Citroën Standard

- IT** Sistema precompresso, carico medio, doppia spina
- EN** Precompressed unit, medium load, double pin
- DE** Vorspannungssystem, mittlere Spannung, Doppelstecker
- FR** Ensemble precomprime, charge moyenne, deux tetons
- ES** Sistema pretensado, carga mediana, doble clavija
- PT** Sistema pré-comprimido, carga média, dupla tomada



Code Special Springs	Code PSA Mabec	L1	ØA	ØB	ØD	Spring	Initial Force	25% Lo	32% Lo	ØC	ØT	X min	Spring data				
													D _H	L ₀	R		
15 02 B40069	X 346 590 070	69	20.5	22	40	17	1836	3	2160	42	22.5	25	40	76	108		
15 02 B40076	X 346 590 071	76				10	1080	10	2160					15	2700	76	108
15 02 B40100	X 346 590 072	100				12	972	13	2025					20	2592	102	81
15 02 B40122	X 346 590 073	122				15	941	17	2006					25	2508	127	62.7
15 02 B40143	X 346 590 074	143				19	981	19	1961					30	2528	152	51.6
15 02 B40188	X 346 590 075	188				25	918	25	1835					40	2373	203	36.7
15 02 B50088	X 346 590 076	88	25.5	27	50	24	2856	-	-	52	27.5	25	50	102	119		
15 02 B50100	X 346 590 077	100				12	1428	13	2975					20	3808	102	119
15 02 B50122	X 346 590 078	122				15	1455	17	3104					25	3880	127	97
15 02 B50143	X 346 590 079	143				19	1520	19	3040					30	3920	152	80
15 02 B50188	X 346 590 080	188				25	1495	25	2990					40	3887	203	59.8
15 02 B50232	X 346 590 081	232				32	1405	31	2766					50	3600	254	43.9
15 02 B63105	X 346 590 082	105	36.5	38	63	32	5376	-	-	65	38.5	25	63	127	168		
15 02 B63122	X 346 590 083	122				15	2520	17	5376					25	6720	127	168
15 02 B63143	X 346 590 084	143				19	2584	19	5168					30	6664	152	136
15 02 B63188	X 346 590 085	188				25	2500	25	5000					40	6500	203	100
15 02 B63232	X 346 590 086	232				32	2509	31	4939					50	6429	254	78.4
15 02 B63277	X 346 590 087	277				38	2459	38	4917					60	6341	305	64.7

- IT** Sistema precompresso, carico medio, spina singola
- EN** Precompressed unit, medium load, single pin
- DE** Vorspannungssystem, mittlere Spannung, Einfachstecker
- FR** Ensemble precomprime, charge moyenne, un teton
- ES** Sistema pretensado, carga mediana, clavija individual
- PT** Sistema pré-comprimido, carga média, tomada simples

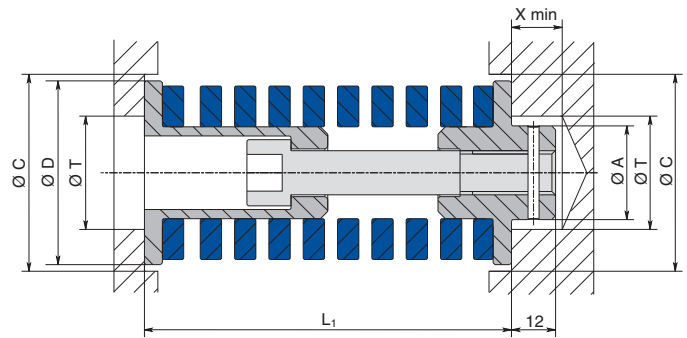


Code Special Springs	Code PSA Mabec	L1	ØA	ØB	ØD	Spring	Initial Force	25% Lo	32% Lo	ØC	ØT	X min	Spring data				
													D _H	L ₀	R		
15 01 B40069	X 346 590 063	69	20.5	-	40	17	1836	3	2160	42	22.5	25	40	76	108		
15 01 B40076	X 346 590 062	76				10	1080	10	2160					15	2700	76	108
15 01 B40100	X 346 590 061	100				12	972	13	2025					20	2592	102	81
15 01 B40143	X 346 590 059	143				19	980	19	1961					30	2528	152	51.6
15 01 B40188	X 346 590 058	188				25	918	25	1835					40	2386	203	36.7
15 01 B50088	X 346 590 057	88				24	2856	-	-					8	3808	102	119
15 01 B50100	X 346 590 056	100	12	1428	13	2975	20	3808	102	119							
15 01 B50143	X 346 590 054	143	19	1520	19	3040	30	3920	152	80							
15 01 B50188	X 346 590 053	188	25	1495	25	2990	40	3887	203	59.8							
15 01 B50232	X 346 590 052	232	32	1405	31	2766	50	3600	254	43.9							
15 01 B63105	X 346 590 051	105	32	5376	-	-	8	6720	127	168							
15 01 B63143	X 346 590 049	143	19	2584	19	5168	30	6664	152	136							
15 01 B63188	X 346 590 048	188	25	2500	25	5000	40	6500	203	100							
15 01 B63232	X 346 590 047	232	32	2509	31	4939	50	6429	254	78.4							
15 01 B63277	X 346 590 046	277	38	2459	38	4917	60	6341	305	64.7							

