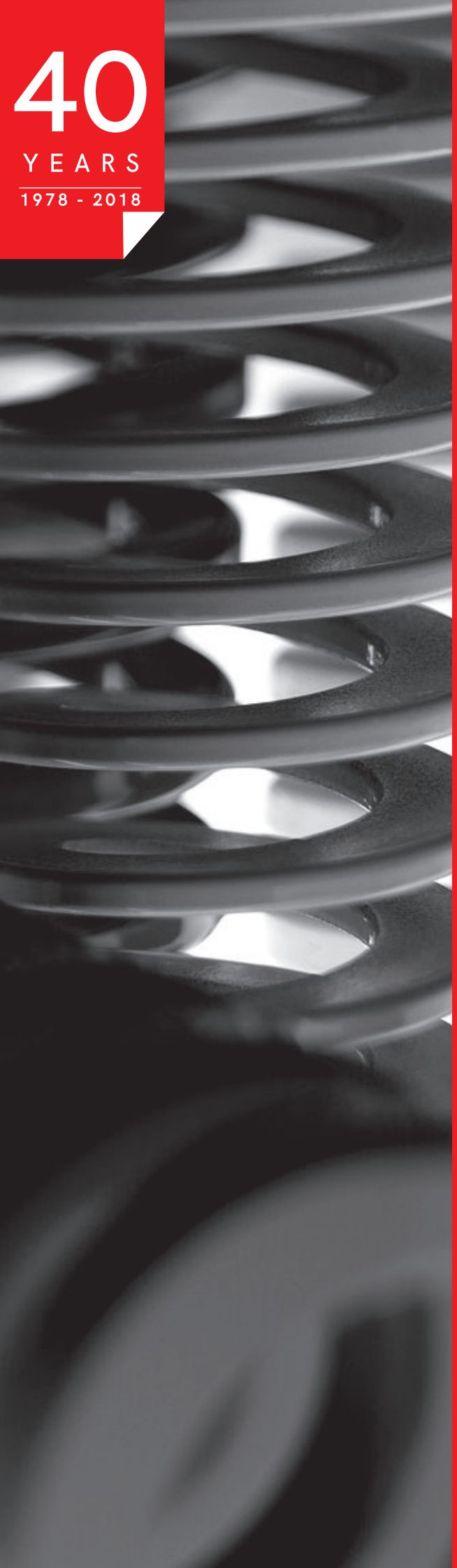


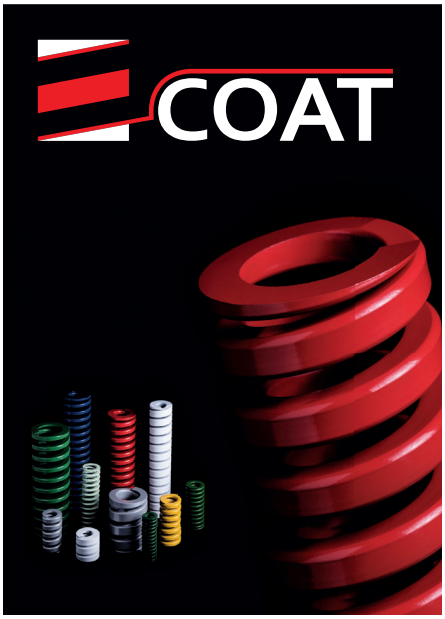
40
YEARS
1978 - 2018

INNOVATING SAFETY

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

ISO 10243 : 2010

SPECIAL SPRINGS



IT Elettroforesi - il punto di riferimento per le molle ISO di Special Springs. 100% copertura della superfice. Minimo e controllato spessore 10 < 30 µm. Elevata resistenza alla corrosione. Elevata resistenza meccanica.

EN E-coating - the new benchmark for the Special Springs ISO springs. 100% coating cover. Minimum and controlled thickness 10 < 30 µm. High corrosion resistance. High mechanical strength.

DE E-Coating - der neue Maßstab für die Special Springs ISO Schraubendruckfedern. 100% Beschichtung der Oberfläche. Dünne und kontrollierte Dicke 10 <30 µm. Hohe Korrosionsbeständigkeit. Hohe mechanische Festigkeit.

FR E-coating - le nouveau standard pour les ressorts fil ISO de Special Springs. 100% de couverture de la surface. Epaisseur fine et contrôlée 10 <30 µm. Haute résistance à la corrosion. Haute résistance mécanique.

ES E-coating: la nueva referencia para los muelles ISO de Special Springs. 100% revestimiento de la superficie. Espesor fino y controlado 10 <30 µm. Alta resistencia a la corrosión. Alta resistencia mecánica.

PT E-coating - a nova referência para as molas ISO de Special Springs. 100% revestimento da superficie. Espessura fina e controlada 10 <30 µm. Alta resistência à corrosão. Alta resistência mecânica.

IT Migliore scelta della molla grazie all'indicazione di valori minimi di durata a data deflessione. Tuttavia, il numero elevato di variabili nelle condizioni di lavoro possono influire anche significativamente sulla reale durata delle molle.

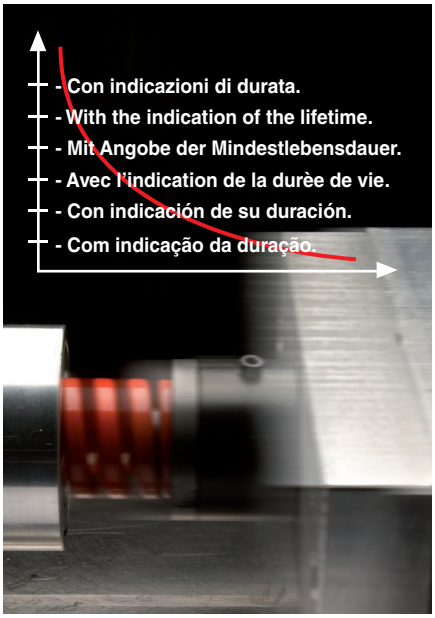
EN Improved selection of the spring thanks to the indication of the minimum lifetime at given spring deflection. However, the high number of variables in the working conditions may significantly influence the real lifetime of the springs.

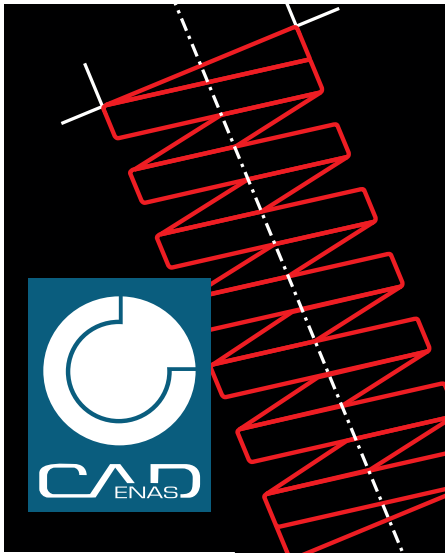
DE Verbesserte Federauswahl durch Angabe der Mindestlebensdauer bei einem gegebenen Federweg. Die hohe Anzahl von Variablen in den Arbeitsbedingungen kann jedoch die tatsächliche Lebensdauer der Federn erheblich beeinflussen.

FR Amélioration de la sélection du ressort fil grâce à l'indication de la durée de vie minimale à une déflexion donnée. Cependant, le nombre élevé de variables dans les conditions de travail peut influencer de manière significative la durée de vie réelle des ressorts.

ES Selección mejorada del muelle gracias a la indicación del tiempo de vida mínimo para una determinada deflexión. Sin embargo, el alto número de variables en las condiciones de trabajo puede influir significativamente en la vida real de los resortes.

PT Melhor seleção da mola graças à indicação da vida útil mínima numa determinada deflexão. No entanto, o elevado número de variáveis nas condições de trabalho pode influenciar significativamente a vida real das molas.





IT Partcommunity ed eCATALOGsolutions di Cadenas per un immediato e facile download dei files 2-3D di tutte le molle Special Springs.

EN Partcommunity and eCATALOGsolution by Cadenas to download easily and quickly 2-3D files of all Special Springs' springs.

DE Partcommunity und eCATALOGsolution von Cadenas zum einfachen und schnellen Herunterladen von 2-3D-Dateien aller Federn von Special Springs.

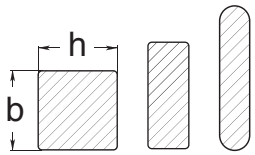
FR Partcommunity et eCATALOGsolution de Cadenas pour télécharger facilement et rapidement les fichiers 2-3D de tous les ressorts fil de Special Springs.

ES Partcommunity y eCATALOGsolution de Cadenas para descargar de forma fácil y rápida los archivos 2-3D de todos los muelles de Special Springs.

PT Partcommunity e eCATALOGsolution de Cadenas para baixar facilmente e rapidamente arquivos 2-3D de todas as molas Special Springs.

CUSTOMIZED SPRINGS

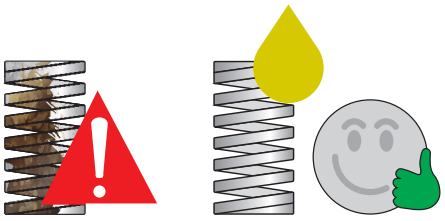
- **Custom made wire profiles**
- **100% In house processes**
- **No minimum quantity**
- **Competitive price**



- **Quality certified**
- **Short delivery**
- **Springs upon customer specs.**

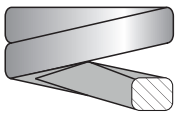
UNPAINTED SPRINGS

- **MODELS:** Same of standard series.
- **MIN. QUANTITY:** Same of standard on catalogue.
- **HOW TO ORDER:** Add "**U**" to code, see page 11.
- **SPRINGS IDENTIFICATION:** Unpainted springs can be identified by label or by checking sizes.



- **RUST PROTECTION:** Rust can cause early breaking, thus we recommend special care when using unpainted springs.

RANGE OVERVIEW



Rectangular Wire

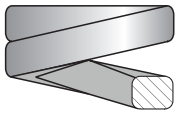
D_H	D_d	L_0	VL Extra ligth	V Ligth	B Medium	R Strong	G Extra strong	A Ultra strong
			Special Springs Standard	ISO 10243:2010	ISO 10243:2010	ISO 10243:2010	ISO 10243:2010	Special Springs Standard
			Max. Defl. 50% L_0	Max. Defl. 40% L_0	Max. Defl. 37,5% L_0	Max. Defl. 30% L_0	Max. Defl. 25% L_0	Max. Defl. 15% L_0
			R ± 10%	R ± 10%	R ± 10%	R ± 10%	R ± 10%	R ± 10%
mm	mm	mm	N/mm	N/mm	N/mm	N/mm	N/mm	N/mm
10	5	25	8.5	10	16.0	22.1	36.8	167
		32	6.5	8.5	13.0	17.5	27.9	130
		38	5.5	6.8	11.9	17.1	23.7	105
		44	4.8	6.0	10.3	15.0	19.2	86
		51	4.2	5.0	8.9	12.8	16.5	79
		64	3.3	4.3	7.5	10.7	13.2	62
		76	2.7	3.2	5.3	7.5	10.9	51
		305	0.65	1.1	1.6	2.1	2.6	11.5
12.5	6.3	25	16	17.4	30.0	42.1	58.5	288
		32	12.2	16.4	24.8	33.2	43.9	216
		38	10.3	13.6	21.4	29.3	36.0	176
		44	8.7	12.1	18.5	24.6	30.3	149
		51	7.5	11.4	15.5	19.6	26.2	128
		64	5.8	9.3	12.1	15.0	21.2	100
		76	4.7	7.1	10.2	13.2	17.1	84
		89	4.1	5.4	8.4	11.4	14.5	71
		102	3.6	4.1	6.3	8.4	12.7	61
		305	1.25	1.4	2.1	2.8	4.3	22
16	8	25	20.2	23.4	49.4	75.7	118	-
		32	16	22.9	37.1	52.8	89.0	449
		38	12.3	19.3	33.9	48.5	72.1	363
		44	10.6	17.1	30.0	42.8	60.9	309
		51	8.9	15.7	26.4	37.1	52.3	256
		64	7	10.7	20.5	30.3	41.2	203
		76	5.8	10.0	17.8	25.7	34.1	166
		89	4.8	8.6	15.2	21.7	29.5	139
		102	4.1	7.8	13.5	19.3	25.6	114
		115	3.9	6.6	11.8	15.7	22.4	105
		127	-	-	-	-	-	94
		152	-	-	-	-	-	78
		305	1.5	2.5	4.8	7.1	8.4	38.8
20	10	25	29.4	55.8	98.0	216	293	-
		32	22.6	45.0	72.6	168	224	-
		38	18.6	33.3	56.0	129	177	-
		44	15.7	30.0	47.5	112	149	452
		51	13.7	24.5	41.7	94.0	128	378
		64	11.3	20.0	32.3	72.1	99.0	301
		76	9.8	16.0	25.1	59.7	81.7	247
		89	8.3	14.0	22.0	50.5	69.5	208
		102	7.4	12.0	19.8	44.2	60.6	188
		115	6.4	10.9	18.1	38.4	53.0	159
		127	5.9	9.5	16.6	34.1	47.5	146
		139	5.4	8.4	15.1	31.0	43.0	-
		152	4.9	7.5	13.2	28.2	39.0	120
		178	-	-	-	-	-	-
		305	2.5	4.0	6.1	15.0	21.2	60
25	12.5	25	53.9	100	147	375	459	-
		32	42.2	80.3	118	297	374	-
		38	35.8	62.0	93.0	219	300	-
		44	31.4	52.9	80.8	187	244	1158
		51	27.0	44.0	68.6	156	208	933
		64	21.6	35.2	53.0	123	161	644
		76	18.1	28.0	43.2	99.0	131	556
		89	15.2	24.0	38.2	84.0	111	462
		102	13.2	21.1	33.0	73.0	96.3	390
		115	11.8	18.7	28.0	65.0	85.7	360
		127	10.6	16.7	25.9	57.7	76.3	326

new

new

Continue...

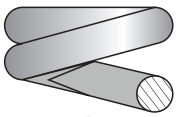
RANGE OVERVIEW



Rectangular Wire

D_H	D_d	L_0	T Super strong	W Hyper strong
			Special Springs Standard	Special Springs Standard
			Max. Defl.	Max. Defl.
			R ± 10%	R ± 10%
mm	mm	mm	N/mm	N/mm
10	5	20	580	-
		30	360	-
		40	260	-
		50	200	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
12.5	6.3	20	970	-
		30	590	-
		40	400	-
		50	320	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
16	8	20	1650	1818
		35	920	1000
		50	580	615
		75	410	400
		100	280	286
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
19	10	25	2270	2400
		40	1160	1333
		50	830	1000
		75	500	600
		100	380	429
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
25	12.5	30	4550	4800
		50	2000	2400
		60	1500	-
		75	1250	1500
		100	900	1000
		125	710	857
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-

new



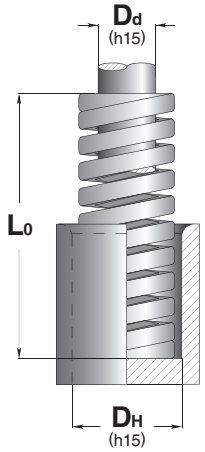
Round Wire

D_H	D_d	L_0	TV Ligth	TB Me-dium	TR Strong	L
			Special Springs Standard	Special Springs Standard	Special Springs Standard	Special Springs Standard
			Max. Defl. 40% L_0	Max. Defl. 37,5% L_0	Max. Defl. 30% L_0	Max. Defl. 32% L_0
			R ± 10%	R ± 10%	R ± 10%	R ± 10%
mm	mm	mm	N/mm	N/mm	N/mm	N/mm
10	5	25	4.4	12.3	20.7	
		32	3.4	9.5	16.1	
		38	2.8	7.8	13.0	
		44	2.4	6.5	10.9	
		51	2.1	5.6	9.6	
		64	1.6	4.5	7.7	
		76	1.3	3.7	6.3	
		305	0.3	0.9	1.5	
12.5	6.3	25	8.5	21.7	37.5	
		32	6.5	16.8	28.9	
		38	5.3	13.8	23.5	
		44	4.4	11.6	19.6	
		51	3.8	10.0	17.3	
		64	2.9	7.8	13.5	
		76	2.5	6.4	11.2	
		89	2.1	5.6	9.5	
		305	0.6	1.5	2.7	
16	8	25	17.9	31.9	81.6	
		32	13.5	24.0	61.3	
		38	10.5	19.4	49.9	
		44	8.8	16.1	40.8	
		51	7.6	13.8	35.6	
		64	5.9	10.7	27.8	
		76	4.8	8.8	22.8	
		89	4.0	7.5	19.6	
		102	3.5	6.5	17.0	
		305	1.1	2.1	5.4	

p. 35

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

LEGENDA



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
Innenführungdurchmesser
Diamètre de l'arbre de guidage
Diámetro de la clavija de guía
Diâmetro da tomada de guia

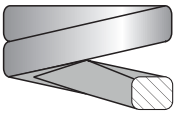
L_0 Lunghezza libera della molla
Spring free length
Länge der unbelasteten Feder
Longueur libre du ressort
Longitud libre del muelle
Comprimento livre da mola

Max. Defl. Deflessione totale massima
Maximum total working deflection
Maximaler Gesamtfederweg
Déflexion totale maximale
Deflexión total máxima
Deflexão total máxima

R Carico (N) necessario per deflettere la molla di 1mm
Spring rate (N) - load required for 1mm deflection
Kraftzunahme (N) für 1 mm gefragt pro
Charge (N) exigée pour comprimer le ressort 1mm
Carga (N) necesaria para desviar el muelle de 1mm
Carga (N) necessária para defletir a mola de 1mm

Continue...

