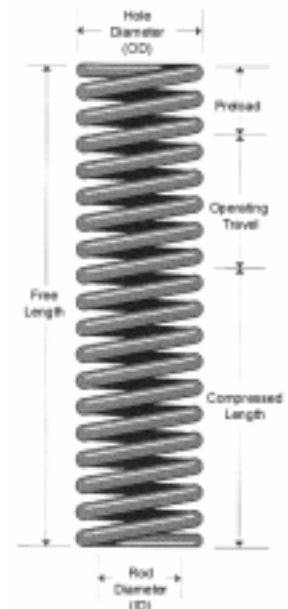


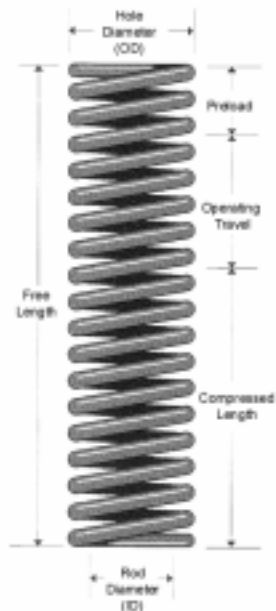
Die Springs - Blue

| Medium Duty Die Springs - Blue | | | | | | | | | | | | |
|--------------------------------|---------------|------------------|-------------|----------------------------|-------------------------------------|----------|----------------------------------|----------|--|----------|------------------------------------|-------|
| Hole Dia. (in) | Rod Dia. (in) | Free Length (in) | Part Number | Load at 1/10 in. Def. (lb) | Load Deflection Table | | | | | | | Price |
| | | | | | For Optimum Life 25% free length | | For Long Life 35% free length | | Max. Operating Deflection 40% free length | | Max. Deflection 50% free length | |
| | | | | | Load lb. | Def. in. | Load lb. | Def. in. | Load lb. | Def. in. | Deflection in. | |
| 3/8 | 3/16 | 1 | M-100 | 6.0 | 15.0 | .25 | 21.0 | .35 | 24.0 | .40 | .50 | 1.26 |
| | | 1-1/4 | M-100-A | 5.4 | 16.9 | .31 | 23.6 | .44 | 27.0 | .50 | .63 | 1.34 |
| | | 1-1/2 | M-101 | 4.0 | 15.0 | .38 | 21.0 | .53 | 24.0 | .60 | .75 | 1.53 |
| | | 1-3/4 | M-101-A | 3.4 | 14.9 | .44 | 20.8 | .61 | 23.8 | .70 | .88 | 1.73 |
| | | 2 | M-102 | 2.8 | 14.0 | .50 | 19.6 | .70 | 22.4 | .80 | 1.00 | 1.93 |
| | | 2-1/2 | M-103 | 2.4 | 15.0 | .63 | 21.0 | .88 | 24.0 | 1.00 | 1.25 | 2.11 |
| | | 3 | M-104 | 2.1 | 15.8 | .75 | 22.0 | 1.05 | 25.2 | 1.20 | 1.50 | 2.33 |
| | | 12 | M-105 | .6 | 18.0 | 3.00 | 25.2 | 4.20 | 28.8 | 4.80 | 6.00 | 9.58 |
| 1/2 | 9/32 | 1 | M-110 | 11.0 | 27.5 | .25 | 38.5 | .35 | 44.0 | .40 | .50 | 1.39 |
| | | 1-1/4 | M-110-A | 8.2 | 25.6 | .31 | 35.9 | .44 | 41.0 | .50 | .63 | 1.50 |
| | | 1-1/2 | M-111 | 6.8 | 25.5 | .38 | 35.7 | .53 | 40.8 | .60 | .75 | 1.73 |
| | | 1-3/4 | M-111-A | 6.0 | 26.3 | .44 | 36.8 | .61 | 42.0 | .70 | .88 | 1.85 |
| | | 2 | M-112 | 5.5 | 27.5 | .50 | 38.5 | .70 | 44.0 | .80 | 1.00 | 2.04 |
| | | 2-1/2 | M-113 | 4.5 | 28.1 | .63 | 39.4 | .88 | 45.0 | 1.00 | 1.25 | 2.25 |
| | | 3 | M-114 | 3.5 | 26.3 | .75 | 36.8 | 1.05 | 42.0 | 1.20 | 1.50 | 2.52 |
| | | 3-1/2 | M-115 | 3.0 | 26.3 | .88 | 36.8 | 1.23 | 42.0 | 1.40 | 1.75 | 2.75 |
| | | 4-1/2 | M-115-A | 2.5 | 28.1 | 1.13 | 39.4 | 1.58 | 45.0 | 1.80 | 2.25 | 4.15 |
| | | 5-1/2 | M-115-B | 2.1 | 28.9 | 1.38 | 40.4 | 1.93 | 46.2 | 2.20 | 2.75 | 6.03 |
| | | 6-1/2 | M-115-C | 1.4 | 22.8 | 1.63 | 31.9 | 2.28 | 36.4 | 2.60 | 3.25 | 6.06 |
| | | 7-1/2 | M-115-D | 1.2 | 22.5 | 1.88 | 31.5 | 2.63 | 36.0 | 3.00 | 3.75 | 7.14 |
| | | 12 | M-116 | .7 | 21.0 | 3.00 | 29.4 | 4.20 | 33.6 | 4.80 | 6.00 | 10.29 |
| 5/8 | 11/32 | 1 | M-120 | 16.4 | 41.0 | .25 | 57.4 | .35 | 65.6 | .40 | .50 | 1.71 |
| | | 1-1/4 | M-120-A | 12.8 | 40.0 | .31 | 56.0 | .44 | 64.0 | .50 | .63 | 1.77 |
| | | 1-1/2 | M-121 | 10.8 | 40.5 | .38 | 56.7 | .53 | 64.8 | .60 | .75 | 1.93 |
| | | 1-3/4 | M-121-A | 9.6 | 42.0 | .44 | 58.8 | .61 | 67.2 | .70 | .88 | 2.11 |
| | | 2 | M-122 | 8.8 | 44.0 | .50 | 61.6 | .70 | 70.4 | .80 | 1.00 | 2.32 |
| | | 2-1/2 | M-123 | 6.0 | 37.5 | .63 | 52.5 | .88 | 60.0 | 1.00 | 1.25 | 2.46 |
| | | 3 | M-124 | 5.6 | 42.0 | .75 | 58.8 | 1.05 | 67.2 | 1.20 | 1.50 | 2.76 |
| | | 3-1/2 | M-125 | 4.8 | 42.0 | .88 | 58.8 | 1.23 | 67.2 | 1.40 | 1.75 | 3.05 |
| | | 4 | M-126 | 4.4 | 44.0 | 1.00 | 61.6 | 1.40 | 70.4 | 1.60 | 2.00 | 3.29 |
| | | | | 12 | M-127 | 1.6 | 48.0 | 3.00 | 67.2 | 4.20 | 76.8 | 4.80 |
| 3/4 | 3/8 | 1 | M-1 | 31.2 | 78.0 | .25 | 109.2 | .35 | 124.8 | .40 | .50 | 2.41 |
| | | 1-1/4 | M-1-A | 25.6 | 80.0 | .31 | 112.0 | .44 | 128.0 | .50 | .63 | 2.60 |
| | | 1-1/2 | M-2 | 20.0 | 75.0 | .38 | 105.0 | .53 | 120.0 | .60 | .75 | 2.73 |
| | | 1-3/4 | M-2-A | 17.6 | 77.0 | .44 | 107.8 | .61 | 123.2 | .70 | .88 | 3.00 |
| | | 2 | M-3 | 14.4 | 72.0 | .50 | 100.8 | .70 | 115.2 | .80 | 1.00 | 3.11 |
| | | 2-1/2 | M-4 | 12.0 | 75.0 | .63 | 105.0 | .88 | 120.0 | 1.00 | 1.25 | 3.31 |
| | | 3 | M-5 | 9.6 | 72.0 | .75 | 100.8 | 1.05 | 115.2 | 1.20 | 1.50 | 3.63 |
| | | 3-1/2 | M-6 | 8.0 | 70.0 | .88 | 98.0 | 1.23 | 112.0 | 1.40 | 1.75 | 4.07 |
| | | 4 | M-7 | 7.2 | 72.0 | 1.00 | 100.8 | 1.40 | 115.2 | 1.60 | 2.00 | 4.34 |
| | | 4-1/2 | M-8 | 6.4 | 72.0 | 1.13 | 100.8 | 1.58 | 115.2 | 1.80 | 2.25 | 4.78 |
| | | 5 | M-9 | 6.0 | 75.0 | 1.25 | 105.0 | 1.75 | 120.0 | 2.00 | 2.50 | 5.39 |
| | | 5-1/2 | M-10 | 5.5 | 75.6 | 1.38 | 105.9 | 1.93 | 121.0 | 2.20 | 2.75 | 5.74 |
| | | 6 | M-11 | 5.0 | 75.0 | 1.50 | 105.0 | 2.10 | 120.0 | 2.40 | 3.00 | 6.28 |
| | | 6-1/2 | M-11-B | 4.5 | 73.1 | 1.63 | 102.4 | 2.28 | 117.0 | 2.60 | 3.25 | 10.62 |
| 7-1/2 | M-11-C | 3.8 | 71.3 | 1.88 | 99.8 | 2.63 | 114.0 | 3.00 | 3.75 | 11.00 | | |
| | | 12 | M-11-A | 2.4 | 72.0 | 3.00 | 100.8 | 4.20 | 115.2 | 4.80 | 6.00 | 12.83 |



