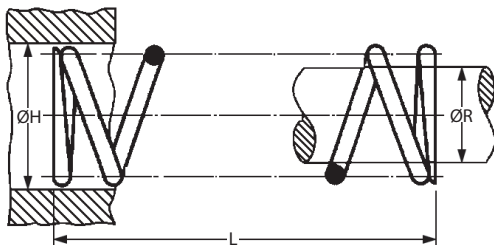


R

Die Springs - Light Duty

ISO 10243 Colour Coded Green 1.1 - 569N, 5 - 10mm Rod Dia.



Discounts: 10+ -5% 25+ -10% 50+ -15% 100+ -20%

Part Number	Hole Dia. ØH	Rod Dia. ØR	Free Length L	Load at 1mm Def. N	Load Deflection								Price Each 1 - 9
					For Optimum Life (25% of free length)		For Long Life (30% of free length)		Max. Operating Def. (35% of free length)		Max. Deflection*		
					Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	
R203104	10.0	5.0	25	10.0	62.5	6.3	75.0	7.5	87.5	8.8	103.0	10.3	£1.57
R203105	10.0	5.0	32	8.5	68.0	8.0	81.6	9.6	95.2	11.2	111.4	13.1	£1.81
R203106	10.0	5.0	38	6.8	64.6	9.5	77.5	11.4	90.4	13.3	106.1	15.6	£2.05
R203107	10.0	5.0	44	6.0	66.0	11.0	79.2	13.2	92.4	15.4	108.0	18.0	£2.42
R203108	10.0	5.0	51	5.0	63.8	12.8	76.5	15.3	89.3	17.9	104.5	20.9	£2.58
R203110	10.0	5.0	64	4.3	68.8	16.0	82.6	19.2	96.3	22.4	111.8	26.0	£3.05
R203112	10.0	5.0	76	3.2	60.8	19.0	73.0	22.8	85.1	26.6	99.8	31.2	£3.15
R203148	10.0	5.0	305	1.1	83.9	76.3	100.7	91.5	117.4	106.8	137.5	125.0	£13.57
R203204	12.5	6.3	25	17.9	111.9	6.3	134.3	7.5	156.6	8.8	184.4	10.3	£1.81
R203205	12.5	6.3	32	16.4	131.2	8.0	157.4	9.6	183.7	11.2	214.8	13.1	£2.09
R203206	12.5	6.3	38	13.6	129.2	9.5	155.0	11.4	180.9	13.3	212.2	15.6	£2.40
R203207	12.5	6.3	44	12.1	133.1	11.0	159.7	13.2	186.3	15.4	217.8	18.0	£2.58
R203208	12.5	6.3	51	11.4	145.4	12.8	174.4	15.3	203.5	17.9	238.3	20.9	£2.67
R203210	12.5	6.3	64	9.3	148.8	16.0	178.6	19.2	208.3	22.4	244.6	26.3	£2.96
R203212	12.5	6.3	76	7.1	134.9	19.0	161.9	22.8	188.9	26.6	221.5	31.2	£3.57
R203214	12.5	6.3	89	5.4	120.2	22.3	144.2	26.7	168.2	31.2	197.1	36.5	£3.71
R203248	12.5	6.3	305	1.4	106.8	76.3	128.1	91.5	149.5	106.8	175.0	125.0	£14.05
R203304	16.0	8.0	25	23.4	146.3	6.3	175.5	7.5	204.8	8.8	241.0	10.3	£2.35
R203305	16.0	8.0	32	22.9	183.2	8.0	219.8	9.6	256.5	11.2	300.0	13.1	£2.42
R203306	16.0	8.0	38	19.3	183.4	9.5	220.0	11.4	256.7	13.3	301.1	15.6	£2.62
R203307	16.0	8.0	44	17.1	188.1	11.0	225.7	13.2	263.3	15.4	307.8	18.0	£2.96
R203308	16.0	8.0	51	15.7	200.2	12.8	240.2	15.3	280.2	17.9	328.1	20.9	£3.05
R203310	16.0	8.0	64	10.7	171.2	16.0	205.4	19.2	239.7	22.4	281.4	26.3	£3.33
R203312	16.0	8.0	76	10.0	190.0	19.0	228.0	22.8	266.0	26.6	312.0	31.2	£3.75
R203314	16.0	8.0	89	8.6	191.4	22.3	229.6	26.7	267.9	31.2	313.9	36.5	£4.30
R203316	16.0	8.0	102	7.8	198.9	25.5	238.7	30.6	278.5	35.7	326.0	41.8	£4.47
R203348	16.0	8.0	305	2.5	190.6	76.3	228.8	91.5	266.9	106.8	312.5	125.0	£15.09
R203404	20.0	10.0	25	55.8	348.8	6.3	418.5	7.5	488.3	8.8	569.2	10.3	£3.23
R203405	20.0	10.0	32	45.0	360.0	8.0	432.0	9.6	504.0	11.2	562.5	12.5	£3.68
R203406	20.0	10.0	38	33.3	316.4	9.5	379.6	11.4	442.9	13.3	499.5	15.0	£3.71
R203407	20.0	10.0	44	30.0	330.0	11.0	396.0	13.2	462.0	15.4	540.0	18.0	£3.93
R203408	20.0	10.0	51	24.5	312.4	12.8	374.9	15.3	437.3	17.9	490.0	20.0	£4.16
R203410	20.0	10.0	64	20.0	320.0	16.0	384.0	19.2	448.0	22.4	500.0	25.0	£4.47
R203412	20.0	10.0	76	16.0	304.0	19.0	364.8	22.8	425.6	26.6	480.0	30.0	£4.82
R203414	20.0	10.0	89	14.0	311.5	22.3	373.8	26.7	436.1	31.2	490.0	35.0	£5.56
R203416	20.0	10.0	102	12.0	306.0	25.5	367.2	30.6	428.4	35.7	492.0	41.0	£5.86
R203418	20.0	10.0	115	10.9	313.4	28.8	376.1	34.5	438.7	40.3	501.4	46.0	£6.67
R203420	20.0	10.0	127	9.5	301.6	31.8	362.0	38.1	422.3	44.5	484.5	51.0	£7.29

Material

High tensile strength chromium alloy steels.

* Load values shown represent loads near solid and are for design information only.

Performance

Heat Resistance: Up to +230°C (Loss of load occurs above +120°C).

Other Info.

Spring Ends: Squared and ground.

For compressed length, subtract the **Deflection** from the **Free Length**.



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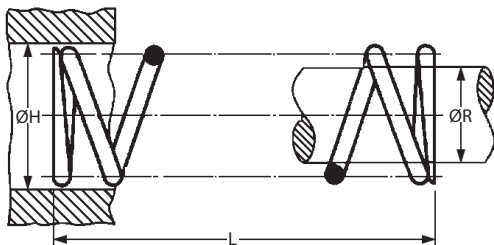
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SPRINGS

R

Die Springs - Light Duty

ISO 10243 Colour Coded Green 4 - 1840N, 10 - 20mm Rod Dia.



Discounts: 10+ -5% 25+-10% 50+-15% 100+-20%

Part Number	Hole Dia. ØH	Rod Dia. ØR	Free Length L	Load Deflection										Price Each 1 - 9
				Load at 1mm Def. N	For Optimum Life (25% of free length)		For Long Life (30% of free length)		Max. Operating Def. (35% of free length)		Max. Deflection*			
					Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm		
R203422	20	10.0	139	8.4	291.9	34.8	350.3	41.7	408.7	48.7	470.4	56.0	£8.07	
R203424	20	10.0	152	7.5	285.0	38.0	342.0	45.6	399.0	53.2	457.5	61.0	£8.55	
R203448	20	10.0	305	4.0	305.0	76.3	366.0	91.5	427.0	106.8	488.0	122.0	£17.23	
R203508	25	12.5	25	100.0	625.0	6.3	750.0	7.5	875.0	8.8	1,020.0	10.2	£4.22	
R203505	25	12.5	32	80.3	642.4	8.0	770.9	9.6	899.4	11.2	1,003.8	12.5	£4.82	
R203506	25	12.5	38	62.0	589.0	9.5	706.8	11.4	824.6	13.3	930.0	15.0	£4.58	
R203507	25	12.5	44	52.9	581.9	11.0	698.3	13.2	814.7	15.4	952.2	18.0	£5.11	
R203508	25	12.5	51	44.0	561.0	12.8	673.2	15.3	785.4	17.9	880.0	20.0	£4.94	
R203510	25	12.5	64	35.2	563.2	16.0	675.8	19.2	788.5	22.4	880.0	25.0	£5.39	
R203512	25	12.5	76	28.0	532.0	19.0	638.4	22.8	744.8	26.6	840.0	30.0	£5.90	
R203514	25	12.5	89	24.0	534.0	22.3	640.8	26.7	747.6	31.2	840.0	35.0	£6.23	
R203516	25	12.5	102	21.1	538.1	25.5	645.7	30.6	753.3	35.7	865.1	41.0	£6.64	
R203518	25	12.5	115	18.7	537.6	28.8	645.2	34.5	752.7	40.3	860.2	46.0	£8.31	
R203520	25	12.5	127	16.7	530.2	31.8	636.3	38.1	742.3	44.5	851.7	51.0	£8.37	
R203522	25	12.5	139	15.3	531.7	34.8	638.0	41.7	744.3	48.7	856.8	56.0	£9.42	
R203524	25	12.5	152	14.0	532.0	38.0	638.4	45.6	744.8	53.2	854.0	61.0	£10.13	
R203528	25	12.5	178	12.5	556.3	44.5	667.5	53.4	778.8	62.3	887.5	71.0	£12.57	
R203532	25	12.5	203	10.4	527.8	50.8	633.4	60.9	738.9	71.1	842.4	81.0	£13.35	
R203548	25	12.5	305	7.0	533.8	76.3	640.5	91.5	747.3	106.8	854.0	122.0	£19.34	
R203606	32	16.0	38	94.0	893.0	9.5	1,071.6	11.4	1,250.2	13.3	1,410.0	15.0	£6.90	
R203607	32	16.0	44	79.5	874.5	11.0	1,049.4	13.2	1,224.3	15.4	1,431.0	18.0	£7.71	
R203608	32	16.0	51	67.0	854.3	12.8	1,025.1	15.3	1,196.0	17.9	1,340.0	20.0	£7.34	
R203610	32	16.0	64	53.0	848.0	16.0	1,017.6	19.2	1,187.2	22.4	1,325.0	25.0	£8.00	
R203612	32	16.0	76	44.0	836.0	19.0	1,003.2	22.8	1,170.4	26.6	1,320.0	30.0	£8.90	
R203614	32	16.0	89	37.2	827.7	22.3	993.2	26.7	1,158.8	31.2	1,302.0	35.0	£9.90	
R203616	32	16.0	102	32.0	816.0	25.5	979.2	30.6	1,142.4	35.7	1,312.0	41.0	£10.35	
R203618	32	16.0	115	29.0	833.8	28.8	1,000.5	34.5	1,167.3	40.3	1,334.0	46.0	£11.89	
R203620	32	16.0	127	25.0	793.8	31.8	952.5	38.1	1,111.3	44.5	1,275.0	51.0	£12.38	
R203622	32	16.0	139	23.0	799.3	34.8	959.1	41.7	1,119.0	48.7	1,288.0	56.0	£14.17	
R203624	32	16.0	152	21.5	817.0	38.0	980.4	45.6	1,143.8	53.2	1,311.5	61.0	£15.67	
R203628	32	16.0	178	18.2	809.9	44.5	971.9	53.4	1,133.9	62.3	1,292.2	71.0	£17.63	
R203632	32	16.0	203	15.8	801.9	50.8	962.2	60.9	1,122.6	71.1	1,279.8	81.0	£20.14	
R203640	32	16.0	254	12.5	793.8	63.5	952.5	76.2	1,111.3	88.9	1,275.0	102.0	£26.47	
R203648	32	16.0	305	10.3	785.4	76.3	942.5	91.5	1,099.5	106.8	1,256.6	122.0	£30.57	
R203708	40	20.0	51	92.0	1,173.0	12.8	1,407.6	15.3	1,642.2	17.9	1,840.0	20.0	£8.13	
R203710	40	20.0	64	73.0	1,168.0	16.0	1,401.6	19.2	1,635.2	22.4	1,825.0	25.0	£9.57	
R203712	40	20.0	76	63.0	1,197.0	19.0	1,436.4	22.8	1,675.8	26.6	1,890.0	30.0	£10.67	
R203714	40	20.0	89	51.0	1,134.8	22.3	1,361.7	26.7	1,588.7	31.2	1,785.0	35.0	£11.63	

