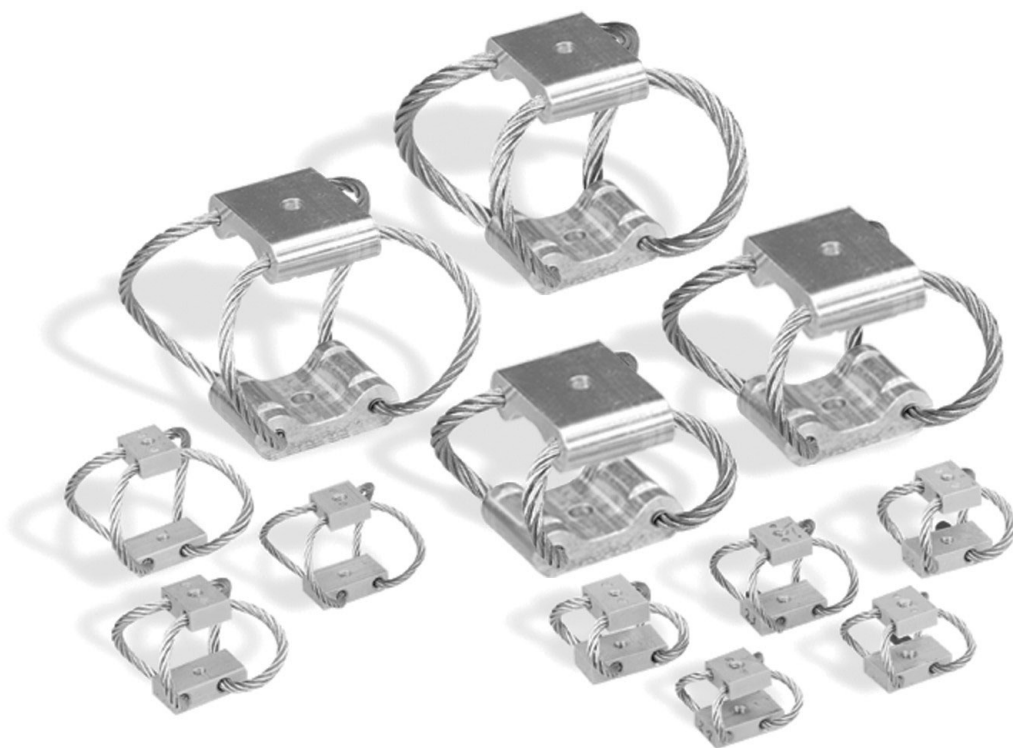


Overview



U.S. Patents 6,290,217
6,244,579

Compact Wire Rope Isolators

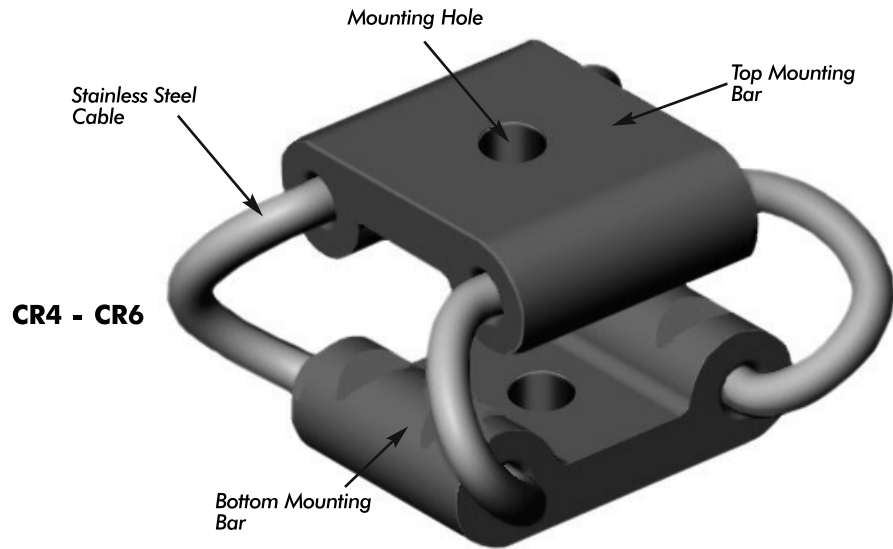
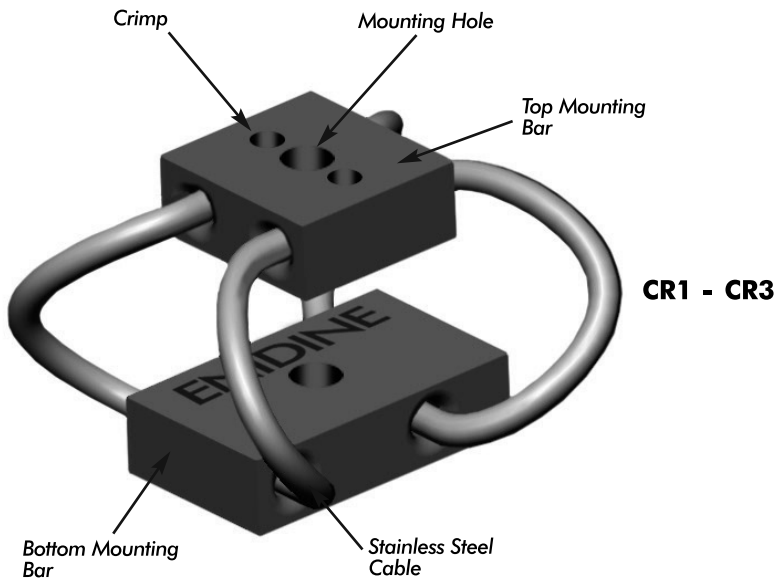
For the best in vibration isolation capabilities, choose Enidine's Compact Wire Rope Isolators. Smaller than traditional wire ropes, these unique isolators provide cost-effective, simultaneous shock and vibration attenuation where package space is at a premium.

Enidine Compact Wire Rope Isolators feature an easy, single-point installation, which allows them to be installed in virtually any application. Their small size also permits the isolation of individual system components, making them ideal for use in sensitive equipment and electronics. Just as with our standard Enidine Wire Rope Isolators, Enidine Compact Wire Rope Isolators feature a patented, all-metal design and components that ensure maximum reliability, regardless of temperature or substrate requirement, and that can help meet MILSPECS similar to those of our Wire Rope Isolator series. Please refer to our "Compact Wire Rope Isolator Sizing Information" on pages 37-38 for more information.

If your application is outside the standard Compact Wire Rope Isolator product range, please consult the standard Wire Rope Isolator or HERM portions of this catalog. If a standard solution is still not available, Enidine engineers can design an isolator to suit your specifications.

For further information on Enidine Wire Rope, HERM and Compact Wire Rope Isolator products, technical assistance and pricing, please contact Enidine or your nearest authorized distributor. A list of Enidine distributors can be found by visiting our website at www.enidine.com.

