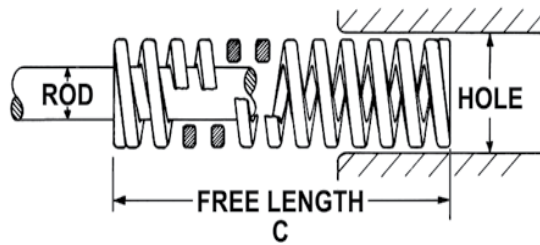


# Medium Heavy Duty Die Springs



Color coded **RED STRIPE**



Hole Diam. (in)	Rod Diam. (in)	Free Length (in)	Wire Size (in)	CATALOG NUMBER	Pounds @ 1/10 inch defl.	Total Deflection Recommended for Long Life (20% of C)		Total Deflection Recommended for Avg. Life (25% of C)		Maximum Operating Deflection (35% of C)		* Max. Comp. Length (in)
						Load lbs.	Defl. in.	Load lbs.	Defl. in.	Load lbs.	Defl. in.	
3/8	3/16	1.00	0.045 X 0.070	MHC100L	9.0	18.0	0.20	22.5	0.25	31.5	0.35	0.58
		1.25		MHC100AL	7.3	18.3	0.25	22.8	0.31	31.9	0.44	0.71
		1.50		MHC101L	6.7	20.1	0.30	25.1	0.38	35.2	0.53	0.85
		1.75		MHC101AL	5.7	20.0	0.35	24.9	0.44	34.9	0.61	0.95
		2.00		MHC102L	5.0	20.0	0.40	25.0	0.50	35.0	0.70	1.09
		2.50		MHC103L	4.0	20.0	0.50	25.0	0.63	35.0	0.88	1.36
		3.00		MHC104L	3.0	18.0	0.60	22.5	0.75	31.5	1.05	1.69
		12.00		MHC106L	0.8	19.2	2.40	24.0	3.00	33.6	4.20	6.46
1/2	9/32	1.00	0.060 X 0.095	MHC110L	16.6	33.2	0.20	41.5	0.25	58.1	0.35	0.50
		1.25		MHC110AL	13.0	32.5	0.25	40.6	0.31	56.9	0.44	0.61
		1.50		MHC111L	9.9	29.7	0.30	37.1	0.38	52.0	0.53	0.72
		1.75		MHC111AL	8.5	29.8	0.35	37.2	0.44	52.1	0.61	0.84
		2.00		MHC112L	7.5	30.0	0.40	37.5	0.50	52.5	0.70	0.95
		2.50		MHC113L	6.0	30.0	0.50	37.5	0.63	52.5	0.88	1.18
		3.00		MHC114L	5.5	33.0	0.60	41.3	0.75	57.8	1.05	1.40
		3.50		MHC115L	4.0	28.0	0.70	35.0	0.88	49.0	1.23	1.68
12.00	MHC117L	1.2	28.8	2.40	36.0	3.00	50.4	4.20	5.68			
5/8	11/32	1.00	0.086 X 0.112	MHC120L	30.0	60.0	0.20	75.0	0.25	105.0	0.35	0.56
		1.25		MHC120AL	21.5	53.8	0.25	67.2	0.31	94.1	0.44	0.70
		1.50		MHC121L	19.2	57.6	0.30	72.0	0.38	100.8	0.53	0.79
		1.75		MHC121AL	16.8	58.8	0.35	73.5	0.44	102.9	0.61	0.92
		2.00		MHC122L	14.8	59.2	0.40	74.0	0.50	103.6	0.70	1.00
		2.50		MHC123L	11.5	57.5	0.50	71.9	0.63	100.6	0.88	1.22
		3.00		MHC124L	10.0	60.0	0.60	75.0	0.75	105.0	1.05	1.43
		3.50		MHC125L	8.5	59.5	0.70	74.4	0.88	104.1	1.23	1.69
4.00	MHC126L	7.6	60.8	0.80	76.0	1.00	106.4	1.40	1.92			
12.00	MHC127L	2.6	62.4	2.40	78.0	3.00	109.2	4.20	5.70			
3/4	3/8	1.00	0.100 X 0.155	MHC1L	50.0	100.0	0.20	125.0	0.25	175.0	0.35	0.58
		1.25		MHC1AL	38.0	95.0	0.25	118.8	0.31	166.3	0.44	0.72
		1.50		MHC2L	32.0	96.0	0.30	120.0	0.38	168.0	0.53	0.87
		1.75		MHC2AL	28.5	99.8	0.35	124.7	0.44	174.6	0.61	1.02
		2.00		MHC3L	24.8	99.2	0.40	124.0	0.50	173.6	0.70	1.16
		2.50		MHC4L	19.2	96.0	0.50	120.0	0.63	168.0	0.88	1.46
		3.00		MHC5L	14.4	86.4	0.60	108.0	0.75	151.2	1.05	1.74
		3.50		MHC6L	12.8	89.6	0.70	112.0	0.88	156.8	1.23	2.02
		4.00		MHC7L	12.0	96.0	0.80	120.0	1.00	168.0	1.40	2.31
		4.50		MHC8L	11.0	99.0	0.90	123.8	1.13	173.3	1.58	2.62
		5.00		MHC9L	9.0	90.0	1.00	112.5	1.25	157.5	1.75	2.86
		5.50		MHC10L	8.0	88.0	1.10	110.0	1.38	154.0	1.93	3.15
		6.00		MHC11L	7.5	90.0	1.20	112.5	1.50	157.5	2.10	3.45
		12.00		MHC11AL	3.6	86.4	2.40	108.0	3.00	151.2	4.20	6.78

\* NOTE: For design purposes only. We do not recommend deflecting a spring to maximum deflection.