- Medium Duty Blue Die Springs.
- Manufactured from 6150 Chrome Vanadium Alloy.
- High resistance to shock loads and increased deflection.
- Withstands higher operating temperature for a longer life.

Die Springs - Blue



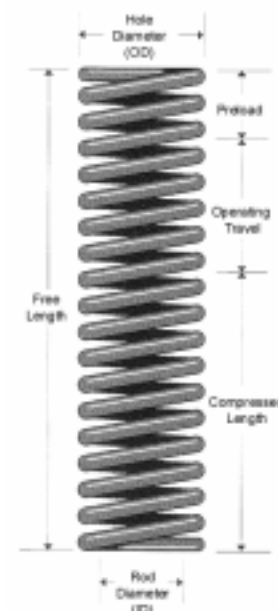
Medium Duty Die Springs - Blue

| Hole Dia. (in) | Rod Dia. (in) | Free Length (in) | Part Number | Load at 1/10 in. Def. (lb) | Load Deflection Table | | | | | | | | Price |
|----------------|---------------|------------------|-------------|----------------------------|----------------------------------|----------|-------------------------------|----------|---|----------|---------------------------------|----------|-------|
| | | | | | For Optimum Life 25% free length | | For Long Life 35% free length | | Max. Operating Deflection 40% free length | | Max. Deflection 50% free length | | |
| | | | | | Load lb. | Def. in. | Load lb. | Def. in. | Load lb. | Def. in. | Load lb. | Def. in. | |
| 1 | 1/2 | 1 | M-12 | 55.0 | 137.5 | .25 | 192.5 | .35 | 220.0 | .40 | .50 | 3.11 | |
| | | 1-1/4 | M-12-A | 45.0 | 140.6 | .31 | 196.9 | .44 | 225.0 | .50 | .63 | 3.23 | |
| | | 1-1/2 | M-13 | 35.0 | 131.3 | .38 | 183.8 | .53 | 210.0 | .60 | .75 | 3.35 | |
| | | 1-3/4 | M-13-A | 30.0 | 131.3 | .44 | 183.8 | .61 | 210.0 | .70 | .88 | 3.63 | |
| | | 2 | M-14 | 26.0 | 130.0 | .50 | 182.0 | .70 | 208.0 | .80 | 1.00 | 3.75 | |
| | | 2-1/2 | M-15 | 20.0 | 125.0 | .63 | 175.0 | .88 | 200.0 | 1.00 | 1.25 | 4.03 | |
| | | 3 | M-16 | 16.5 | 123.8 | .75 | 173.3 | 1.05 | 198.0 | 1.20 | 1.50 | 4.52 | |
| | | 3-1/2 | M-17 | 15.0 | 131.3 | .88 | 183.8 | 1.23 | 210.0 | 1.40 | 1.75 | 4.73 | |
| | | 4 | M-18 | 12.0 | 120.0 | 1.00 | 168.0 | 1.40 | 192.0 | 1.60 | 2.00 | 5.37 | |
| | | 4-1/2 | M-19 | 10.4 | 117.0 | 1.13 | 163.8 | 1.58 | 187.2 | 1.80 | 2.25 | 5.94 | |
| | | 5 | M-20 | 9.6 | 120.0 | 1.25 | 168.0 | 1.75 | 192.0 | 2.00 | 2.50 | 6.34 | |
| | | 5-1/2 | M-21 | 8.8 | 121.0 | 1.38 | 169.4 | 1.93 | 193.6 | 2.20 | 2.75 | 7.09 | |
| 6 | M-22 | 8.0 | 120.0 | 1.50 | 168.0 | 2.10 | 192.0 | 2.40 | 3.00 | 7.65 | | | |
| 7 | M-23 | 7.2 | 126.0 | 1.75 | 176.4 | 2.45 | 201.6 | 2.80 | 3.50 | 9.09 | | | |
| 8 | M-24 | 6.0 | 120.0 | 2.00 | 168.0 | 2.80 | 192.0 | 3.20 | 4.00 | 9.98 | | | |
| 12 | M-24-A | 4.0 | 120.0 | 3.00 | 168.0 | 4.20 | 192.0 | 4.80 | 6.00 | 14.55 | | | |
| 1-1/4 | 5/8 | 1-1/2 | M-36 | 49.6 | 186.0 | .38 | 260.4 | .53 | 297.6 | .60 | .75 | 4.87 | |
| | | 1-3/4 | M-36-A | 42.4 | 185.5 | .44 | 259.7 | .61 | 296.8 | .70 | .88 | 5.03 | |
| | | 2 | M-37 | 35.2 | 176.0 | .50 | 246.4 | .70 | 281.6 | .80 | 1.00 | 5.51 | |
| | | 2-1/2 | M-38 | 28.8 | 180.0 | .63 | 252.0 | .88 | 288.0 | 1.00 | 1.25 | 5.87 | |
| | | 3 | M-39 | 24.0 | 180.0 | .75 | 252.0 | 1.05 | 288.0 | 1.20 | 1.50 | 6.64 | |
| | | 3-1/2 | M-40 | 20.0 | 175.0 | .88 | 245.0 | 1.23 | 280.0 | 1.40 | 1.75 | 7.12 | |
| | | 4 | M-41 | 17.6 | 176.0 | 1.00 | 246.4 | 1.40 | 281.6 | 1.60 | 2.00 | 7.86 | |
| | | 4-1/2 | M-42 | 16.0 | 180.0 | 1.13 | 252.0 | 1.58 | 288.0 | 1.80 | 2.25 | 8.71 | |
| | | 5 | M-43 | 13.6 | 170.0 | 1.25 | 238.0 | 1.75 | 272.0 | 2.00 | 2.50 | 9.47 | |
| | | 5-1/2 | M-44 | 12.8 | 176.0 | 1.38 | 246.4 | 1.93 | 281.6 | 2.20 | 2.75 | 10.27 | |
| | | 6 | M-45 | 12.0 | 180.0 | 1.50 | 252.0 | 2.10 | 288.0 | 2.40 | 3.00 | 11.30 | |
| | | 7 | M-46 | 10.4 | 182.0 | 1.75 | 254.8 | 2.45 | 291.2 | 2.80 | 3.50 | 12.63 | |
| 8 | M-47 | 8.8 | 176.0 | 2.00 | 246.4 | 2.80 | 281.6 | 3.20 | 4.00 | 14.60 | | | |
| 10 | M-48 | 7.2 | 180.0 | 2.50 | 252.0 | 3.50 | 288.0 | 4.00 | 5.00 | 18.73 | | | |
| 12 | M-48-A | 6.0 | 180.0 | 3.00 | 252.0 | 4.20 | 288.0 | 4.80 | 6.00 | 21.71 | | | |
| 1-1/2 | 3/4 | 2 | M-49 | 53.0 | 265.0 | .50 | 371.0 | .70 | 424.0 | .80 | 1.00 | 5.99 | |
| | | 2-1/2 | M-50 | 45.0 | 281.3 | .63 | 393.8 | .88 | 450.0 | 1.00 | 1.25 | 6.63 | |
| | | 3 | M-51 | 36.0 | 270.0 | .75 | 378.0 | 1.05 | 432.0 | 1.20 | 1.50 | 7.94 | |
| | | 3-1/2 | M-52 | 30.0 | 262.5 | .88 | 367.5 | 1.23 | 420.0 | 1.40 | 1.75 | 8.84 | |
| | | 4 | M-53 | 27.0 | 270.0 | 1.00 | 378.0 | 1.40 | 432.0 | 1.60 | 2.00 | 10.00 | |
| | | 4-1/2 | M-54 | 23.0 | 258.8 | 1.13 | 362.3 | 1.58 | 414.0 | 1.80 | 2.25 | 10.66 | |
| | | 5 | M-55 | 21.0 | 262.5 | 1.25 | 367.5 | 1.75 | 420.0 | 2.00 | 2.50 | 12.30 | |
| | | 5-1/2 | M-55-A | 18.5 | 254.4 | 1.38 | 356.1 | 1.93 | 407.0 | 2.20 | 2.75 | 13.68 | |
| | | 6 | M-56 | 17.0 | 255.0 | 1.50 | 357.0 | 2.10 | 408.0 | 2.40 | 3.00 | 14.55 | |
| | | 7 | M-56-A | 14.5 | 253.8 | 1.75 | 355.3 | 2.45 | 406.0 | 2.80 | 3.50 | 16.48 | |
| | | 8 | M-57 | 12.8 | 256.0 | 2.00 | 358.4 | 2.80 | 409.6 | 3.20 | 4.00 | 19.65 | |
| | | 10 | M-58 | 10.0 | 250.0 | 2.50 | 350.0 | 3.50 | 400.0 | 4.00 | 5.00 | 24.94 | |
| 12 | M-58-A | 8.0 | 240.0 | 3.00 | 336.0 | 4.20 | 384.0 | 4.80 | 6.00 | 30.54 | | | |