Overview



Overview

Application Worksheet

Materials and Finishes:

Standard: Wire Rope: 302/304 Stainless Steel
Mount Bars: 6061-T6 Aluminum, Chemical Conversion Coated per MIL-C-5541, Class 1A
Threads: Tapped

Optional: Mount Bars: 6061-T6 Aluminum, Anodized per MIL-A-8625, Type II, Class 1
302/304 Stainless Steel per ASTM A276, Passivated

Special: Consult Enidine

Isolator Options:

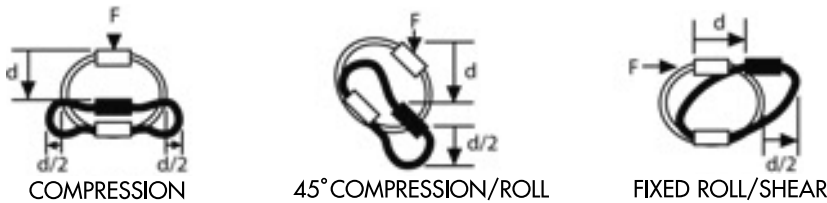
Mounting: Enidine offers a full range of mounting combinations of thru-hole, countersunk, and threaded bars. All configurations are available in either Imperial or Metric styles. Add an "M" after the mounting option for Metric. Some models have reduced mounting options available due to limited fastener installation space. Consult Enidine if a preferred mounting configuration is not listed.

Bellmouth: The bellmouth feature includes mount bars with radii manufactured into the wire rope hole edges. This option is recommended for high fatigue applications. Compact rope models (CR1 - CR6) include this feature as the standard.

Performance:

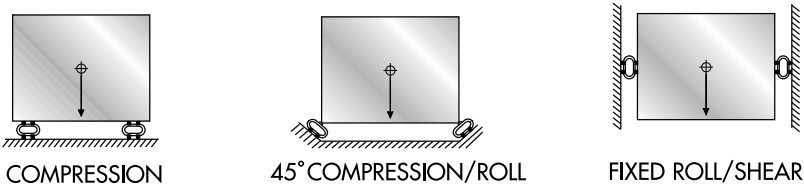
Stiffness (Kv or Ks):
Compact wire rope isolators exhibit non-linear stiffness behavior. Small deflections, usually associated with vibration isolation, will have a different spring rate than larger shock deflections. Enidine publishes typical vibration stiffness values (Kv), and average shock stiffness values (Ks) within the catalog. These values can be used with the provided equations listed on Page 36 to predict system performance.

Isolator Axes:
Compact wire rope isolators are multi-axis isolators. The diagram below includes load axis definitions and deflection considerations.



Damping: Typically 5-15%, depending on size and input level. For specific damping considerations, please consult Enidine.

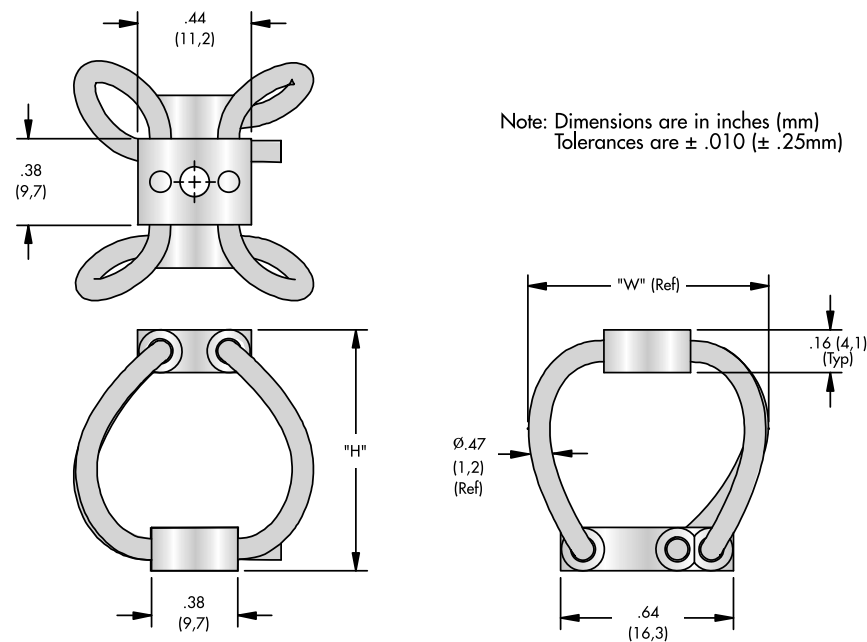
Mounting Orientation:
The diagrams below illustrate typical mounting orientations.



Stabilizers:
Stabilizers are used to control deflections of tall supported masses. Stabilizers are typically recommended when the height equals 2-times the width or depth dimension. In most applications, the quantity of stabilizers required are half as many as the base isolators, and selected one size softer than the base isolators.

APPLICATION WORKSHEET - INPUTS IMPERIAL/METRIC		
	IMPERIAL	METRIC
PART I: SYSTEM DATA:		
1. Total Supported Load (Wt):	Wt = _____ lbs. Wt = _____ Kg x 9.81 = _____ N	
2. Number of Isolators (n):	n = _____	
3. Static Load per Isolator (W):	W = $\frac{Wt}{n}$	W = _____ lbs.* W = _____ N*
* Assumes a central CG		
4. Load Axis: Compression Shear or Roll 45° Compression/Roll	Load Axis	Load Axis
PART II: VIBRATION SIZING:		
1. Input Excitation Frequency	$f_i = \text{_____ Hz} \left(= \frac{\text{rpm}}{60} \right)$	
2. System Response Natural Frequency for 80% isolation:	$f_n = \frac{f_i}{3.0} = \text{_____ Hz}$	
3. Maximum Isolator Vibration Stiffness: (Kv)	$K_v = \frac{W (2\pi f_n)^2}{g}$ $g = 386 \text{ in./sec}^2 \text{ or } 9.81 \text{ m/sec}^2$	Kv = _____ lbs./in. Kv = _____ N/m
4. Select an isolator by comparing calculated values with technical data for the desired load axis provided in tables for each isolator. a.) Calculated "W" must be less than the isolator's max static load and b.) Isolator's vibration stiffness must be less than the calculated maximum Kv		
PART III: SHOCK SIZING:		
1. Maximum Allowable Transmitted Acceleration:	A _T = _____ Gs	
2. Shock Input Velocity:	V = _____ in./sec. V = _____ m/sec. Free Fall Impact: $V = \sqrt{2gh}$ $g = 386 \text{ in./sec}^2 \text{ or } 9.81 \text{ m/sec}^2$ h = Drop Height (in. or m)	
3. Min. Isolator Response Deflection:	$D_{min} = \frac{V^2}{g(A_T)}$	D _{min} = _____ in. D _{min} = _____ m
4. Maximum Isolator Shock Stiffness:	$K_s = \frac{W(V/D_{min})^2}{g}$	K _s = _____ lbs./in. K _s = _____ N/m
5. Select an isolator by comparing calculated values with technical data for the desired load axis provided in tables for each isolator. a.) Calculated "W" must be less than the isolator's max static load and b.) Calculated D _{min} must be less than the isolator's max deflection Note: Metric deflections are calculated in meters (m) and technical data is in millimeters (mm). and c.) Isolator's shock stiffness must be less than calculated maximum "K _s "		
6. Check actual deflection using "K _s " from technical data to ensure that the isolator's max deflection is not exceeded.	$D_{actual} = \sqrt{\frac{V}{K_s(\text{Isolator})g}}$	D _{actual} = _____ in. D _{actual} = _____ m
7. If isolator's max deflection is exceeded, select another isolator and repeat steps 5 and 6.		