# Inch Standard

Hole Diam. (in)	Rod Diam. (in)	Free Length (in)	Wire Size (in)	CATALOG NUMBER	Pounds @ 1/10 inch defl.	Total Deflection Recommended for Long Life (20% of C)		Total Deflection Recommended for Avg. Life (25% of C)		Maximum Operating Deflection (35% of C)		* Max. Comp. Length (in)
						Load lbs.	Defl. in.	Load lbs.	Defl. in.	Load lbs.	Defl. in.	
1	1/2	1.00	0.125 X 0.214	MHC12L	76.0	152.0	0.20	190.0	0.25	266.0	0.35	0.61
		1.25		MHC12AL	62.4	156.0	0.25	195.0	0.31	273.0	0.44	0.75
		1.50		MHC13L	49.6	148.8	0.30	186.0	0.38	260.4	0.53	0.89
		1.75		MHC13AL	44.0	154.0	0.35	192.5	0.44	269.5	0.61	1.02
		2.00		MHC14L	40.0	160.0	0.40	200.0	0.50	280.0	0.70	1.15
		2.50		MHC15L	31.0	155.0	0.50	193.8	0.63	271.3	0.88	1.44
		3.00		MHC16L	25.0	150.0	0.60	187.5	0.75	262.5	1.05	1.73
		3.50		MHC17L	21.6	151.2	0.70	189.0	0.88	264.6	1.23	2.02
		4.00		MHC18L	18.4	147.2	0.80	184.0	1.00	257.6	1.40	2.30
		4.50		MHC19L	17.0	153.0	0.90	191.3	1.13	267.8	1.58	2.59
		5.00		MHC20L	14.4	144.0	1.00	180.0	1.25	252.0	1.75	2.88
		5.50		MHC21L	12.8	140.8	1.10	176.0	1.38	246.4	1.93	3.16
		6.00		MHC22L	12.0	144.0	1.20	180.0	1.50	252.0	2.10	3.45
		7.00		MHC23L	10.0	140.0	1.40	175.0	1.75	245.0	2.45	4.03
8.00	MHC24L	8.8	140.8	1.60	176.0	2.00	246.4	2.80	4.60			
12.00	MHC24AL	6.2	148.8	2.40	186.0	3.00	260.4	4.20	6.70			
1-1/4	5/8	1.50	0.165 X 0.270	MHC36L	113.4	340.2	0.30	425.3	0.38	595.4	0.53	0.92
		1.75		MHC36AL	94.5	330.8	0.35	413.4	0.44	578.8	0.61	1.07
		2.00		MHC37L	81.0	324.0	0.40	405.0	0.50	567.0	0.70	1.22
		2.50		MHC38L	62.4	312.0	0.50	390.0	0.63	546.0	0.88	1.55
		3.00		MHC39L	51.2	307.2	0.60	384.0	0.75	537.6	1.05	1.83
		3.50		MHC40L	43.5	304.5	0.70	380.6	0.88	532.9	1.23	2.12
		4.00		MHC41L	36.8	294.4	0.80	368.0	1.00	515.2	1.40	2.43
		4.50		MHC42L	32.0	288.0	0.90	360.0	1.13	504.0	1.58	2.68
		5.00		MHC43L	29.0	290.0	1.00	362.5	1.25	507.5	1.75	2.94
		5.50		MHC44L	26.4	290.4	1.10	363.0	1.38	508.2	1.93	3.22
		6.00		MHC45L	25.0	300.0	1.20	375.0	1.50	525.0	2.10	3.58
		7.00		MHC46L	20.0	280.0	1.40	350.0	1.75	490.0	2.45	4.10
		8.00		MHC47L	18.4	294.4	1.60	368.0	2.00	515.2	2.80	4.76
		10.00		MHC48L	14.5	290.0	2.00	362.5	2.50	507.5	3.50	5.78
12.00	MHC48AL	12.1	290.4	2.40	363.0	3.00	508.2	4.20	6.94			
1-1/2	3/4	2.00	0.191 X 0.320	MHC49L	104.0	416.0	0.40	520.0	0.50	728.0	0.70	1.21
		2.50		MHC50L	81.5	407.5	0.50	509.4	0.63	713.1	0.88	1.51
		3.00		MHC51L	62.4	374.4	0.60	468.0	0.75	655.2	1.05	1.75
		3.50		MHC52L	52.8	369.6	0.70	462.0	0.88	646.8	1.23	2.08
		4.00		MHC53L	47.3	378.4	0.80	473.0	1.00	662.2	1.40	2.31
		4.50		MHC54L	41.6	374.4	0.90	468.0	1.13	655.2	1.58	2.58
		5.00		MHC55L	36.8	368.0	1.00	460.0	1.25	644.0	1.75	2.82
		5.50		MHC55AL	33.6	369.6	1.10	462.0	1.38	646.8	1.93	3.05
		6.00		MHC56L	30.4	364.8	1.20	456.0	1.50	638.4	2.10	3.45
		7.00		MHC56AL	26.4	369.6	1.40	462.0	1.75	646.8	2.45	3.89
		8.00		MHC57L	22.0	352.0	1.60	440.0	2.00	616.0	2.80	4.45
		10.00		MHC58L	17.6	352.0	2.00	440.0	2.50	616.0	3.50	5.55
		12.00		MHC58AL	14.4	345.6	2.40	432.0	3.00	604.8	4.20	6.80
		2		1	2.50	0.235 X 0.440	MHC70L	118.4	592.0	0.50	740.0	0.63
3.00	MHC71L		96.0		576.0		0.60	720.0	0.75	1008.0	1.05	1.77
3.50	MHC72L		80.0		560.0		0.70	700.0	0.88	980.0	1.23	2.05
4.00	MHC73L		66.4		531.2		0.80	664.0	1.00	929.6	1.40	2.32
4.50	MHC74L		60.0		540.0		0.90	675.0	1.13	945.0	1.58	2.60
5.00	MHC75L		55.1		551.0		1.00	688.8	1.25	964.3	1.75	2.92
5.50	MHC76L		49.7		546.7		1.10	683.4	1.38	956.7	1.93	3.18
6.00	MHC77L		45.3		543.6		1.20	679.5	1.50	951.3	2.10	3.46
7.00	MHC79L		38.5		539.0		1.40	673.8	1.75	943.3	2.45	4.05
8.00	MHC80L		33.5		536.0		1.60	670.0	2.00	938.0	2.80	4.62
10.00	MHC82L		26.0		520.0		2.00	650.0	2.50	910.0	3.50	5.75
12.00	MHC83L	21.9	525.6	2.40	657.0	3.00	919.8	4.20	6.88			