- Medium Duty Blue Die Springs.
- Manufactured from 6150 Chrome Vanadium Alloy.
- High resistance to shock loads and increased deflection.
- Withstands higher operating temperature for a longer life.

Die Springs - Blue

| Medium Duty Die Springs - Blue | | | | | | | | | | | | |
|--------------------------------|---------------|------------------|-------------|----------------------------|-------------------------------------|----------|----------------------------------|----------|--|----------|------------------------------------|-------|
| Hole Dia. (in) | Rod Dia. (in) | Free Length (in) | Part Number | Load at 1/10 in. Def. (lb) | Load Deflection Table | | | | | | | Price |
| | | | | | For Optimum Life 25% free length | | For Long Life 35% free length | | Max. Operating Deflection 40% free length | | Max. Deflection 50% free length | |
| | | | | | Load lb. | Def. in. | Load lb. | Def. in. | Load lb. | Def. in. | Deflection in. | |
| 2 | 1 | 2-1/2 | M-70 | 100.0 | 625.0 | .63 | 875.0 | .88 | 1000.0 | 1.00 | 1.25 | 13.02 |
| | | 3 | M-71 | 83.0 | 622.5 | .75 | 871.5 | 1.05 | 996.0 | 1.20 | 1.50 | 14.31 |
| | | 3-1/2 | M-72 | 64.8 | 567.0 | .88 | 793.8 | 1.23 | 907.2 | 1.40 | 1.75 | 15.79 |
| | | 4 | M-73 | 60.0 | 600.0 | 1.00 | 840.0 | 1.40 | 960.0 | 1.60 | 2.00 | 17.22 |
| | | 4-1/2 | M-74 | 53.0 | 596.3 | 1.13 | 834.8 | 1.58 | 954.0 | 1.80 | 2.25 | 19.29 |
| | | 5 | M-75 | 47.0 | 587.5 | 1.25 | 822.5 | 1.75 | 940.0 | 2.00 | 2.50 | 20.72 |
| | | 5-1/2 | M-76 | 39.2 | 539.0 | 1.38 | 754.6 | 1.93 | 862.4 | 2.20 | 2.75 | 23.05 |
| | | 6 | M-77 | 39.0 | 585.0 | 1.50 | 819.0 | 2.10 | 936.0 | 2.40 | 3.00 | 25.19 |
| | | 7 | M-79 | 31.2 | 546.0 | 1.75 | 764.4 | 2.45 | 873.6 | 2.80 | 3.50 | 28.33 |
| | | 8 | M-80 | 28.5 | 570.0 | 2.00 | 798.0 | 2.80 | 912.0 | 3.20 | 4.00 | 32.26 |
| | | 10 | M-82 | 20.8 | 520.0 | 2.50 | 728.0 | 3.50 | 832.0 | 4.00 | 5.00 | 41.64 |
| | | 12 | M-83 | 17.5 | 525.0 | 3.00 | 735.0 | 4.20 | 840.0 | 4.80 | 6.00 | 52.13 |



Common Die Spring Terminology

Hole Diameter: This identifies the outside diameter (OD) of the die spring. BMS 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. BMS 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 spring 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 die spring length after operating force has been applied.

Deflection: The amount of change in the 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 the 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.

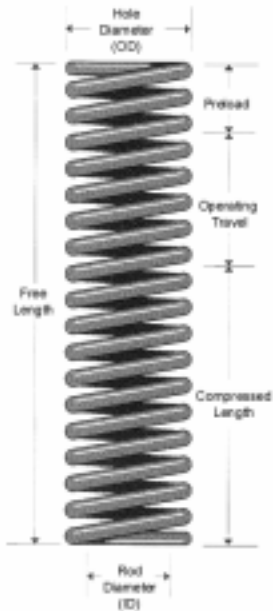
Elastic Limit: The maximum compression stress that a die spring can endure without taking permanent set.

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 initial 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 millimeter of sectional area.

Die Springs - Red

Medium Heavy Duty Die Springs - Red

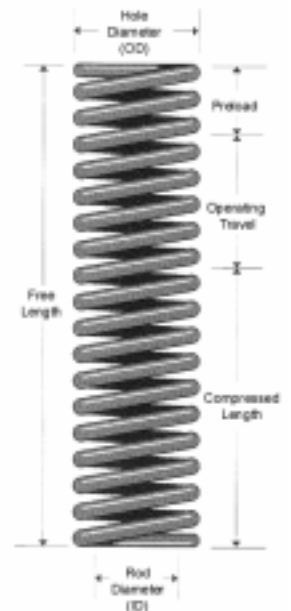


- Medium Heavy Duty Red Die Springs.
- Manufactured from 6150 Chrome Vanadium Alloy.
- High resistance to shock loads and increased deflection.
- Withstands higher operating temperature for a longer life.