Material

High tensile strength chromium alloy steels.

* Load values shown represent loads near solid and are for design information only.

Performance

Heat Resistance: Up to +230°C (Loss of load occurs above +120°C).

Other Info.

Spring Ends: Squared and ground.

For compressed length, subtract the Deflection from the Free Length.



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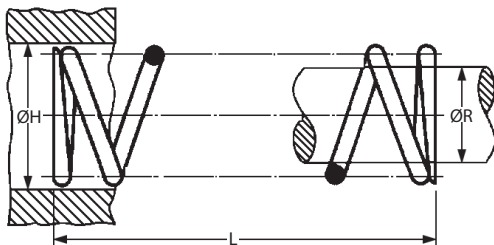
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Product information updated 2023/08/22. See <https://amironic.co.uk/> for the latest prices and availability.

R

Die Springs - Light Duty

ISO 10243 Colour Coded Green 14.8 - 5670N, 20 - 38mm Rod Dia.



Discounts: 10+ -5% 25+ -10% 50+ -15% 100+ -20%

Part Number	Hole Dia. ØH	Rod Dia. ØR	Free Length L	Load at 1mm Def. N	Load Deflection								Price Each 1 - 9
					For Optimum Life (25% of free length)		For Long Life (30% of free length)		Max. Operating Def. (35% of free length)		Max. Deflection*		
					Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	
R203716	40	20	102	43.0	1,096.5	25.5	1,315.8	30.6	1,535.1	35.7	1,763.0	41.0	£13.15
R203718	40	20	115	39.6	1,138.5	28.8	1,366.2	34.5	1,593.9	40.3	1,821.6	46.0	£14.17
R203720	40	20	127	37.0	1,174.8	31.8	1,409.7	38.1	1,644.7	44.5	1,887.0	51.0	£17.40
R203722	40	20	139	32.0	1,112.0	34.8	1,334.4	41.7	1,556.8	48.7	1,792.0	56.0	£19.63
R203724	40	20	152	28.0	1,064.0	38.0	1,276.8	45.6	1,489.6	53.2	1,708.0	61.0	£20.54
R203728	40	20	178	25.2	1,121.4	44.5	1,345.7	53.4	1,570.0	62.3	1,789.2	71.0	£23.28
R203732	40	20	203	22.7	1,152.0	50.8	1,382.4	60.9	1,612.8	71.1	1,838.7	81.0	£27.10
R203740	40	20	254	17.0	1,079.5	63.5	1,295.4	76.2	1,511.3	88.9	1,734.0	102.0	£38.43
R203748	40	20	305	14.8	1,128.5	76.3	1,354.2	91.5	1,579.9	106.8	1,805.6	122.0	£44.67
R203810	50	25	64	156.0	2,496.0	16.0	2,995.2	19.2	3,494.4	22.4	3,900.0	25.0	£18.39
R203812	50	25	76	125.0	2,375.0	19.0	2,850.0	22.8	3,325.0	26.6	3,750.0	30.0	£19.34
R203814	50	25	89	109.0	2,425.3	22.3	2,910.3	26.7	3,395.4	31.2	3,815.0	35.0	£21.82
R203816	50	25	102	94.0	2,397.0	25.5	2,876.4	30.6	3,355.8	35.7	3,854.0	41.0	£23.80
R203818	50	25	115	81.0	2,328.8	28.8	2,794.5	34.5	3,260.3	40.3	3,726.0	46.0	£28.32
R203820	50	25	127	71.0	2,254.3	31.8	2,705.1	38.1	3,156.0	44.5	3,621.0	51.0	£27.66
R203822	50	25	139	66.5	2,310.9	34.8	2,773.1	41.7	3,235.2	48.7	3,724.0	56.0	£29.76
R203824	50	25	152	60.0	2,280.0	38.0	2,736.0	45.6	3,192.0	53.2	3,660.0	61.0	£32.48
R203828	50	25	178	52.0	2,314.0	44.5	2,776.8	53.4	3,239.6	62.3	3,692.0	71.0	£40.53
R203832	50	25	203	44.0	2,233.0	50.8	2,679.6	60.9	3,126.2	71.1	3,564.0	81.0	£46.18
R203840	50	25	254	35.0	2,222.5	63.5	2,667.0	76.2	3,111.5	88.9	3,570.0	102.0	£55.72
R203848	50	25	305	28.5	2,173.1	76.3	2,607.8	91.5	3,042.4	106.8	3,477.0	122.0	£70.86
R203912	63	38	76	189.0	3,591.0	19.0	4,309.2	22.8	5,027.4	26.6	5,670.0	30.0	£40.62
R203914	63	38	89	158.0	3,515.5	22.3	4,218.6	26.7	4,921.7	31.2	5,530.0	35.0	£45.32
R203916	63	38	102	131.0	3,340.5	25.5	4,008.6	30.6	4,676.7	35.7	5,371.0	41.0	£53.90
R203918	63	38	115	116.0	3,335.0	28.8	4,002.0	34.5	4,669.0	40.3	5,336.0	46.0	£56.72
R203920	63	38	127	103.0	3,270.3	31.8	3,924.3	38.1	4,578.4	44.5	5,253.0	51.0	£62.04
R203924	63	38	152	84.3	3,203.4	38.0	3,844.1	45.6	4,484.8	53.2	5,142.3	61.0	£66.12
R203928	63	38	178	71.5	3,181.8	44.5	3,818.1	53.4	4,454.5	62.3	5,076.5	71.0	£73.72
R203932	63	38	203	61.7	3,131.3	50.8	3,757.5	60.9	4,383.8	71.1	4,997.7	81.0	£92.36
R203940	63	38	254	47.0	2,984.5	63.5	3,581.4	76.2	4,178.3	88.9	4,794.0	102.0	£117.12
R203948	63	38	305	38.2	2,912.8	76.3	3,495.3	91.5	4,077.9	106.8	4,660.4	122.0	£149.39

Material

High tensile strength chromium alloy steels.

* Load values shown represent loads near solid and are for design information only.

Performance

Heat Resistance: Up to +230°C (Loss of load occurs above +120°C).

Other Info.

Spring Ends: Squared and ground.

For compressed length, subtract the **Deflection** from the **Free Length**.



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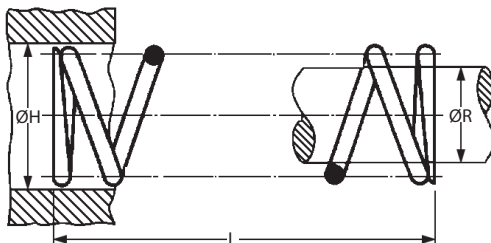
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SPRINGS

R

Die Springs - Medium Duty

ISO 10243 Colour Coded Blue 1.6 - 921N, 5 - 10mm Rod Dia.