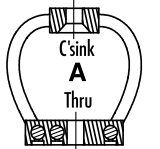
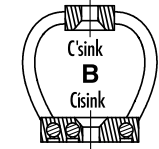
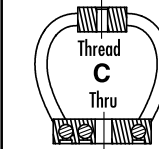
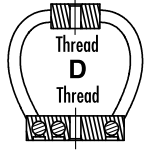
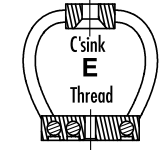
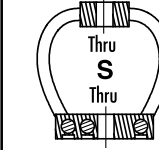
Technical Data



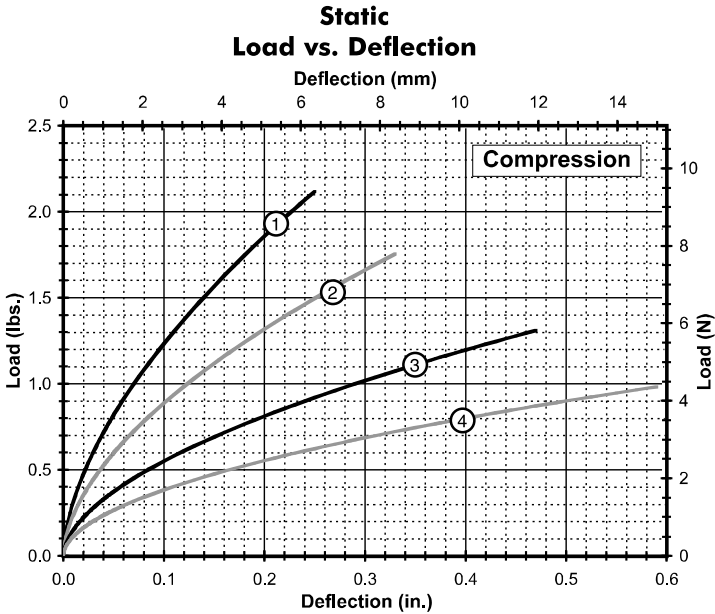
Size	Height "H" in. (mm)	Width (Ref) "W" in. (mm)	Unit Weight oz (g)	Mounting Options	Thru Hole in. (mm)	Thread in. (mm)	C'sink Imperial (Metric)
CR1-100	0.66 (17)	± .06 (± 1,52)	0.11 (3,1)	A, B, C, D, E, S	Ø .130 (Ø 3,30)	#4-40 UNC (M3 X 0,5)	82° (90°)
CR1-200	0.75 (19)		0.11 (3,1)				
CR1-300	0.90 (23)		0.12 (3,4)				
CR1-400	1.04 (26)		0.12 (3,4)				

Model Number Ordering Code	
CR1 - 400 - D M P	
Mount Bar Options:	*[] - 6061-T6 AL ALY (or Equiv.) Chem Conv. Coated [Y] - 6061-T6 AL ALY (or Equiv.) Anodized [P] - 302/304 Stainless Steel (or Equiv.) Passivated
Add "M" for Metric	For C'sink and Threaded Options
Mounting Options:	See Chart
Isolator Size:	See Sizing Table

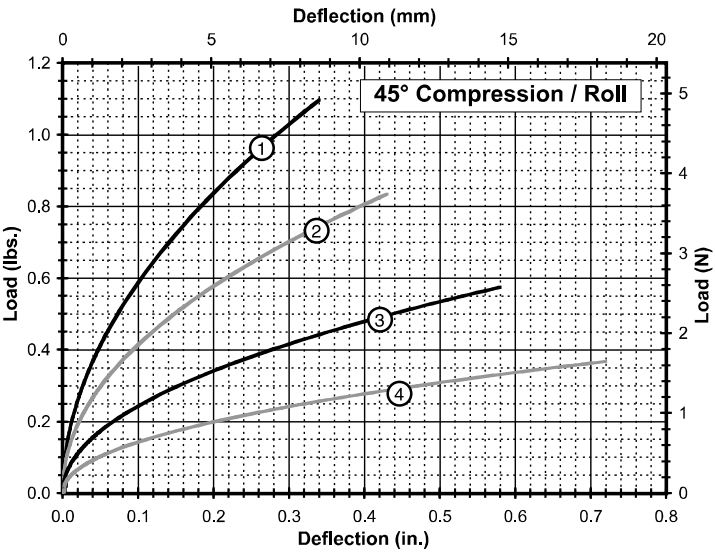
* Standard features. Any non-standard items may require longer lead times. Call for quotation.

Mounting Options		
		
		
- Maximum recommended torque for tapped aluminum bar is 10 in.-lbs. (1,2 Nm) - Wire Rope Material: Stranded 300 series stainless steel - Operating Temperature Range: -150°F to 500°F (-100°C to 260°C) - U.S. Patent 6,290,217		

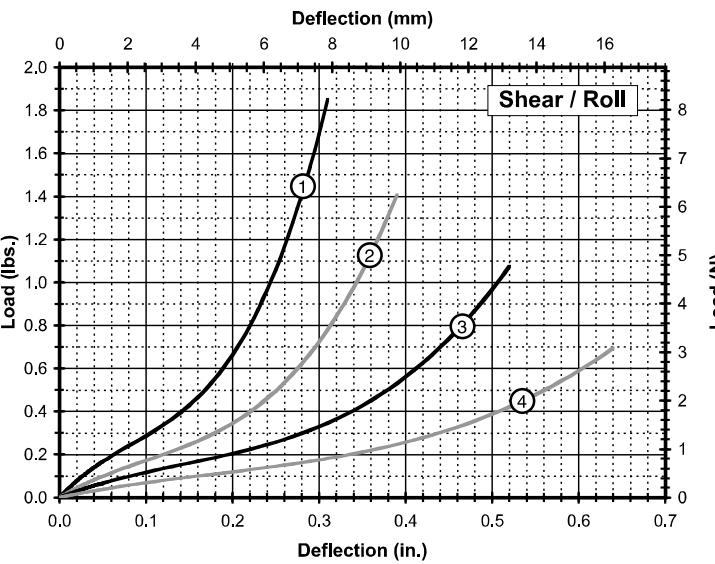
Technical Data



Curve	Model	Max Static Load Lbs. (N)	Max Deflection in. (mm)	Kv (vibration) Lbs./in. (kN/m)	Ks (shock) Lbs./in. (kN/m)
1	CR1-100	0.75 (3,3)	0.25 (6,4)	22 (3,9)	11 (1,9)
2	CR1-200	0.55 (2,4)	0.33 (8,4)	16 (2,8)	7.0 (1,2)
3	CR1-300	0.40 (1,8)	0.47 (11,9)	10 (1,75)	3.5 (0,61)
4	CR1-400	0.30 (1,3)	0.59 (15,0)	7.5 (1,31)	2.2 (0,39)