RANGE OVERVIEW

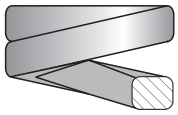


Rectangular Wire

D_H	D_d	L_0	VL Extra ligth	V Ligth	B Medium	R Strong	G Extra strong	A Ultra strong
			Special Springs Standard	ISO 10243:2010	ISO 10243:2010	ISO 10243:2010	ISO 10243:2010	Special Springs Standard
			Max. Defl. 50% L_0	Max. Defl. 40% L_0	Max. Defl. 37,5% L_0	Max. Defl. 30% L_0	Max. Defl. 25% L_0	Max. Defl. 15% L_0
			R ± 10%	R ± 10%	R ± 10%	R ± 10%	R ± 10%	R ± 10%
mm	mm	mm	N/mm	N/mm	N/mm	N/mm	N/mm	N/mm
25	12.5	139	9.6	15.3	23.2	52.7	66.0	-
		152	8.8	14.0	20.8	47.8	63.5	255
		178	7.6	12.5	17.8	41.0	53.9	230
		203	6.7	10.4	15.8	35.8	47.0	202
		305	4.4	7.0	10.2	22.9	30.9	136
32	16	38	43.1	94.0	185	388	480	-
		44	37.3	79.5	158	324	390	1300
		51	32.4	67.0	134	272	320	1150
		64	25.5	53.0	99.0	212	269	1077
		76	21.6	44.0	80.5	172	219	874
		89	18.1	37.2	69.1	141	180	721
		102	15.7	32.0	58.8	122	115	620
		115	14.2	29.0	51.5	107	140	560
		127	12.7	25.0	44.8	93.0	124	496
		139	11.6	23.0	42.3	86.0	112	-
		152	10.6	21.5	37.8	78.0	102	408
		178	9.0	18.2	32.5	67.2	88.2	353
		203	7.8	15.8	28.9	59.1	76.0	304
		254	6.4	12.5	21.4	46.4	60.8	243
		305	5.3	10.3	18.3	38.0	49.0	196
40	20	51	48.1	92.0	182	350	628	-
		64	39.2	73.0	140	269	487	1128
		76	33.3	63.0	108	219	379	1017
		89	28.4	51.0	90.7	190	321	880
		102	24.5	43.0	81.0	163	281	762
		115	22.1	39.6	71.8	142	245	679
		127	19.6	37.0	62.7	128	221	622
		139	17.7	32.0	57.5	115	171	-
		152	16.2	28.0	51.6	105	168	509
		178	13.7	25.2	44.1	89	150	429
		203	12.3	22.7	36.7	77	132	374
		254	9.8	17.0	30.1	61	107	296
		305	8.3	14.8	24.6	51	87.8	246
50	25	64	86.3	156	209	413	709	1980
		76	70.6	125	168	339	572	1811
		89	59.8	109	140	288	475	1410
		102	52.0	94.0	119	245	405	1215
		115	46.1	81.0	106	215	352	1076
		127	42.2	71.0	97.0	192	316	968
		139	38.2	66.5	87.0	168	289	-
		152	34.3	60.0	80.0	154	239	806
		178	29.4	52.0	69.5	134	215	698
		203	25.5	44.0	59.8	117	187	612
		229	-	-	50.9	-	-	-
		254	20.6	35.0	43.9	89	153	472
		305	17.2	28.5	38.6	73	127	388
63	38	76	57.8	189	312	618	952	1900
		89	51.4	158	260	515	819	1517
		102	44.4	131	221	438	700	1295
		115	38.0	116	187	370	620	1070
		127	33.2	103	168	333	565	979
		152	27.4	84.3	136	269	458	775
		178	24.0	71.5	114	226	384	630
		203	21.0	61.7	100	198	337	546
		229	-	-	89.2	-	-	-
		254	16.4	47.0	78.4	155	263	423
		305	13.6	38.2	64.7	128	218	349

new

new



Rectangular Wire

D_H	D_d	L_0	T Super strong	W Hyper strong
			Special Springs Standard	Special Springs Standard
			Max. Defl.	Max. Defl.
			R ± 10%	R ± 10%
mm	mm	mm	N/mm	N/mm
		-	-	-
		-	-	-
25	12.5	-	-	-
		-	-	-
		-	-	-
		35	5360	6667
		50	3000	3636
		75	1670	2222
		100	1200	1538
		125	940	1250
		150	810	1053
		-	-	-
32	16	-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		-	-	-
		40	5710	7143
		50	4000	5000
		75	2220	2778
		100	1540	1923
		150	1050	1316
		200	740	926
38	20	-	-	-
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		60	4605	-
		75	3932	-
		100	2650	-
		125	2000	-
		150	1605	-
		200	1167	-
50	25	-	-	-
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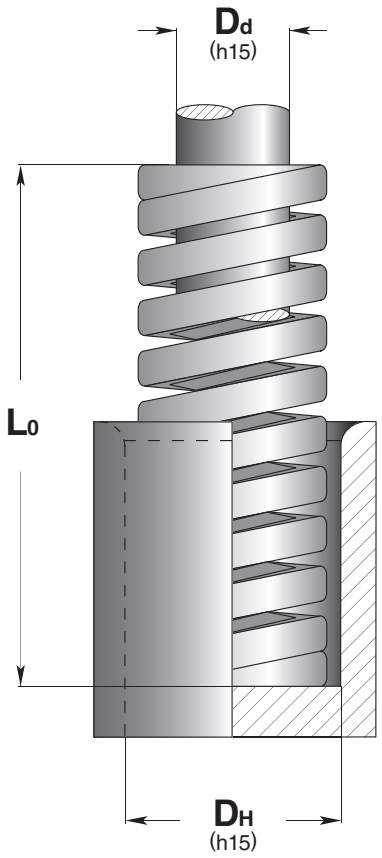
new

LEGENDA



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
Innenführungdurchmesser
Diamètre de l'arbre de guidage
Diámetro de la clavija de guía
Diâmetro da tomada de guia

L_0
Lunghezza libera della molla
Spring free length
Länge der unbelasteten Feder
Longueur libre du ressort
Longitud libre del muelle
Comprimento livre da mola

Max. Defl.
Deflessione totale massima
Maximum total working deflection
Maximaler Gesamtfederweg
Déflexion totale maximale
Deflexión total máxima
Deflexão total máxima

R
Carico (N) necessario per deflettere la molla di 1mm
Spring rate (N) - load required for 1mm deflection
Kraftzunahme (N) für 1 mm gefragt pro
Charge (N) exigée pour comprimer le ressort 1mm
Carga (N) necesaria para desviar el muelle de 1mm
Carga (N) necessária para defletir a mola de 1mm

USE RECOMMENDATIONS

IT L'utilizzo corretto delle molle Special Springs assicura prestazioni molto superiori alle indicazioni di durata fornite. Usi scorretti riducono significativamente i valori di durata e sono causa di pericolo e danni.

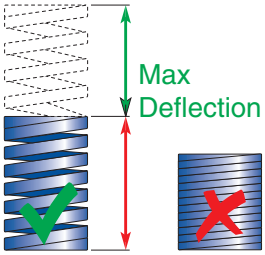
EN The correct use of Special Springs' springs assures higher performance levels respect to the lifetime values indicated. Incorrect uses can significantly reduce the expected lifetime and may cause damages or injury.

DE Der korrekte Gebrauch der Special Springs Federn garantiert eine Leistung, die sehr höher als der angegebenen Lebensdauer ist. 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 beaucoup supérieures aux indications de durée fournies. 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 muy superiores a las indicaciones de duración indicadas. Utilizaciones incorrectas reducen significativamente los valores de duración y pueden provocar situaciones de peligro y daños.

PT A utilização correta das molas Special Springs assegura prestações muito superiores às indicações de duração fornecidas. Usos incorretos reduzem significativamente os valores de duração e são causa de perigo e danos.



IT Non utilizzare le molle oltre la massima deflessione. Pericolo di cedimenti improvvisi e danni allo stampo.

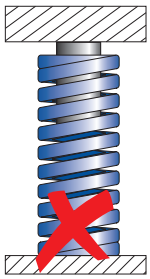
EN Do not exceed the maximum deflection. High risk of sudden failure and damages on the tool.

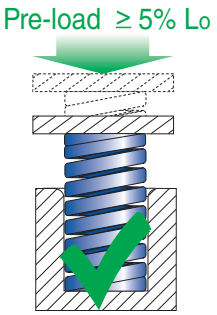
DE Die Federn nicht über dem maximalen Federweg verwenden. Es besteht die Gefahr eines plötzlichen Bruchs bzw. Schäden am Werkzeug.

FR Ne pas dépasser le maximum de déflection. Risques très élevés de cassures soudaines et de dégats sur l'outil.

ES No utilizar los muelles sobrepasando la deflexión máxima indicada. Peligro de roturas imprevistas y daños al troquel.

PT Não exceder a compressão máxima da mola, pois pode ocorrer a quebra causando danos a ferramenta.





IT A parità di deflessione totale, maggiore è il precarico, maggiore sarà la durata. Quindi molle di lunghezza maggiore a parità di forza totale garantiscono maggiore durata. Si raccomanda sempre un precarico minimo del 5% della lunghezza libera. Assenza o insufficienza di pre-carico sono causa di cedimenti prematuri delle molle.

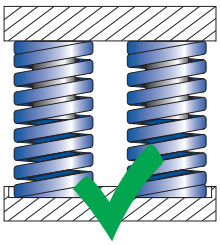
EN The bigger is the pre-load the longer is the lifetime for the same total deflection. Thus longer springs with same total force, will assure longer lifetime. It is recommended to always apply a minimum pre-load of 5% of the free length. Absent or insufficient pre-load causes unexpected failure to the springs.

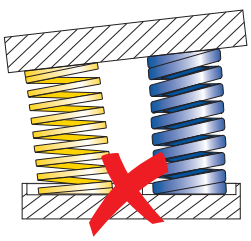
DE Bei gleichem Gesamtfederweg gilt, dass die Lebensdauer der Federn umso höher ist, je größer die Vorspannung ist. Daher, Federn mit einer größeren Länge bei gleicher Gesamtkraft garantieren deshalb für eine längere Lebensdauer. Es wird zu einer Mindestvorspannung von 5% der freien Länge empfohlen. Der Mangel oder Unzulänglichkeit des Mindestvorspannung, plötzliche Erdsenkung, verursachen können.

FR À parité de déflexion totale, le plus la pré-charge sera importante, le 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 pré-charge minimum de 5% de la longueur libre. La Manque ou l'insuffisance du pré-charge causeront des d'affaissements anticipés des ressorts.

ES A paridad de deflexión total, cuanto mayor es la precarga, mayor será la duración de los muelles. Por eso, los muelles de mayor longitud a paridad de fuerza total garantizan una mayor duración. Aconsejamos una precarga mínima del 5% de la longitud libre. Falta o la insuficiencia de precarga, puede llevar a des aflojamientos repentinos de los muelles.

PT Em igualdade de deflexão total, quanto maior será a pré-carga, maior será a duração das molas. portanto molas mais longas, em igualdaded de força total, garantem maior duração. Aconselha-se uma pré-carga mínima de 5% do comprimento livre. A ausência ou falha de pré-carga causar falha prematura das molas.





IT Se vengono utilizzate molle diverse simultaneamente, assicurare che le deflessioni e le forze siano bilanciate. Garantire sempre la massima perpendicolarità tra i piani di contatto, per evitare cedimenti prematuri delle molle.

EN When using different types of springs simultaneously, ensure that deflections and forces guarantee a balanced load. Always ensure the best perpendicularity between surfaces, to avoid early failure of the springs.

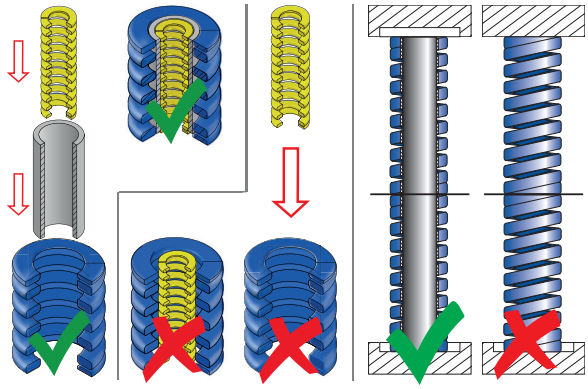
DE Wenn gleichzeitig mehrere Federn verwendet werden, muss sichergestellt werden, dass Federweg und Kräfte ausgeglichen sind. Es muss für eine perfekte Rechtwinkligkeit zwischen die Auflageflächen immer garantiert sein, um ein vorzeitiges Nachgeben der Federn zu vermeiden.

FR Si on utilise des ressorts différentes simultanément, assurer que les déflections et les forces soient balancées. Garantir toujours la perpendicularité maximale entre les surfaces de contacte, afin d'éviter des affaissements anticipés des ressorts.

ES Si utilizan muelles diferentes simultáneamente, comprueben que las deflexiones y las fuerzas estén equilibradas. Siempre garanticen la máxima perpendicularidad entre los planos de contacto para evitar prematuros aflojamientos de los muelles.

PT Se molas diferentes forem utilizadas ao mesmo tempo, assegurar que as deflexões e as forças sejam equilibradas. Sempre garantir a máxima perpendicularidade entre os planos de contato a fim de evitar prematuros cedimentos das molas.

USE RECOMMENDATIONS



IT Molle sovrapposte solo se completamente guidate. Molle accoppiate solo se non a contatto. Pericolo di cedimenti improvvisi e danni.

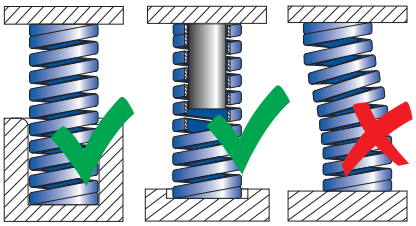
EN Overlapped springs only if guided. Coupled springs only if not in contact. Risk of sudden failure and damages.

DE Überlappende Schraubendruckfedern nur wenn geführt. Gekoppelte Federn nur wenn nicht in Kontakt.Gefahr von plötzlichem Versagen und Schäden.

FR Ressorts superposés uniquement s'ils sont guidés. Ressorts couplés uniquements'ilsnesontpasencontact.Risquededéfaillancesoudaineetdedommages.

ES Muelles superpuestos solo si son guiados. Muelles acoplados solo si no están en contacto.Riesgo de falla repentina y daños.

PT Molas sobrepostas somente se guiadas. Molas acopladas somente se não estiverem em contato. Risco de falha repentina e danos.



IT Maggiore è il guidaggio maggiore sarà la durata delle molle. È necessario guidare tutte le molle con un rapporto lunghezza/diametro maggiore di 3,5 sempre.

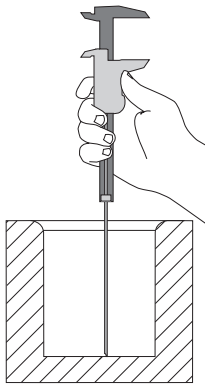
EN The bigger the guide the longer the lifetime. It is essential to always guide all springs with a free length /diameter ratio exceeding 3.5.

DE Je größer die Führung ist, desto länger ist die Lebensdauer der Federn. Alle Federn müssen immer 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 toujours 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 siempre necesario guiar todos los muelles con una relación de longitud/diámetro mayor de 3,5.

PT Quanto maior será a guiagem, maior a duração das molas. É sempre necessário guiar todas as molas com relação de comprimento/diâmetro maior que 3,5.



IT Le manutenzioni dello stampo possono modificare la deflessione di lavoro originale delle molle. Controllare e ripristinare sempre le deflessioni originali. Pericolo di cedimenti prematuri o danni allo stampo.

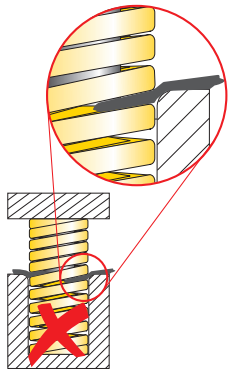
EN Tool maintenance can vary the original working deflection of the springs. Always check and re-set the original working stroke. High risk of early failures or damages of the tool.

DE Wartungseingriffe an der Form können den ursprünglichen Federweg der Federn ändern. Die Originellen Federwege müssen immer kontrolliert und wiederhergestellt werden. Gefahr von plötzliche Erdsenkung und Schäden an der Form.

FR Les entretiens sur le moule peuvent modifier la déflexion du travail original des ressorts. Il faut toujours contrôler et rétablir les déflexions originelles. Danger d'affaissements prématurés ou des dommages au moule.

ES Las manutenciones del molde pueden modificar la deflexión de trabajo original de los muelles. Controlar y restablecer siempre las deflexiones iniciales. Peligro de prematuros aflojamientos de los muelles o daños al molde.