Discounts: 10+ -5% 25+ -10% 50+ -15% 100+ -20%

Part Number	Hole Dia. ØH	Rod Dia. ØR	Free Length L	Load Deflection										Price Each 1 - 9
				Load at 1mm Def. N	For Optimum Life (20% of free length)		For Long Life (25% of free length)		Max. Operating Def. (30% of free length)		Max. Deflection*			
				Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm			
R204104	10.0	5.0	25	16.0	80.0	5.0	100.0	6.3	120.0	7.5	152.0	9.5	181.0	£1.81
R204105	10.0	5.0	32	13.0	83.2	6.4	104.0	8.0	124.8	9.6	158.6	12.2	182.0	£2.02
R204106	10.0	5.0	38	11.9	90.4	7.6	113.1	9.5	135.7	11.4	171.4	14.4	182.0	£2.22
R204107	10.0	5.0	44	10.3	90.6	8.8	113.3	11.0	136.0	13.2	172.0	16.7	182.0	£2.58
R204108	10.0	5.0	51	8.9	90.8	10.2	113.5	12.8	136.2	15.3	172.7	19.4	182.0	£2.76
R204110	10.0	5.0	64	7.5	96.0	12.8	120.0	16.0	144.0	19.2	182.3	24.3	182.0	£3.10
R204112	10.0	5.0	76	5.3	80.6	15.2	100.7	19.0	120.8	22.8	153.2	28.9	182.0	£3.52
R204148	10.0	5.0	305	1.6	97.6	61.0	122.0	76.3	146.4	91.5	185.6	116.0	182.0	£14.72
R204204	12.5	6.3	25	30.0	150.0	5.0	187.5	6.3	225.0	7.5	285.0	9.5	345.0	£2.09
R204205	12.5	6.3	32	24.8	158.7	6.4	198.4	8.0	238.1	9.6	302.6	12.2	345.0	£2.40
R204206	12.5	6.3	38	21.4	162.6	7.6	203.3	9.5	244.0	11.4	308.2	14.4	345.0	£2.46
R204207	12.5	6.3	44	18.5	162.8	8.8	203.5	11.0	244.2	13.2	309.0	16.7	345.0	£2.96
R204208	12.5	6.3	51	15.5	158.1	10.2	197.6	12.8	237.2	15.3	300.7	19.4	345.0	£3.15
R204210	12.5	6.3	64	12.1	154.9	12.8	193.6	16.0	232.3	19.2	294.0	24.3	345.0	£3.43
R204212	12.5	6.3	76	10.2	155.0	15.2	193.8	19.0	232.6	22.8	294.8	28.9	345.0	£3.75
R204214	12.5	6.3	89	8.4	149.5	17.8	186.9	22.3	224.3	26.7	283.9	33.8	345.0	£4.54
R204248	12.5	6.3	305	2.1	128.1	61.0	160.1	76.3	192.2	91.5	243.6	116.0	345.0	£15.63
R204304	16.0	8.0	25	49.4	247.0	5.0	308.8	6.3	370.5	7.5	469.3	9.5	569.3	£2.58
R204305	16.0	8.0	32	37.1	237.4	6.4	296.8	8.0	356.2	9.6	452.6	12.2	569.3	£2.71
R204306	16.0	8.0	38	33.9	257.6	7.6	322.1	9.5	386.5	11.4	488.2	14.4	569.3	£3.05
R204307	16.0	8.0	44	30.0	264.0	8.8	330.0	11.0	396.0	13.2	501.0	16.7	569.3	£3.33
R204308	16.0	8.0	51	26.4	269.3	10.2	336.6	12.8	403.9	15.3	512.2	19.4	569.3	£3.48
R204310	16.0	8.0	64	20.5	262.4	12.8	328.0	16.0	393.6	19.2	498.2	24.3	569.3	£3.82
R204312	16.0	8.0	76	17.8	270.6	15.2	338.2	19.0	405.8	22.8	514.4	28.9	569.3	£4.30
R204314	16.0	8.0	89	15.2	270.6	17.8	338.2	22.3	405.8	26.7	513.8	33.8	569.3	£4.66
R204316	16.0	8.0	102	13.5	275.4	20.4	344.3	25.5	413.1	30.6	523.8	38.8	569.3	£5.18
R204348	16.0	8.0	305	4.8	292.8	61.0	366.0	76.3	439.2	91.5	556.8	116.0	569.3	£17.87
R204404	20.0	10.0	25	98.0	490.0	5.0	612.5	6.3	735.0	7.5	921.2	9.4	1121.2	£3.68
R204405	20.0	10.0	32	72.6	464.6	6.4	580.8	8.0	697.0	9.6	871.2	12.0	1121.2	£3.91
R204406	20.0	10.0	38	56.0	425.6	7.6	532.0	9.5	638.4	11.4	784.0	14.0	1121.2	£3.91
R204407	20.0	10.0	44	47.5	418.0	8.8	522.5	11.0	627.0	13.2	783.8	16.5	1121.2	£4.47
R204408	20.0	10.0	51	41.7	425.3	10.2	531.7	12.8	638.0	15.3	792.3	19.0	1121.2	£4.47
R204410	20.0	10.0	64	32.3	413.4	12.8	516.8	16.0	620.2	19.2	775.2	24.0	1121.2	£4.85
R204412	20.0	10.0	76	25.1	381.5	15.2	476.9	19.0	572.3	22.8	702.8	28.0	1121.2	£5.25
R204414	20.0	10.0	89	22.0	391.6	17.8	489.5	22.3	587.4	26.7	726.0	33.0	1121.2	£5.90
R204416	20.0	10.0	102	19.8	403.9	20.4	504.9	25.5	605.9	30.6	752.4	38.0	1121.2	£7.02
R204418	20.0	10.0	115	18.1	416.3	23.0	520.4	28.8	624.5	34.5	778.3	43.0	1121.2	£7.81
R204420	20.0	10.0	127	16.6	421.6	25.4	527.1	31.8	632.5	38.1	796.8	48.0	1121.2	£8.63

Material

High tensile strength chromium alloy steels.

* Load values shown represent loads near solid and are for design information only.

Performance

Heat Resistance: Up to +230°C (Loss of load occurs above +120°C).

Other Info.

Spring Ends: Squared and ground.

For compressed length, subtract the Deflection from the Free Length.



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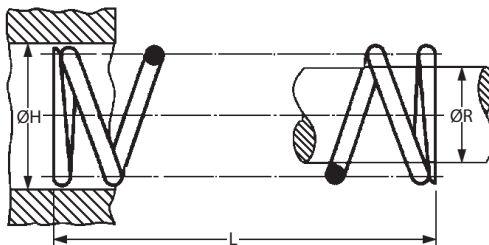
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Product information updated 2023-08-22. See <https://amironic.co.uk/> for the latest prices and availability.

R

Die Springs - Medium Duty

ISO 10243 Colour Coded Blue 6.1 - 3450N, 10 - 20mm Rod Dia.



Discounts: 10+ -5% 25+ -10% 50+ -15% 100+ -20%

Part Number	Hole Dia. ØH	Rod Dia. ØR	Free Length L	Load at 1mm Def. N	Load Deflection								Price Each 1 - 9
					For Optimum Life (20% of free length)		For Long Life (25% of free length)		Max. Operating Def. (30% of free length)		Max. Deflection*		
					Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	
R204422	20	10.0	139	15.1	419.8	27.8	524.7	34.8	629.7	41.7	785.2	52.0	£9.42
R204424	20	10.0	152	13.2	401.3	30.4	501.6	38.0	601.9	45.6	752.4	57.0	£10.06
R204448	20	10.0	305	6.1	372.1	61.0	465.1	76.3	558.2	91.5	695.4	114.0	£19.45
R204504	25	12.5	25	147.0	735.0	5.0	918.8	6.3	1,102.5	7.5	1,381.8	9.4	£4.66
R204505	25	12.5	32	118.0	755.2	6.4	944.0	8.0	1,132.8	9.6	1,416.0	12.0	£4.89
R204506	25	12.5	38	93.0	706.8	7.6	883.5	9.5	1,060.2	11.4	1,302.0	14.0	£5.00
R204507	25	12.5	44	80.8	711.0	8.8	888.8	11.0	1,066.6	13.2	1,333.2	16.5	£5.62
R204508	25	12.5	51	68.6	699.7	10.2	874.7	12.8	1,049.6	15.3	1,303.4	19.0	£5.56
R204510	25	12.5	64	53.0	678.4	12.8	848.0	16.0	1,017.6	19.2	1,272.0	24.0	£6.10
R204512	25	12.5	76	43.2	656.6	15.2	820.8	19.0	985.0	22.8	1,209.6	28.0	£6.47
R204514	25	12.5	89	38.2	680.0	17.8	850.0	22.3	1,019.9	26.7	1,260.6	33.0	£7.29
R204516	25	12.5	102	33.0	673.2	20.4	841.5	25.5	1,009.8	30.6	1,254.0	38.0	£7.96
R204518	25	12.5	115	28.0	644.0	23.0	805.0	28.8	966.0	34.5	1,204.0	43.0	£8.90
R204520	25	12.5	127	25.9	657.9	25.4	822.3	31.8	986.8	38.1	1,243.2	48.0	£10.53
R204522	25	12.5	139	23.2	645.0	27.8	806.2	34.8	967.4	41.7	1,206.4	52.0	£11.47
R204524	25	12.5	152	20.8	632.3	30.4	790.4	38.0	948.5	45.6	1,185.6	57.0	£11.75
R204528	25	12.5	178	17.8	633.7	35.6	792.1	44.5	950.5	53.4	1,192.6	67.0	£14.36
R204532	25	12.5	203	15.8	641.5	40.6	801.9	50.8	962.2	60.9	1,200.8	76.0	£17.11
R204548	25	12.5	305	10.2	622.2	61.0	777.8	76.3	933.3	91.5	1,162.8	114.0	£23.39
R204606	32	16.0	38	185.0	1,406.0	7.6	1,757.5	9.5	2,109.0	11.4	2,590.0	14.0	£7.19
R204607	32	16.0	44	158.0	1,390.4	8.8	1,738.0	11.0	2,085.6	13.2	2,607.0	16.5	£7.81
R204608	32	16.0	51	134.0	1,366.8	10.2	1,708.5	12.8	2,050.2	15.3	2,546.0	19.0	£7.68
R204610	32	16.0	64	99.0	1,267.2	12.8	1,584.0	16.0	1,900.8	19.2	2,376.0	24.0	£8.13
R204612	32	16.0	76	80.5	1,223.6	15.2	1,529.5	19.0	1,835.4	22.8	2,254.0	28.0	£9.05
R204614	32	16.0	89	69.1	1,230.0	17.8	1,537.5	22.3	1,845.0	26.7	2,280.3	33.0	£9.90
R204616	32	16.0	102	58.8	1,199.5	20.4	1,499.4	25.5	1,799.3	30.6	2,234.4	38.0	£11.45
R204618	32	16.0	115	51.5	1,184.5	23.0	1,480.6	28.8	1,776.8	34.5	2,214.5	43.0	£12.76
R204620	32	16.0	127	44.8	1,137.9	25.4	1,422.4	31.8	1,706.9	38.1	2,150.4	48.0	£13.50
R204622	32	16.0	139	42.3	1,175.9	27.8	1,469.9	34.8	1,763.9	41.7	2,199.6	52.0	£15.63
R204624	32	16.0	152	37.8	1,149.1	30.4	1,436.4	38.0	1,723.7	45.6	2,154.6	57.0	£16.71
R204628	32	16.0	178	32.5	1,157.0	35.6	1,446.3	44.5	1,735.5	53.4	2,177.5	67.0	£20.71
R204632	32	16.0	203	28.9	1,173.3	40.6	1,466.7	50.8	1,760.0	60.9	2,196.4	76.0	£23.92
R204640	32	16.0	254	21.4	1,087.1	50.8	1,358.9	63.5	1,630.7	76.2	2,033.0	95.0	£31.58
R204648	32	16.0	305	18.3	1,116.3	61.0	1,395.4	76.3	1,674.5	91.5	2,086.2	114.0	£37.47
R204708	40	20.0	51	181.6	1,852.3	10.2	2,315.4	12.8	2,778.5	15.3	3,450.4	19.0	£10.67
R204710	40	20.0	64	140.0	1,792.0	12.8	2,240.0	16.0	2,688.0	19.2	3,360.0	24.0	£12.47
R204712	40	20.0	76	108.0	1,641.6	15.2	2,052.0	19.0	2,462.4	22.8	3,024.0	28.0	£13.57
R204714	40	20.0	89	90.7	1,614.5	17.8	2,018.1	22.3	2,421.7	26.7	2,993.1	33.0	£15.09