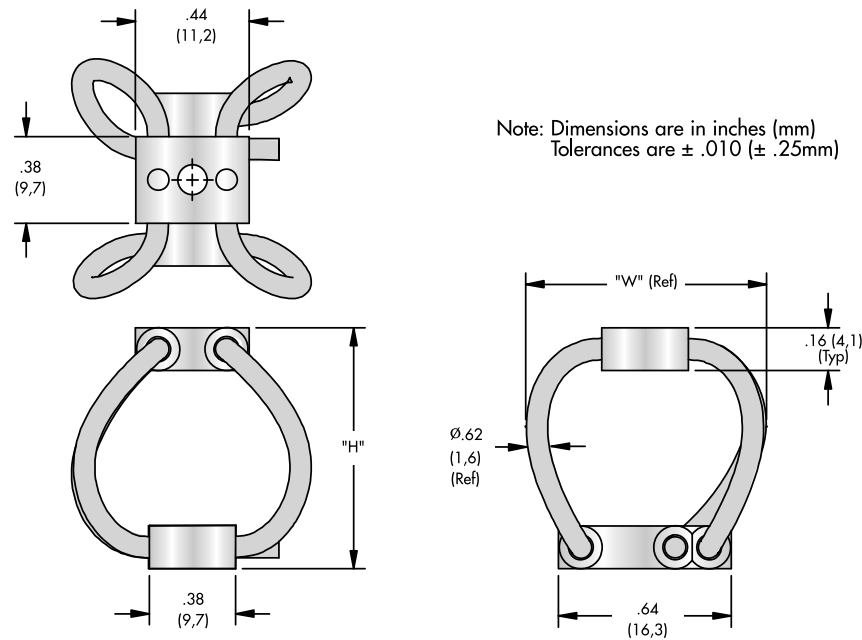
Curve	Model	Max Static Load Lbs. (N)	Max Deflection in. (mm)	Kv (vibration) Lbs./in. (kN/m)	Ks (shock) Lbs./in. (kN/m)
1	CR1-100	0.35 (1,6)	0.34 (8,6)	12 (2,1)	4.5 (0,79)
2	CR1-200	0.25 (1,1)	0.43 (10,9)	8.5 (1,5)	2.5 (0,44)
3	CR1-300	0.17 (0,76)	0.58 (14,7)	5.0 (0,88)	1.5 (0,26)
4	CR1-400	0.11 (0,49)	0.72 (18,3)	3.0 (0,53)	0.7 (0,12)



Curve	Model	Max Static Load Lbs. (N)	Max Deflection in. (mm)	Kv (vibration) Lbs./in. (kN/m)	Ks (shock) Lbs./in. (kN/m)
1	CR1-100	0.25 (1,1)	0.31 (7,9)	4.0 (0,70)	4.0 (0,70)
2	CR1-200	0.20 (0,89)	0.39 (9,9)	2.5 (0,44)	2.5 (0,44)
3	CR1-300	0.16 (0,71)	0.52 (13,2)	1.5 (0,26)	1.5 (0,26)
4	CR1-400	0.12 (0,53)	0.64 (16,3)	0.8 (0,13)	0.8 (0,13)

Note: Do not extrapolate plotted curves.

Technical Data



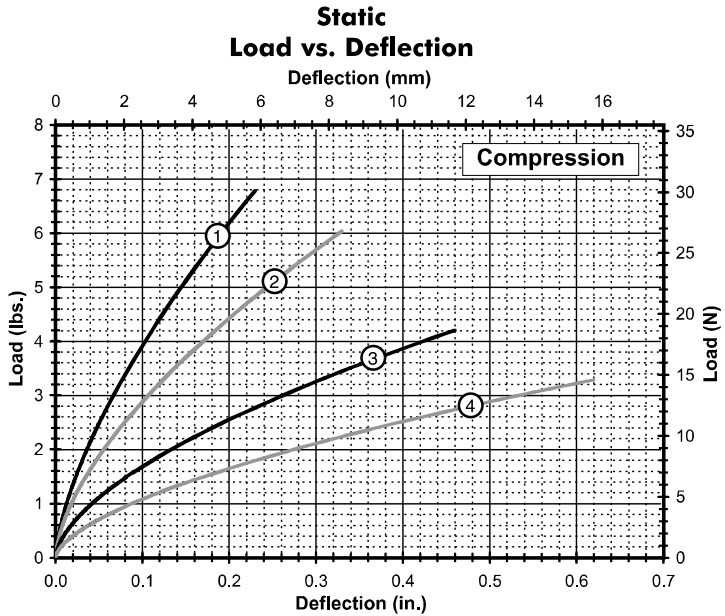
Size	Height "H" in. (mm)	Width (Ref) "W" in. (mm)	Unit Weight oz (g)	Mounting Options	Thru Hole in. (mm)	Thread in. (mm)	C'sink Imperial (Metric)
CR2-100	0.64 (16)	± .06 (± 1,52)	0.13 (3,7)	A, B, C, D, E, S	∅ .130 (∅ 3.30)	#4-40 UNC (M3 X 0,5)	82° (90°)
CR2-200	0.75 (19)		0.14 (4,0)				
CR2-300	0.89 (23)		0.15 (4,3)				
CR2-400	1.07 (27)		0.16 (4,5)				

Model Number Ordering Code			
CR2 - 400 - D M P	Mount Bar Options:	*[] - 6061-T6 AL ALY (or Equiv.) Chem Conv. Coated	
		[Y] - 6061-T6 AL ALY (or Equiv.) Anodized	
		[P] - 302/304 Stainless Steel (or Equiv.) Passivated	
	Add "M" for Metric	For C'sink and Threaded Options	
	Mounting Options:	See Chart	
	Isolator Size:	See Sizing Table	

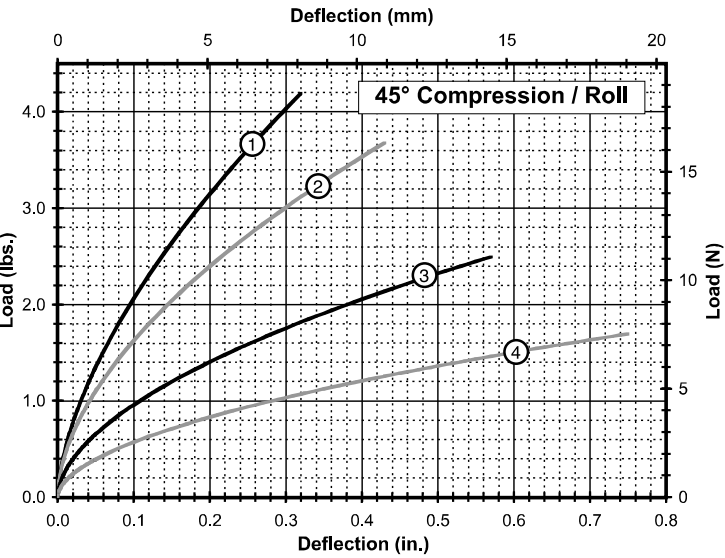
* Standard features. Any non-standard items may require longer lead times. Call for quotation.