PT As manutenções do molde podem modificar a deflexão de trabalho original das molas. Verifique e reajusta sempre as deflexões iniciais. Perigo de 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. Controllare e rimuovere sempre questi corpi.

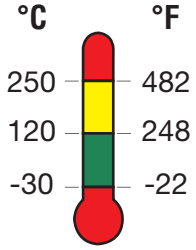
EN The presence of scraps or any solid piece between coils causes a reduction of springs deflection with overloads and early failure of the springs and damage of the tool. Check and always remove the scraps.

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. Immer diese Körper überprüfen und entfernen.

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. Contrôler et éliminer ces corps étrangers.

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. Siempre buscar y eliminar estos organismos.

PT A presença de corpos estranhos entre as espiras das molas provoca reduções de curso, sobrecargas e rupturas das molas com danos no molde.Sempre procurar e remover esses órgãos.



IT Nel range di temperature 120÷ 250°C considerare una perdita di carico tra l'1 e il 2% ogni 40°C.

EN In the temperature range of 120 ÷ 250°C consider a loss between 1 to 2% of the load every 40°C.

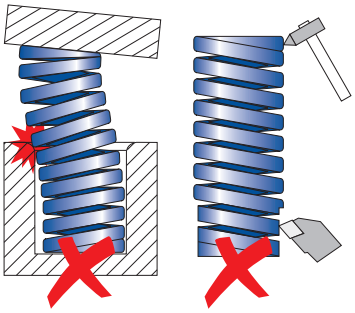
DE ImTemperaturbereichvon120÷250°CisteinVerlustzwischen1bis2%derBelastungalle40°Czuberücksichtigen.

FR Dans la plage de température de 120 ÷ 250°C, il faut envisager une perte entre 1 et 2% de la charge tous les 40 °C.

ES En el rango de temperatura de 120 ÷ 250°C considere una pérdida entre 1 y 2% de la carga cada 40 °C.

PT Na faixa de temperatura de 120 ÷ 250°C, considere uma perda entre 1 e 2% da carga a cada 40 °C.

USE RECOMMENDATIONS



IT Qualsiasi danno sulla superficie delle molle (tagli, abrasioni, molature) può ridurre significativamente la durata. Sostituire sempre le molle danneggiate.

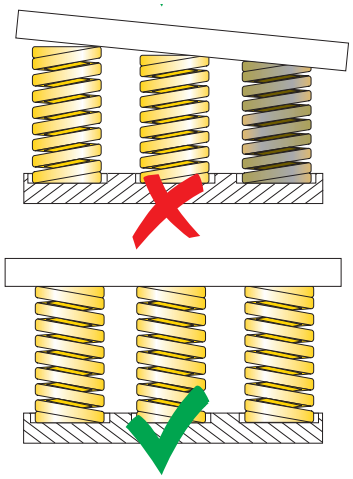
EN Any alteration on the surface of the springs (cutting, grinding, scratches, etc.) may significantly reduce the lifetime. Always replace the damaged springs with new ones.

DE Schäden gleich welcher Art auf der Oberfläche der Federn (Schnitte, Abschürfungen, Abrieb) können die Lebensdauer deutlich reduzieren. Beschädigte Federn müssen ausgewechselt werden.

FR Tout dommage sur la surface des ressort (coupures, abrasions, meulages) peut réduire significativement la durée. Il faut toujours remplacer les ressorts endommagés.

ES Cualquier daño sobre la superficie de los muelles (cortes, abrasiones, amoladuras) puede reducir significativamente la duración. Sustituir siempre los muelles dañados.

PT Qualquer dano na superfície das molas (cortes, abrasões, amoladuras) pode reduzir consideravelmente a duração. Substituir sempre as molas danificadas



IT Una molla collassata crea uno sbilanciamento dei carichi con danni alle altre molle o allo stampo. Sostituire sempre tutte le molle. Una sostituzione programmata delle molle previene danni e riduce costi.

EN If one spring collapses, an imbalanced load will occur with damage to the other springs. Replace all springs. Advance planned maintenance prevents damages and saves money.

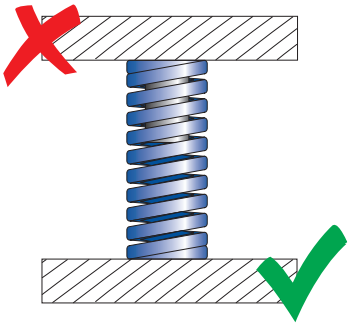
DE Durch eine defekte Feder entsteht ein Ungleichgewicht der Spannungen, durch das die anderen Federn oder die Form beschädigt werden. Es müssen immer alle Federn ausgewechselt werden. Ein geplantes Auswechseln der Federn beugt Schäden vor und hilft dabei, Kosten zu senken.

FR Un ressort affaissé crée un déséquilibre des charges avec des dommages aux autres ressorts et au moule. Remplacer toujours tous les ressorts. Un remplacement programmé des ressorts 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. Siempre sustituir todos los muelles. Una sustitución programada de los muelles previene daños y reduce costes.

PT Uma mola que cedeu provoca um desequilíbrio das cargas provocando danos nas outras molas e no molde. Sempre substituir todas as molas. A substituição programada das molas previne danos e reduz custos.

< 50 HRC



≥ 50 HRC

IT Le molle sono realizzate con acciai legati temprati. Per prevenire l'usura e l'abrasione delle superfici in contatto con le molle si raccomanda di provvedere con materiali e durezze adeguati per un uso ottimale.

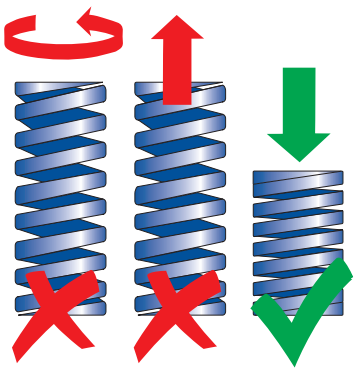
EN The springs are made with hardened alloy steel. To prevent wear and abrasion of surfaces in contact with the springs, please use adequate material and hardness in surfaces for optimal use.

DE Die Federn werden aus gehärtetem Stahl gefertigt. Um zu verhindern, Verschleiß und Abrieb der Oberflächen in Kontakt mit den Federn wird empfohlen, mit geeigneten Materialien und Härte für die optimale Nutzung zu verwenden.

FR Les ressorts sont réalisés avec des aciers alliés tempérés. Pour prévoir l'usure et l'abrasion des surfaces en contact avec les ressorts, il est recommandé d'utiliser des matériaux et des duretés adéquates pour un usage optimal

ES Los muelles son fabricados con acero templado. Para prevenir el desgaste y la abrasión de la superficies en contacto con los muelles se recomienda usar materiales y durezas adecuados para un uso óptimo.

PT As molas são fabricadas com aço-liga endurecido. Para evitar desgaste das superfícies de contato com as molas, recomenda-se o uso de material com dureza adequada.



IT Non applicare forze in direzione diversa da quella in compressione. Utilizzare le molle in trazione o torsione è causa di deformazione e cedimento. L'uso improprio delle molle può comportare incidenti imprevedibili con danni a cose e persone.

EN Do not apply forces other than in compression direction. Using of compression springs as traction or torsion springs is cause of deformation and sudden failure. The improper use of springs may bring to unforeseen accidents with damage and injury.

DE Bringen Sie keine Kräfte in der anderen Richtung als Kompression. Die federn zu ziehen oder zu verdrehen zu verwenden, ist aufgrund der Deformation und Versagen. Eine unsachgemäße Verwendung der Federn können unvorhersehbare Unfälle mit Sachschäden und Personen führen.

FR N'appliquez les forces que pour la compression. Utilisation de ressorts de compression en traction ou torsion est la cause de déformation et de panne instantanée. L'utilisation inadaptée des ressorts peut causer des accidents imprévus avec des dégâts et provoquer des blessures

ES No aplicar fuerzas que no sean de compresión. Utilizar los muelles en tracción o torsión es causa de deformación y rotura. El uso inadecuado de los muelles puede comportar incidentes imprevisibles con daños a cosas y personas.

PT As molas devem ser utilizadas somente como molas de compressão. Não utilizar as molas como molas de tração ou compressão, o uso indevido das molas pode ocasionar quebras repentinas e causar acidentes com danos e ferimentos.

USE RECOMMENDATIONS

IT Evitare di stoccare le molle in posizione completamente compressa per lunghi periodi. Proteggere le molle da agenti corrosivi per evitare ossidazioni e prematuri cedimenti. Sostituire sempre le molle che presentano ruggine.

EN Avoid storage of springs in the fully compressed position for long periods to prevent fatigue. Protect the springs from corrosive agents to prevent oxidation and early failures. Always replace rusty springs.

DE Bitte vermeiden Sie eine lange Lagerung der Federn in komplett komprimiertem Zustand. Schützen Sie die Federn vor korrosiven Stoffen, so dass Oxidation und verfrühter Bruch vermieden werden. Rostige Federn stets ersetzen

FR Evitez de stocker les ressorts dans la position complètement comprimée pendant de longues périodes. Protéger les les ressorts des agents corrosifs pour empêcher l'oxydation et une défaillance prématurée. Toujours remplacer les ressorts qui ont la rouille.

ES Evitar el almacenamiento de los muelles en posición completamente comprimida por largos periodos de tiempo. Proteger los muelles de agentes corrosivos para evitar óxido y roturas prematuras. Sustituir siempre los muelles que presenten óxido

PT Afim de evitar a fadiga das molas, não armazene-as na posição de compressão. Armazene-as em local protegido, para evitar a oxidação e corrosão. Sempre substitua as molas enferrujadas.

IT La conformità alla direttiva RoHs e i materiali utilizzati consentono di smaltire le molle come normale rottame metallico.

EN The compliance to RoHs and the material used allow to dispose springs as regular metal scrap.

DE Da die Federn die Richtlinie RoHs erfüllen und aufgrund der verwendeten Materialien können sie als normaler Metallmüll entsorgt werden.

FR La conformité de RoHs et du matériel utilisé permet de céder les ressorts comme déchets métalliques.

ES La conformidad con la directiva RoHs y los materiales utilizados permiten desechar los muelles como chatarra metálica normal.

PT As molas são fabricadas em conformidade com a RoHs, assim como o material utilizado na fabricação, permitem descartar as molas como sucata.

HOW TO ORDER

PAINTED SPRINGS

Example:

Series
DH
L0
Quantity

R 40-064 (10 pcs)

UNPAINTED SPRINGS

Example:

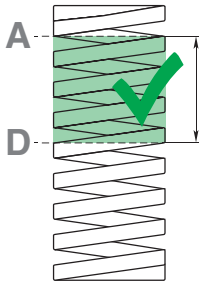
Series
DH
L0
Unpainted
Quantity

R 40-64U (10 pcs)

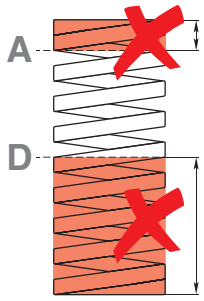
HOW TO CHECK SPRING COSTANT (R)

R ± 10%
Spring Constant

IT Si definisce RIGIDITÁ il carico necessario in N per deflettere la molla di 1 mm.
EN Spring constant is the load required in N to deflect a spring by 1 mm.
DE Die Federrate ist die notwendige Kraft in N, die man benötigt, um eine Feder 1 mm zu spannen.
FR La constante ressort est la charge requise en N pour comprimer le ressort de 1 mm.
ES La constante de los muelles es la carga requerida en N para comprimir un muelle 1 mm.
PT Constante elástica da mola é a carga solicitada em N para comprimi-la 1 mm.



IT La verifica della rigidità viene effettuata considerando i valori di forza rilevati alle deflessioni indicate nelle colonne A e D.
EN Springs rate is verified considering the force values as stated in columns A and D.
DE Die Federrate wird unter Berücksichtigung der in den Spalten A und D angegebenen Kraftwerte überprüft.
FR La raideur de ressorts fil est vérifiée en considérant les valeurs de force indiquées dans les colonnes A et D.
ES La rigidez de los muelles se verifica considerando los valores de fuerza indicados en las columnas A y D.
PT A rigidez das molas é verificada considerando os valores de força indicados nas colunas A e D.

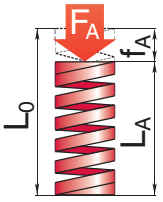


IT La rigidità verificata al di fuori degli intervalli indicati può risultare che non rientri nella tolleranza di ±10%.
EN Springs rate, when verified outside the indicated range of values, may result out of the ±10% tolerance.
DE Wenn die Federrate außerhalb des angegebenen Wertebereichs überprüft wird, könnte Sie aus der Toleranz von ± 10% resultieren.
FR La raideur des ressorts fil, lorsqu'elle est vérifiée en dehors de la plage de valeurs indiquée, peut résulter hors de la tolérance de ± 10%.
ES La rigidez de los muelles, cuando se verifica fuera del rango de valores indicado, puede resultar fuera de la tolerancia de ± 10%.
PT A rigidez das molas, quando verificada fora do intervalo de valores indicado, pode resultar fora da tolerância de ± 10%.

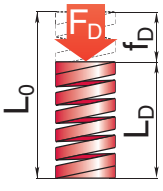
R25-025

Esempio di calcolo - Calculation example - Berechnungsbeispiel - Exemple de calcul - Ejemplo de cálculo - Exemplo de cálculo

1
IT Comprimere la molla di f_A = 5 mm (col. A) rispetto alla lunghezza nominale L_0 e misurare la forza F_A (N)
EN Deflect the spring to f_A = 5 mm (col. A) in relation to nominal length L_0 and then measure the force F_A (N)
DE Die Schraubendruckfeder auf f_A = 5 mm (col. A) im Verhältnis zur Nennlänge L_0 ablenken und dann die Kraft F_A (N) messen.
FR Défléchir le ressort fil à f_A = 5 mm (col. A) par rapport à la longueur nominale L_0 et puis mesurer la force F_A (N)
ES Flexionar el muelle a una f_A = 5 mm (col. A) en relación con la longitud nominal L_0 y luego medir la fuerza F_A (N)
PT Deflexionar a mola para uma di f_A = 5 mm (col. A) em relação ao comprimento nominal L_0 e depois medir a força F_A (N)



2
IT Comprimere la molla di f_D = 7,5 mm (col. D) rispetto alla lunghezza nominale L_0 e misurare la forza F_D (N)
EN Deflect the spring to f_D = 7,5 mm (col. D) in relation to nominal length L_0 and measure the force F_D (N)
DE Die Schraubendruckfeder auf Die Schraubendruckfeder auf f_D = 7,5 mm (Spalte D) im Verhältnis zur Nennlänge L_0 ablenken und dann die Kraft F_D (N) messen.
FR Défléchir le ressort fil à f_D = 7,5 mm (col. D) par rapport à la longueur nominale L_0 et puis mesurer la force F_D (N)
ES Flexionar el muelle a una f_D = 7,5 mm (col. D) en relación con la longitud nominal L_0 y luego mida la fuerza F_D (N)
PT Deflexionar a mola para uma f_D = 7,5 mm (col. D) em relação ao comprimento nominal Lo e depois medir a força L_0 e depois medir a força F_D (N)



3
IT Calcolare la rigidità R applicando la formula:
EN Calculate the springs constant R by the following formula:
DE Die Federrate R mit folgender Formel berechnen:
FR Calculer la constante ressort R par la formule suivante:
ES Calcular la constante R con la siguiente fórmula:
PT Calcular a constante elástica da mola R pela seguinte fórmula:

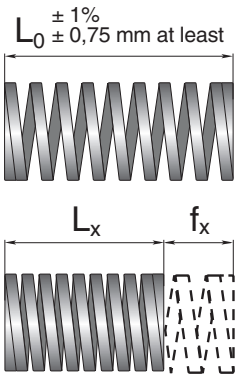
$$R = (F_D - F_A) / (f_D - f_A)$$

4
IT Il valore di R calcolato al punto ③ dovrà corrispondere a quello indicato a catalogo
EN The R value as resulted at point ③ shall correspond to the one stated in the catalog
DE Der R-Wert, wie er aus Punkt ③ entsteht, soll dem im Katalog angegebenen entsprechen
FR La valeur R indiquée au point ③ doit correspondre à celle indiquée dans le catalogue
ES El valor R como resultado en el punto ③ debe corresponder al indicado en el catálogo
PT O valor de R como resultado no ponto ③ deve corresponder ao indicado no catálogo

$$R = 375 \text{ N/mm} \pm 10\%$$

HOW TO CALCULATE FORCE F_x

$F_x = R \cdot f_x$
Force at L_x



IT La forza di una molla F_x ad una data deflessione f_x è il prodotto della rigidità per il valore di deflessione, ed è influenzata dalle tolleranze della rigidità R e della lunghezza libera L_0. Il calcolo è valido solo per valori di deflessione compresi tra quelli indicati nelle colonne A e D.

EN The springs force F_x at given deflection f_x is the result of the springs rate and the deflection value. It may be influenced by the tolerances of spring rate R and free length L_0. Calculation is correct only when using deflection values in the range of columns A and D.