Precompressed Unit

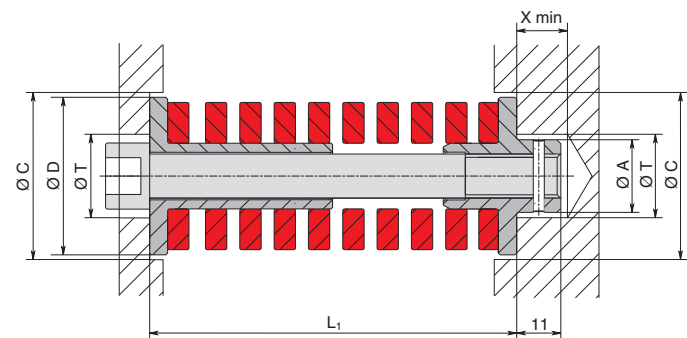
Peugeot - Citroën Standard

- IT** Sistema precompresso, carico medio, spina singola corta
- EN** Precompressed unit, medium load, short single pin
- DE** Vorspannungssystem, mittlere Spannung, kurzer Einfachstecker
- FR** Ensemble precomprime, charge moyenne, un teton court
- ES** Sistema pretensado, carga mediana, clavija individual corta
- PT** Sistema pré-comprimido, carga média, tomada simples curta



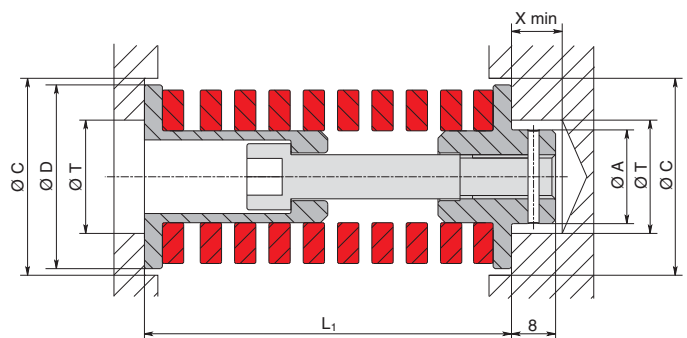
Code Special Springs	Code PSA Mabec	L1	ØA	ØB	ØD	Initial Force	25% Lo	32% Lo	ØC	ØT	X min	Spring data					
												D _H	L ₀	R			
15 01 B40122	X 346 590 060	122	20.5	-	40	15	940	17	2006	25	2508	42	22.5	13	40	127	62.7
15 01 B50122	X 346 590 055	122	25.5	-	50	15	1455	17	3104	25	3880	52	27.5	13	50	127	97
15 01 B63122	X 346 590 050	122	36.5	-	63	15	2520	17	5376	25	6720	65	38.5	13	63	127	168

- IT** Sistema precompresso, carico forte Ø25
- EN** Precompressed unit, strong load Ø25
- DE** Vorspannungssystem, starke Spannung Ø25
- FR** Ensemble precomprime, charge forte Ø25
- ES** Sistema pretensado, carga fuerte Ø25
- PT** Sistema pré-comprimido, carga pesada Ø25



Code Special Springs	Code PSA Mabec	L1	ØA	ØB	ØD	Initial Force	20% Lo	28% Lo	ØC	ØT	X min	Spring data					
												D _H	L ₀	R			
15 00 R25069	X 346 590 045	69	13	-	25	2	246	11	1599	16	2214	27	14	14	25	64	123

- IT** Sistema precompresso, carico forte Ø32
- EN** Precompressed unit, strong load Ø32
- DE** Vorspannungssystem, starke Spannung Ø32
- FR** Ensemble precomprime, charge forte Ø32
- ES** Sistema pretensado, carga fuerte Ø32
- PT** Sistema pré-comprimido, carga pesada Ø32



Code Special Springs	Code PSA Mabec	L1	ØA	ØB	ØD	Initial Force	20% Lo	28% Lo	ØC	ØT	X min	Spring data					
												D _H	L ₀	R			
15 00 R32088	X 346 590 044	88	13	-	33	21	2562	-	8	3528	34	14	8	32	102	122	
15 00 R32108	X 346 590 043	108	13	-	33	14	1498	9	2461	18	3424	34	14	8	32	115	107

1 N = 0.1 daN = 0.102 kgf



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