Mounting Options		
- Maximum recommended torque for tapped aluminum bar is 13 in.-lbs. (1,5 Nm) - Wire Rope Material: Stranded 300 series stainless steel - Operating Temperature Range: -150°F to 500°F (-100°C to 260°C) - U.S. Patent 6,290,217		

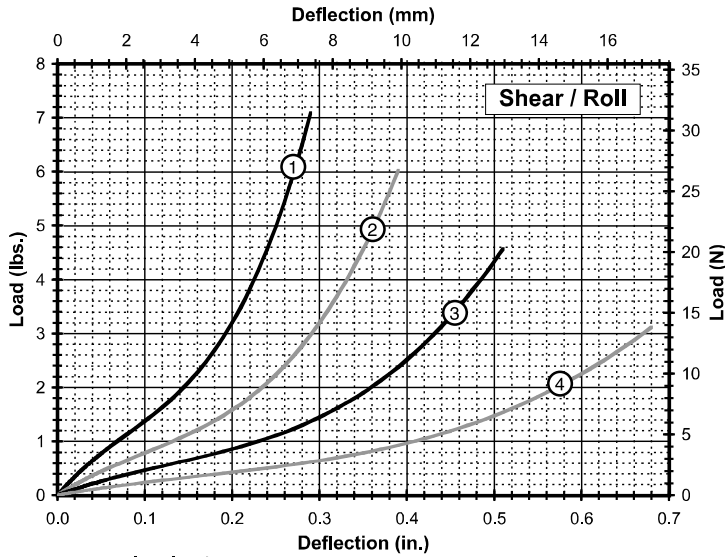
Technical Data



Curve	Model	Max Static Load Lbs. (N)	Max Deflection in. (mm)	Kv (vibration) Lbs./in. (kN/m)	Ks (shock) Lbs./in. (kN/m)
1	CR2-100	2.6 (12)	0.23 (5,8)	65 (11)	35 (6,1)
2	CR2-200	2.1 (9,3)	0.33 (8,4)	50 (8,8)	23 (4,0)
3	CR2-300	1.5 (6,7)	0.46 (11,7)	30 (5,3)	11 (1,9)
4	CR2-400	1.1 (4,9)	0.62 (15,7)	20 (3,5)	7 (1,2)



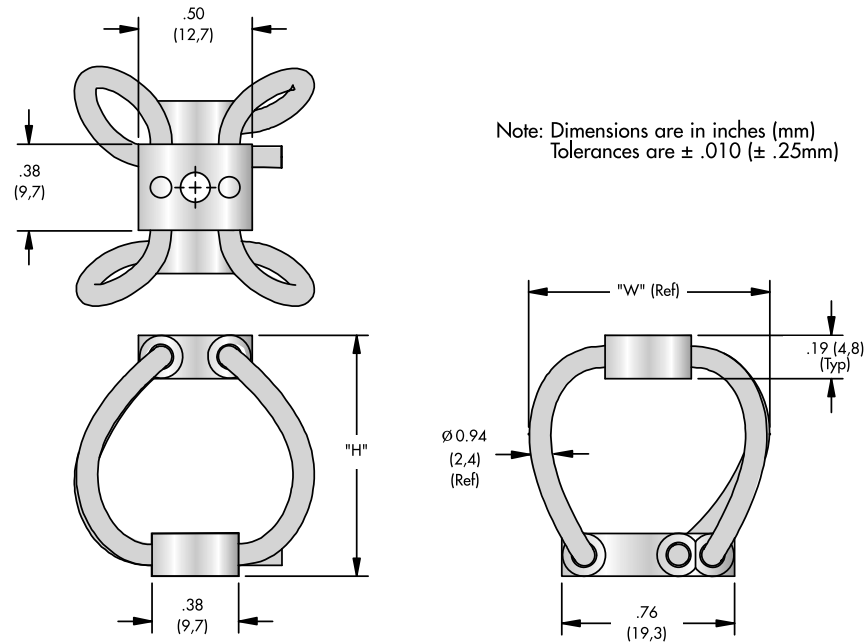
Curve	Model	Max Static Load Lbs. (N)	Max Deflection in. (mm)	Kv (vibration) Lbs./in. (kN/m)	Ks (shock) Lbs./in. (kN/m)
1	CR2-100	1.3 (5,8)	0.32 (8,1)	35 (6,1)	16 (2,8)
2	CR2-200	1.1 (4,9)	0.43 (10,9)	30 (5,3)	11 (1,9)
3	CR2-300	0.75 (3,3)	0.57 (14,5)	18 (3,2)	6 (1,0)
4	CR2-400	0.50 (2,2)	0.75 (19,1)	11 (1,9)	3 (0,51)



Curve	Model	Max Static Load Lbs. (N)	Max Deflection in. (mm)	Kv (vibration) Lbs./in. (kN/m)	Ks (shock) Lbs./in. (kN/m)
1	CR2-100	1.3 (5,6)	0.29 (7,4)	17 (3,0)	17 (3,0)
2	CR2-200	0.90 (4,0)	0.39 (9,9)	10 (1,8)	10 (1,8)
3	CR2-300	0.65 (2,9)	0.51 (13,0)	6 (1,1)	6 (1,1)
4	CR2-400	0.45 (2,0)	0.68 (17,3)	3 (0,53)	3 (0,53)

Note: Do not extrapolate plotted curves.

Technical Data



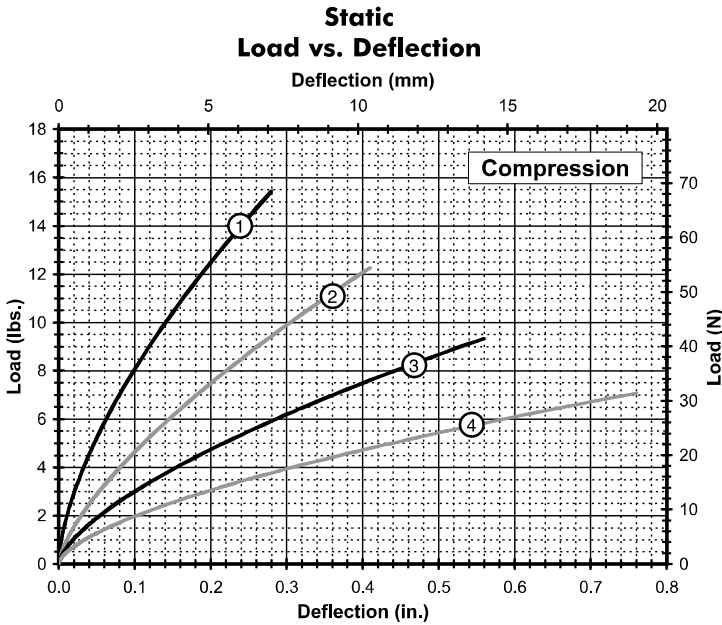
Size	Height "H" in. (mm)	Width (Ref) "W" in. (mm)	Unit Weight OZ (g)	Mounting Options	Thru Hole in. (mm)	Thread in. (mm)	C'sink Imperial (Metric)
CR3-100	0.75 (19)	± .06 (± 1,52)	0.88 (22)	A, B, C, D, E, S	Ø .130 (Ø 3,30)	#4-40 UNC (M3 X 0,5)	82° (90°)
CR3-200	0.90 (23)		0.20 (5,7)				
CR3-300	1.06 (27)		0.22 (6,2)				
CR3-400	1.28 (33)		0.24 (6,8)				
			0.26 (7,4)				

