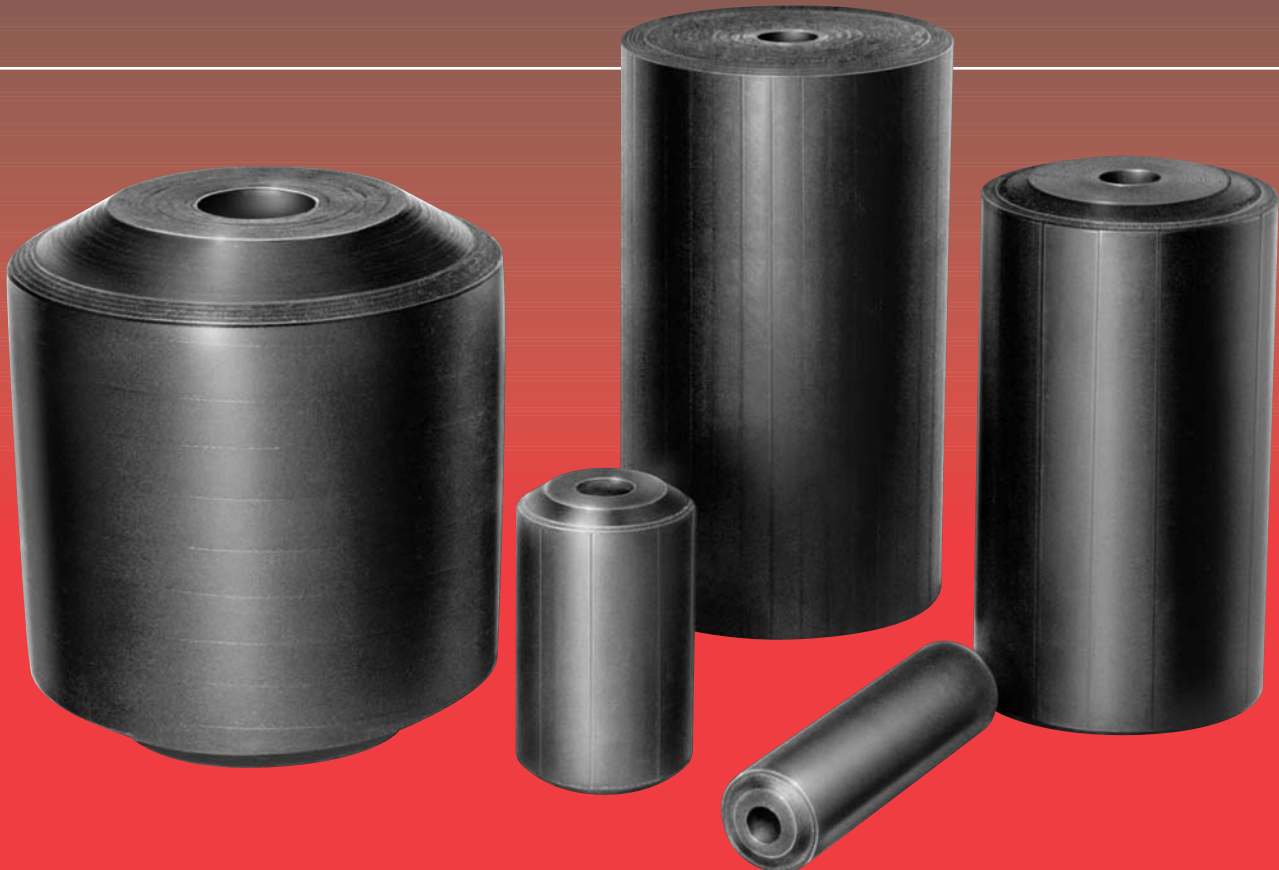


MARSH MELLOW[®]

SPRINGS



The new solution to vibration isolation problems

Increase productivity and reduce downtime with Marsh Mellow fabric & rubber springs.

Long life, simple mounting, fast replacement time, and virtually maintenance-free operation boost machine availability for greater productivity.