DE Die Federkraft F_x bei gegebenem Federweg f_x ist das Ergebnis der Federrate und des Federwegswertes. Es kann durch die Toleranzen der Federrate R und der freien Länge L_0 beeinflusst werden. Die Berechnung ist nur korrekt, wenn die Federwegswerte im Bereich der Spalten A und D verwendet werden.

FR La force des ressorts F_x à une déflexion donnée f_x est le résultat de la raideur et de la valeur de la déflexion. Il peut être influencé par les tolérances de la raideur R et de la longueur libre L_0. Le calcul n'est correct que lors de l'utilisation de valeurs de déflexion dans la plage des colonnes A et D.

ES La fuerza de los meulles F_x a la deflexión dada f_x es el resultado de la rigidez de los muelles y el valor de deflexión. Puede estar influenciado por las tolerancias de la rigidez de muelles R y la longitud libre L_0. El cálculo es correcto solo cuando se usan valores de deflexión en el rango de las columnas A y D.

PT A força da mola F_x na deflexão dada f_x é o resultado da rigidez da mola e do valor de deflexão. Pode ser influenciada pelas tolerâncias da rigidez da mola R e do comprimento livre L_0. O cálculo está correto somente quando se utiliza valores de deflexão no intervalo das colunas A e D.

R32-076

Esempio di calcolo - Calculation example - Berechnungsbeispiel - Exemple de calcul - Ejemplo de cálculo - Exemplo de cálculo

1

IT Per meglio comprendere, si calcola il valore di forza nominale e il valore minimo e massimo ammissibile di una molla R 32-076 ad una lunghezza L_x di 55,1 mm come segue:

EN For a better understanding, the example below shows the calculation of the nominal value of force and the min and max values possible for the spring R 32-076 at a given length L_x of 55,1 mm as follows:

DE Zum besseren Verständnis berechnen wir den Nominalwert der Kraft und die zulässigen Minimal- und Maximalwerte der Feder R 32-076 bei einer gegebenen Länge L_x von 55,1 mm wie folgt:

FR Pour une meilleure compréhension, nous calculons la valeur nominale de la force et les valeurs min et max admises du ressort R 32-076 à une longueur donnée L_x de 55,1 mm comme suit:

ES Para una mejor comprensión, calculamos el valor nominal de fuerza y los valores mínimo y máximo admitidos para el muelle R 32-076 con L_x di 55,1mm como sigue:

PT Para um melhor entendimento podemos calcular o valor da força nominal e os valores mínimo e máximo da Mola R 32-076 em um determinado comprimento - L_x de 55,1 mm, conforme segue:

$$R = 172 \text{ N} \pm 10\%$$
$$R_{min} = 154{,}8 \text{ N}$$
$$R_{max} = 189{,}2 \text{ N}$$

$$L_0 = 76 \text{ mm} \pm 1\%$$
$$L_{0\,min} = 75{,}24 \text{ mm}$$
$$L_{0\,max} = 76{,}76 \text{ mm}$$

2

IT Il valore nominale di forza ($F_{x\,nom}$) sarà:
EN Nominal value of force ($F_{x\,nom}$) will be:
DE Der Nominalwert der Kraft ($F_{x\,nom}$) wird:
FR La valeur nominale de la force ($F_{x\,nom}$) sera:
ES El valor nominal de fuerza ($F_{x\,nom}$) sería:
PT O valor da força nominal ($F_{x\,nom}$) será:

$$F_{x\,nom} = R \cdot (L_0 - L_x)$$
$$F_{x\,nom} = 172 \cdot (76 - 55{,}1)$$
$$F_{x\,nom} = 3595 \text{ N}$$

3

IT Il valore minimo di forza ($F_{x\,min}$) sarà:
EN Min value of force ($F_{x\,min}$) will be:
DE Der Minimalwert der Kraft ($F_{x\,min}$) wird:
FR La valeur min de force ($F_{x\,min}$) sera:
ES El valor mínimo de fuerza ($F_{x\,min}$) sería:
PT O valor mínimo da força ($F_{x\,min}$) será:

$$F_{x\,min} = R_{min} \cdot (L_{0\,min} - L_x)$$
$$F_{x\,min} = 154{,}8 \cdot (75{,}24 - 55{,}1)$$
$$F_{x\,min} = 3117{,}67 \text{ N}$$

4

IT Il valore massimo di forza ($F_{x\,max}$) sarà:
EN Max value of force ($F_{x\,max}$) will be:
DE Der Maximalwert der Kraft ($F_{x\,max}$) wird:
FR La valeur max value de force ($F_{x\,max}$) sera:
ES El valor máximo de fuerza ($F_{x\,max}$) sería:
PT O valor máximo da força ($F_{x\,max}$) será:

$$F_{x\,max} = R_{max} \cdot (L_{0\,max} - L_x)$$
$$F_{x\,max} = 189{,}2 \cdot (76{,}76 - 55{,}1)$$
$$F_{x\,max} = 4098{,}07 \text{ N}$$

HOW TO SELECT SPRINGS

1

IT Per una rapida selezione delle molle, è sufficiente definire: durata, diametro di alloggiamento, forza totale e deflessione totale di utilizzo con precarico almeno 5% L0.

EN For a quick selection, you are request to define estimated life, hole diameter, total force and total working deflection including at least 5% pre-load.

DE Für eine schnelle Auswahl sollen Sie die geschätzte Lebensdauer, den Hülsensdurchmesser, die Gesamtkraft und die gesamte Arbeitsfederweg einschließlich mindestens 5% Vorspannung definieren.

FR Pour une sélection rapide, vous devez définir la durée de vie estimée, le diamètre du trou de logement, la force totale et la déflexion de travail totale compris une précharge d'au moins 5%.

ES Para una selección rápida, se le solicita que defina la vida útil estimada, el diámetro del agujero de alojamiento, la fuerza total y la deflexión total de trabajo, incluida al menos el 5% de precarga.

PT Para uma seleção rápida, você é solicitado a definir a vida útil estimada, o diâmetro do furo de alojamento, a força total e a deflexão total de trabalho, incluindo pelo menos 5% de pré-carga.

2

IT Individuare i valori di durata e il diametro DH da tabella a pag. 15

EN Find the estimated life and the hole diameter DH as stated in chart at page 15.

DE Die geschätzte Lebensdauer und den Hülsendurchmesser DH finden Sie in der Tabelle auf Seite 15.

FR Trouvez la durée de vie estimée et le diamètre du trou de logement DH comme indiqué dans le tableau à la page 15.

ES Encuentre la vida estimada y el diámetro del agujero de alojamiento DH como se indica en la tabla en la página 15.

PT Encontre a vida estimada e o diâmetro do furo de alojamento, conforme indicado na tabela da página 15.

Estimated Life	DH - Hole diameter (mm)						
	10	12.5	16	20	25	32	40
	Load (N)						
	-	-	-	220	410	485	745
	70	130	185	315	560	830	1130
+3.000.000 cycles	110	190	330	525	845	1520	2030
	125	200	380	935	1560	2530	3270
	145	230	455	1090	1760	2800	4770
	-	-	-	-	4090	6350	7700

3

IT Visualizzare le forze disponibili da tabella a pag. 15

EN Check the available forces as stated in chart at page 15.

DE Überprüfen Sie die verfügbaren Kräfte in der Tabelle auf Seite 15.

FR Vérifiez les forces disponibles comme indiqué dans le tableau à la page 15.

ES Verifique las fuerzas disponibles como se indica en la tabla en la página 15.

PT Verifique as forças disponíveis conforme indicado na tabela na página 15.

Estimated Life	DH - Hole diameter (mm)						
	10	12.5	16	20	25	32	40
	Load (N)						
	60	110	140	220	410	485	745
	70	130	185	315	560	830	1130
+3.000.000 cycles	110	190	330	525	845	1520	2030
	125	200	380	935	1560	2530	3270
	145	230	455	1090	1760	2800	4770
	390	660	1285	1880	4090	6350	7700

4

IT Selezionare la forza richiesta e la serie corrispondente da tabella a pag. 15

EN Select the requested force and the corresponding Series as stated in chart at page 15.

DE Wählen Sie die angeforderte Kraft und die entsprechende Serie in der Tabelle auf Seite 15.

FR Sélectionnez la force demandée et la série correspondante comme indiqué dans le tableau de la page 15.

ES Seleccione la fuerza solicitada y la serie correspondiente como se indica en la tabla en la página 15.

PT Selecione a força solicitada e a série correspondente conforme indicado na tabela da página 15.

DH - Hole diameter (mm)							Series
10	12.5	16	20	25	32	40	
Load (N)							
60	110	140	220	410	485	745	VL
70	130	185	315	560	830	1130	V
110	190	330	525	845	1520	2030	B
125	200	380	935	1560	2530	3270	R
145	230	455	1090	1760	2800	4770	G
390	660	1285	1880	4090	6350	7700	A

5

IT Scegliere la deflessione richiesta nella serie selezionata.

EN Choose the requested deflection in the selected Series.

DE Wählen Sie den gewünschten Federweg in der ausgewählten Serie.

FR Choisissez la déflexion demandée dans la série sélectionnée

ES Elija la deflexión solicitada en la Serie seleccionada

PT Escolha a deflexão solicitada na Série selecionada

pag. serie - see Series pages - siehe Serienseiten - voir les pages de la série - vea las paginas de la serie - veja as paginas da série

Code	DH Hole Diameter	Dd Rod Diameter	L0 Free Length	R Spring Constant	A 20% L0		B 25% L0		C 27.5% L0		D 30% L0		E approx. do not use	
	b x h			± 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
R 10 - 025			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	10	5	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

6

IT Scelta la deflessione, selezionare il codice molla.

EN Once chosen the deflection, select the spring's code.

DE Wenn Sie den Federweg ausgewählt haben, wählen Sie den Federcode.

FR Une fois choisie la déflexion, sélectionnez le code du ressort fil.

ES Una vez elegida la deflexión, seleccione el código del muelle.

PT Uma vez escolhida a deflexão, selecione o código da mola.

pag. serie - see Series pages - siehe Serienseiten - voir les pages de la série - vea las paginas de la serie - veja as paginas da série

Code	DH Hole Diameter	Dd Rod Diameter	L0 Free Length	R Spring Constant	A 20% L0		B 25% L0		C 27.5% L0		D 30% L0		E approx. do not use	
	b x h			± 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
R 10 - 025			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	10	5	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

1 N = 0.1 daN = 0.102 kg

SELECTION DATA

RECTANGULAR WIRE

Estimated Life	DH - Hole diameter (mm) 10	12.5	16	20	25	32	40	50	63	Series
	Load (N)									
+ 3.000.000 cycles	60	110	140	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
	390	660	1285	1880	4090	6350	7700	12280	-	A
	Load (N)									
~ 1.500.000 cycles	80	150	185	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
	470	790	1540	2260	4910	7620	9240	14730	-	A
	Load (N)									
300 - 500.000 cycles	90	170	205	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
	530	890	1730	2540	5530	8570	10400	16580	-	A
	Load (N)									
100 - 200.000 cycles	105	190	230	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
	590	990	1925	2825	6140	9520	11550	18420	-	A

ROUND WIRE

	Load (N)									
+ 3.000.000 cycles	25	50	100	-	-	-	-	-	-	TV
	70	130	175	-	-	-	-	-	-	TB
	100	175	360	-	-	-	-	-	-	TR
	Load (N)									
~ 1.500.000 cycles	30	60	115	-	-	-	-	-	-	TV
	90	150	210	-	-	-	-	-	-	TB
	120	220	450	-	-	-	-	-	-	TR
	Load (N)									
300 - 500.000 cycles	35	70	135	-	-	-	-	-	-	TV
	100	170	240	-	-	-	-	-	-	TB
	135	240	500	-	-	-	-	-	-	TR
	Load (N)									
100 - 200.000 cycles	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.

1 N = 0.1 daN = 0.102 kg

HOW TO READ THE CATALOG

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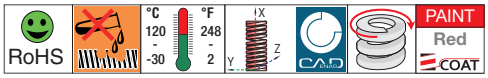
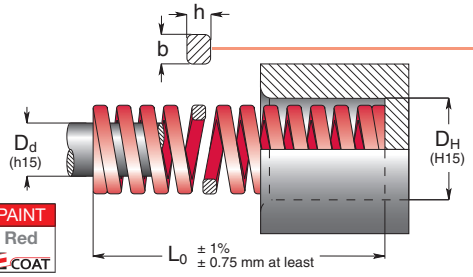
1 **R SERIES** — ISO 10243 : 2010

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





3

4 5 7 9 10 11 12 13 14

Code	D_H Hole Diameter b x h mm	D_d Rod Diameter mm	L_0 Free Length mm	R Spring Constant ± 10% N/mm	A 20 % L_0 + 3.000.000 mm	A N	B 25% L_0 ~ 1.500.000 mm	B N	C 27.5% L_0 300 - 500.000 mm	C N	D 30 % L_0 100 - 200.000 mm	D N	E approx. do not use mm	Pcs
R 10 - 025			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	10	5	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			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	12.5	6.3	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			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	16	8	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

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How to order: R 50 - 152 (Series D_H - L_0) 1 N = 0.1 daN = 0.102 kgf Load (N) = R (N/mm) x Deflection (mm)

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Cross wire section
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Section du profilé
Sección del perfil
Seção do perfil

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Außenführungsdurchmesser
Diamètre du trou de logement
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Diâmetro do furo de alojamento

6
Diametro della spina di guida
Rod diameter
Innenführungdurchmesser
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Diámetro de la clavija de guía
Diâmetro da tomada de guia

7
Lunghezza libera della molla
Spring free length
Länge der unbelasteten Feder
Longueur libre du ressort
Longitud libre del muelle
Comprimento livre da mola

8
Carico (N) necessario per deflettere la molla di 1mm
Spring rate (N) - load required for 1mm deflection
Kraftzunahme (N) für 1 mm gefragt pro
Charge (N) exigée pour comprimer le ressort 1mm
Carga (N) necesaria para desviar el muelle de 1mm
Carga (N) necessária para defletir a mola de 1mm

9
Deflessione totale consigliata per una durata della molla maggiore a 3.000.000 di cicli
Advised total 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

10
Deflessione totale consigliata per una durata della molla di circa 1.500.000 di cicli
Advised total 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

11
Deflessione totale consigliata per una durata della molla di circa 300.000 - 500.000 cicli
Advised total working deflection for about 300.000 - 500.000 cycles
Empfohlener Gesamtfederweg für eine Lebensdauer der Feder von ca. 300.0000 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 aproxi madamente 300.000 - 500.000 ciclos
Deflexão total aconselhada para duração da mola de cerca 300.000 - 500.000 ciclos

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Deflessione totale massima per una durata della molla di circa 100.000 - 200.000 cicli
Advised total 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

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Deflessione approssimativa per molla a blocco
Solid deflection (approximate value)
Näherungswert Federweg für Blockfeder
Déflexion approximative pour ressort à bloc
Deflexión aproximada por muelle a bloque
Deflexão aproximativa por mola a bloco

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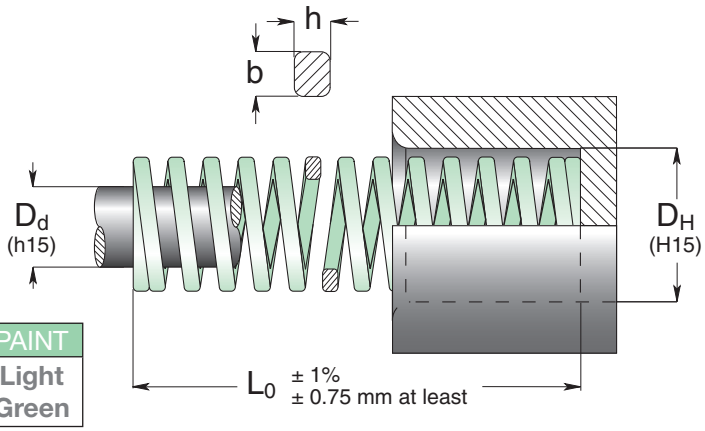
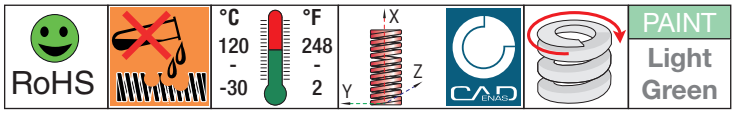
Numero di pezzi per confezione
Quantity for standard packaging
Stück pro Packung
Número de piezas por confección
Nombre de pièces par boîte
Número de peças por embalagem