Model Number Ordering Code			
CR3 - 400 - D M P	Mount Bar Options:	*[] - 6061-T6 AL ALY (or Equiv.) Chem Conv. Coated	
		[Y] - 6061-T6 AL ALY (or Equiv.) Anodized	
		[P] - 302/304 Stainless Steel (or Equiv.) Passivated	
	Add "M" for Metric	For C'sink and Threaded Options	
	Mounting Options:	See Chart	
	Isolator Size:	See Sizing Table	

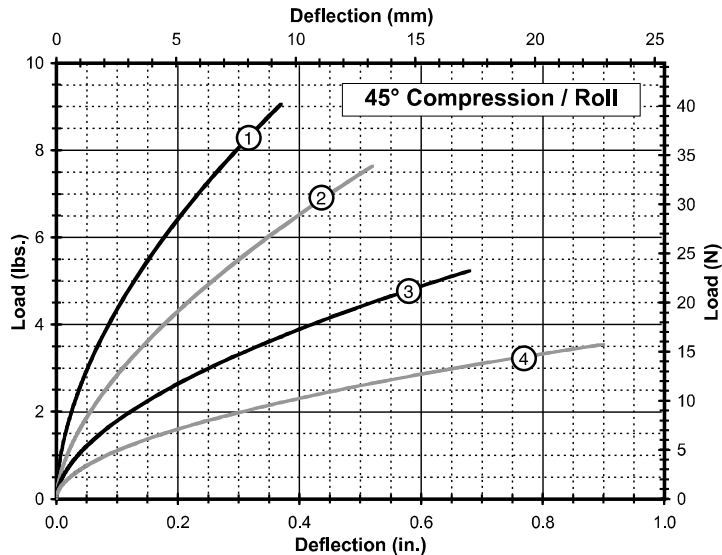
* Standard features. Any non-standard items may require longer lead times. Call for quotation.

Mounting Options		
• Maximum recommended torque for tapped aluminum bar is 13 in.-lbs. (1,5 Nm) • Wire Rope Material: Stranded 300 series stainless steel • Operating Temperature Range: -150°F to 500°F (-100°C to 260°C) • U.S. Patent 6,290,217		

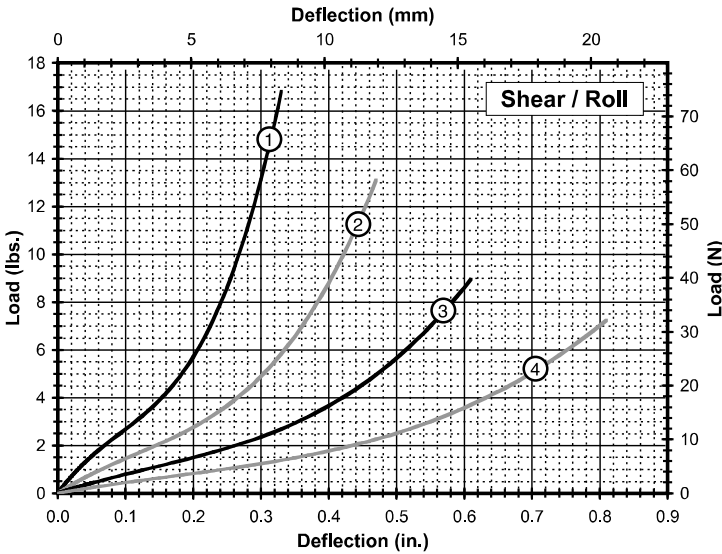
Technical Data



Curve	Model	Max Static Load Lbs. (N)	Max Deflection in. (mm)	Kv (vibration) Lbs./in. (kN/m)	Ks (shock) Lbs./in. (kN/m)
1	CR3-100	6.5 (29)	0.28 (7,1)	135 (24)	68 (12)
2	CR3-200	5.0 (22)	0.41 (10,4)	70 (12)	35 (6,1)
3	CR3-300	4.0 (18)	0.56 (14,2)	48 (8,4)	20 (3,5)
4	CR3-400	2.5 (11)	0.76 (19,3)	33 (5,8)	11 (1,9)



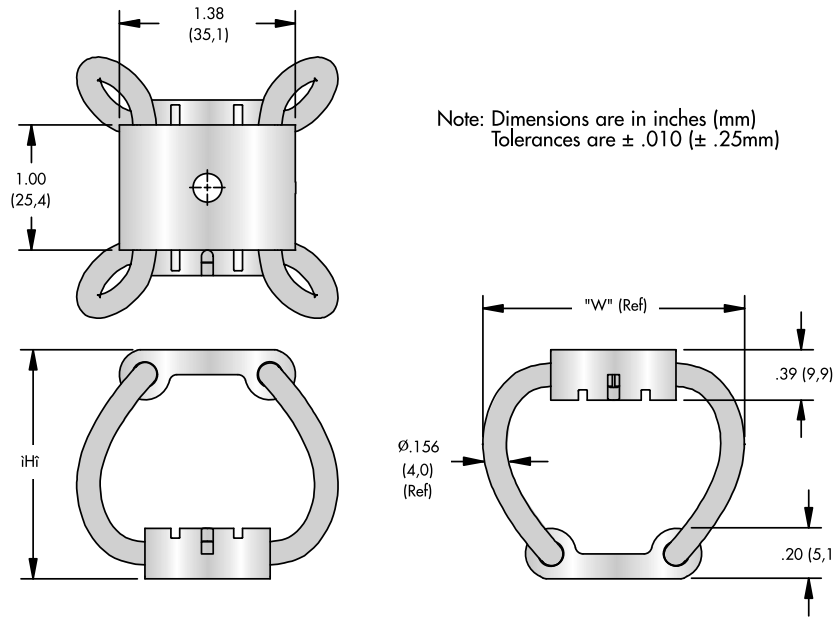
Curve	Model	Max Static Load Lbs. (N)	Max Deflection in. (mm)	Kv (vibration) Lbs./in. (kN/m)	Ks (shock) Lbs./in. (kN/m)
1	CR3-100	2.7 (12)	0.37 (9,4)	80 (14)	30 (5,3)
2	CR3-200	2.3 (10)	0.52 (13,2)	50 (8,8)	18 (3,2)
3	CR3-300	1.5 (6,7)	0.68 (17,3)	33 (5,8)	10 (1,8)
4	CR3-400	1.0 (4,4)	0.90 (22,9)	20 (3,5)	5 (0,91)



Curve	Model	Max Static Load Lbs. (N)	Max Deflection in. (mm)	Kv (vibration) Lbs./in. (kN/m)	Ks (shock) Lbs./in. (kN/m)
1	CR3-100	2.7 (12)	0.33 (8,4)	35 (6,1)	35 (6,1)
2	CR3-200	1.9 (8,5)	0.47 (11,9)	20 (3,5)	20 (3,5)
3	CR3-300	1.4 (6,2)	0.61 (15,5)	10 (1,8)	10 (1,8)
4	CR3-400	1.0 (4,4)	0.81 (20,6)	6 (1,1)	6 (1,1)

Note: Do not extrapolate plotted curves.