Material

High tensile strength chromium alloy steels.

* Load values shown represent loads near solid and are for design information only.

Performance

Heat Resistance: Up to +230°C (Loss of load occurs above +120°C).

Other Info.

Spring Ends: Squared and ground.

For compressed length, subtract the **Deflection** from the **Free Length**.



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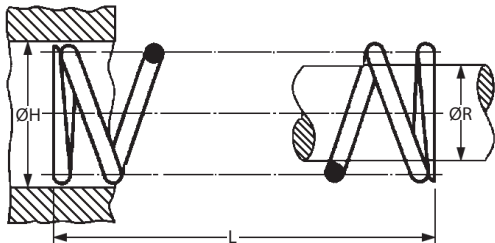
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SPRINGS

R

Die Springs - Medium Duty

ISO 10243 Colour Coded Blue 24.6 - 8736N, 20 - 38mm Rod Dia.



Discounts: 10+ -5% 25+ -10% 50+ -15% 100+ -20%

Part Number	Hole Dia. ØH	Rod Dia. ØR	Free Length L	Load at 1mm Def. N	Load Deflection								Price Each 1 - 9
					For Optimum Life (20% of free length)		For Long Life (25% of free length)		Max. Operating Def. (30% of free length)		Max. Deflection*		
					Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	
R204716	40	20	102	81.0	1,652.4	20.4	2,065.5	25.5	2,478.6	30.6	3,078.0	38.0	£16.71
R204718	40	20	115	71.8	1,651.4	23.0	2,064.3	28.8	2,477.1	34.5	3,087.4	43.0	£19.51
R204720	40	20	127	62.7	1,592.6	25.4	1,990.7	31.8	2,388.9	38.1	3,009.6	48.0	£20.64
R204722	40	20	139	57.5	1,598.5	27.8	1,998.1	34.8	2,397.8	41.7	2,990.0	52.0	£24.24
R204724	40	20	152	51.6	1,568.6	30.4	1,960.8	38.0	2,353.0	45.6	2,941.2	57.0	£24.50
R204728	40	20	178	44.1	1,570.0	35.6	1,962.5	44.5	2,354.9	53.4	2,954.7	67.0	£30.52
R204732	40	20	203	36.7	1,490.0	40.6	1,862.5	50.8	2,235.0	60.9	2,789.2	76.0	£34.77
R204740	40	20	254	30.1	1,529.1	50.8	1,911.4	63.5	2,293.6	76.2	2,859.5	95.0	£44.58
R204748	40	20	305	24.6	1,500.6	61.0	1,875.8	76.3	2,250.9	91.5	2,804.4	114.0	£51.54
R204810	50	25	64	209.0	2,675.2	12.8	3,344.0	16.0	4,012.8	19.2	5,016.0	24.0	£20.74
R204812	50	25	76	168.0	2,553.6	15.2	3,192.0	19.0	3,830.4	22.8	4,704.0	28.0	£23.39
R204814	50	25	89	140.0	2,492.0	17.8	3,115.0	22.3	3,738.0	26.7	4,620.0	33.0	£25.92
R204816	50	25	102	119.0	2,427.6	20.4	3,034.5	25.5	3,641.4	30.6	4,522.0	38.0	£28.05
R204818	50	25	115	106.0	2,438.0	23.0	3,047.5	28.8	3,657.0	34.5	4,558.0	43.0	£31.54
R204820	50	25	127	97.0	2,463.8	25.4	3,079.8	31.8	3,695.7	38.1	4,656.0	48.0	£33.72
R204822	50	25	139	87.0	2,418.6	27.8	3,023.3	34.8	3,627.9	41.7	4,524.0	52.0	£37.20
R204824	50	25	152	80.0	2,432.0	30.4	3,040.0	38.0	3,648.0	45.6	4,560.0	57.0	£38.62
R204828	50	25	178	69.5	2,474.2	35.6	3,092.8	44.5	3,711.3	53.4	4,656.5	67.0	£45.01
R204832	50	25	203	59.8	2,427.9	40.6	3,034.9	50.8	3,641.8	60.9	4,544.8	76.0	£48.86
R204836	50	25	229	50.9	2,331.2	45.8	2,914.0	57.3	3,496.8	68.7	4,377.4	86.0	£64.01
R204840	50	25	254	43.9	2,230.1	50.8	2,787.7	63.5	3,345.2	76.2	4,170.5	95.0	£63.52
R204848	50	25	305	38.6	2,354.6	61.0	2,943.3	76.3	3,531.9	91.5	4,400.4	114.0	£74.32
R204912	63	38	76	312.0	4,742.4	15.2	5,928.0	19.0	7,113.6	22.8	8,736.0	28.0	£47.87
R204914	63	38	89	260.0	4,628.0	17.8	5,785.0	22.3	6,942.0	26.7	8,580.0	33.0	£50.23
R204916	63	38	102	221.0	4,508.4	20.4	5,635.5	25.5	6,762.6	30.6	8,398.0	38.0	£58.11
R204918	63	38	115	187.0	4,301.0	23.0	5,376.3	28.8	6,451.5	34.5	8,041.0	43.0	£61.62
R204920	63	38	127	168.0	4,267.2	25.4	5,334.0	31.8	6,400.8	38.1	8,064.0	48.0	£65.19
R204924	63	38	152	136.0	4,134.4	30.4	5,168.0	38.0	6,201.6	45.6	7,752.0	57.0	£74.89
R204928	63	38	178	114.0	4,058.4	35.6	5,073.0	44.5	6,087.6	53.4	7,638.0	67.0	£88.23
R204932	63	38	203	100.0	4,060.0	40.6	5,075.0	50.8	6,090.0	60.9	7,600.0	76.0	£99.05
R204936	63	38	229	89.2	4,085.4	45.8	5,106.7	57.3	6,128.0	68.7	7,671.2	86.0	£111.14
R204940	63	38	254	78.4	3,982.7	50.8	4,978.4	63.5	5,974.1	76.2	7,448.0	95.0	£125.69
R204948	63	38	305	64.7	3,946.7	61.0	4,933.4	76.3	5,920.1	91.5	7,375.8	114.0	£154.75

Material

High tensile strength chromium alloy steels.

* Load values shown represent loads near solid and are for design information only.

Performance

Heat Resistance: Up to +230°C (Loss of load occurs above +120°C).

Other Info.

Spring Ends: Squared and ground.

For compressed length, subtract the Deflection from the Free Length.



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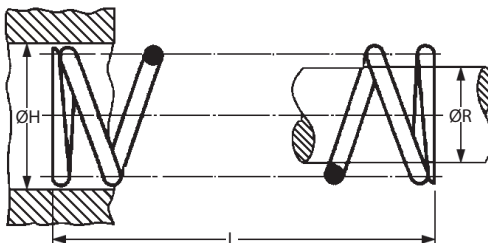
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Product information updated 11/2024. See our website for the latest prices and availability.

R

Die Springs - Heavy Duty

ISO 10243 Colour Coded Red 2.1 - 1620N, 5 - 20mm Rod Dia.