Marsh Mellow springs cannot break, trap particles, corrode, or bottom-out.

Each spring features a bias-ply fabric wrap for dependability and uniform performance.

The variable rate/ constant frequency of the spring allows each spring size to accommodate a wide load range and perform consis-

tently, whatever the load. Tough, quiet Marsh Mellow springs are a great new solution to those same old isolation problems.

Replace old-fashioned metal springs with fabric and rubber springs for long-lasting, low-cost isolation performance. Specify Marsh Mellow springs by Firestone.

Firestone

Firestone Marsh Mellow® spring Selection Guide

Marsh Mellow spring	Maximum Allowable Stroke @ 800 1200 CPM in/mm	UNLOADED SIZE			MINIMUM LOADING			MAXIMUM LOADING		
		Outside Diameter in/mm	Inside Diameter in/mm	Free Height in/mm	Minimum Loading lbs/kN	Compressed Height in/mm	Natural Frequency CPM/Hz	Maximum Loading lbs/kN	Compressed Height in/mm	Natural Frequency CPM/Hz
W22-358-0216	0.13 3	1½ 41	⅝ 16	1¾ 44	145 .64	1.50 38	414 6.9	315 1.4	1.27 32	304 5.1
W22-358-0222	0.26 7	1½ 41	⅝ 16	3½ 89	140 .62	2.98 76	279 4.7	320 1.4	2.54 65	253 4.2
W22-358-0031	0.38 10	3¼ 83	1 ¼ 32	5 127	400 1.78	4.25 108	251 4.2	900 4.0	3.63 92	186 3.1
W22-358-0183	0.30 8	3 76	1 25	4 102	410 1.82	3.25 83	197 3.3	680 3.0	2.90 74	242 4.0
W22-358-0047	0.30 8	3 76	1 25	4 102	420 1.87	3.40 86	174 2.9	910 4.0	2.90 74	161 2.7
W22-358-0030	0.23 6	3 76	1 25	3 76	475 2.11	2.55 65	293 4.9	925 4.1	2.18 55	216 3.6
W22-358-0180	0.45 11	4 102	2 51	6 152	530 2.36	5.10 130	218 3.6	1100 4.9	4.35 110	162 2.7
W22-358-0123	0.45 11	3½ 89	1 25	6 152	570 2.53	5.10 130	223 3.7	1225 5.4	4.35 110	165 2.8
W22-358-0178	0.45 11	4½ 114	2 51	6 152	720 3.20	5.10 130	235 3.9	1690 7.5	4.35 110	173 2.9
W22-358-0091	0.53 13	4½ 114	1 25	7 178	1120 4.98	5.95 151	213 3.6	2550 11.3	5.08 129	158 2.6
W22-358-0064	0.53 13	5 127	1 25	7 178	1400 6.22	5.95 151	210 3.5	2860 12.7	5.08 129	165 2.8
W22-358-0172	0.45 11	6 152	3 76	6 152	1400 6.22	5.10 130	208 3.5	3080 13.7	4.35 110	192 3.2
W22-358-0186	0.60 15	6½ 165	3 76	8 203	1530 6.8	6.80 173	195 3.3	3350 14.9	5.80 147	144 2.4
W22-358-0187	0.53 13	5½ 140	2 51	7 178	1540 6.84	5.95 151	182 3.0	3280 14.6	5.08 129	181 3.0
W22-358-0200	0.45 11	6 152	1 25	6 152	1765 7.84	5.10 130	232 3.9	4050 18.0	4.35 110	171 2.9
W22-358-0042	0.75 19	6 152	1 25	10 254	1980 8.8	8.50 216	175 2.9	4340 19.3	7.25 184	129 2.2
W22-358-0190	0.60 15	6½ 165	2 51	8 203	1990 8.84	6.80 173	186 3.1	4400 19.6	5.80 147	160 2.7
W22-356-0122	0.60 15	6 152	1 25	8 203	2180 9.69	6.80 173	192 3.2	4670 20.8	5.80 147	142 2.4
W22-358-0179	0.60 15	7½ 191	3½ 89	8 203	2300 10.22	6.80 173	180 3.0	5150 22.9	5.80 147	164 2.7
W22-358-0176	0.75 19	7½ 191	3½ 89	10 254	2300 10.22	8.50 216	175 2.9	5300 23.6	7.25 184	144 2.4
W22-358-0228	0.90 23	8 203	3½ 89	12 305	2700 12	10.20 259	158 2.6	5870 26.1	8.70 221	116 1.9
W22-358-0232	0.60 15	8 203	2 51	8 203	3300 14.67	6.80 173	188 3.1	7900 35.1	5.80 147	178 3.0
W22-358-0230	0.60 15	9 229	2 51	8 203	5200 23.11	6.80 173	182 3.0	11400 50.7	5.80 147	151 2.5
W22-358-0108	1.05 27	10 254	2 51	14 356	5500 24.44	11.90 302	148 2.5	12250 54.4	10.15 258	110 1.8
W22-358-0254	0.60 15	10 254	2 51	8 203	6600 29.33	6.80 173	199 3.3	15000 66.7	5.80 147	159 2.7
W22-358-0143	0.45 11	11 279	2 51	6 152	8200 36.44	5.10 130	220 3.7	20000 88.9	4.35 110	204 3.4
W22-358-0243	0.60 15	11 279	2 51	8 203	8300 36.89	6.80 173	195 3.3	18000 80.0	5.80 147	144 2.4