VL SERIES — Special Springs Standard

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 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 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	Pcs
VL 10 - 025			25	8.5	7.5	64	10.0	85	11.25	96	12.5	106	14.1	50
VL 10 - 032			32	6.5	9.6	62	12.8	83	14.40	94	16.0	104	18.5	50
VL 10 - 038			38	5.5	11.4	63	15.2	84	17.10	94	19.0	105	22.5	50
VL 10 - 044	10	5	44	4.8	13.2	63	17.6	84	19.80	95	22.0	106	23.2	50
VL 10 - 051			51	4.2	15.3	64	20.4	86	22.95	96	25.5	107	27.5	25
VL 10 - 064			64	3.3	19.2	63	25.6	84	28.80	95	32.0	106	34.0	25
VL 10 - 076			76	2.7	22.8	62	30.4	82	34.20	92	38.0	103	40.4	25
VL 10 - 305	1.65 x 1.0		305	0.65	91.5	59	122	79	137.25	89	152.5	99	172.7	10
VL 13 - 025			25	16	7.5	120	10.0	160	11.25	180	12.5	200	13.6	50
VL 13 - 032			32	12.2	9.6	117	12.8	156	14.40	176	16.0	195	17.9	50
VL 13 - 038			38	10.3	11.4	117	15.2	157	17.10	176	19.0	196	21.9	50
VL 13 - 044			44	8.7	13.2	115	17.6	153	19.80	172	22.0	191	26.4	25
VL 13 - 051	12.5	6.3	51	7.5	15.3	115	20.4	153	22.95	172	25.5	191	29.6	25
VL 13 - 064			64	5.8	19.2	111	25.6	148	28.80	167	32.0	186	37.1	25
VL 13 - 076			76	4.7	22.8	107	30.4	143	34.20	161	38.0	179	44.9	25
VL 13 - 089			89	4.1	26.7	109	35.6	146	40.05	164	44.5	182	53.2	20
VL 13 - 102			102	3.6	30.6	110	40.8	147	45.90	165	51.0	184	59.4	10
VL 13 - 305	2.3 x 1.3		305	1.25	91.5	114	122	153	137.25	172	152.5	191	186.6	10
VL 16 - 025			25	20.2	7.5	152	10.0	202	11.25	227	12.5	253	14.0	50
VL 16 - 032			32	16	9.6	154	12.8	205	14.40	230	16.0	256	18.7	50
VL 16 - 038			38	12.3	11.4	140	15.2	187	17.10	210	19.0	234	22.0	25
VL 16 - 044			44	10.6	13.2	140	17.6	187	19.80	210	22.0	233	26.1	25
VL 16 - 051	16	8	51	8.9	15.3	136	20.4	182	22.95	204	25.5	227	30.4	25
VL 16 - 064			64	7	19.2	134	25.6	179	28.80	202	32.0	224	38.8	25
VL 16 - 076			76	5.8	22.8	132	30.4	176	34.20	198	38.0	220	46.4	20
VL 16 - 089			89	4.8	26.7	128	35.6	171	40.05	192	44.5	214	54.2	20
VL 16 - 102			102	4.1	30.6	125	40.8	167	45.90	188	51.0	209	62.4	20
VL 16 - 115			115	3.9	34.5	135	46.0	179	51.75	202	57.5	224	70.6	10
VL 16 - 305	3.05 x 1.5		305	1.5	91.5	137	122	183	137.25	206	152.5	229	190.2	10
VL 20 - 025			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	20	10	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	3.9 x 1.7		305	2.5	91.5	229	122	305	137	343	153	381	196	10

new sizes

How to order: VL 50 - 152 (Series D_H - L_0)

1 N = 0.1 daN = 0.102 kgf Load (N) = R (N/mm) x Deflection (mm)

Special Springs Standard

SERIES VL

VL NEW

Code	D_H Hole Diameter	D_d Rod Diameter	L_0 Free Length	R Spring Constant	A 30% L_0		C 40% L_0		C 45% L_0		D 50% L_0		E 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	Pcs
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
VL 40 - 051	40	20	51	48.1	15.3	736	20.4	981	23.0	1104	25.5	1227	28.0	20
VL 40 - 064			64	39.2	19.2	753	25.6	1004	28.8	1129	32.0	1254	36.2	10
VL 40 - 076			76	33.3	22.8	759	30.4	1012	34.2	1139	38.0	1265	43.7	10
VL 40 - 089			89	28.4	26.7	758	35.6	1011	40.1	1137	44.5	1264	51.7	10
VL 40 - 102			102	24.5	30.6	750	40.8	1000	45.9	1125	51.0	1250	59.8	10
VL 40 - 115			115	22.1	34.5	762	46.0	1017	51.8	1144	57.5	1271	67.9	10
VL 40 - 127			127	19.6	38.1	747	50.8	996	57.2	1120	63.5	1245	75.2	5
VL 40 - 139			139	17.7	41.7	738	55.6	984	62.6	1107	69.5	1230	82.4	5
VL 40 - 152			152	16.2	45.6	739	60.8	985	68.4	1108	76.0	1231	90.6	5
VL 40 - 178			178	13.7	53.4	732	71.2	975	80.1	1097	89.0	1219	106	5
VL 40 - 203			203	12.3	60.9	749	81.2	999	91.4	1124	101	1248	122	5
VL 40 - 254			254	9.8	76.2	747	102	996	114	1120	127	1245	154	2
VL 40 - 305	8.0 x 3.4		305	8.3	91.5	759	122	1013	137	1139	152	1266	185	2
VL 50 - 064	50	25	64	86.3	19.2	1657	25.6	2209	28.8	2485	32.0	2762	35.1	5
VL 50 - 076			76	70.6	22.8	1610	30.4	2146	34.2	2415	38.0	2683	42.2	5
VL 50 - 089			89	59.8	26.7	1597	35.6	2129	40.1	2395	44.5	2661	50.3	5
VL 50 - 102			102	52.0	30.6	1591	40.8	2122	45.9	2387	51.0	2652	58.4	5
VL 50 - 115			115	46.1	34.5	1590	46.0	2121	51.8	2386	57.5	2651	66.1	5
VL 50 - 127			127	42.2	38.1	1608	50.8	2144	57.2	2412	63.5	2680	73.8	5
VL 50 - 139			139	38.2	41.7	1593	55.6	2124	62.6	2389	69.5	2655	80.9	5
VL 50 - 152			152	34.3	45.6	1564	60.8	2085	68.4	2346	76.0	2607	89.0	2
VL 50 - 178			178	29.4	53.4	1570	71.2	2093	80.1	2355	89.0	2617	105	2
VL 50 - 203			203	25.5	60.9	1553	81.2	2071	91.4	2329	101	2588	121	2
VL 50 - 254			254	20.6	76.2	1570	102	2093	114	2355	127	2616	152	2
VL 50 - 305	10.5 x 4.1		305	17.2	91.5	1574	122	2098	137	2361	152	2623	184	2
VL 63 - 076	63	38	76	57.8	22.8	1318	30.4	1757	34.2	1977	38.0	2196	47.3	5
VL 63 - 089			89	51.4	26.7	1372	35.6	1830	40.0	2059	44.5	2287	54.9	5
VL 63 - 102			102	44.4	30.6	1359	40.8	1812	45.9	2038	51.0	2264	64.1	5
VL 63 - 115			115	38	34.5	1311	46.0	1748	51.7	1967	57.5	2185	75.6	5
VL 63 - 127			127	33.2	38.1	1265	50.8	1687	57.1	1897	63.5	2108	82.6	2
VL 63 - 152			152	27.4	45.6	1249	60.8	1666	68.4	1874	76.0	2082	99.8	2
VL 63 - 178			178	24	53.4	1282	71.2	1709	80.1	1922	89.0	2136	118.4	2
VL 63 - 203			203	21	60.9	1279	81.2	1705	91.3	1918	101.5	2132	135.9	2
VL 63 - 254			254	16.4	76.2	1250	101.6	1666	114.3	1875	127	2083	172.8	2
VL 63 - 305	11 x 4.9		305	13.6	91.5	1244	122	1659	137.2	1867	152.5	2074	208.6	2

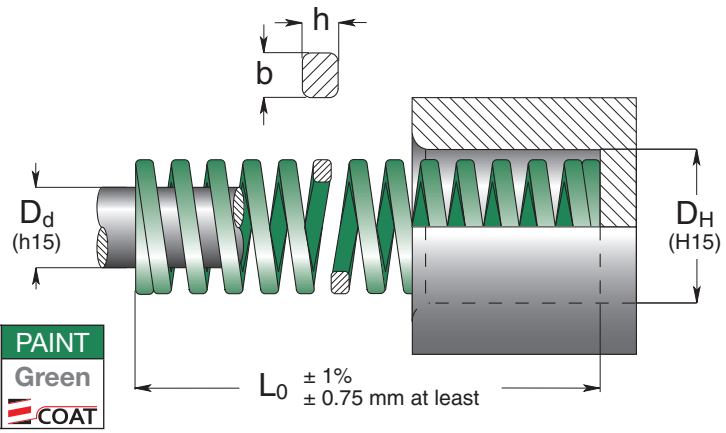
new sizes

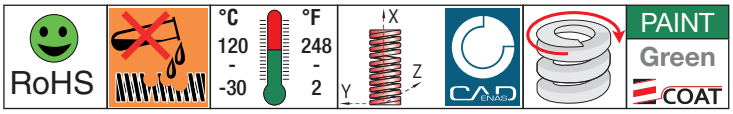
How to order: VL 50 - 152 (Series D_H - L_0) 1 N = 0.1 daN = 0.102 kgf Load (N) = R (N/mm) x Deflection (mm)

V SERIES

ISO 10243 : 2010

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





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 35% L_0		D 40% L_0		E 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	Pcs
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

How to order: V 50 - 152 (Series D_H - L_0)

1 N = 0.1 daN = 0.102 kgf

Load (N) = R (N/mm) x Deflection (mm)

ISO 10243 : 2010

SERIES V

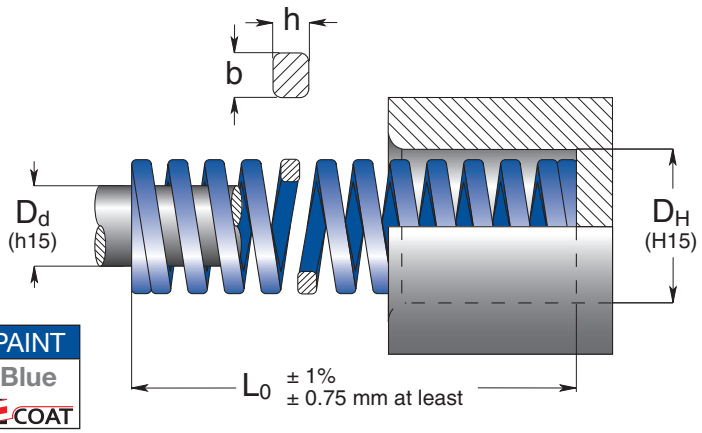
Code	D_H Hole Diameter	D_d Rod Diameter	L_0 Free Length	R Spring Constant	A 25% L_0		B 30% L_0		C 35% L_0		D 40% L_0		E approx. do not use	
	b x h			± 10%	+ 3.000.000		~ 1.500.000		300 - 500.000		100 - 200.000			
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm	Pcs
V 25 - 025	25	12.5	25	100	6.3	630	7.5	750	8.8	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

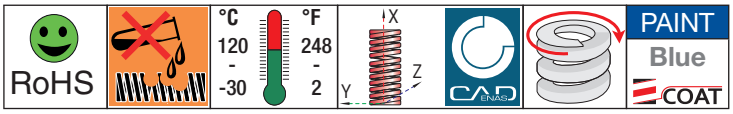
How to order: V 50 - 152 (Series D_H - L_0) 1 N = 0.1 daN = 0.102 kgf Load (N) = R (N/mm) x Deflection (mm)

B SERIES

ISO 10243 : 2010

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 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	Pcs
B 10 - 025			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	10	5	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			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	12.5	6.3	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			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	16	8	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	10
B 20 - 025			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	20	10	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	10

How to order: B 50 - 152 (Series D_H - L_0)

1 N = 0.1 daN = 0.102 kgf

Load (N) = R (N/mm) x Deflection (mm)

ISO 10243 : 2010

SERIES B

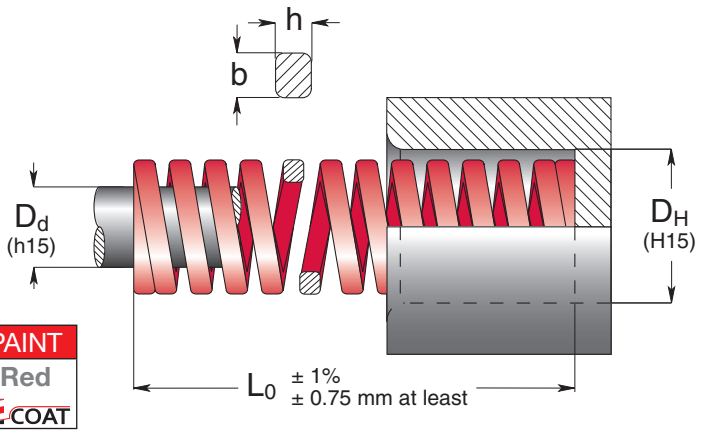
Code	D_H Hole Diameter	D_d Rod Diameter	L_0 Free Length	R Spring Constant	A 25% L_0		B 30% L_0		C 33.75% L_0		D 37.5% L_0		E approx. do not use	
	b x h			± 10%	+ 3.000.000		~ 1.500.000		300 - 500.000		100 - 200.000			
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm	Pcs
B 25 - 025	25	12.5	25	147	6.3	926	7.5	1103	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	80.5	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

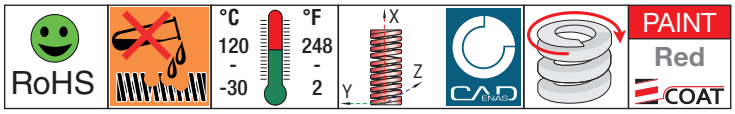
How to order: B 50 - 152 (Series D_H - L_0) 1 N = 0.1 daN = 0.102 kgf Load (N) = R (N/mm) x Deflection (mm)

R SERIES

ISO 10243 : 2010

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.	
	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	Pcs
R 10 - 025			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	10	5	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			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	12.5	6.3	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			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	16	8	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			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	20	10	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

How to order: R 50 - 152 (Series D_H - L_0)

1 N = 0.1 daN = 0.102 kgf Load (N) = R (N/mm) x Deflection (mm)

ISO 10243 : 2010

SERIES R

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	
	b x h			± 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
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

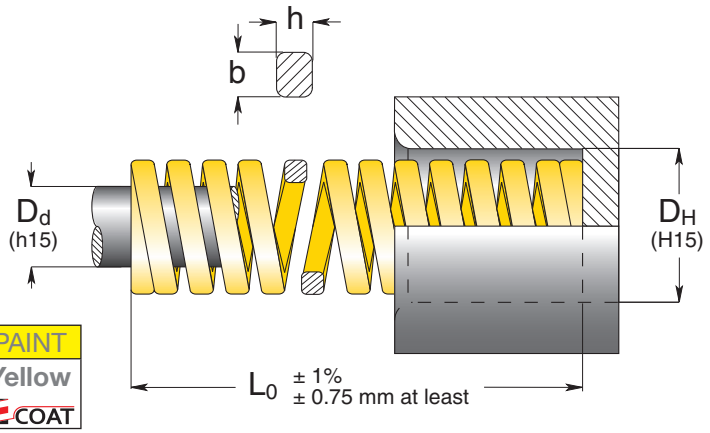
How to order: R 50 - 152 (Series D_H - L_0)

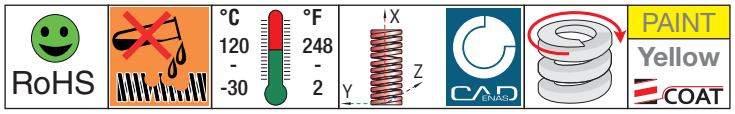
1 N = 0.1 daN = 0.102 kgf Load (N) = R (N/mm) x Deflection (mm)

G SERIES

ISO 10243 : 2010

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 Hole Diameter	D_d Hole Diameter	L_0 Free Length	R Spring Constant	A 17% L_0		B 20% L_0		C 22.5% L_0		D 25% L_0		E approx. do not use	
	b x h			± 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
G 10 - 025			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	10	5	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			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	12.5	6.3	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			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	16	8	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			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	20	10	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	23.6	1015	27.8	1195	31.3	1346	34.8	1496	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

How to order: G 50 - 152 (Series D_H - L_0)

1 N = 0.1 daN = 0.102 kgf

Load (N) = R (N/mm) x Deflection (mm)

ISO 10243 : 2010

SERIES G

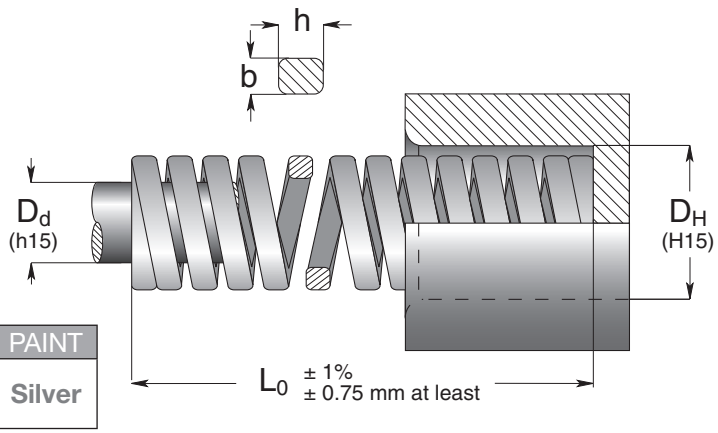
Code	D_H Hole Diameter	D_d Rod Diameter	L_0 Free Length	R Spring Constant	A 17% L_0		B 20% L_0		C 22.5% L_0		D 25% L_0		E approx. do not use	
	b x h			± 10%	+ 3.000.000		~ 1.500.000		300 - 500.000		100 - 200.000			
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm	Pcs
G 25 - 025	25	12.5	25	459	4.3	1974	5.0	2295	5.6	2570	6.3	2892	6.7	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	23.6	1558	27.8	1835	31.3	2066	34.8	2297	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	23.6	2643	27.8	3114	31.3	3506	34.8	3898	48	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	171	23.6	4036	27.8	4754	31.3	5352	34.8	5951	42.0	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	150	30.3	4545	35.6	5325	40.1	6015	44.5	6675	56.5	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	23.6	6820	27.8	8034	31.3	9046	34.8	10057	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	5
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