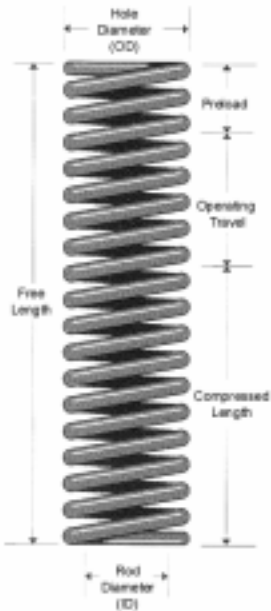
| Hole Dia. (in) | Rod Dia. (in) | Free Length (in) | Part Number | Load at 1/10 in. Def. (lb) | Load Deflection Table | | | | | | | Price |
|----------------|---------------|------------------|-------------|----------------------------|----------------------------------|----------|-------------------------------|----------|---|----------|---------------------------------|-------|
| | | | | | For Optimum Life 20% free length | | For Long Life 25% free length | | Max. Operating Deflection 30% free length | | Max. Deflection 37% free length | |
| | | | | | Load lb. | Def. in. | Load lb. | Def. in. | Load lb. | Def. in. | Deflection in. | |
| 3/8 | 3/16 | 1 | MHC-100 | 9.0 | 18.0 | .20 | 22.5 | .25 | 27.0 | .30 | .37 | 1.36 |
| | | 1-1/4 | MHC-100-A | 7.3 | 18.3 | .25 | 22.8 | .31 | 27.4 | .38 | .46 | 1.44 |
| | | 1-1/2 | MHC-101 | 6.7 | 20.1 | .30 | 25.1 | .38 | 30.2 | .45 | .56 | 1.66 |
| | | 1-3/4 | MHC-101-A | 5.8 | 20.3 | .35 | 25.4 | .44 | 30.5 | .53 | .65 | 1.77 |
| | | 2 | MHC-102 | 5.0 | 20.0 | .40 | 25.0 | .50 | 30.0 | .60 | .74 | 2.04 |
| | | 2-1/2 | MHC-103 | 4.2 | 21.0 | .50 | 26.3 | .63 | 31.5 | .75 | .93 | 2.20 |
| | | 3 | MHC-104 | 3.0 | 18.0 | .60 | 22.5 | .75 | 27.0 | .90 | 1.11 | 2.41 |
| 1/2 | 9/32 | 12 | MHC-105 | .9 | 21.6 | 2.40 | 27.0 | 3.00 | 32.4 | 3.60 | 4.44 | 9.78 |
| | | 1 | MHC-110 | 16.8 | 33.6 | .20 | 42.0 | .25 | 50.4 | .30 | .37 | 1.50 |
| | | 1-1/4 | MHC-110-A | 13.0 | 32.5 | .25 | 40.6 | .31 | 48.8 | .38 | .46 | 1.69 |
| | | 1-1/2 | MHC-111 | 9.5 | 28.5 | .30 | 35.6 | .38 | 42.8 | .45 | .56 | 1.82 |
| | | 1-3/4 | MHC-111-A | 8.5 | 29.8 | .35 | 37.2 | .44 | 44.6 | .53 | .65 | 1.96 |
| | | 2 | MHC-112 | 7.5 | 30.0 | .40 | 37.5 | .50 | 45.0 | .60 | .74 | 2.20 |
| | | 2-1/2 | MHC-113 | 6.0 | 30.0 | .50 | 37.5 | .63 | 45.0 | .75 | .93 | 2.33 |
| | | 3 | MHC-114 | 5.7 | 34.2 | .60 | 42.8 | .75 | 51.3 | .90 | 1.11 | 2.68 |
| | | 3-1/2 | MHC-115 | 4.0 | 28.0 | .70 | 35.0 | .88 | 42.0 | 1.05 | 1.30 | 2.96 |
| | | 12 | MHC-117 | 1.2 | 28.8 | 2.40 | 36.0 | 3.00 | 43.2 | 3.60 | 4.44 | 10.59 |
| 5/8 | 11/32 | 1 | MHC-120 | 30.0 | 60.0 | .20 | 75.0 | .25 | 90.0 | .30 | .37 | 1.82 |
| | | 1-1/4 | MHC-120-A | 21.5 | 53.8 | .25 | 67.2 | .31 | 80.6 | .38 | .46 | 1.95 |
| | | 1-1/2 | MHC-121 | 19.0 | 57.0 | .30 | 71.3 | .38 | 85.5 | .45 | .56 | 2.11 |
| | | 1-3/4 | MHC-121-A | 16.8 | 58.8 | .35 | 73.5 | .44 | 88.2 | .53 | .65 | 2.32 |
| | | 2 | MHC-122 | 14.8 | 59.2 | .40 | 74.0 | .50 | 88.8 | .60 | .74 | 2.46 |
| | | 2-1/2 | MHC-123 | 11.5 | 57.5 | .50 | 71.9 | .63 | 86.3 | .75 | .93 | 2.78 |
| | | 3 | MHC-124 | 10.0 | 60.0 | .60 | 75.0 | .75 | 90.0 | .90 | 1.11 | 2.91 |
| | | 3-1/2 | MHC-125 | 8.5 | 59.5 | .70 | 74.4 | .88 | 89.3 | 1.05 | 1.30 | 3.26 |
| | | 4 | MHC-126 | 7.6 | 60.8 | .80 | 76.0 | 1.00 | 91.2 | 1.20 | 1.48 | 3.53 |
| | | 12 | MHC-127 | 2.7 | 64.8 | 2.40 | 81.0 | 3.00 | 97.20 | 3.60 | 4.44 | 11.77 |
| 3/4 | 3/8 | 1 | MHC-1 | 50.0 | 100.0 | .20 | 125.0 | .25 | 150.0 | .30 | .37 | 2.68 |
| | | 1-1/4 | MHC-1-A | 38.0 | 95.0 | .25 | 118.8 | .31 | 142.5 | .38 | .46 | 2.76 |
| | | 1-1/2 | MHC-2 | 32.0 | 96.0 | .30 | 120.0 | .38 | 144.0 | .45 | .56 | 2.91 |
| | | 1-3/4 | MHC-2-A | 28.8 | 100.8 | .35 | 126.0 | .44 | 151.2 | .53 | .65 | 3.11 |
| | | 2 | MHC-3 | 24.8 | 99.2 | .40 | 124.0 | .50 | 148.8 | .60 | .74 | 3.35 |
| | | 2-1/2 | MHC-4 | 19.2 | 96.0 | .50 | 120.0 | .63 | 144.0 | .75 | .93 | 3.59 |
| | | 3 | MHC-5 | 14.4 | 86.4 | .60 | 108.0 | .75 | 129.6 | .90 | 1.11 | 3.99 |
| | | 3-1/2 | MHC-6 | 12.8 | 89.6 | .70 | 112.0 | .88 | 134.4 | 1.05 | 1.30 | 4.22 |
| | | 4 | MHC-7 | 12.0 | 96.0 | .80 | 120.0 | 1.00 | 144.0 | 1.20 | 1.48 | 4.76 |
| | | 4-1/2 | MHC-8 | 11.2 | 100.8 | .90 | 126.0 | 1.13 | 151.2 | 1.35 | 1.67 | 5.39 |
| | | 5 | MHC-9 | 9.0 | 90.0 | 1.00 | 112.5 | 1.25 | 135.0 | 1.50 | 1.85 | 5.86 |
| | | 5-1/2 | MHC-10 | 8.0 | 88.0 | 1.10 | 110.0 | 1.38 | 132.0 | 1.65 | 2.04 | 6.39 |
| 6 | MHC-11 | 7.5 | 90.0 | 1.20 | 112.5 | 1.50 | 135.0 | 1.80 | 2.22 | 6.89 | | |
| 12 | MHC-11-A | 3.6 | 86.4 | 2.40 | 108.0 | 3.00 | 129.6 | 3.60 | 4.44 | 13.97 | | |