Advantages with Marsh Mellow® springs

Constant Vibration Isolation with Changing Loads

The variable spring rate allows for a nearly constant natural frequency with changing loads. This results in consistent vibration isolation with variable loading.

High Load Carrying Capacity

Due to the Marsh Mellow® spring's greater deflection capabilities and load carrying influences of the fabric reinforcement, it can carry a greater load when compared to an all rubber part of the same modulus and dimensions.

Excellent Vibration Isolation

Low natural frequencies provide excellent isolation of forced frequencies in the range of 800-1200 cycles per minute (13-20Hz).

Lateral Vibration Isolation

The lateral spring rate of a Marsh Mellow® spring can be less than the vertical spring rate, resulting in a lower lateral natural frequency. Marsh Mellow springs provide better vibration isolation in all degrees of freedom.

Compact Overall Size

The ability to support greater loads and maintain cylindrical shape results in a smaller overall size of the Marsh Mellow spring compared to an all rubber spring with identical load capacity. This is important when considering an application with a small design envelope.

Corrosion Resistant for a Durable, Long Life

Due to its rubber and fabric reinforced construction, the Marsh Mellow spring has been proven in the damp and corrosive environments of mines and mills where a standard coil spring will fail.

Does Not Bottom-Out

Due to the rubber construction, Marsh Mellow springs do not bottom-out like coil springs. Bottoming-out under overload or surge load sends a large amount of stress to all of the machine's components.

Eliminates Downtime and Potential Damage to Machinery

When a coil spring fails, it will often crack, allowing fragments of the coil to damage equipment. This problem is eliminated with the rubber construction of Marsh Mellow springs. Additionally, Marsh Mellow springs exhibit exceptionally high overload characteristics and usually do not fail catastrophically, offering some support even during failure.

Increased Stability at Higher Percentages of Compression

Rubber is an incompressible fluid which will flow to the path of least resistance. In a Marsh Mellow spring, as the height compresses, the fabric reinforced rubber plies pantograph and the diameter grows. This supports the rubber core laterally, even at 30-40% compression.

Effective Noise Reduction

Marsh Mellow springs reduce structurally transmitted noise caused by vibration. Marsh Mellow springs are quiet, unlike steel springs which often suffer coil chatter and readily transmit high frequency structural noise.

Low Cost

The Marsh Mellow spring's high load capability means fewer springs may be needed in an application, resulting in less overall cost.

Maintenance Free

Marsh Mellow springs have no moving parts. No maintenance or lubrication is required.