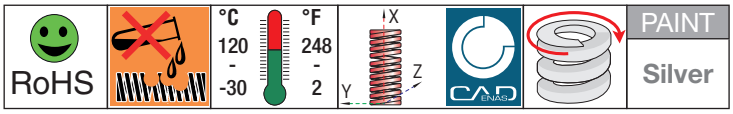
Estimated life 100.000 cycles

How to order: G 50 - 152 (Series D_H - L_0) 1 N = 0.1 daN = 0.102 kgf Load (N) = R (N/mm) x Deflection (mm)

A SERIES Special Springs Standard

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 Hole Diameter	D_d Rod Diameter	L_0 Free Length	R Spring Constant	A 10% L_0		B 12% L_0		C 13.5% L_0		D 15% L_0		E 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	Pcs
A 10 - 025			25	167	2.5	418	3.0	501	3.4	564	3.8	626	5.9	50
A 10 - 032			32	130	3.2	416	3.8	499	4.3	562	4.8	624	7.5	50
A 10 - 038			38	105	3.8	399	4.6	479	5.1	539	5.7	599	8.2	50
A 10 - 044	10	5	44	86	4.4	378	5.3	454	5.9	511	6.6	568	11.0	50
A 10 - 051			51	79	5.1	403	6.1	483	6.9	544	7.7	604	12.5	25
A 10 - 064			64	62	6.4	397	7.7	476	8.6	536	9.6	595	15.8	25
A 10 - 076			76	51	7.6	388	9.1	465	10.3	523	11.4	581	19.0	25
A 10 - 305	2.0 x 2.8		305	11.5	30.5	351	36.6	421	41.2	474	45.8	526	89.0	10
A 13 - 025			25	288	2.5	720	3.0	864	3.4	972	3.8	1080	5.6	50
A 13 - 032			32	216	3.2	691	3.8	829	4.3	933	4.8	1037	7.3	50
A 13 - 038			38	176	3.8	669	4.6	803	5.1	903	5.7	1003	9.2	50
A 13 - 044			44	149	4.4	656	5.3	787	5.9	885	6.6	983	11.1	25
A 13 - 051	12.5	6.3	51	128	5.1	653	6.1	783	6.9	881	7.7	979	12.6	25
A 13 - 064			64	100	6.4	640	7.7	768	8.6	864	9.6	960	16.1	25
A 13 - 076			76	84	7.6	638	9.1	766	10.3	862	11.4	958	19.3	25
A 13 - 089			89	71	8.9	632	10.7	758	12.0	853	13.4	948	23.3	20
A 13 - 102			102	61	10.2	622	12.2	747	13.8	840	15.3	933	26.9	10
A 13 - 305	2.75 x 3.4		305	22	30.5	671	36.6	805	41.2	906	45.8	1007	94.0	10
A 16 - 032			32	449	3.2	1437	3.8	1724	4.3	1940	4.8	2155	6.6	50
A 16 - 038			38	363	3.8	1379	4.6	1655	5.1	1862	5.7	2069	8.1	25
A 16 - 044			44	309	4.4	1360	5.3	1632	5.9	1835	6.6	2039	10.1	25
A 16 - 051			51	256	5.1	1306	6.1	1567	6.9	1763	7.7	1958	11.3	25
A 16 - 064			64	203	6.4	1299	7.7	1559	8.6	1754	9.6	1949	14.3	25
A 16 - 076	16	8	76	166	7.6	1262	9.1	1514	10.3	1703	11.4	1892	18.0	20
A 16 - 089			89	139	8.9	1237	10.7	1485	12.0	1670	13.4	1856	20.5	20
A 16 - 102			102	114	10.2	1163	12.2	1395	13.8	1570	15.3	1744	24.3	20
A 16 - 115			115	105	11.5	1208	13.8	1449	15.5	1630	17.3	1811	27.0	10
A 16 - 127			127	94	12.7	1194	15.2	1433	17.1	1612	19.1	1791	31.5	10
A 16 - 152			152	78	15.2	1186	18.2	1423	20.5	1601	22.8	1778	38.0	10
A 16 - 305	3.5 x 4.75		305	38.8	30.5	1183	36.6	1420	41.2	1598	45.8	1775	77.2	10
A 20 - 044			44	452	4.4	1989	5.3	2387	5.9	2685	6.6	2983	8.9	25
A 20 - 051			51	378	5.1	1928	6.1	2313	6.9	2603	7.7	2892	10.6	25
A 20 - 064			64	301	6.4	1926	7.7	2312	8.6	2601	9.6	2890	13.8	25
A 20 - 076			76	247	7.6	1877	9.1	2253	10.3	2534	11.4	2816	16.2	25
A 20 - 089	20	10	89	208	8.9	1851	10.7	2221	12.0	2499	13.4	2777	20.1	20
A 20 - 102			102	188	10.2	1918	12.2	2301	13.8	2589	15.3	2876	22.3	20
A 20 - 115			115	159	11.5	1829	13.8	2194	15.5	2468	17.3	2743	25.5	10
A 20 - 127			127	146	12.7	1854	15.2	2225	17.1	2503	19.1	2781	27.9	10
A 20 - 152			152	120	15.2	1824	18.2	2189	20.5	2462	22.8	2736	34.1	10
A 20 - 305	4.0 x 6.0		305	60	30.5	1830	36.6	2196	41.2	2471	45.8	2745	68.8	10

new sizes

How to order: A 50 - 152 (Series D_H - L_0)

1 N = 0.1 daN = 0.102 kgf Load (N) = R (N/mm) x Deflection (mm)

Code	D_H Hole Diameter	D_d Rod Diameter	L_0 Free Length	R Spring Constant	A 10% L_0		B 12% L_0		C 13.5% L_0		D 15% L_0		E approx. do not use	
	b x h			± 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
A 25 - 044			44	1158	4.4	5095	5.3	6114	5.9	6879	6.6	7643	9.8	25
A 25 - 051			51	933	5.1	4758	6.1	5710	6.9	6424	7.7	7137	11.0	25
A 25 - 064			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	25	12.5	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 - 044			44	1300	4.4	5720	5.3	6890	5.9	7670	6.6	8643	9.3	20
A 32 - 051			51	1150	5.1	5865	6.1	7015	6.9	7935	7.7	8855	10.4	20
A 32 - 064			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	10.7	7702	12.0	8663	13.4	9628	20	10
A 32 - 102	32	16	102	620	10.2	6324	12.2	7589	13.8	8537	15.3	9486	23	10
A 32 - 115			115	560	11.5	6440	13.8	7728	15.5	8694	17.3	9660	26	10
A 32 - 127			127	496	12.7	6299	15.2	7559	17.1	8504	19.1	9449	28	10
A 32 - 152			152	408	15.2	6202	18.2	7442	20.5	8372	22.8	9302	34	10
A 32- 178			178	353	17.8	6280	21.4	7536	24.0	8483	26.7	9420	39	5
A 32 - 203			203	304	20.3	6171	24.4	7405	27.4	8331	30.5	9257	45	5
A 32 - 254			254	243	25.4	6177	30.5	7413	34.3	8332	38.1	9266	62	5
A 32 - 305	7.5 x 9.2		305	196	30.5	5978	36.6	7174	41.2	8070	45.8	8967	75	5
A 40 - 064			64	1128	6.4	7219	7.7	8663	8.6	9746	9.6	10829	12	10
A 40 - 076			76	1017	7.6	7729	9.1	9275	10.3	10434	11.4	11594	14.5	10
A 40 - 089			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	40	20	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	15.2	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	75	2
A 50 - 064			64	1980	6.4	12672	7.7	15206	8.6	17107	9.6	19008	13.4	5
A 50 - 076			76	1811	7.6	13764	9.1	16516	10.3	18581	11.4	20645	16.3	5
A 50 - 089			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	50	25	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	70	2
A 63 - 076			76	1900	7.6	14440	9.1	17328	10.3	19494	11.4	21660	13	5
A 63 - 089			89	1517	8.9	13501	10.7	16202	12.0	18227	13.4	20252	20	5
A 63 - 102			102	1295	10.2	13209	12.2	15851	13.8	17832	15.3	19814	23	5
A 63 - 115			115	1070	11.5	12305	13.8	14766	15.5	16612	17.3	18458	27	5
A 63 - 127	63	38	127	979	12.7	12433	15.2	14920	17.1	16785	19.1	18650	30	2
A 63 - 152			152	775	15.2	11780	18.2	14136	20.5	15903	22.8	17670	35	2
A 63 - 178			178	630	17.8	11214	21.4	13457	24.0	15139	26.7	16821	44	2
A 63 - 203			203	546	20.3	11084	24.4	13301	27.4	14963	30.5	16626	48	2
A 63 - 254			254	423	25.4	10744	30.5	12893	34.3	14505	38.1	16116	62	2
A 63 - 305	11.8 x 17.8		305	349	30.5	10645	36.6	12773	41.2	14370	45.8	15967	77	2

new sizes

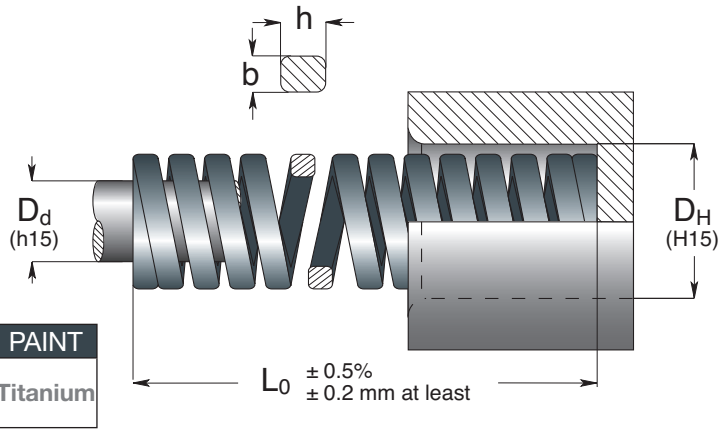
A

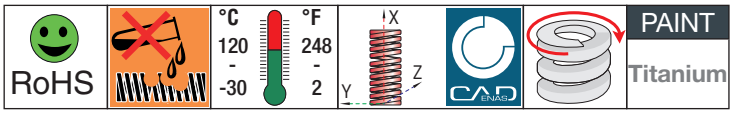
NEW

How to order: A 50 - 152 (Series D_H - L_0) 1 N = 0.1 daN = 0.102 kgf Load (N) = R (N/mm) x Deflection (mm)

T SERIES Special Springs Standard

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





Code	D_H Hole Diameter	D_d Rod Diameter	L_0 Free Length	R Spring Constant ± 10%		F max	
	b x h						
	mm	mm	mm	N/mm	mm	N	Pcs
T 10 - 020	10	5	20	580	2.2	1.250	25
T 10 - 030			30	360	3.5		25
T 10 - 040			40	260	4.8		12
T 10 - 050	2.1 x 4		50	200	6.0		12
T 13 - 020	12.5	6.3	20	970	2.4	2.000	25
T 13 - 030			30	590	3.3		25
T 13 - 040			40	400	5.0		12
T 13 - 050	2.65 x 5.35		50	320	6.0		12
T 16 - 020	16	8	20	1650	2.1	3.500	16
T 16 - 035			35	920	3.8		16
T 16 - 050			50	580	6.0		12
T 16 - 075			75	410	8.5		8
T 16 - 100	3.4 x 6.9		100	280	12.5		8
T 19 - 025	19	10	25	2270	2.2	5.000	16
T 19 - 040			40	1160	4.3		16
T 19 - 050			50	830	6.0		12
T 19 - 075			75	500	10,0		8
T 19 - 100	4.1 x 8.3		100	380	14.0		8
T 25 - 030	25	12,5	30	4550	2.2	10.000	10
T 25 - 050			50	2000	5,0		10
T 25 - 060			60	1500	6.5		4
T 25 - 075			75	1250	8.0		4
T 25 - 100			100	900	11.1		4
T 25 - 125	6 x 11		125	710	14.0		4
T 32 - 035	32	16	35	5360	2.8	15.000	8
T 32 - 050			50	3000	5.0		8
T 32 - 075			75	1670	9,0		4
T 32 - 100			100	1200	12.5		4
T 32 - 125			125	940	16.0		2
T 32 - 150	7.4 x 13		150	810	18.5		2
T 38 - 040	38	20	40	5710	3.5	20.000	4
T 38 - 050			50	4000	5.0		4
T 38 - 075			75	2220	9.0		4
T 38 - 100			100	1540	13.0		2
T 38 - 150			150	1050	19.0		2
T 38 - 200	8.25 x 16		200	740	27.0		2
T 50 - 060	50	25	60	4605	7.6	35.000	4
T 50 - 075			75	3932	8.9		4
T 50 - 100			100	2650	13.2		2
T 50 - 125			125	2000	17.5		2
T 50 - 150			150	1605	21.8		2
T 50 - 200	11.8 x 17.8		200	1167	30.0		2

IT
- CARICO MASSIMO FINO A 6 VOLTE LA SERIE EXTRA-FORTE (colore giallo) ISO
- CARICO MASSIMO OLTRE 2 VOLTE LA SERIE SUPER-FORTE (colore argento) - STANDARD SPECIAL SPRINGS

Ideali per carichi estremamente elevati con piccole corse di lavoro. Massima durata in ambienti difficili con contaminanti e temperature elevate.

EN
- CARICO MASSIMO FINO A 6 VOLTE LA SERIE EXTRA-FORTE (colore giallo) ISO
- CARICO MASSIMO OLTRE 2 VOLTE LA SERIE SUPER-FORTE (colore argento) - STANDARD SPECIAL SPRINGS

Ideali per carichi estremamente elevati con piccole corse di lavoro. Massima durata in ambienti difficili con contaminanti e temperature elevate.

DE
- CARICO MASSIMO FINO A 6 VOLTE LA SERIE EXTRA-FORTE (colore giallo) ISO
- CARICO MASSIMO OLTRE 2 VOLTE LA SERIE SUPER-FORTE (colore argento) - STANDARD SPECIAL SPRINGS

Ideali per carichi estremamente elevati con piccole corse di lavoro. Massima durata in ambienti difficili con contaminanti e temperature elevate.

FR
- CARICO MASSIMO FINO A 6 VOLTE LA SERIE EXTRA-FORTE (colore giallo) ISO
- CARICO MASSIMO OLTRE 2 VOLTE LA SERIE SUPER-FORTE (colore argento) - STANDARD SPECIAL SPRINGS

Ideali per carichi estremamente elevati con piccole corse di lavoro. Massima durata in ambienti difficili con contaminanti e temperature elevate.

ES
- CARICO MASSIMO FINO A 6 VOLTE LA SERIE EXTRA-FORTE (colore giallo) ISO
- CARICO MASSIMO OLTRE 2 VOLTE LA SERIE SUPER-FORTE (colore argento) - STANDARD SPECIAL SPRINGS

Ideali per carichi estremamente elevati con piccole corse di lavoro. Massima durata in ambienti difficili con contaminanti e temperature elevate.