Die Springs - Red

| Medium Heavy Duty Die Springs - Red | | | | | | | | | | | | |
|-------------------------------------|---------------|------------------|-------------|----------------------------|-------------------------------------|----------|----------------------------------|----------|--|----------|------------------------------------|-------|
| Hole Dia. (in) | Rod Dia. (in) | Free Length (in) | Part Number | Load at 1/10 in. Def. (lb) | Load Deflection Table | | | | | | | Price |
| | | | | | For Optimum Life 20% free length | | For Long Life 25% free length | | Max. Operating Deflection 30% free length | | Max. Deflection 37% free length | |
| | | | | | Load lb. | Def. in. | Load lb. | Def. in. | Load lb. | Def. in. | Deflection in. | |
| 1 | 1/2 | 1 | MHC-12 | 76.0 | 152.0 | .20 | 190.0 | .25 | 228.0 | .30 | .37 | 3.31 |
| | | 1-1/4 | MHC-12-A | 62.4 | 156.0 | .25 | 195.0 | .31 | 234.0 | .38 | .46 | 3.50 |
| | | 1-1/2 | MHC-13 | 49.6 | 148.8 | .30 | 186.0 | .38 | 223.2 | .45 | .56 | 3.67 |
| | | 1-3/4 | MHC-13-A | 44.0 | 154.0 | .35 | 192.5 | .44 | 231.0 | .53 | .65 | 4.06 |
| | | 2 | MHC-14 | 40.0 | 160.0 | .40 | 200.0 | .50 | 240.0 | .60 | .74 | 4.17 |
| | | 2-1/2 | MHC-15 | 31.0 | 155.0 | .50 | 193.8 | .63 | 232.5 | .75 | .93 | 4.57 |
| | | 3 | MHC-16 | 25.0 | 150.0 | .60 | 187.5 | .75 | 225.0 | .90 | 1.11 | 4.87 |
| | | 3-1/2 | MHC-17 | 21.6 | 151.2 | .70 | 189.0 | .88 | 226.8 | 1.05 | 1.30 | 5.33 |
| | | 4 | MHC-18 | 18.4 | 147.2 | .80 | 184.0 | 1.00 | 220.8 | 1.20 | 1.48 | 5.81 |
| | | 4-1/2 | MHC-19 | 17.0 | 153.0 | .90 | 191.3 | 1.13 | 229.5 | 1.35 | 1.67 | 6.42 |
| | | 5 | MHC-20 | 14.4 | 144.0 | 1.00 | 180.0 | 1.25 | 216.0 | 1.50 | 1.85 | 7.32 |
| | | 5-1/2 | MHC-21 | 12.8 | 140.8 | 1.10 | 176.0 | 1.38 | 211.2 | 1.65 | 2.04 | 7.76 |
| 6 | MHC-22 | 12.0 | 144.0 | 1.20 | 180.0 | 1.50 | 216.0 | 1.80 | 2.22 | 8.59 | | |
| 7 | MHC-23 | 10.0 | 140.0 | 1.40 | 175.0 | 1.75 | 210.0 | 2.10 | 2.59 | 10.12 | | |
| 8 | MHC-24 | 8.8 | 140.8 | 1.60 | 176.0 | 2.00 | 211.2 | 2.40 | 2.96 | 11.75 | | |
| 12 | MHC-24-A | 6.2 | 148.8 | 2.40 | 186.0 | 3.00 | 223.2 | 3.60 | 4.44 | 16.81 | | |
| 1-1/4 | 5/8 | 1-1/2 | MHC-36 | 114.4 | 343.2 | .30 | 429.0 | .38 | 514.8 | .45 | .56 | 5.10 |
| | | 1-3/4 | MHC-36-A | 100.8 | 352.8 | .35 | 441.0 | .44 | 529.2 | .53 | .65 | 5.33 |
| | | 2 | MHC-37 | 86.4 | 345.6 | .40 | 432.0 | .50 | 518.4 | .60 | .74 | 5.63 |
| | | 2-1/2 | MHC-38 | 62.4 | 312.0 | .50 | 390.0 | .63 | 468.0 | .75 | .93 | 6.04 |
| | | 3 | MHC-39 | 51.2 | 307.2 | .60 | 384.0 | .75 | 460.8 | .90 | 1.11 | 6.90 |
| | | 3-1/2 | MHC-40 | 44.0 | 308.0 | .70 | 385.0 | .88 | 462.0 | 1.05 | 1.30 | 7.40 |
| | | 4 | MHC-41 | 36.8 | 294.4 | .80 | 368.0 | 1.00 | 441.6 | 1.20 | 1.48 | 7.99 |
| | | 4-1/2 | MHC-42 | 32.0 | 288.0 | .90 | 360.0 | 1.13 | 432.0 | 1.35 | 1.67 | 8.99 |
| | | 5 | MHC-43 | 29.0 | 290.0 | 1.00 | 362.5 | 1.25 | 435.0 | 1.50 | 1.85 | 9.95 |
| | | 5-1/2 | MHC-44 | 26.4 | 290.4 | 1.10 | 363.0 | 1.38 | 435.6 | 1.65 | 2.04 | 11.02 |
| | | 6 | MHC-45 | 25.0 | 300.0 | 1.20 | 375.0 | 1.50 | 450.0 | 1.80 | 2.22 | 12.40 |
| | | 7 | MHC-46 | 20.0 | 280.0 | 1.40 | 350.0 | 1.75 | 420.0 | 2.10 | 2.59 | 14.20 |
| 8 | MHC-47 | 18.4 | 294.4 | 1.60 | 368.0 | 2.00 | 441.6 | 2.40 | 2.96 | 16.38 | | |
| 10 | MHC-48 | 14.5 | 290.0 | 2.00 | 362.5 | 2.50 | 435.0 | 3.00 | 3.70 | 21.77 | | |
| 12 | MHC-48-A | 12.4 | 297.6 | 2.40 | 372.0 | 3.00 | 446.6 | 3.60 | 4.44 | 25.65 | | |
| 1-1/2 | 3/4 | 2 | MHC-49 | 108.0 | 432.0 | .40 | 540.0 | .50 | 648.0 | .60 | .74 | 7.76 |
| | | 2-1/2 | MHC-50 | 85.6 | 428.0 | .50 | 535.0 | .63 | 642.0 | .75 | .93 | 8.67 |
| | | 3 | MHC-51 | 62.4 | 374.4 | .60 | 468.0 | .75 | 561.6 | .90 | 1.11 | 10.11 |
| | | 3-1/2 | MHC-52 | 52.8 | 369.6 | .70 | 462.0 | .88 | 554.4 | 1.05 | 1.30 | 11.01 |
| | | 4 | MHC-53 | 48.0 | 384.0 | .80 | 480.0 | 1.00 | 576.0 | 1.20 | 1.48 | 12.47 |
| | | 4-1/2 | MHC-54 | 43.2 | 388.8 | .90 | 486.0 | 1.13 | 583.2 | 1.35 | 1.67 | 14.01 |
| | | 5 | MHC-55 | 36.8 | 368.0 | 1.00 | 460.0 | 1.25 | 552.0 | 1.50 | 1.85 | 15.22 |
| | | 5-1/2 | MHC-55-A | 34.4 | 378.4 | 1.10 | 473.0 | 1.38 | 567.6 | 1.65 | 2.04 | 16.84 |
| | | 6 | MHC-56 | 30.4 | 364.8 | 1.20 | 456.0 | 1.50 | 547.2 | 1.80 | 2.22 | 18.26 |
| | | 7 | MHC-56-A | 26.4 | 369.6 | 1.40 | 462.0 | 1.75 | 554.4 | 2.10 | 2.59 | 21.03 |
| | | 8 | MHC-57 | 22.0 | 352.0 | 1.60 | 440.0 | 2.00 | 528.0 | 2.40 | 2.96 | 24.13 |
| | | 10 | MHC-58 | 17.6 | 352.0 | 2.00 | 440.0 | 2.50 | 528.0 | 3.00 | 3.70 | 29.87 |
| 12 | MHC-58-A | 14.4 | 345.6 | 2.40 | 432.0 | 3.00 | 518.4 | 3.60 | 4.44 | 35.80 | | |