Technical Data



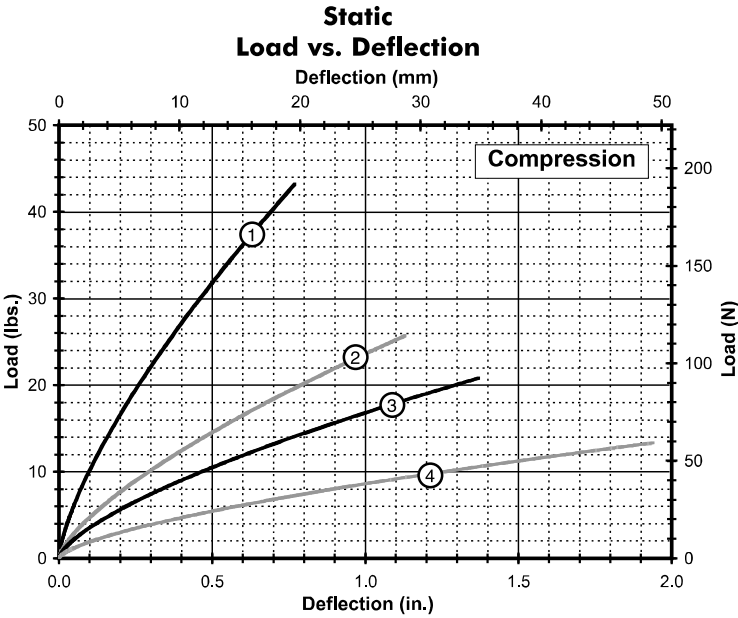
Size	Height "H" in. (mm)	Width (Ref) "W" in. (mm)	Unit Weight oz (g)	Mounting Options	Thru Hole in. (mm)	Thread in. (mm)	C'sink Imperial (Metric)
CR5-100	1.60 (41)	1.89 (48)	1.6 (45)	A, B, C, D, E, S	$\phi .230$ ($\phi 7,00$)	#10-32 UNF (M6 X 1,0)	82° (90°)
CR5-200	2.09 (53)	2.13 (54)	1.7 (48)				
CR5-300	2.36 (60)	2.32 (59)	1.8 (51)				
CR5-400	2.99 (76)	2.64 (67)	2.0 (57)				

Model Number Ordering Code			
CR5 - 400 - D M P	Mount Bar Options:	*[] - 6061-T6 AL ALY (or Equiv.) Chem Conv. Coated	
		[Y] - 6061-T6 AL ALY (or Equiv.) Anodized	
		[P] - 302/304 Stainless Steel (or Equiv.) Passivated	
	Add "M" for Metric	All Mounting Options	
	Mounting Options:	See Chart	
	Isolator Size:	See Sizing Table	

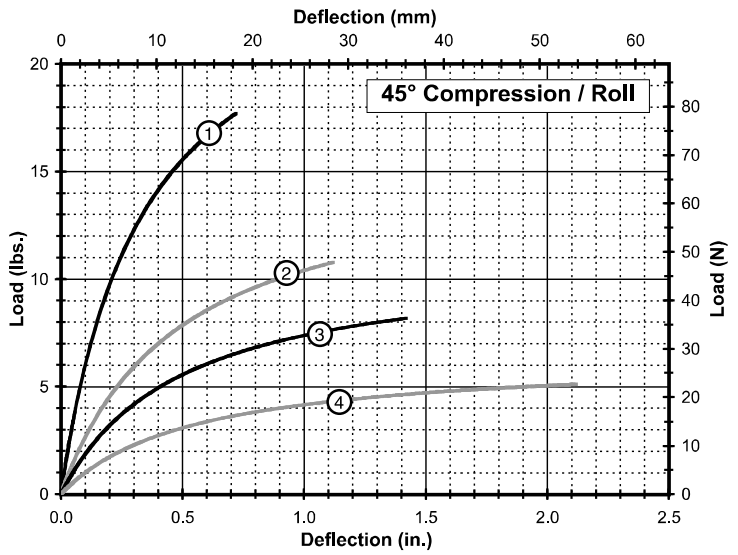
* Standard features. Any non-standard items may require longer lead times. Call for quotation.

Mounting Options		
Thru A C'sink	C'sink B C'sink	Thru C Thread
Thread D Thread	Thread E C'sink	Thru S Thru
- Maximum recommended torque for tapped aluminum bar is 40 in.-lbs. (7,5 Nm) - Wire Rope Material: Stranded 300 series stainless steel - Operating Temperature Range: -150°F to 500°F (-100°C to 260°C) - U.S. Patent 6,244,579		

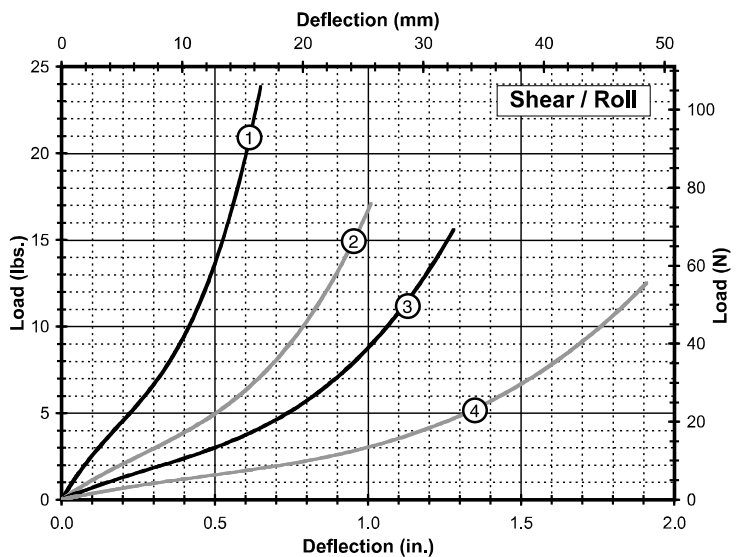
Technical Data



Compression					
Curve	Model	Max Static Load Lbs. (N)	Max Deflection in. (mm)	Kv (vibration) Lbs./in. (kN/m)	Ks (shock) Lbs./in. (kN/m)
1	CR5-100	18 (80)	0.77 (19,6)	125 (22)	65 (11)
2	CR5-200	8.5 (38)	1.13 (28,7)	60 (11)	25 (4,4)
3	CR5-300	6.0 (27)	1.37 (34,8)	45 (7,9)	18 (3,2)
4	CR5-400	3.5 (16)	1.94 (49,3)	25 (4,4)	8 (1,4)