PT
- CARICO MASSIMO FINO A 6 VOLTE LA SERIE EXTRA-FORTE (colore giallo) ISO
- CARICO MASSIMO OLTRE 2 VOLTE LA SERIE SUPER-FORTE (colore argento) - STANDARD SPECIAL SPRINGS

Ideali per carichi estremamente elevati con piccole corse di lavoro. Massima durata in ambienti difficili con contaminanti e temperature elevate.

new sizes

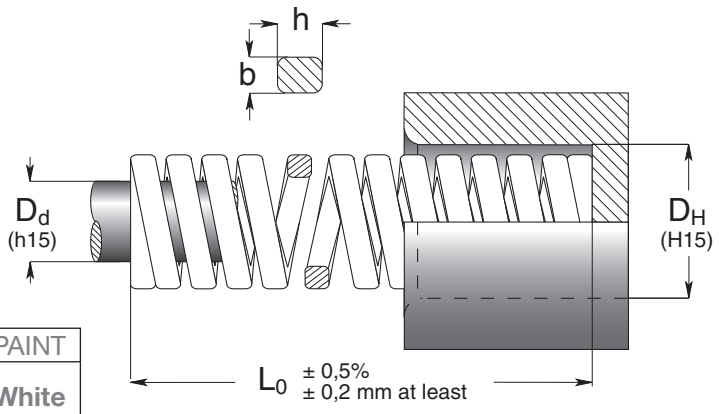
How to order: T 50 - 150 (Series D_H - L_0)

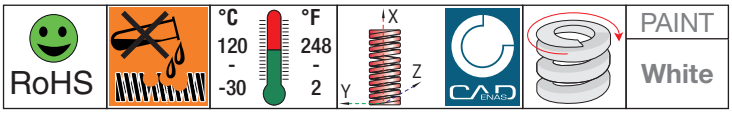
1 N = 0.1 daN = 0.102 kgf

Load (N) = R (N/mm) x Deflection (mm)

Special Springs Standard

IT Iper-forte
EN Hyper-strong
DE Hyper-starke
FR Hyper-forte
ES Hyper-fuerte
PT Carga-hiper





Code	D_H Hole Diameter	D_d Rod Diameter	L_0 Free Length	R Spring Constant	F max	
	b x h			± 10%		
	mm	mm	mm	N/mm	mm	N	Pcs
W 16 - 020	16	6.3	20	1.818	2.2	4.000	16
W 16 - 035			35	1.000	4.0		16
W 16 - 050			50	615	6.5		12
W 16 - 075			75	400	10.0		8
W 16 - 100	4.6 x 5.0		100	286	14.0		8
W 19 - 025	19	8	25	2.400	2.5	6.000	16
W 19 - 040			40	1.333	4.5		16
W 19 - 050			50	1.000	6.0		12
W 19 - 075			75	600	10.0		8
W 19 - 100	5.1 x 6.5		100	429	14.0		8
W 25 - 030	25	10	30	4.800	2.5	12.000	10
W 25 - 050			50	2.400	5.0		10
W 25 - 075			75	1.500	8.0		4
W 25 - 100			100	1.000	12.0		4
W 25 - 125	6.9 x 9.1		125	857	14.0		4
W 32 - 035	32	12.5	35	6.667	3.0	20.000	8
W 32 - 050			50	3.636	5.5		8
W 32 - 075			75	2.222	9.0		4
W 32 - 100			100	1.538	13.0		4
W 32 - 125			125	1.250	16.0		2
W 32 - 150	9.25 x 10.8		150	1.053	19.0		2
W 38 - 040	38	16	40	7.143	3.5	25.000	4
W 38 - 050			50	5.000	5.0		4
W 38 - 075			75	2.778	9.0		4
W 38 - 100			100	1.923	13.0		2
W 38 - 150			150	1.316	19.0		2
W 38 - 200	10.5 x 12.6		200	926	27.0		2

IT
- CARICO MASSIMO FINO A 6 VOLTE LA SERIE EXTRA-FORTE (colore giallo) ISO
- CARICO MASSIMO OLTRE 2 VOLTE LA SERIE SUPER-FORTE (colore argento) - STANDARD SPECIAL SPRINGS

Ideali per carichi estremamente elevati con piccole corse di lavoro. Massima durata in ambienti difficili con contaminanti e temperature elevate.

EN
- CARICO MASSIMO FINO A 6 VOLTE LA SERIE EXTRA-FORTE (colore giallo) ISO
- CARICO MASSIMO OLTRE 2 VOLTE LA SERIE SUPER-FORTE (colore argento) - STANDARD SPECIAL SPRINGS

Ideali per carichi estremamente elevati con piccole corse di lavoro. Massima durata in ambienti difficili con contaminanti e temperature elevate.

DE
- CARICO MASSIMO FINO A 6 VOLTE LA SERIE EXTRA-FORTE (colore giallo) ISO
- CARICO MASSIMO OLTRE 2 VOLTE LA SERIE SUPER-FORTE (colore argento) - STANDARD SPECIAL SPRINGS

Ideali per carichi estremamente elevati con piccole corse di lavoro. Massima durata in ambienti difficili con contaminanti e temperature elevate.

FR
- CARICO MASSIMO FINO A 6 VOLTE LA SERIE EXTRA-FORTE (colore giallo) ISO
- CARICO MASSIMO OLTRE 2 VOLTE LA SERIE SUPER-FORTE (colore argento) - STANDARD SPECIAL SPRINGS

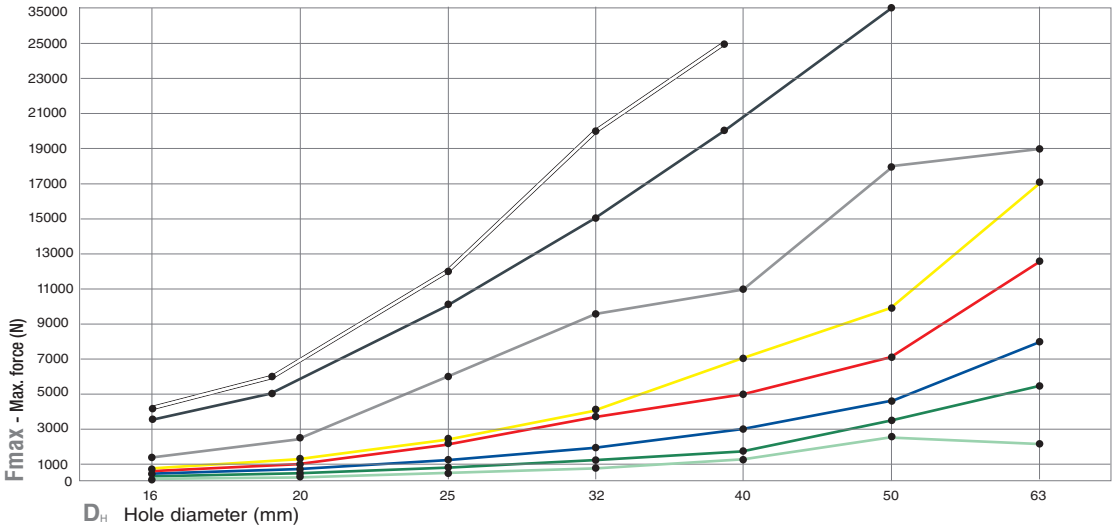
Ideali per carichi estremamente elevati con piccole corse di lavoro. Massima durata in ambienti difficili con contaminanti e temperature elevate.

ES
- CARICO MASSIMO FINO A 6 VOLTE LA SERIE EXTRA-FORTE (colore giallo) ISO
- CARICO MASSIMO OLTRE 2 VOLTE LA SERIE SUPER-FORTE (colore argento) - STANDARD SPECIAL SPRINGS

Ideali per carichi estremamente elevati con piccole corse di lavoro. Massima durata in ambienti difficili con contaminanti e temperature elevate.

PT
- CARICO MASSIMO FINO A 6 VOLTE LA SERIE EXTRA-FORTE (colore giallo) ISO
- CARICO MASSIMO OLTRE 2 VOLTE LA SERIE SUPER-FORTE (colore argento) - STANDARD SPECIAL SPRINGS

Ideali per carichi estremamente elevati con piccole corse di lavoro. Massima durata in ambienti difficili con contaminanti e temperature elevate.



	SERIES	STD.	LOAD
	W	Sp. Sp.	Hyper-strong
	T	Sp. Sp.	Super-Strong
	A	Sp. Sp.	Ultra-Strong
	G	ISO	Extra-Strong
	R	ISO	Strong
	B	ISO	Medium
	V	ISO	Light
	VL	Sp. Sp.	Extra-light

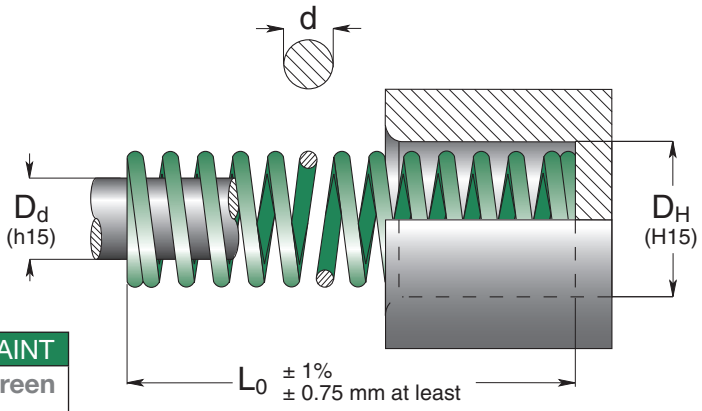
How to order: W 32 - 150 (Series D_H - L_0) 1 N = 0.1 daN = 0.102 kgf Load (N) = R (N/mm) x Deflection (mm)

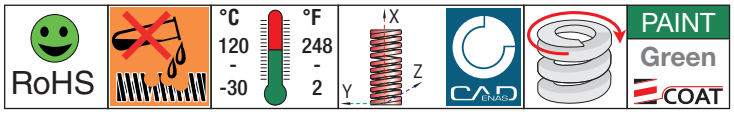
T NEW
W NEW

TV SERIES

Round Wire

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





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 35% L_0		D 40% L_0		E approx. do not use	
	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
TV 10 - 025	10	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	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	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

How to order: TV 16 - 102 (Series D_H - L_0)

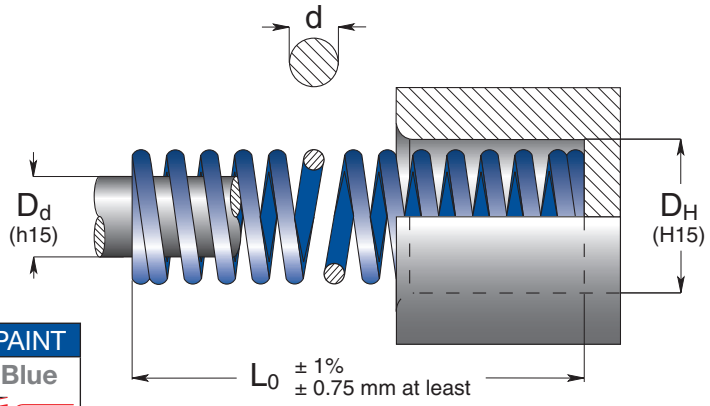
1 N = 0.1 daN = 0.102 kgf

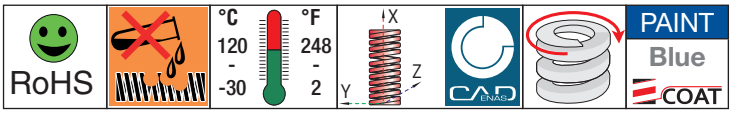
Load (N) = R (N/mm) x Deflection (mm)

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





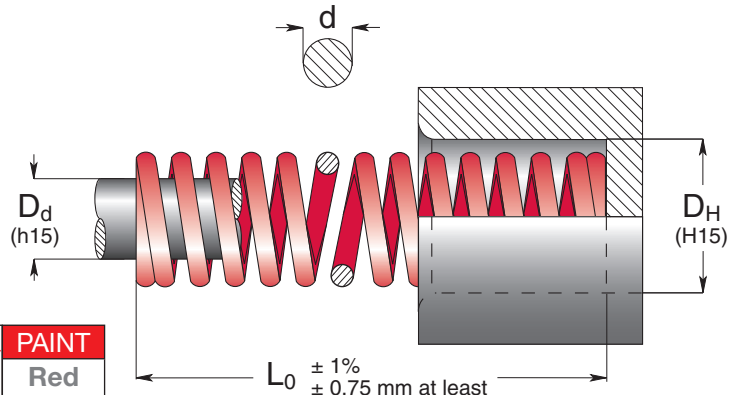
Code	D_H Hole Diameter	D_d Rod Diameter	L_0 Free Length	R Spring Constant	A 25% L_0		B 30% L_0		C 33.75% L_0		D 37.5% L_0		E approx. do not use	
	d			± 10%	+ 3.000.000		~ 1.500.000		300 - 500.000		100 - 200.000			
	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	mm	Pcs
TB 10 - 025	10	5	25	12.3	6.3	77	7.5	92	8.4	104	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	1.5		305	0.9	76.3	68	91.5	82	103	93	114	102	129	10
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	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	2.2		305	2.1	76.3	159	91.5	191	103	216	114	238	134	10

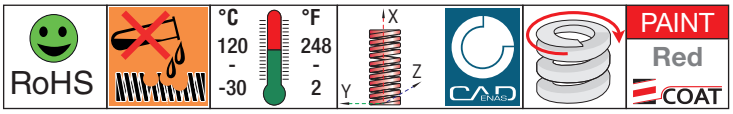
How to order: TB 16 - 102 (Series D_H - L_0) 1 N = 0.1 daN = 0.102 kgf Load (N) = R (N/mm) x Deflection (mm)

TR SERIES

Round Wire

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	
	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
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

How to order: TR 16 - 102 (Series D_H - L_0)

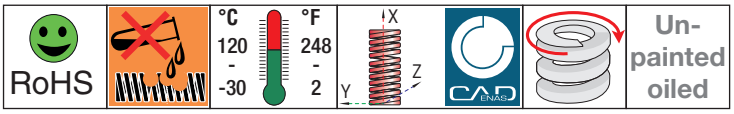
1 N = 0.1 daN = 0.102 kgf

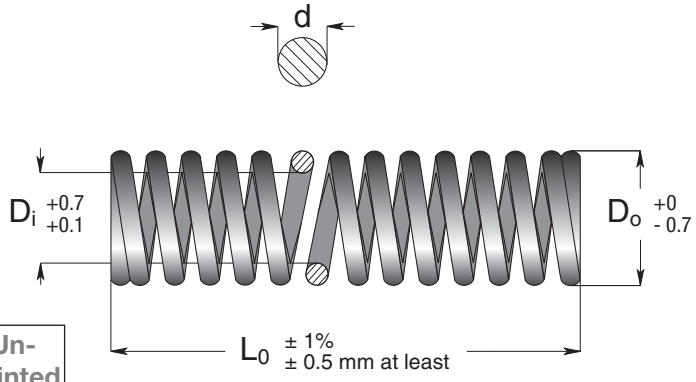
Load (N) = R (N/mm) x Deflection (mm)

Round Wire

SERIES L

IT Molle non colorate con oliatura antiruggine.
EN Not painted springs 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

L_0 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
Load (N) required for 1mm deflection
Kraftzunahme (N) für 1 mm gefragt pro
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 total 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 total 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 total working deflection for about 300.000 - 500.000 cycles
Empfohlener Gesamtfederweg für eine Lebensdauer der Feder von ca. 300.0000 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 total 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

Code	D_o Outside Diameter	D_i Inside Diameter	d	L_0 Free Length	R Spring Constant	A 16% L_0		B 24% L_0		C 28% L_0		D 32% L_0		
					± 10%	+ 3.000.000		~ 1.500.000		300 - 500.000		100 - 200.000		
	mm	mm	mm	mm	N/mm	mm	N	mm	N	mm	N	mm	N	Pcs
L 3 - 010	3	2	0.4	10	2.94	1.6	4.4	2.4	6.62	2.8	6.9	3.2	8.8	50
L 3 - 015				15	1.96	2.4		3.6		4.2		4.8		50
L 3 - 020				20	0.98	3.2		4.8		5.6		6.4		50
L 3 - 025				25	0.98	4		6		7.0		8		50
L 4 - 010	4	2.6	0.6	10	4.9	1.6	7.8	2.4	11.6	2.8	14.5	3.2	15.7	50
L 4 - 015				15	2.94	2.4		3.6		4.2		4.8		50
L 4 - 020				20	2.94	3.2		4.8		5.6		6.4		50
L 4 - 025				25	1.96	4		6		7.0		8		50
L 4 - 030				30	1.96	4.8		7.2		8.4		9.6		50
L 6 - 015	6	4	0.9	15	7.85	2.4	17.7	3.6	26.5	4.2	32.4	4.8	35.5	50
L 6 - 020				20	5.88	3.2		4.8		5.6		6.4		50
L 6 - 025				25	4.9	4		6		7.0		8		50
L 6 - 030				30	3.92	4.8		7.2		8.4		9.6		50
L 6 - 035				35	2.94	5.6		8.4		9.8		11.2		50

How to order: L 6 - 030 (Series D_H - L_0) 1 N = 0.1 daN = 0.102 kgf Load (N) = R (N/mm) x Deflection (mm)