\* NOTE: For design purposes only. We do not recommend deflecting a spring to maximum deflection.

## Die Spring Basics

A die spring is a highly engineered mechanical spring with specific wire designs that stores energy elastically by resisting movement when pressure is applied. The desired wire segment is selected to produce the maximum amount of force within a minimal amount of space.

**Altering Die Springs** Each die spring is carefully engineered to perform within specific applications. Under no circumstances should you alter a die spring. Altering a die spring will change its designed characteristics and allows additional stresses to occur causing early failure. Grinding on the die spring not only changes the spring's original properties, but the heat from grinding can change the temper of the material and negatively affect the spring's performance.

**Compressed Length** The sum of the preload travel and operating travel.

**Corrosion** Frequently, die spring failure can be traced to corrosive elements which affect the surface of the spring's material, causing premature failure. Be aware of conditions that may affect the spring's surface such as rust, lubricants, soaps, and chemicals. Clean, protected die springs provide the best performance.

**Cycle Rate** The more rapidly a spring is cycled, the greater the need to operate in the recommended long life deflections from the catalog.

**Die Spring Guidance** Make sure that the hole size and/or rod size match the die spring's operating dimensions.

**Duty Ranges** We offer 4 separate duty ranges to best suit your applications – Medium Duty, Medium Heavy Duty, Heavy Duty, and Extra Heavy Duty. Do not mix springs of different duties.

**Free Length** The length of the spring without any load or force applied.

**Hole Diameter** Die springs are designed to be used in a hole dimension as indicated in the catalog. The actual O.D. will be somewhat smaller to prevent interference.

**Material** In our case, the spring material is High Tensile Strength Chrome Silicon Material. We use an optimal rectangular wire design. The maximum rated service temperature is 425°F.

**Operating Travel** Operating travel is the deflection of the spring where it is operating between the preload and the total travel of the spring during operation. This is the area where the actual work is performed.

**Preload** The initial force which is applied to a die spring. Preload is recommended to compress the first coils at each end where additional stresses are present because of the turn-down of the end coils. Applying a preload will extend the life of the spring.

**Quality** Our die springs are manufactured in an ISO9001-2008 facility.

**Rates** Die spring rates are normally listed as *Pounds per Inch of deflection* (i.e. 60 pounds load per inch.) As a die spring is deflected, the loads will increase for the amount of travel it is deflected. That is, a spring with a 60lb/inch rate will produce 60 lbs of resistance at 1" of travel, 120 lbs. at 2" of travel, etc. For purposes of simplification, the loads in our catalog are shown in pounds needed to deflect a spring 1/10<sup>th</sup> of an inch. Simply multiply the rates given by 10 to determine the actual spring rate.

**Rod Diameter** Die springs are designed to fit over a rod for guidance and the actual I.D. of the spring is actually somewhat larger to fit over a rod without interference.

**Solid Height** Solid height is the height of the spring when all of the coils are totally collapsed to solid. You never want to operate a die spring close to this condition.



## DieMax<sup>™</sup> L Die Springs

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