Discounts: 10+ -5% 25+ -10% 50+ -15% 100+ -20%

Part Number	Hole Dia. ØH	Rod Dia. ØR	Free Length L	Load at 1mm Def. N	Load Deflection								Price Each 1 - 9
					For Optimum Life (15% of free length)		For Long Life (20% of free length)		Max. Operating Def. (25% of free length)		Max. Deflection*		
					Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	
R205104	10.0	5.0	25	22.1	82.9	3.8	110.5	5.0	138.1	6.3	165.8	7.5	£1.91
R205105	10.0	5.0	32	17.5	84.0	4.8	112.0	6.4	140.0	8.0	168.0	9.6	£2.40
R205106	10.0	5.0	38	17.1	97.5	5.7	130.0	7.6	162.5	9.5	194.9	11.4	£2.53
R205107	10.0	5.0	44	15.0	99.0	6.6	132.0	8.8	165.0	11.0	198.0	13.2	£2.87
R205108	10.0	5.0	51	12.8	97.9	7.7	130.6	10.2	163.2	12.8	195.8	15.3	£3.15
R205110	10.0	5.0	64	10.7	102.7	9.6	137.0	12.8	171.2	16.0	205.4	19.2	£3.48
R205112	10.0	5.0	76	7.5	85.5	11.4	114.0	15.2	142.5	19.0	171.0	22.8	£4.01
R205148	10.0	5.0	305	2.1	96.1	45.8	128.1	61.0	160.1	76.3	192.2	91.5	£16.00
R205204	12.5	6.3	25	42.1	157.9	3.8	210.5	5.0	263.1	6.3	315.8	7.5	£2.53
R205205	12.5	6.3	32	33.2	159.4	4.8	212.5	6.4	265.6	8.0	318.7	9.6	£2.62
R205206	12.5	6.3	38	29.3	167.0	5.7	222.7	7.6	278.4	9.5	334.0	11.4	£2.87
R205207	12.5	6.3	44	24.6	162.4	6.6	216.5	8.8	270.6	11.0	324.7	13.2	£3.33
R205208	12.5	6.3	51	19.6	149.9	7.7	199.9	10.2	249.9	12.8	299.9	15.3	£3.27
R205210	12.5	6.3	64	15.0	144.0	9.6	192.0	12.8	240.0	16.0	288.0	19.2	£3.82
R205212	12.5	6.3	76	13.2	150.5	11.4	200.6	15.2	250.8	19.0	301.0	22.8	£4.16
R205214	12.5	6.3	89	11.4	152.2	13.4	202.9	17.8	253.7	22.3	304.4	26.7	£4.89
R205248	12.5	6.3	305	2.8	128.1	45.8	170.8	61.0	213.5	76.3	256.2	91.5	£17.43
R205304	16.0	8.0	25	75.7	283.9	3.8	378.5	5.0	473.1	6.3	567.8	7.5	£2.76
R205305	16.0	8.0	32	52.8	253.4	4.8	337.9	6.4	422.4	8.0	506.9	9.6	£3.15
R205306	16.0	8.0	38	48.5	276.5	5.7	368.6	7.6	460.8	9.5	552.9	11.4	£3.27
R205307	16.0	8.0	44	42.8	282.5	6.6	376.6	8.8	470.8	11.0	565.0	13.2	£3.48
R205308	16.0	8.0	51	37.1	283.8	7.7	378.4	10.2	473.0	12.8	567.6	15.3	£3.75
R205310	16.0	8.0	64	30.3	290.9	9.6	387.8	12.8	484.8	16.0	581.8	19.2	£4.16
R205312	16.0	8.0	76	25.7	293.0	11.4	390.6	15.2	488.3	19.0	586.0	22.8	£4.62
R205314	16.0	8.0	89	21.7	289.7	13.4	386.3	17.8	482.8	22.3	579.4	26.7	£5.05
R205316	16.0	8.0	102	19.3	295.3	15.3	393.7	20.4	492.2	25.5	590.6	30.6	£5.56
R205348	16.0	8.0	305	7.1	324.8	45.8	433.1	61.0	541.4	76.3	649.7	91.5	£18.72
R205404	20.0	10.0	25	216.0	810.0	3.8	1,080.0	5.0	1,350.0	6.3	1,620.0	7.5	£3.82
R205405	20.0	10.0	32	168.0	806.4	4.8	1,075.2	6.4	1,344.0	8.0	1,612.8	9.6	£4.30
R205406	20.0	10.0	38	129.0	735.3	5.7	980.4	7.6	1,225.5	9.5	1,419.0	11.4	£4.30
R205407	20.0	10.0	44	112.0	739.2	6.6	985.6	8.8	1,232.0	11.0	1,456.0	13.0	£4.85
R205408	20.0	10.0	51	94.0	719.1	7.7	958.8	10.2	1,198.5	12.8	1,410.0	15.0	£4.82
R205410	20.0	10.0	64	72.1	692.2	9.6	922.9	12.8	1,153.6	16.0	1,369.9	19.0	£5.42
R205412	20.0	10.0	76	59.7	680.6	11.4	907.4	15.2	1,134.3	19.0	1,373.1	23.0	£5.90
R205414	20.0	10.0	89	50.5	674.2	13.4	898.9	17.8	1,123.6	22.3	1,363.5	27.0	£7.02
R205416	20.0	10.0	102	44.2	676.3	15.3	901.7	20.4	1,127.1	25.5	1,370.2	31.0	£8.10
R205418	20.0	10.0	115	38.4	662.4	17.3	883.2	23.0	1,104.0	28.8	1,344.0	35.0	£9.25
R205420	20.0	10.0	127	34.1	649.6	19.1	866.1	25.4	1,082.7	31.8	1,295.8	38.0	£10.11

Material

High tensile strength chromium alloy steels.

* Load values shown represent loads near solid and are for design information only.

Performance

Heat Resistance: Up to +230°C (Loss of load occurs above +120°C).

Other Info.

Spring Ends: Squared and ground.

For compressed length, subtract the **Deflection** from the **Free Length**.



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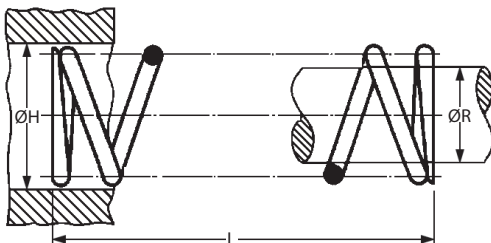
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Die Springs - Heavy Duty

ISO 10243 Colour Coded Red 15 - 5250N, 10 - 20mm Rod Dia.



Discounts: 10+ -5% 25+ -10% 50+ -15% 100+ -20%

Part Number	Hole Dia. ØH	Rod Dia. ØR	Free Length L	Load Deflection										Price Each 1 - 9
				Load at 1mm Def. N	For Optimum Life (15% of free length)		For Long Life (20% of free length)		Max. Operating Def. (25% of free length)		Max. Deflection*			
					Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm		
R205422	20	10.0	139	31.0	646.4	20.9	861.8	27.8	1,077.3	34.8	1,302.0	42.0	£11.96	
R205424	20	10.0	152	28.2	643.0	22.8	857.3	30.4	1,071.6	38.0	1,297.2	46.0	£12.29	
R205448	20	10.0	305	15.0	686.3	45.8	915.0	61.0	1,143.8	76.3	1,365.0	91.0	£24.43	
R205504	25	12.5	25	375.0	1,406.3	3.8	1,875.0	5.0	2,343.8	6.3	2,812.5	7.5	£5.11	
R205505	25	12.5	32	297.0	1,425.6	4.8	1,900.8	6.4	2,376.0	8.0	2,851.2	9.6	£5.72	
R205506	25	12.5	38	219.0	1,248.3	5.7	1,664.4	7.6	2,080.5	9.5	2,409.0	11.0	£5.62	
R205507	25	12.5	44	187.0	1,234.2	6.6	1,645.6	8.8	2,057.0	11.0	2,431.0	13.0	£6.23	
R205508	25	12.5	51	156.0	1,193.4	7.7	1,591.2	10.2	1,989.0	12.8	2,340.0	15.0	£6.39	
R205510	25	12.5	64	123.0	1,180.8	9.6	1,574.4	12.8	1,968.0	16.0	2,337.0	19.0	£6.82	
R205512	25	12.5	76	99.0	1,128.6	11.4	1,504.8	15.2	1,881.0	19.0	2,277.0	23.0	£7.34	
R205514	25	12.5	89	84.0	1,121.4	13.4	1,495.2	17.8	1,869.0	22.3	2,268.0	27.0	£8.23	
R205516	25	12.5	102	73.0	1,116.9	15.3	1,489.2	20.4	1,861.5	25.5	2,263.0	31.0	£8.95	
R205518	25	12.5	115	65.0	1,121.3	17.3	1,495.0	23.0	1,868.8	28.8	2,275.0	35.0	£10.30	
R205520	25	12.5	127	57.7	1,099.2	19.1	1,465.6	25.4	1,832.0	31.8	2,192.6	38.0	£11.32	
R205522	25	12.5	139	52.7	1,098.8	20.9	1,465.1	27.8	1,831.3	34.8	2,213.4	42.0	£12.99	
R205524	25	12.5	152	47.8	1,089.8	22.8	1,453.1	30.4	1,816.4	38.0	2,198.8	46.0	£14.05	
R205528	25	12.5	178	41.0	1,094.7	26.7	1,459.6	35.6	1,824.5	44.5	2,173.0	53.0	£16.82	
R205532	25	12.5	203	35.8	1,090.1	30.5	1,453.5	40.6	1,816.9	50.8	2,183.8	61.0	£18.57	
R205548	25	12.5	305	22.9	1,047.7	45.8	1,396.9	61.0	1,746.1	76.3	2,083.9	91.0	£29.24	
R205606	32	16.0	38	388.0	2,211.6	5.7	2,948.8	7.6	3,686.0	9.5	4,268.0	11.0	£7.40	
R205607	32	16.0	44	324.0	2,138.4	6.6	2,851.2	8.8	3,564.0	11.0	4,212.0	13.0	£8.55	
R205608	32	16.0	51	272.0	2,080.8	7.7	2,774.4	10.2	3,468.0	12.8	4,080.0	15.0	£8.55	
R205610	32	16.0	64	212.0	2,035.2	9.6	2,713.6	12.8	3,392.0	16.0	4,028.0	19.0	£8.90	
R205612	32	16.0	76	172.0	1,960.8	11.4	2,614.4	15.2	3,268.0	19.0	3,956.0	23.0	£9.71	
R205614	32	16.0	89	141.0	1,882.4	13.4	2,509.8	17.8	3,137.3	22.3	3,807.0	27.0	£11.15	
R205616	32	16.0	102	122.0	1,866.6	15.3	2,488.8	20.4	3,111.0	25.5	3,782.0	31.0	£12.11	
R205618	32	16.0	115	107.0	1,845.8	17.3	2,461.0	23.0	3,076.3	28.8	3,745.0	35.0	£13.76	
R205620	32	16.0	127	93.0	1,771.7	19.1	2,362.2	25.4	2,952.8	31.8	3,534.0	38.0	£15.33	
R205622	32	16.0	139	86.0	1,793.1	20.9	2,390.8	27.8	2,988.5	34.8	3,612.0	42.0	£17.71	
R205624	32	16.0	152	78.0	1,778.4	22.8	2,371.2	30.4	2,964.0	38.0	3,588.0	46.0	£19.45	
R205628	32	16.0	178	67.2	1,794.2	26.7	2,392.3	35.6	2,990.4	44.5	3,561.6	53.0	£23.48	
R205632	32	16.0	203	59.1	1,799.6	30.5	2,399.5	40.6	2,999.3	50.8	3,605.1	61.0	£28.75	
R205640	32	16.0	254	46.4	1,767.8	38.1	2,357.1	50.8	2,946.4	63.5	3,526.4	76.0	£37.43	
R205648	32	16.0	305	38.0	1,738.5	45.8	2,318.0	61.0	2,897.5	76.3	3,458.0	91.0	£48.09	
R205708	40	20.0	51	350.0	2,677.5	7.7	3,570.0	10.2	4,462.5	12.8	5,250.0	15.0	£12.01	
R205710	40	20.0	64	269.0	2,582.4	9.6	3,443.2	12.8	4,304.0	16.0	5,111.0	19.0	£13.68	
R205712	40	20.0	76	219.0	2,496.6	11.4	3,328.8	15.2	4,161.0	19.0	5,037.0	23.0	£15.20	
R205714	40	20.0	89	190.0	2,536.5	13.4	3,382.0	17.8	4,227.5	22.3	5,130.0	27.0	£17.23	