Precautions with Marsh Mellow® springs

Temperature

Our standard industrial Marsh Mellow springs have an operating range of -40°F to 135°F (-40°C to 57°C). The upper limit is defined by the actual rubber temperature during operation. High frequency inputs or large deflections will cause the rubber temperature to increase.

Design Envelope

Adequate clearance should be provided around the Marsh Mellow spring to prevent rubbing of the outer cover. The outside diameter of the spring at various heights is listed in the table of dynamic characteristics on each individual data page.

Contaminates

Shielding should be used to protect the rubber from exposure to hot metal, petroleum base fluids, acids, etc. Please consult Firestone if you wish to know how the spring will withstand a specific contaminate. For liquids such as acids, it is important to know both concentration and temperature.

Storage

The best storage environment is a dark, dry area at normal room temperature.

Percent Compression

The general compression range of a Marsh Mellow spring is 15% to 27%, however, this value may vary somewhat among springs and applications. Always follow the load ranges and their corresponding compression percentages as shown in the selection guide.

Allowable Stroke

When applying a Marsh Mellow spring, the stroke throughout the range of motion of the machine being isolated must be considered. Delta strain, defined as the ratio of the stroke to the free length, is restricted to less than 7.5%.

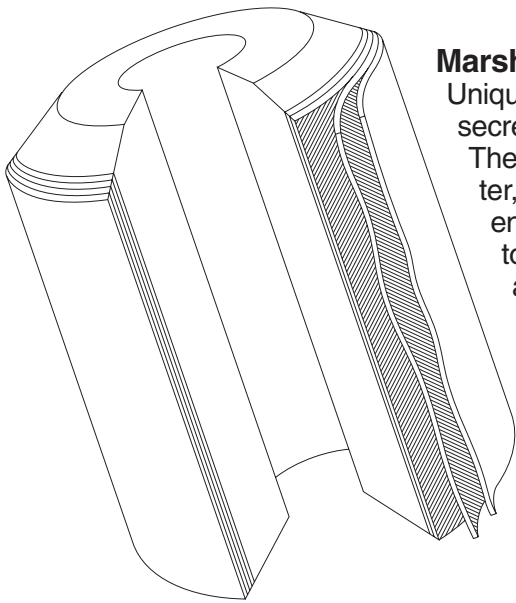
Note that a given stroke is typical of vibrating screen types of applications, where the stroke is designed into the system. In other isolation applications, this stroke may not be known. The stroke is typically not excessive in standard isolation applications but should be considered. Consult Firestone for assistance.

Disturbing Frequency Range

Marsh Mellow springs are suitable for disturbing frequencies in the 800-1200 CPM (13-20HZ) range for medium stroke applications. High frequency high stroke applications may lead to overheating the Marsh Mellow spring. Low stroke applications, however, are capable of handling higher disturbing frequencies. Please consult Firestone with specific applications.

Lateral Stability

The lateral spring rate to load ratio for a Marsh Mellow spring decreases as deflection increases. This is one reason it is important not to exceed the given load capabilities.