- Medium Heavy Duty Red Die Springs.
- Manufactured from 6150 Chrome Vanadium Alloy.
- High resistance to shock loads and increased deflection.
- Withstands higher operating temperature for a longer life.



| Medium Heavy Duty Die Springs - Red | | | | | | | | | | | | |
|-------------------------------------|---------------|------------------|-------------|----------------------------|----------------------------------|----------|-------------------------------|----------|---|----------|---------------------------------|-------|
| Hole Dia. (in) | Rod Dia. (in) | Free Length (in) | Part Number | Load at 1/10 in. Def. (lb) | Load Deflection Table | | | | | | | Price |
| | | | | | For Optimum Life 20% free length | | For Long Life 25% free length | | Max. Operating Deflection 30% free length | | Max. Deflection 37% free length | |
| | | | | | Load lb. | Def. in. | Load lb. | Def. in. | Load lb. | Def. in. | Deflection in. | |
| 2 | 1 | 2-1/2 | MHC-70 | 118.4 | 592.0 | .50 | 740.0 | .63 | 888.0 | .75 | .93 | 14.70 |
| | | 3 | MHC-71 | 96.0 | 576.0 | .60 | 720.0 | .75 | 864.0 | .90 | 1.11 | 16.05 |
| | | 3-1/2 | MHC-72 | 80.0 | 560.0 | .70 | 700.0 | .88 | 840.0 | 1.05 | 1.30 | 18.78 |
| | | 4 | MHC-73 | 66.4 | 531.2 | .80 | 664.0 | 1.00 | 796.8 | 1.20 | 1.48 | 20.34 |
| | | 4-1/2 | MHC-74 | 60.0 | 540.0 | .90 | 675.0 | 1.13 | 810.0 | 1.35 | 1.67 | 22.52 |
| | | 5 | MHC-75 | 56.0 | 560.0 | 1.00 | 700.0 | 1.25 | 840.0 | 1.50 | 1.85 | 23.90 |
| | | 5-1/2 | MHC-76 | 50.4 | 554.4 | 1.10 | 693.0 | 1.38 | 831.6 | 1.65 | 2.04 | 25.08 |
| | | 6 | MHC-77 | 47.2 | 566.4 | 1.20 | 708.0 | 1.50 | 849.6 | 1.80 | 2.22 | 27.94 |
| | | 7 | MHC-79 | 40.0 | 560.0 | 1.40 | 700.0 | 1.75 | 840.0 | 2.10 | 2.59 | 31.65 |
| | | 8 | MHC-80 | 35.2 | 563.2 | 1.60 | 704.0 | 2.00 | 844.8 | 2.40 | 2.96 | 36.54 |
| | | 10 | MHC-82 | 26.0 | 520.0 | 2.00 | 650.0 | 2.50 | 780.0 | 3.00 | 3.70 | 45.93 |
| | | 12 | MHC-83 | 22.4 | 537.6 | 2.40 | 672.0 | 3.00 | 806.4 | 3.60 | 4.44 | 52.57 |

Common Die Spring Terminology

Hole Diameter: This identifies the outside diameter (OD) of the die spring. BMS 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. BMS 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 spring 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 die spring length after operating force has been applied.

Deflection: The amount of change in the 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 the 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.

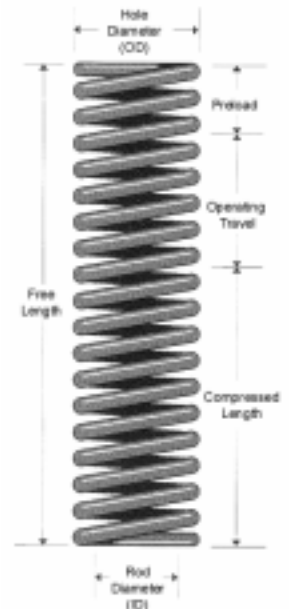
Elastic Limit: The maximum compression stress that a die spring can endure without taking permanent set.

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 initial 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 millimeter of sectional area.