Material

High tensile strength chromium alloy steels.

* Load values shown represent loads near solid and are for design information only.

Performance

Heat Resistance: Up to +230°C (Loss of load occurs above +120°C).

Other Info.

Spring Ends: Squared and ground.

For compressed length, subtract the **Deflection** from the **Free Length**.



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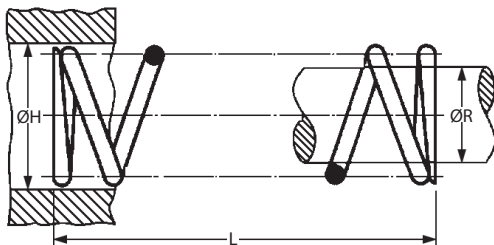


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Die Springs - Heavy Duty

ISO 10243 Colour Coded Red 51 - 7847N, 20 - 25mm Rod Dia.



Discounts: 10+ -5% 25+ -10% 50+ -15% 100+ -20%

Part Number	Hole Dia. ØH	Rod Dia. ØR	Free Length L	Load at 1mm Def. N	Load Deflection								Price Each 1 - 9
					For Optimum Life (15% of free length)		For Long Life (20% of free length)		Max. Operating Def. (25% of free length)		Max. Deflection*		
					Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	
R205716	40	20	102	163.0	2,493.9	15.3	3,325.2	20.4	4,156.5	25.5	5,053.0	31.0	£20.01
R205718	40	20	115	142.0	2,449.5	17.3	3,266.0	23.0	4,082.5	28.8	4,970.0	35.0	£22.04
R205720	40	20	127	128.0	2,438.4	19.1	3,251.2	25.4	4,064.0	31.8	4,864.0	38.0	£24.43
R205722	40	20	139	115.0	2,397.8	20.9	3,197.0	27.8	3,996.3	34.8	4,830.0	42.0	£22.62
R205724	40	20	152	105.0	2,394.0	22.8	3,192.0	30.4	3,990.0	38.0	4,830.0	46.0	£27.91
R205728	40	20	178	89.0	2,376.3	26.7	3,168.4	35.6	3,960.5	44.5	4,717.0	53.0	£33.68
R205732	40	20	203	77.0	2,344.7	30.5	3,126.2	40.6	3,907.8	50.8	4,697.0	61.0	£39.96
R205740	40	20	254	61.0	2,324.1	38.1	3,098.8	50.8	3,873.5	63.5	4,636.0	76.0	£51.38
R205748	40	25	305	51.0	2,333.3	45.8	3,111.0	61.0	3,888.8	76.3	4,641.0	91.0	£65.70
R205810	50	25	64	413.0	3,964.8	9.6	5,286.4	12.8	6,608.0	16.0	7,847.0	19.0	£22.67
R205812	50	25	76	339.0	3,864.6	11.4	5,152.8	15.2	6,441.0	19.0	7,797.0	23.0	£23.76
R205814	50	25	89	288.0	3,844.8	13.4	5,126.4	17.8	6,408.0	22.3	7,776.0	27.0	£27.66
R205816	50	25	102	245.0	3,748.5	15.3	4,998.0	20.4	6,247.5	25.5	7,595.0	31.0	£30.04
R205818	50	25	115	215.0	3,708.8	17.3	4,945.0	23.0	6,181.3	28.8	7,525.0	35.0	£34.38
R205820	50	25	127	192.0	3,657.6	19.1	4,876.8	25.4	6,096.0	31.8	7,296.0	38.0	£35.05
R205822	50	25	139	168.0	3,502.8	20.9	4,670.4	27.8	5,838.0	34.8	7,056.0	42.0	£38.95
R205824	50	25	152	154.0	3,511.2	22.8	4,681.6	30.4	5,852.0	38.0	7,084.0	46.0	£41.53
R205828	50	25	178	134.0	3,577.8	26.7	4,770.4	35.6	5,963.0	44.5	7,102.0	53.0	£48.21
R205832	50	25	203	117.0	3,562.7	30.5	4,750.2	40.6	5,937.8	50.8	7,137.0	61.0	£55.49
R205840	50	25	254	89.0	3,390.9	38.1	4,521.2	50.8	5,651.5	63.5	6,764.0	76.0	£74.52
R205848	50	25	305	73.0	3,339.8	45.8	4,453.0	61.0	5,566.3	76.3	6,643.0	91.0	£86.07

Material

High tensile strength chromium alloy steels.

* Load values shown represent loads near solid and are for design information only.

Performance

Heat Resistance: Up to +230°C (Loss of load occurs above +120°C).

Other Info.

Spring Ends: Squared and ground.

For compressed length, subtract the **Deflection** from the **Free Length**.



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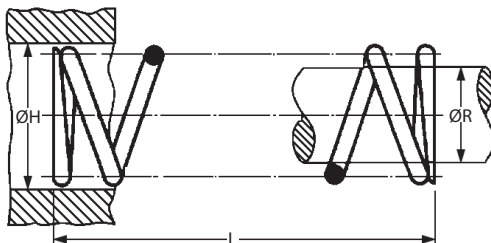


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Die Springs - Extra Heavy Duty

ISO 10243 Colour Coded Yellow 2.6 - 1816N, 5 - 10mm Rod Dia.