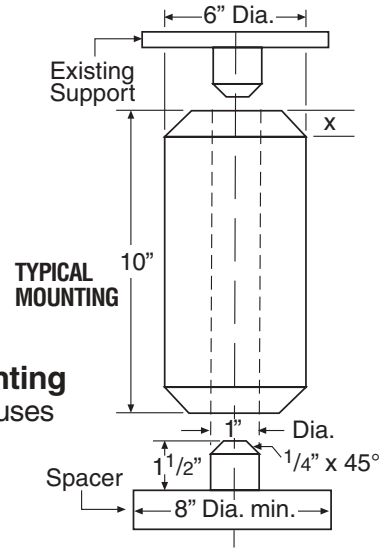


Marsh Mellow spring construction-

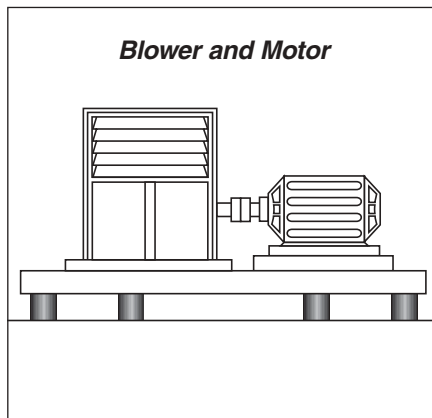
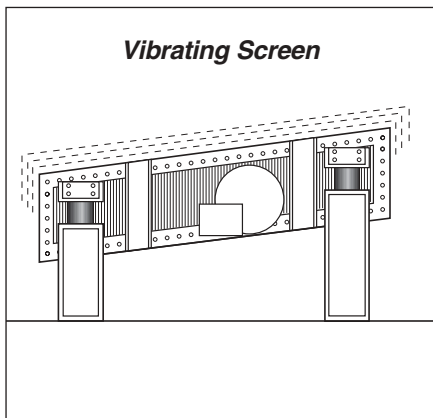
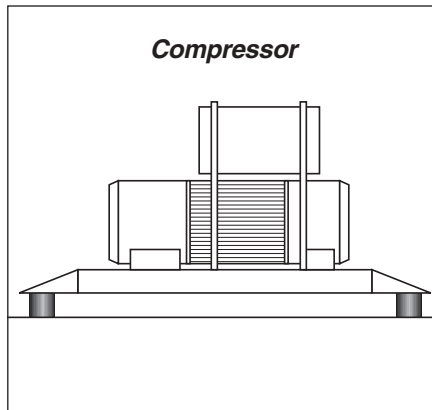
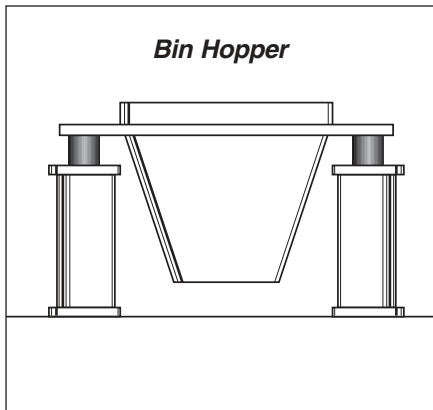
Unique construction elements are the secret of the spring's design flexibility. The solid rubber core with hollow center, bias-ply fabric wrap, and tapered ends, may be varied and combined to meet specific load and performance requirements.

Marsh Mellow spring mounting

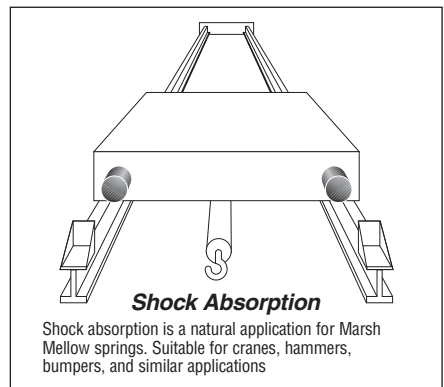
Installation is simple, fast, and uses a minimum of space. Normally, a spacer and two pins are all that's required.



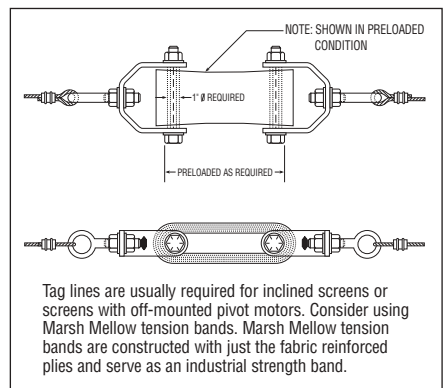
Vibration Isolation



Shock Impact



Tag Line



Distributed by:

Norman Equipment Co
800-250-8891

Firestone

World's Number 1
Air Spring.

FIRESTONE INDUSTRIAL PRODUCTS COMPANY

www.normanequipment.com