L SERIES

Round Wire

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 28% L_0		D 32% L_0		
	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	Pcs
L 8 - 015			15	12.75	2.4		3.6		4.2		4.8		50
L 8 - 020			20	9.81	3.2		4.8		5.6		6.4		50
L 8 - 025	8	5.4	25	7.85	4	31.4	6	47.1	7.0	55.6	8	62.8	50
L 8 - 030			30	6.86	4.8		7.2		8.4		9.6		50
L 8 - 035			35	5.88	5.6		8.4		9.8		11.2		50
L 8 - 040	1.2		40	4.9	6.4		9.6		11.2		12.8		50
L 10 - 025			25	12.75	4		6		7.0		8		50
L 10 - 030			30	9.81	4.8		7.2		8.4		9.6		50
L 10 - 035	10	6.5	35	8.83	5.6	49	8.4	73.6	9.8	85.8	11.2	98	50
L 10 - 040			40	7.85	6.4		9.6		11.2		12.8		50
L 10 - 045			45	6.86	7.2		10.8		12.6		14.4		50
L 10 - 050	1.5		50	5.88	8		12		14.0		16		25
L 12 - 025			25	17.65	4		6		7.0		8		50
L 12 - 030			30	14.71	4.8		7.2		8.4		9.6		50
L 12 - 035			35	12.75	5.6		8.4		9.8		11.2		50
L 12 - 040	12	8	40	10.79	6.4	70.6	9.6	106.9	11.2	124.1	12.8	141.2	25
L 12 - 045			45	9.81	7.2		10.8		12.6		14.4		25
L 12 - 050			50	8.83	8		12		14.0		16		25
L 12 - 055			55	7.85	8.8		13.2		15.4		17.6		25
L 12 - 060	1.8		60	7.85	9.6		14.4		16.8		19.2		25
L 14 - 025			25	24.52	4		6		7.0		8		50
L 14 - 030			30	19.61	4.8		7.2		8.4		9.4		50
L 14 - 035			35	17.65	5.6		8.4		9.8		11.2		25
L 14 - 040			40	14.71	6.4		9.6		11.2		12.8		25
L 14 - 045	14	9.3	45	13.73	7.2	96.1	10.8	144.2	12.6	167.7	14.4	192.2	25
L 14 - 050			50	11.77	8		12		14.0		16		25
L 14 - 055			55	10.79	8.8		13.2		15.4		17.6		25
L 14 - 060			60	9.81	9.6		14.4		16.8		19.2		25
L 14 - 065			65	8.83	10.4		15.6		18.2		20.8		20
L 14 - 070	2.2		70	8.83	11.2		16.8		19.6		22.4		20
L 16 - 025			25	31.38	4		6		7.0		8		50
L 16 - 030			30	26.48	4.8		7.2		8.4		9.4		50
L 16 - 035			35	22.56	5.6		8.4		9.8		11.2		25
L 16 - 040			40	19.61	6.4		9.6		11.2		12.8		25
L 16 - 045			45	17.65	7.2		10.8		12.6		14.4		25
L 16 - 050	16	10.7	50	15.69	8	125.5	12	188.3	14.0	219.8	16	251.1	25
L 16 - 055			55	14.71	8.8		13.2		15.4		17.6		25
L 16 - 060			60	12.75	9.6		14.4		16.8		19.2		25
L 16 - 065			65	11.77	10.4		15.6		18.2		20.8		20
L 16 - 070			70	10.79	11.2		16.8		19.6		22.4		20
L 16 - 075			75	10.79	12		18		21.0		24		20
L 16 - 080	2.4		80	9.81	12.8		19.2		22.4		25.6		20
L 18 - 025			25	40.21	4		6		7.0		8		50
L 18 - 030			30	33.34	4.8		7.2		8.4		9.4		50
L 18 - 035			35	28.44	5.6		8.4		9.8		11.2		25
L 18 - 040			40	24.52	6.4		9.6		11.2		12.8		25
L 18 - 045			45	22.56	7.2		10.8		12.6		14.4		25
L 18 - 050	18	12	50	19.61	8		12		14.0		16		25
L 18 - 055			55	17.65	8.8	158.9	13.2	238.3	15.4	280.4	17.6	317.7	25
L 18 - 060			60	16.67	9.6		14.4		16.8		19.2		25
L 18 - 065			65	15.69	10.4		15.6		18.2		20.8		20
L 18 - 070			70	14.71	11.2		16.8		19.6		22.4		20
L 18 - 075			75	13.73	12		18		21.0		24		20
L 18 - 080			80	12.75	12.8		19.2		22.4		25.6		20
L 18 - 090	2.8		90	10.79	14.4		21.6		25.2		28.8		20
L 20 - 025			25	49.03	4		6		7.0		8		50
L 20 - 030			30	41.19	4.8		7.2		8.4		9.4		50
L 20 - 035			35	35.3	5.6		8.4		9.8		11.2		25
L 20 - 040			40	30.4	6.4		9.6		11.2		12.8		25
L 20 - 045			45	27.46	7.2		10.8		12.6		14.4		25
L 20 - 050			50	24.52	8		12		14.0		16		25
L 20 - 055	20	13.5	55	22.56	8.8	196.1	13.2	294.2	15.4	346.3	17.6	392.3	25
L 20 - 060			60	20.59	9.6		14.4		16.8		19.2		25
L 20 - 065			65	18.63	10.4		15.6		18.2		20.8		20
L 20 - 070			70	17.65	11.2		16.8		19.6		22.4		20
L 20 - 075			75	16.67	12		18		21.0		24		20
L 20 - 080			80	15.69	12.8		19.2		22.4		25.6		20
L 20 - 090			90	13.73	14.4		21.6		25.2		28.8		20
L 20 - 100	3		100	12.75	16		24		28.0		32		20

How to order: L 6 - 030 (Series D_H - L_0)

1 N = 0.1 daN = 0.102 kgf

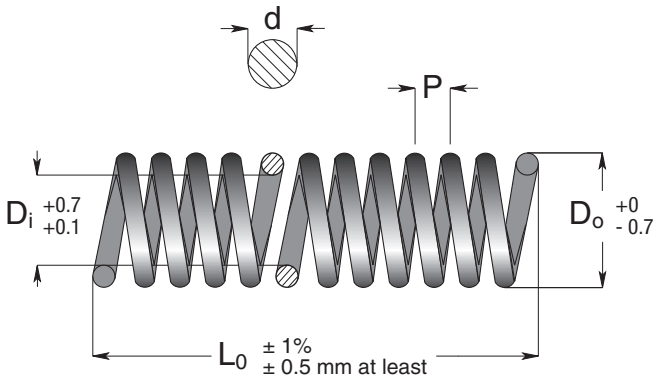
Load (N) = R (N/mm) x Deflection (mm)

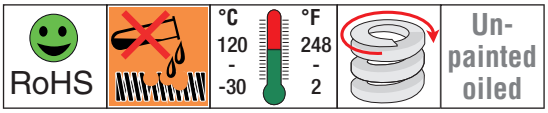
Round Wire

SERIES L

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 28% L_0		D 32% L_0		
	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	Pcs
L 22 - 025			25	59.82	4		6		7.0		8		50
L 22 - 030			30	49.03	4.8		7.2		8.4		9.4		50
L 22 - 035			35	42.17	5.6		8.4		9.8		11.2		25
L 22 - 040			40	37.27	6.4		9.6		11.2		12.8		25
L 22 - 045			45	33.34	7.2		10.8		12.6		14.4		25
L 22 - 050			50	29.42	8		12		14.0		16		25
L 22 - 055	22	14.7	55	27.46	8.8	237.3	13.2	356	15.4	415.9	17.6	474.6	25
L 22 - 060			60	24.52	9.6		14.4		16.8		19.2		20
L 22 - 065			65	22.56	10.4		15.6		18.2		20.8		20
L 22 - 070			70	21.57	11.2		16.8		19.6		22.4		20
L 22 - 075			75	19.61	12		18		21.0		24		20
L 22 - 080			80	18.63	12.8		19.2		22.4		25.6		20
L 22 - 090			90	16.67	14.4		21.6		25.2		28.8		20
L 22 - 100	3.4		100	14.71	16		24		28.0		32		20
L 25 - 025			25	76.49	4		6		7.0		8		50
L 25 - 030			30	63.74	4.8		7.2		8.4		9.6		25
L 25 - 035			35	54.92	5.6		8.4		9.8		11.2		25
L 25 - 040			40	48.05	6.4		9.6		11.2		12.8		25
L 25 - 045			45	42.17	7.2		10.8		12.6		14.4		25
L 25 - 050			50	38.25	8		12		14.0		16		25
L 25 - 055	25	17	55	35.3	8.8	307	13.2	459.9	15.4	537.9	17.6	613.9	20
L 25 - 060			60	32.36	9.6		14.4		16.8		19.2		20
L 25 - 065			65	29.42	10.4		15.6		18.2		20.8		20
L 25 - 070			70	27.46	11.2		16.8		19.6		22.4		20
L 25 - 075			75	25.5	12		18		21.0		24		20
L 25 - 080			80	23.54	12.8		19.2		22.4		25.6		20
L 25 - 090			90	21.57	14.4		21.6		25.2		28.8		20
L 25 - 100	3.8		100	19.61	16		24		28.0		32		20
L 30 - 050			50	51.94	8		12		14.0		16		20
L 30 - 060			60	44.1	9.6		14.4		16.8		19.2		20
L 30 - 070	30	20	70	37.24	11.2		16.8		19.6		22.4		20
L 30 - 080			80	32.34	12.8	414	19.2	621	22.4	724.1	25.6	828	10
L 30 - 090			90	28.42	14.4		21.6		25.2		28.8		10
L 30 - 100			100	25.48	16		24		28.0		32		10
L 30 - 125	4.5		125	20.58	20		30		35.0		40		10

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





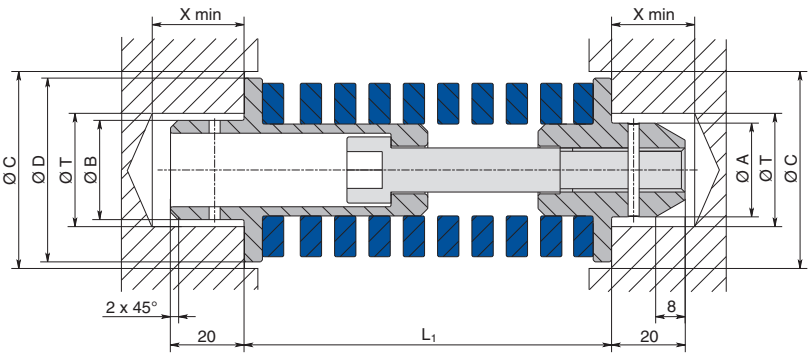
Code	D_o Outside Diameter	D_i Inside Diameter	d Wire Diameter	L_0 Free Length	P Pitch	
	mm	mm	mm	mm	mm	Pcs
L 03 - 300	3	2.0	0.4	300	1.04	10
L 04 - 300	4	2.6	0.6	300	1.50	10
L 06 - 300	6	4.0	0.9	300	2.00	10
L 08 - 300	8	5.4	1.2	300	2.80	10
L 10 - 300	10	6.5	1.5	300	3.50	10
L 12 - 300	12	8.0	1.8	300	4.30	10
L 14 - 300	14	9.3	2.2	300	4.80	10
L 16 - 300	16	10.7	2.4	300	5.50	10
L 18 - 300	18	12.0	2.8	300	5.30	10
L 20 - 300	20	13.5	3.0	300	6.80	10
L 22 - 300	22	14.7	3.4	300	6.70	10
L 25 - 300	25	17.0	3.8	300	8.20	10

How to order: L 6 - 300 (Series D_H - L_0) 1 N = 0.1 daN = 0.102 kgf Load (N) = R (N/mm) x Deflection (mm)

Precompressed Unit

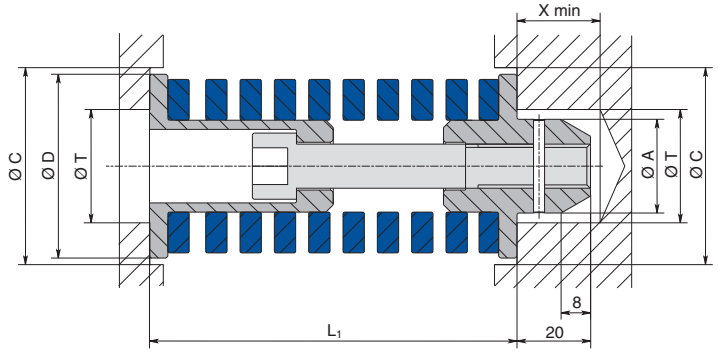
Peugeot - Citroën Standard

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	Initial Force		25% L_0		32% L_0		ØC	ØT	X min	Spring data		
															D_H	L_{0tt}	R
		mm	mm	mm	mm	mm	N	mm	N	mm	N	mm	mm	mm	mm	mm	N/mm
15 02 B40069	X 346 590 070	69	20.5	22	40	17	1836	3	2160	8	2700	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	-	-	8	3808	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	-	-	8	6720	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	Initial Force		25% L_0		32% L_0		ØC	ØT	X min	Spring data		
															D_H	L_{0tt}	R
		mm	mm	mm	mm	mm	N	mm	N	mm	N	mm	mm	mm	mm	mm	N/mm
15 01 B40069	X 346 590 063	69	20.5	-	40	3	1836	3	2160	8	2700	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				13	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	25.5	-	50	-	2856	-	-	8	3808	52	27,5	25	50	102	119
15 01 B50100	X 346 590 056	100				13	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				31	1405	31	2766	50	3600					254	43.9
15 01 B63105	X 346 590 051	105	36.5	-	63	-	5376	-	-	8	6720	65	38.5	25	63	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				31	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

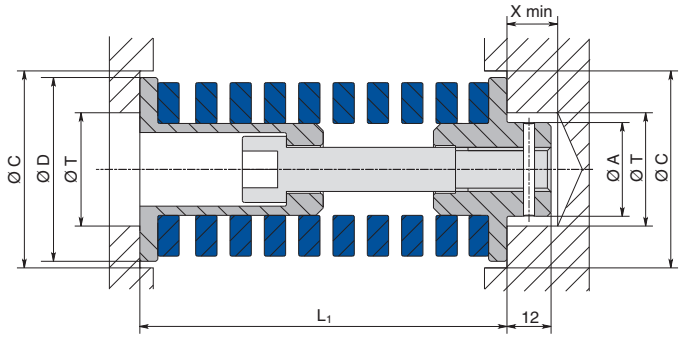
How to order: 15 01 B50188

1 N = 0.1 daN = 0.102 kgf

Precompressed Unit

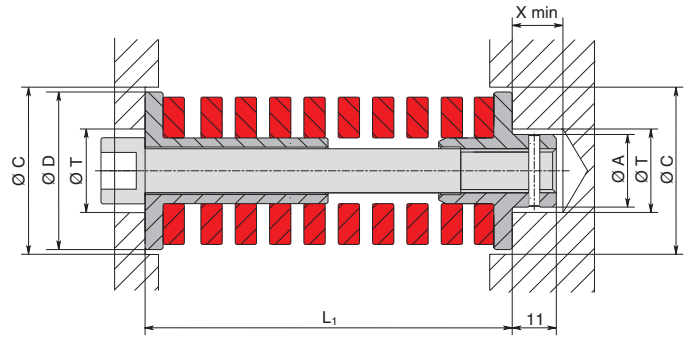
Peugeot - Citroën Standard

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



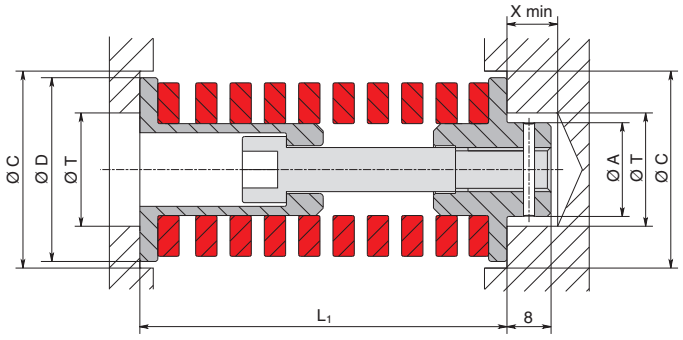
Code Special Springs	Code PSA Mabec	L1	ØA	ØB	ØD		Initial Force		25% L_0		32% L_0		ØC	ØT	X min	Spring data D_H	Spring data L_{0tt}	Spring data R
		mm	mm	mm	mm	mm	N	mm	N	mm	N	mm	mm	mm	mm	mm	N/mm
15 01 B40122	X 346 590 060	122	20.5	-	40	15	940	17	2006	25	2508	42	22.5	13	40	127	62.7
15 01 B50122	X 346 590 055	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% L_0		28% L_0		ØC	ØT	X min	Spring data D_H	Spring data L_{0tt}	Spring data R
		mm	mm	mm	mm	mm	N	mm	N	mm	N	mm	mm	mm	mm	mm	N/mm
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% L_0		28% L_0		ØC	ØT	X min	Spring data D_H	Spring data L_{0tt}	Spring data R
		mm	mm	mm	mm	mm	N	mm	N	mm	N	mm	mm	mm	mm	mm	N/mm
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				14	1498	9	2461	18	3424					115	107

How to order: 15 00 R25069

1 N = 0.1 daN = 0.102 kgf

Headquarter

Special Springs S.r.l.
Via Nardi 124/A
36060 Romano d'Ezzelino (VI) - ITALY
tel. +39 0424 539181 fax +39 0424 898230
info@specialsprings.com - www.specialsprings.com

North America Subsidiary

Special Springs LLC
7707 Ronda Drive, Canton,
Michigan 48187 - USA
Ph. +1 734.892.2324 fax. +1 734.404.5417
info@specialspringsna.com - www.specialspringsna.com

South America Subsidiary

Special Springs do Brasil
Avenida Dom Pedro I, 2156 - Vila Pires
09130-012 Santo André / SP - BRASIL
Ph. +55 11 2324 3545
comercial@specialsprings.com.br - www.specialsprings.com.br

India Subsidiary

Global Special Springs Pvt. Ltd.
Survay no. 69/2 Chandarda Tal. Kadi Dist. Mehesana (Ahmedabad-Mehesana Highway)
Gujarat, 382705 - INDIA
Ph. / fax. +91 2764 273065
info@globalspecialsprings.com - www.specialsprings.com

Catalog code
9800A04900018