Discounts: 10+ -5% 25+ -10% 50+ -15% 100+ -20%

Part Number	Hole Dia. ØH	Rod Dia. ØR	Free Length L	Load at 1mm Def. N	Load Deflection								Price Each 1 - 9
					For Optimum Life (15% of free length)		For Long Life (17% of free length)		Max. Operating Def. (20% of free length)		Max. Deflection*		
					Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	
R206104	10.0	5.0	25	36.8	138.0	3.8	156.4	4.3	184.0	5.0	228.2	6.2	£2.46
R206105	10.0	5.0	32	27.9	133.9	4.8	151.8	5.4	178.6	6.4	223.2	8.0	£2.67
R206106	10.0	5.0	38	23.7	135.1	5.7	153.1	6.5	180.1	7.6	225.2	9.5	£2.91
R206107	10.0	5.0	44	19.2	126.7	6.6	143.6	7.5	169.0	8.8	211.2	11.0	£3.48
R206108	10.0	5.0	51	16.5	126.2	7.7	143.1	8.7	168.3	10.2	214.5	13.0	£3.48
R206110	10.0	5.0	64	13.2	126.7	9.6	143.6	10.9	169.0	12.8	211.2	16.0	£3.93
R206112	10.0	5.0	76	10.9	124.3	11.4	140.8	12.9	165.7	15.2	207.1	19.0	£4.19
R206148	10.0	5.0	305	2.6	119.0	45.8	134.8	51.9	158.6	61.0	197.6	76.0	£17.11
R206204	12.5	6.3	25	58.5	219.4	3.8	248.6	4.3	292.5	5.0	362.7	6.2	£2.76
R206205	12.5	6.3	32	43.9	210.7	4.8	238.8	5.4	281.0	6.4	351.2	8.0	£2.91
R206206	12.5	6.3	38	36.0	205.2	5.7	232.6	6.5	273.6	7.6	342.0	9.5	£3.19
R206207	12.5	6.3	44	30.3	200.0	6.6	226.6	7.5	266.6	8.8	333.3	11.0	£3.71
R206208	12.5	6.3	51	26.2	200.4	7.7	227.2	8.7	267.2	10.2	340.6	13.0	£3.91
R206210	12.5	6.3	64	21.2	203.5	9.6	230.7	10.9	271.4	12.8	339.2	16.0	£3.91
R206212	12.5	6.3	76	17.1	194.9	11.4	220.9	12.9	259.9	15.2	324.9	19.0	£4.58
R206214	12.5	6.3	89	14.5	193.6	13.4	219.4	15.1	258.1	17.8	319.0	22.0	£5.11
R206248	12.5	6.3	305	4.3	196.7	45.8	223.0	51.9	262.3	61.0	326.8	76.0	£19.85
R206304	16.0	8.0	25	118.0	442.5	3.8	501.5	4.3	590.0	5.0	731.6	6.2	£3.27
R206305	16.0	8.0	32	89.0	427.2	4.8	484.2	5.4	569.6	6.4	712.0	8.0	£3.82
R206306	16.0	8.0	38	72.1	411.0	5.7	465.8	6.5	548.0	7.6	685.0	9.5	£3.91
R206307	16.0	8.0	44	60.9	401.9	6.6	455.5	7.5	535.9	8.8	669.9	11.0	£4.16
R206308	16.0	8.0	51	52.3	400.1	7.7	453.4	8.7	533.5	10.2	679.9	13.0	£4.66
R206310	16.0	8.0	64	41.2	395.5	9.6	448.3	10.9	527.4	12.8	659.2	16.0	£4.82
R206312	16.0	8.0	76	34.1	388.7	11.4	440.6	12.9	518.3	15.2	647.9	19.0	£5.11
R206314	16.0	8.0	89	29.5	393.8	13.4	446.3	15.1	525.1	17.8	649.0	22.0	£5.62
R206316	16.0	8.0	102	25.6	391.7	15.3	443.9	17.3	522.2	20.4	665.6	26.0	£6.14
R206348	16.0	8.0	305	8.4	384.3	45.8	435.5	51.9	512.4	61.0	638.4	76.0	£20.79
R206404	20.0	10.0	25	293.0	1,098.8	3.8	1,245.3	4.3	1,465.0	5.0	1,816.6	6.2	£4.66
R206405	20.0	10.0	32	224.0	1,075.2	4.8	1,218.6	5.4	1,433.6	6.4	1,792.0	8.0	£4.62
R206406	20.0	10.0	38	177.0	1,008.9	5.7	1,143.4	6.5	1,345.2	7.6	1,681.5	9.5	£4.89
R206407	20.0	10.0	44	149.0	983.4	6.6	1,114.5	7.5	1,311.2	8.8	1,639.0	11.0	£5.48
R206408	20.0	10.0	51	128.0	979.2	7.7	1,109.8	8.7	1,305.6	10.2	1,664.0	13.0	£5.53
R206410	20.0	10.0	64	99.0	950.4	9.6	1,077.1	10.9	1,267.2	12.8	1,584.0	16.0	£6.39
R206412	20.0	10.0	76	81.7	931.4	11.4	1,055.6	12.9	1,241.8	15.2	1,552.3	19.0	£6.82
R206414	20.0	10.0	89	69.5	927.8	13.4	1,051.5	15.1	1,237.1	17.8	1,529.0	22.0	£8.31
R206416	20.0	10.0	102	60.6	927.2	15.3	1,050.8	17.3	1,236.2	20.4	1,575.6	26.0	£8.95
R206418	20.0	10.0	115	53.0	914.3	17.3	1,036.2	19.6	1,219.0	23.0	1,537.0	29.0	£10.53
R206420	20.0	10.0	127	47.5	904.9	19.1	1,025.5	21.6	1,206.5	25.4	1,520.0	32.0	£13.39

Material

High tensile strength chromium alloy steels.

* Load values shown represent loads near solid and are for design information only.

Performance

Heat Resistance: Up to +230°C (Loss of load occurs above +120°C).

Other Info.

Spring Ends: Squared and ground.

For compressed length, subtract the Deflection from the Free Length.



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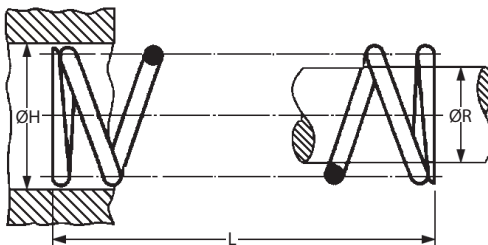
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SPRINGS

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Die Springs - Extra Heavy Duty

ISO 10243 Colour Coded Yellow 21.2 - 8164N, 10 - 20mm Rod Dia.



Discounts: 10+ -5% 25+ -10% 50+ -15% 100+ -20%

Part Number	Hole Dia. ØH	Rod Dia. ØR	Free Length L	Load at 1mm Def. N	Load Deflection								Price Each 1 - 9
					For Optimum Life (15% of free length)		For Long Life (17% of free length)		Max. Operating Def. (20% of free length)		Max. Deflection*		
					Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	
R206422	20	10.0	139	43.0	896.9	20.9	1,016.1	23.6	1,195.4	27.8	1,505.0	35.0	£14.10
R206424	20	10.0	152	39.0	889.2	22.8	1,007.8	25.8	1,185.6	30.4	1,482.0	38.0	£15.12
R206448	20	10.0	305	21.2	969.9	45.8	1,099.2	51.9	1,293.2	61.0	1,611.2	76.0	£27.13
R206505	25	12.5	32	374.4	1,797.1	4.8	2,036.7	5.4	2,396.2	6.4	2,995.2	8.0	£6.71
R206506	25	12.5	38	346.0	1,972.2	5.7	2,235.2	6.5	2,629.6	7.6	3,287.0	9.5	£7.40
R206507	25	12.5	44	244.0	1,610.4	6.6	1,825.1	7.5	2,147.2	8.8	2,684.0	11.0	£7.75
R206508	25	12.5	51	207.5	1,587.4	7.7	1,799.0	8.7	2,116.5	10.2	2,697.5	13.0	£8.31
R206510	25	12.5	64	161.0	1,545.6	9.6	1,751.7	10.9	2,060.8	12.8	2,576.0	16.0	£9.51
R206512	25	12.5	76	130.8	1,491.1	11.4	1,689.9	12.9	1,988.2	15.2	2,485.2	19.0	£9.99
R206514	25	12.5	89	110.5	1,475.2	13.4	1,671.9	15.1	1,966.9	17.8	2,431.0	22.0	£8.81
R206516	25	12.5	102	96.3	1,473.4	15.3	1,669.8	17.3	1,964.5	20.4	2,503.8	26.0	£12.64
R206518	25	12.5	115	85.7	1,478.3	17.3	1,675.4	19.6	1,971.1	23.0	2,485.3	29.0	£14.13
R206520	25	12.5	127	76.3	1,453.5	19.1	1,647.3	21.6	1,980.0	25.4	2,441.6	32.0	£15.12
R206524	25	12.5	152	63.5	1,447.8	22.8	1,640.8	25.8	1,930.4	30.4	2,413.0	38.0	£17.50
R206528	25	12.5	178	53.9	1,439.1	26.7	1,631.0	30.3	1,918.8	35.6	2,371.6	44.0	£23.62
R206532	25	12.5	203	47.0	1,431.2	30.5	1,622.0	34.5	1,908.2	40.6	2,397.0	51.0	£25.56
R206548	25	12.5	305	30.9	1,413.7	45.8	1,602.2	51.9	1,884.9	61.0	2,348.4	76.0	£37.84
R206606	32	16.0	38	528.2	3,010.7	5.7	3,412.2	6.5	4,014.3	7.6	5,017.9	9.5	£11.23
R206607	32	16.0	44	424.4	2,801.0	6.6	3,174.5	7.5	3,734.7	8.8	4,668.4	11.0	£11.45
R206608	32	16.0	51	353.0	2,700.5	7.7	3,060.5	8.7	3,600.6	10.2	4,589.0	13.0	£11.00
R206610	32	16.0	64	269.2	2,584.3	9.6	2,928.9	10.9	3,445.8	12.8	4,307.2	16.0	£11.96
R206612	32	16.0	76	218.5	2,490.9	11.4	2,823.0	12.9	3,321.2	15.2	4,151.5	19.0	£14.05
R206614	32	16.0	89	180.3	2,407.0	13.4	2,727.9	15.1	3,209.3	17.8	3,966.6	22.0	£15.71
R206616	32	16.0	102	155.0	2,371.5	15.3	2,687.7	17.3	3,162.0	20.4	4,030.0	26.0	£18.01
R206618	32	16.0	115	140.0	2,415.0	17.3	2,737.0	19.6	3,220.0	23.0	4,060.0	29.0	£20.29
R206620	32	16.0	127	124.0	2,362.2	19.1	2,677.2	21.6	3,149.6	25.4	3,968.0	32.0	£22.76
R206624	32	16.0	152	102.0	2,325.6	22.8	2,635.7	25.8	3,100.8	30.4	3,876.0	38.0	£28.24
R206628	32	16.0	178	88.2	2,354.9	26.7	2,668.9	30.3	3,139.9	35.6	3,880.8	44.0	£35.38
R206632	32	16.0	203	76.0	2,314.2	30.5	2,622.8	34.5	3,085.6	40.6	3,876.0	51.0	£41.53
R206640	32	16.0	254	60.8	2,316.5	38.1	2,625.3	43.2	3,088.6	50.8	3,891.2	64.0	£53.86
R206648	32	16.0	305	49.0	2,241.8	45.8	2,540.7	51.9	2,989.0	61.0	3,724.0	76.0	£66.57
R206708	40	20.0	51	628.0	4,804.2	7.7	5,444.8	8.7	6,405.6	10.2	8,164.0	13.0	£17.43
R206710	40	20.0	64	487.0	4,675.2	9.6	5,298.6	10.9	6,233.6	12.8	7,792.0	16.0	£19.13
R206712	40	20.0	76	379.0	4,320.6	11.4	4,896.7	12.9	5,760.8	15.2	7,201.0	19.0	£22.14
R206714	40	20.0	89	321.0	4,285.4	13.4	4,856.7	15.1	5,713.8	17.8	7,062.0	22.0	£24.80
R206716	40	20.0	102	281.0	4,299.3	15.3	4,872.5	17.3	5,732.4	20.4	7,306.0	26.0	£28.37
R206718	40	20.0	115	245.0	4,226.3	17.3	4,789.8	19.6	5,635.0	23.0	7,105.0	29.0	£31.18
R206720	40	20.0	127	221.0	4,210.1	19.1	4,771.4	21.6	5,613.4	25.4	7,072.0	32.0	£35.23

Material

High tensile strength chromium alloy steels.

* Load values shown represent loads near solid and are for design information only.