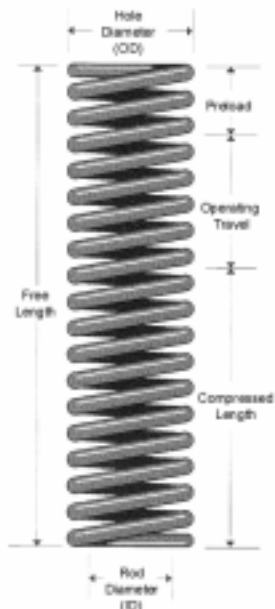
Die Springs - Gold

| Heavy Duty Die Springs - Gold | | | | | | | | | | | | |
|-------------------------------|---------------|------------------|-------------|----------------------------|-------------------------------------|----------|----------------------------------|----------|--|----------|------------------------------------|-------|
| Hole Dia. (in) | Rod Dia. (in) | Free Length (in) | Part Number | Load at 1/10 in. Def. (lb) | Load Deflection Table | | | | | | | Price |
| | | | | | For Optimum Life 15% free length | | For Long Life 20% free length | | Max. Operating Deflection 25% free length | | Max. Deflection 30% free length | |
| | | | | | Load lb. | Def. in. | Load lb. | Def. in. | Load lb. | Def. in. | Deflection in. | |
| 3/8 | 3/16 | 1 | H-100 | 11.0 | 16.5 | .15 | 22.0 | .20 | 27.5 | .25 | .30 | 1.44 |
| | | 1-1/4 | H-100-A | 9.8 | 18.4 | .19 | 24.5 | .25 | 30.6 | .31 | .38 | 1.60 |
| | | 1-1/2 | H-101 | 8.0 | 18.0 | .23 | 24.0 | .30 | 30.0 | .38 | .45 | 1.79 |
| | | 1-3/4 | H-101-A | 8.4 | 22.1 | .26 | 29.4 | .35 | 36.8 | .44 | .53 | 1.98 |
| | | 2 | H-102 | 7.2 | 21.6 | .30 | 28.8 | .40 | 36.0 | .50 | .60 | 2.17 |
| | | 2-1/2 | H-103 | 5.5 | 20.6 | .38 | 27.5 | .50 | 34.4 | .63 | .75 | 2.32 |
| | | 3 | H-104 | 4.2 | 18.9 | .45 | 25.2 | .60 | 31.5 | .75 | .90 | 2.65 |
| 1/2 | 9/32 | 12 | H-105 | 1.2 | 21.6 | 1.80 | 28.8 | 2.40 | 36.0 | 3.00 | 3.60 | 10.29 |
| | | 1 | H-110 | 23.6 | 35.4 | .15 | 47.2 | .20 | 59.0 | .25 | .30 | 1.77 |
| | | 1-1/4 | H-110-A | 18.6 | 34.9 | .19 | 46.5 | .25 | 58.1 | .31 | .38 | 1.88 |
| | | 1-1/2 | H-111 | 15.5 | 34.9 | .23 | 46.5 | .30 | 58.1 | .38 | .45 | 2.01 |
| | | 1-3/4 | H-111-A | 13.8 | 36.2 | .26 | 48.3 | .35 | 60.4 | .44 | .53 | 2.20 |
| | | 2 | H-112 | 11.0 | 33.0 | .30 | 44.0 | .40 | 55.0 | .50 | .60 | 2.33 |
| | | 2-1/2 | H-113 | 8.4 | 31.5 | .38 | 42.0 | .50 | 52.5 | .63 | .75 | 2.65 |
| | | 3 | H-114 | 7.4 | 33.3 | .45 | 44.4 | .60 | 55.5 | .75 | .90 | 2.80 |
| | | 3-1/2 | H-115 | 6.0 | 31.5 | .53 | 42.0 | .70 | 52.5 | .88 | 1.05 | 3.07 |
| 5/8 | 11/32 | 12 | H-117 | 1.6 | 28.8 | 1.80 | 38.4 | 2.40 | 48.0 | 3.00 | 3.60 | 11.28 |
| | | 1 | H-120 | 42.4 | 63.6 | .15 | 84.8 | .20 | 106.0 | .25 | .30 | 1.96 |
| | | 1-1/4 | H-120-A | 29.6 | 55.5 | .19 | 74.0 | .25 | 92.5 | .31 | .38 | 2.19 |
| | | 1-1/2 | H-121 | 27.2 | 61.2 | .23 | 81.6 | .30 | 102.0 | .38 | .45 | 2.27 |
| | | 1-3/4 | H-121-A | 24.0 | 63.0 | .26 | 84.0 | .35 | 105.0 | .44 | .53 | 2.36 |
| | | 2 | H-122 | 20.8 | 62.4 | .30 | 83.2 | .40 | 104.0 | .50 | .60 | 2.68 |
| | | 2-1/2 | H-123 | 17.0 | 63.8 | .38 | 85.0 | .50 | 106.3 | .63 | .75 | 2.83 |
| | | 3 | H-124 | 14.4 | 64.8 | .45 | 86.4 | .60 | 108.0 | .75 | .90 | 3.15 |
| | | 3-1/2 | H-125 | 12.2 | 64.1 | .53 | 85.4 | .70 | 106.8 | .88 | 1.05 | 3.42 |
| 3/4 | 3/8 | 4 | H-126 | 10.8 | 64.8 | .60 | 86.4 | .80 | 108.0 | 1.00 | 1.20 | 3.67 |
| | | 12 | H-127 | 3.0 | 54.0 | 1.80 | 72.0 | 2.40 | 90.0 | 3.00 | 3.60 | 12.64 |
| | | 1 | H-1 | 108.0 | 162.0 | .15 | 216.0 | .20 | 270.0 | .25 | .30 | 2.84 |
| | | 1-1/4 | H-1-A | 88.0 | 165.0 | .19 | 220.0 | .25 | 275.0 | .31 | .38 | 3.05 |
| | | 1-1/2 | H-2 | 65.6 | 147.6 | .23 | 196.8 | .30 | 246.0 | .38 | .45 | 3.11 |
| | | 1-3/4 | H-2-A | 60.0 | 157.5 | .26 | 210.0 | .35 | 262.5 | .44 | .53 | 3.35 |
| | | 2 | H-3 | 49.6 | 148.8 | .30 | 198.4 | .40 | 248.0 | .50 | .60 | 3.63 |
| | | 2-1/2 | H-4 | 40.0 | 150.0 | .38 | 200.0 | .50 | 250.0 | .63 | .75 | 3.99 |
| | | 3 | H-5 | 34.0 | 153.0 | .45 | 204.0 | .60 | 255.0 | .75 | .90 | 4.31 |
| | | 3-1/2 | H-6 | 28.0 | 147.0 | .53 | 196.0 | .70 | 245.0 | .88 | 1.05 | 4.94 |
| | | 4 | H-7 | 25.0 | 150.0 | .60 | 200.0 | .80 | 250.0 | 1.00 | 1.20 | 5.56 |
| | | 4-1/2 | H-8 | 22.0 | 148.5 | .68 | 198.0 | .90 | 247.5 | 1.13 | 1.35 | 6.09 |
| 5 | H-9 | 19.5 | 146.3 | .75 | 195.0 | 1.00 | 243.8 | 1.25 | 1.50 | 6.81 | | |
| 5-1/2 | H-10 | 17.0 | 140.3 | .83 | 187.0 | 1.10 | 233.8 | 1.38 | 1.65 | 7.43 | | |
| 6 | H-11 | 16.0 | 144.0 | .90 | 192.0 | 1.20 | 240.0 | 1.50 | 1.80 | 8.35 | | |
| 12 | H-11-A | 8.0 | 144.0 | 1.80 | 192.0 | 2.40 | 240.0 | 3.00 | 3.60 | 16.50 | | |



- Heavy Duty Gold Die Springs.
- Manufactured from 6150 Chrome Vanadium Alloy.
- High resistance to shock loads and increased deflection.
- Withstands higher operating temperature for a longer life.

Die Springs - Gold

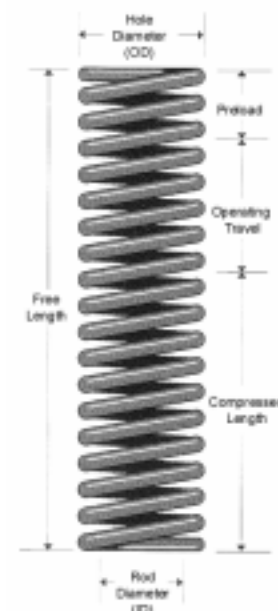


- Heavy Duty Gold Die Springs.
- Manufactured from 6150 Chrome Vanadium Alloy.
- High resistance to shock loads and increased deflection.
- Withstands higher operating temperature for a longer life.