Performance

Heat Resistance: Up to +230°C (Loss of load occurs above +120°C).

Other Info.

Spring Ends: Squared and ground.

For compressed length, subtract the Deflection from the Free Length.



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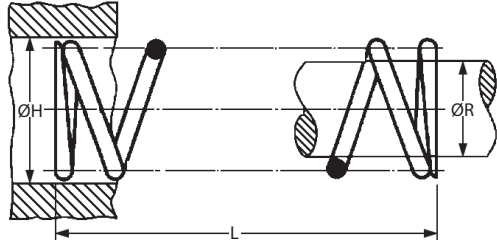
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Die Springs - Extra Heavy Duty

ISO 10243 Colour Coded Yellow 87.8 - 11344N, 20 - 25mm Rod Dia.



Discounts: 10+ -5% 25+ -10% 50+ -15% 100+ -20%

Part Number	Hole Dia. ØH	Rod Dia. ØR	Free Length L	Load at 1mm Def. N	Load Deflection								Price Each 1 - 9
					For Optimum Life (15% of free length)		For Long Life (17% of free length)		Max. Operating Def. (20% of free length)		Max. Deflection*		
					Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	Load N	Deflection mm	
R206724	40	20	152	168.0	3,830.4	22.8	4,341.1	25.8	5,107.2	30.4	6,384.0	38.0	£39.86
R206732	40	20	203	132.0	4,019.4	30.5	4,555.3	34.5	5,359.2	40.6	6,732.0	51.0	£54.78
R206740	40	20	254	107.0	4,076.7	38.1	4,620.3	43.2	5,435.6	50.8	6,848.0	64.0	£70.72
R206748	40	20	305	87.8	4,016.9	45.8	4,552.4	51.9	5,355.8	61.0	6,672.8	76.0	£95.04
R206810	50	25	64	709.0	6,806.4	9.6	7,713.9	10.9	9,075.2	12.8	11,344.0	16.0	£31.84
R206812	50	25	76	572.0	6,520.8	11.4	7,390.2	12.9	8,694.4	15.2	10,868.0	19.0	£36.53
R206814	50	25	89	475.0	6,341.3	13.4	7,186.8	15.1	8,455.0	17.8	10,450.0	22.0	£38.52
R206816	50	25	102	405.0	6,196.5	15.3	7,022.7	17.3	8,262.0	20.4	10,530.0	26.0	£41.73
R206818	50	25	115	352.0	6,072.0	17.3	6,881.6	19.6	8,096.0	23.0	10,208.0	29.0	£46.37
R206820	50	25	127	316.0	6,019.8	19.1	6,822.4	21.6	8,026.4	25.4	10,112.0	32.0	£51.54
R206824	50	25	152	239.0	5,449.2	22.8	6,175.8	25.8	7,265.6	30.4	9,082.0	38.0	£58.65
R206832	50	25	203	187.0	5,694.2	30.5	6,453.4	34.5	7,592.2	40.6	9,537.0	51.0	£83.99
R206840	50	25	254	153.0	5,829.3	38.1	6,606.5	43.2	7,772.4	50.8	9,792.0	64.0	£104.14
R206848	50	25	305	127.0	5,810.3	45.8	6,585.0	51.9	7,747.0	61.0	9,652.0	76.0	£123.72

Material

High tensile strength chromium alloy steels.

* Load values shown represent loads near solid and are for design information only.

Performance

Heat Resistance: Up to +230°C (Loss of load occurs above +120°C).

Other Info.

Spring Ends: Squared and ground.

For compressed length, subtract the **Deflection** from the **Free Length**.



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Die Springs

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Common Die Spring Terminology

Hole Diameters: This identifies the outside diameter (OD) of the die spring. Ondrives die springs are available in eight different hole sizes matched to standard drill sizes. Each spring is made to fit in the hole, so the OD of the spring is actually less than the hole diameter.

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

Free Length: The length of a die spring before it is subject to any operating force or load.

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

Operating Travel: The distance which is subtracted from the spring length after operating force has been applied.

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

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

Remove Set: The manufacturing process of closing a compression spring to solid to eliminate load loss in operation.

Permanent Set: This happens when the elastic limits are exceeded and the spring does not return to its original length when the load is released.

Elastic Limit: The maximum compression stress that a die spring can endure without taking permanent set.

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

Stress: In a spring, this describes the internal force that resists deflection under load. This force is equal to, and in the opposite direction of, the external load. Stress is expressed in Newtons per square millimetre of sectional area.

Selecting Die Springs

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

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

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

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

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

Deflection to Compressed Length Conversion Table

Free Length	Compressed Length (mm) - Deflection is % free length											
	Light Duty			Medium Duty			Heavy Duty			Extra Heavy Duty		
	25%	30%	35%	20%	25%	30%	15%	20%	25%	15%	17%	20%
25	18.8	17.5	16.3	20.0	18.8	17.5	21.3	20.0	18.8	21.3	20.8	20.0
32	24.0	22.4	20.8	25.6	24.0	22.4	27.2	25.6	24.0	27.2	26.6	25.6
38	28.5	26.6	24.7	30.4	28.5	26.6	32.3	30.4	28.5	32.3	31.5	30.4
44	33.0	30.8	28.6	35.2	33.0	30.8	37.4	35.2	33.0	37.4	36.5	35.2
51	38.3	35.7	33.2	40.8	38.3	35.7	43.4	40.8	38.3	43.4	42.3	40.8
64	48.0	44.8	41.6	51.2	48.0	44.8	54.4	51.2	48.0	54.4	53.1	51.2
76	57.0	53.2	49.4	60.8	57.0	53.2	64.6	60.8	57.0	64.6	63.1	60.8
89	66.8	62.3	57.9	71.2	66.8	62.3	75.7	71.2	66.8	75.7	73.9	71.2
102	76.5	71.4	66.3	81.6	76.5	71.4	86.7	81.6	76.5	86.7	84.7	81.6
115	86.3	80.5	74.8	92.0	86.3	80.5	97.8	92.0	86.3	97.8	95.5	92.0
127	95.3	88.9	82.6	101.6	95.3	88.9	108.0	101.6	95.3	108.0	105.4	101.6
139	104.3	97.3	90.4	111.2	104.3	97.3	118.2	111.2	104.3	118.2	115.4	111.2
152	114.0	106.4	98.8	121.6	114.0	106.4	129.2	121.6	114.0	129.2	126.2	121.6
178	133.5	124.6	115.7	142.4	133.5	124.6	151.3	142.4	133.5	151.3	147.7	142.4
203	152.3	142.1	132.0	162.4	152.3	142.1	172.6	162.4	152.3	172.6	168.5	162.4
254	190.5	177.8	165.1	203.2	190.5	177.8	215.9	203.2	190.5	215.9	210.8	203.2
305	228.8	213.5	198.3	244.0	228.8	213.5	259.3	244.0	228.8	259.3	253.2	244.0



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Die Springs

Problems and Answers

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

Spring Failure: Die springs are produced under such careful controls that manufacturing problems have virtually been eliminated. Die spring failure is usually due to either poor spring design and manufacture or incorrect application of the spring. The most common problem source is the use of die springs too close to, or beyond, the springs' physical limitations. The solution, of course, lies with careful selection of die springs for each application.

Other solutions to common spring problems are as follows:

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

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

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

Holes And Rods: Holes or pockets provided in the die for springs must be the specified size. Springs increase in diameter as they are compressed. If the hole is undersized, a wearing or binding action will produce early spring failure.

Holes also must have flat bottoms with square corners. This will allow the spring to work on a flat surface and provide uniform stress on the coils when the spring is compressed.

Working a spring over a rod also provides good protection again buckling. Care should be taken to be sure the rod is smooth. If the rod is shorter than the spring, it should have a tapered nose so that there is no danger of the spring coils coming into contact with a sharp edge.

Alignment: Care should be taken to make certain that whatever device is used to contain or guide the spring is properly aligned on both sides of the die. Holes or rods that do not match can cause problems that create spring failure and damage to the tool.

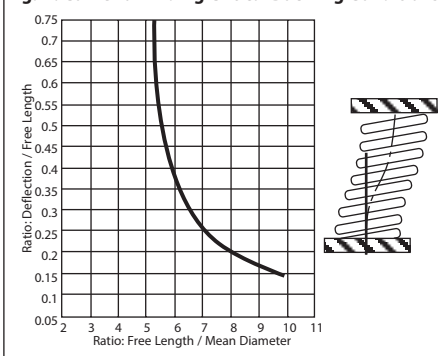
Temperature: Heat is a frequently ignored factor in spring failure or load loss. The maximum rated service temperature for our chromium alloy steel is 230°C. The table below shows the percentage of load-loss due to heat and stress combinations. Thought should be given to the heat generated by the working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

Deflection beyond the manufacturer's recommendation can cause early spring failure. Check the press or die travel to be sure of the actual deflection to which the spring will be subjected. If it is beyond a safe limit, changes should be made without delay.

Spring Alteration: Each die spring is carefully engineered to perform within specific areas of work. Altering the spring such as reducing its length or number of coils, grinding the inside or outside diameter, or placing restrictions on the movement of the coils, can cause early spring failure. Trying to alter a spring by grinding down its end can change the temper of the material and negatively affect spring performance.

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

Fig. A. Curve for finding Critical Buckling Conditions



Load Loss vs. Temperature

Initial Stress MPa	Carbon Steel °C			Chromium Alloy °C		
	120	177	200	120	177	230
276	2.0	3.5	4.5	1.0	2.0	5.0
345	2.0	4.0	5.0	1.0	2.0	5.0
414	2.5	4.5	5.5	1.0	2.0	5.5
483	3.0	5.5	6.5	1.0	2.5	6.0
552	3.0	6.0	8.0	1.5	2.5	6.0
620	4.0	8.0	9.0	1.5	3.0	7.0
689	4.5	9.5	10.5	2.0	4.0	8.0
758	7.0	11.5	14.0	2.0	5.0	10.0
827	9.5	13.0	17.5	3.5	8.0	13.0

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