| Heavy Duty Die Springs - Gold | | | | | | | | | | | | | |
|-------------------------------|---------------|------------------|-------------|----------------------------|----------------------------------|----------|-------------------------------|----------|---|----------|---------------------------------|----------|-------|
| Hole Dia. (in) | Rod Dia. (in) | Free Length (in) | Part Number | Load at 1/10 in. Def. (lb) | Load Deflection Table | | | | | | | | Price |
| | | | | | For Optimum Life 15% free length | | For Long Life 20% free length | | Max. Operating Deflection 25% free length | | Max. Deflection 50% free length | | |
| | | | | | Load lb. | Def. in. | Load lb. | Def. in. | Load lb. | Def. in. | Load lb. | Def. in. | |
| 1 | 1/2 | 1 | H-12 | 208.0 | 312.0 | .15 | 416.0 | .20 | 520.0 | .25 | .30 | 3.75 | |
| | | 1-1/4 | H-12-A | 171.2 | 321.0 | .19 | 428.0 | .25 | 535.0 | .31 | .38 | 3.99 | |
| | | 1-1/2 | H-13 | 118.4 | 266.4 | .23 | 355.2 | .30 | 444.0 | .38 | .45 | 4.14 | |
| | | 1-3/4 | H-13-A | 104.0 | 273.0 | .26 | 364.0 | .35 | 455.0 | .44 | .53 | 4.38 | |
| | | 2 | H-14 | 90.0 | 270.0 | .30 | 360.0 | .40 | 450.0 | .50 | .60 | 4.73 | |
| | | 2-1/2 | H-15 | 68.0 | 255.0 | .38 | 340.0 | .50 | 425.0 | .63 | .75 | 5.40 | |
| | | 3 | H-16 | 54.4 | 244.8 | .45 | 326.4 | .60 | 408.0 | .75 | .90 | 5.57 | |
| | | 3-1/2 | H-17 | 45.6 | 239.4 | .53 | 319.2 | .70 | 399.0 | .88 | 1.05 | 6.13 | |
| | | 4 | H-18 | 40.0 | 240.0 | .60 | 320.0 | .80 | 400.0 | 1.00 | 1.20 | 6.68 | |
| | | 4-1/2 | H-19 | 35.2 | 237.6 | .68 | 316.8 | .90 | 396.0 | 1.13 | 1.35 | 7.36 | |
| | | 5 | H-20 | 31.2 | 234.0 | .75 | 312.0 | 1.00 | 390.0 | 1.25 | 1.50 | 8.31 | |
| | | 5-1/2 | H-20-A | 28.8 | 237.6 | .83 | 316.8 | 1.10 | 396.0 | 1.38 | 1.65 | 8.92 | |
| 6 | H-21 | 25.6 | 230.4 | .90 | 307.2 | 1.20 | 384.0 | 1.50 | 1.80 | 9.62 | | | |
| 7 | H-21-A | 22.4 | 235.2 | 1.05 | 313.6 | 1.40 | 392.0 | 1.75 | 2.10 | 11.29 | | | |
| 8 | H-22 | 19.2 | 230.4 | 1.20 | 307.2 | 1.60 | 384.0 | 2.00 | 2.40 | 12.80 | | | |
| 12 | H-22-A | 12.0 | 216.0 | 1.80 | 288.0 | 2.40 | 360.0 | 3.00 | 3.60 | 19.62 | | | |
| 1-1/4 | 5/8 | 1-1/2 | H-36 | 212.0 | 477.0 | .23 | 636.0 | .30 | 795.0 | .38 | .45 | 5.41 | |
| | | 1-3/4 | H-36-A | 181.6 | 476.7 | .26 | 635.6 | .35 | 794.5 | .44 | .53 | 5.95 | |
| | | 2 | H-37 | 149.6 | 448.8 | .30 | 598.4 | .40 | 748.0 | .50 | .60 | 6.11 | |
| | | 2-1/2 | H-38 | 117.6 | 441.0 | .38 | 588.0 | .50 | 735.0 | .63 | .75 | 6.77 | |
| | | 3 | H-39 | 95.2 | 428.4 | .45 | 571.2 | .60 | 714.0 | .75 | .90 | 7.56 | |
| | | 3-1/2 | H-40 | 75.2 | 394.8 | .53 | 526.4 | .70 | 658.0 | .88 | 1.05 | 8.40 | |
| | | 4 | H-41 | 66.4 | 398.4 | .60 | 531.2 | .80 | 664.0 | 1.00 | 1.20 | 9.40 | |
| | | 4-1/2 | H-42 | 58.4 | 394.2 | .68 | 525.6 | .90 | 657.0 | 1.13 | 1.35 | 10.93 | |
| | | 5 | H-43 | 53.0 | 397.5 | .75 | 530.0 | 1.00 | 662.5 | 1.25 | 1.50 | 11.51 | |
| | | 5-1/2 | H-44 | 47.2 | 389.4 | .83 | 519.2 | 1.10 | 649.0 | 1.38 | 1.65 | 12.97 | |
| | | 6 | H-45 | 42.4 | 381.6 | .90 | 508.8 | 1.20 | 636.0 | 1.50 | 1.80 | 14.07 | |
| | | 7 | H-46 | 36.8 | 386.4 | 1.05 | 515.2 | 1.40 | 644.0 | 1.75 | 2.10 | 16.68 | |
| 8 | H-47 | 32.8 | 393.6 | 1.20 | 524.8 | 1.60 | 656.0 | 2.00 | 2.40 | 19.77 | | | |
| 10 | H-48 | 25.6 | 384.0 | 1.50 | 512.0 | 2.00 | 640.0 | 2.50 | 3.00 | 24.79 | | | |
| 12 | H-48-A | 20.8 | 374.4 | 1.80 | 499.2 | 2.40 | 624.0 | 3.00 | 3.60 | 31.56 | | | |
| 1-1/2 | 3/4 | 2 | H-49 | 190.4 | 571.2 | .30 | 761.6 | .40 | 952.0 | .50 | .60 | 8.67 | |
| | | 2-1/2 | H-50 | 155.0 | 581.3 | .38 | 775.0 | .50 | 968.8 | .63 | .75 | 9.80 | |
| | | 3 | H-51 | 130.0 | 585.0 | .45 | 780.0 | .60 | 975.0 | .75 | .90 | 11.29 | |
| | | 3-1/2 | H-52 | 106.4 | 558.6 | .53 | 744.8 | .70 | 931.0 | .88 | 1.05 | 12.42 | |
| | | 4 | H-53 | 91.2 | 547.2 | .60 | 729.6 | .80 | 912.0 | 1.00 | 1.20 | 13.91 | |
| | | 4-1/2 | H-54 | 78.4 | 529.2 | .68 | 705.6 | .90 | 882.0 | 1.13 | 1.35 | 15.61 | |
| | | 5 | H-55 | 71.2 | 534.0 | .75 | 712.0 | 1.00 | 890.0 | 1.25 | 1.50 | 16.96 | |
| | | 5-1/2 | H-55-A | 64.0 | 528.0 | .83 | 704.0 | 1.10 | 880.0 | 1.38 | 1.65 | 18.86 | |
| | | 6 | H-56 | 58.4 | 525.6 | .90 | 700.8 | 1.20 | 876.0 | 1.50 | 1.80 | 20.47 | |
| | | 7 | H-56-A | 49.6 | 520.8 | 1.05 | 694.4 | 1.40 | 868.0 | 1.75 | 2.10 | 23.40 | |
| | | 8 | H-57 | 43.2 | 518.4 | 1.20 | 691.2 | 1.60 | 864.0 | 2.00 | 2.40 | 26.80 | |
| | | 10 | H-58 | 34.4 | 516.0 | 1.50 | 688.0 | 2.00 | 860.0 | 2.50 | 3.00 | 33.80 | |
| 12 | H-58-A | 28.8 | 518.4 | 1.80 | 691.2 | 2.40 | 864.0 | 3.00 | 3.60 | 40.91 | | | |

Die Springs - Gold

| Heavy Duty Die Springs - Gold | | | | | | | | | | | | |
|-------------------------------|---------------|------------------|-------------|----------------------------|-------------------------------------|----------|----------------------------------|----------|--|----------|------------------------------------|-------|
| Hole Dia. (in) | Rod Dia. (in) | Free Length (in) | Part Number | Load at 1/10 in. Def. (lb) | Load Deflection Table | | | | | | | Price |
| | | | | | For Optimum Life 15% free length | | For Long Life 20% free length | | Max. Operating Deflection 25% free length | | Max. Deflection 30% free length | |
| | | | | | Load lb. | Def. in. | Load lb. | Def. in. | Load lb. | Def. in. | Deflection in. | |
| 2 | 1 | 2-1/2 | H-70 | 260.0 | 975.0 | .38 | 1300.0 | .50 | 1625.0 | .63 | .75 | 16.06 |
| | | 3 | H-71 | 200.0 | 900.0 | .45 | 1200.0 | .60 | 1500.0 | .75 | .90 | 17.44 |
| | | 3-1/2 | H-72 | 170.0 | 892.5 | .53 | 1190.0 | .70 | 1487.5 | .88 | 1.05 | 19.36 |
| | | 4 | H-73 | 150.0 | 900.0 | .60 | 1200.0 | .80 | 1500.0 | 1.00 | 1.20 | 21.76 |
| | | 4-1/2 | H-74 | 120.0 | 810.0 | .68 | 1080.0 | .90 | 1350.0 | 1.13 | 1.35 | 24.32 |
| | | 5 | H-75 | 110.0 | 825.0 | .75 | 1100.0 | 1.00 | 1375.0 | 1.25 | 1.50 | 24.83 |
| | | 5-1/2 | H-76 | 100.0 | 825.0 | .83 | 1100.0 | 1.10 | 1375.0 | 1.38 | 1.65 | 26.53 |
| | | 6 | H-77 | 94.0 | 846.0 | .90 | 1128.0 | 1.20 | 1410.0 | 1.50 | 1.80 | 30.02 |
| | | 7 | H-79 | 82.0 | 861.0 | 1.05 | 1148.0 | 1.40 | 1435.0 | 1.75 | 2.10 | 33.51 |
| | | 8 | H-80 | 73.0 | 876.0 | 1.20 | 1168.0 | 1.60 | 1460.0 | 2.00 | 2.40 | 39.06 |
| | | 10 | H-82 | 55.0 | 825.0 | 1.50 | 1100.0 | 2.00 | 1375.0 | 2.50 | 3.00 | 50.43 |
| | | 12 | H-83 | 42.0 | 756.0 | 1.80 | 1008.0 | 2.40 | 1260.0 | 3.00 | 3.60 | 58.95 |



Common Die Spring Terminology

Hole Diameter: This identifies the outside diameter (OD) of the die spring. BMS 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. BMS 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 spring 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 die spring length after operating force has been applied.

Deflection: The amount of change in the 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 the 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 initial 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 millimeter of sectional area.