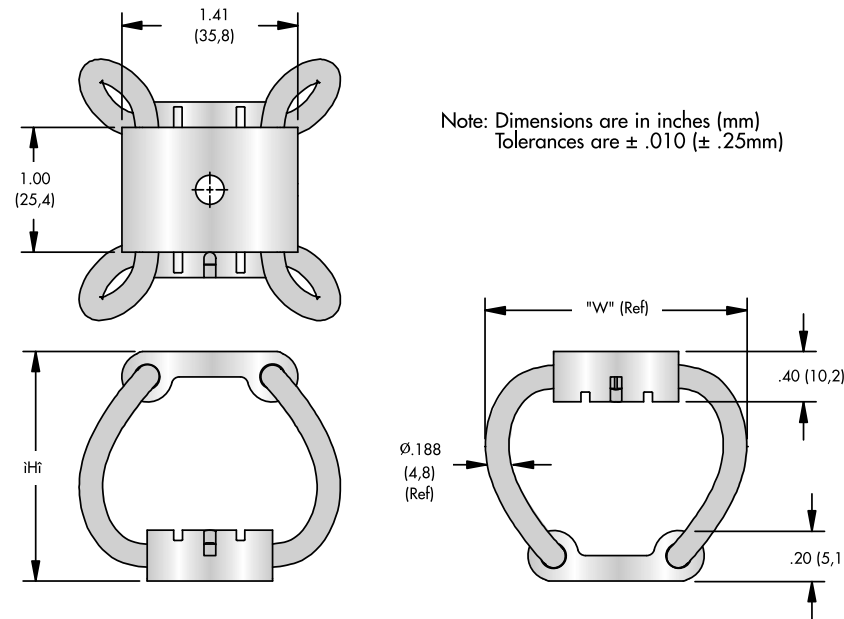
45° Compression / Roll					
Curve	Model	Max Static Load Lbs. (N)	Max Deflection in. (mm)	Kv (vibration) Lbs./in. (kN/m)	Ks (shock) Lbs./in. (kN/m)
1	CR5-100	5.5 (24)	0.72 (18,3)	70 (12)	35 (6,1)
2	CR5-200	3.0 (13)	1.12 (28,4)	30 (5,3)	13 (2,3)
3	CR5-300	2.5 (11)	1.42 (36,1)	20 (3,6)	8 (1,4)
4	CR5-400	1.5 (6,7)	2.12 (53,8)	11 (1,9)	4 (0,70)



Shear / Roll					
Curve	Model	Max Static Load Lbs. (N)	Max Deflection in. (mm)	Kv (vibration) Lbs./in. (kN/m)	Ks (shock) Lbs./in. (kN/m)
1	CR5-100	4.5 (20)	0.65 (16,5)	25 (4,4)	25 (4,4)
2	CR5-200	3.0 (13)	1.01 (25,7)	12 (2,1)	12 (2,1)
3	CR5-300	2.5 (11)	1.28 (32,5)	8 (1,4)	8 (1,4)
4	CR5-400	1.5 (6,7)	1.91 (48,5)	4 (0,70)	4 (0,70)

Note: Do not extrapolate plotted curves.

Technical Data



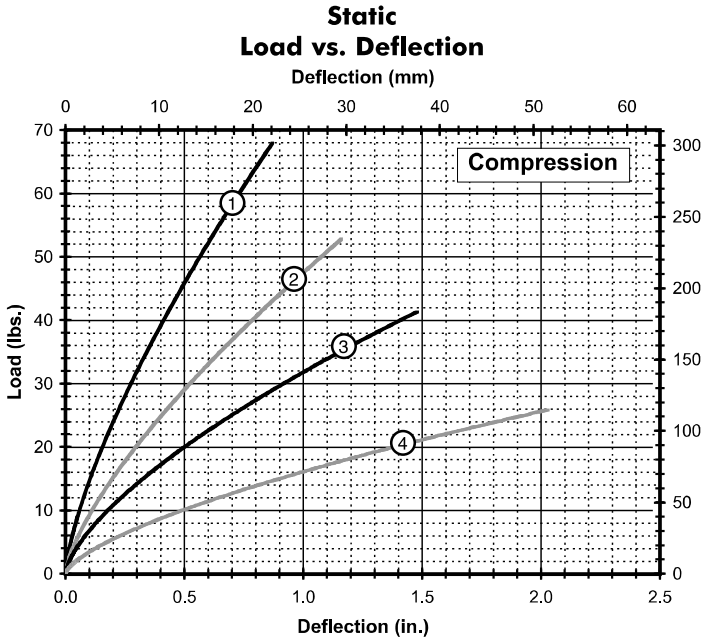
Size	Height "H" in. (mm)	Width (Ref) "W" in. (mm)	Unit Weight OZ (g)	Mounting Options	Thru Hole in. (mm)	Thread in. (mm)	C'sink Imperial (Metric)
CR6-100	1.83 (47)	± .06 (± 1,52)	2.0 (57)	A, B, C, D, E, S	ø .230 (ø 7,00)	#10-32 UNF (M6 X 1,0)	82° (90°)
CR6-200	2.15 (55)		2.2 (62)				
CR6-300	2.51 (64)		2.3 (65)				
CR6-400	3.09 (79)		2.6 (74)				

Model Number Ordering Code			
CR6 - 400 - D M P	Mount Bar Options:	*[] - 6061-T6 AL ALY (or Equiv.) Chem Conv. Coated [Y] - 6061-T6 AL ALY (or Equiv.) Anodized [P] - 302/304 Stainless Steel (or Equiv.) Passivated	
	Add "M" for Metric	All Mounting Options	
	Mounting Options:	See Chart	
	Isolator Size:	See Sizing Table	

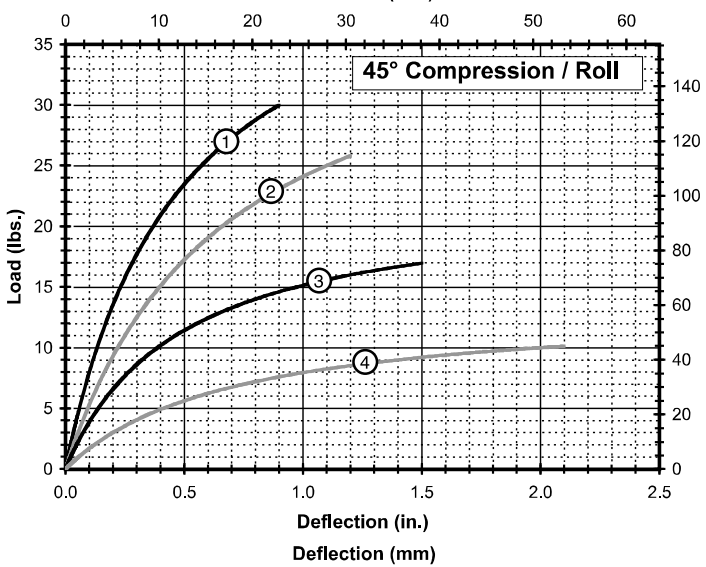
* Standard features. Any non-standard items may require longer lead times. Call for quotation.

Mounting Options		
- Maximum recommended torque for tapped aluminum bar is 40 in.-lbs. (7,5 Nm) - Wire Rope Material: Stranded 300 series stainless steel - Operating Temperature Range: -150°F to 500°F (-100°C to 260°C) - U.S. Patent 6,244,579		

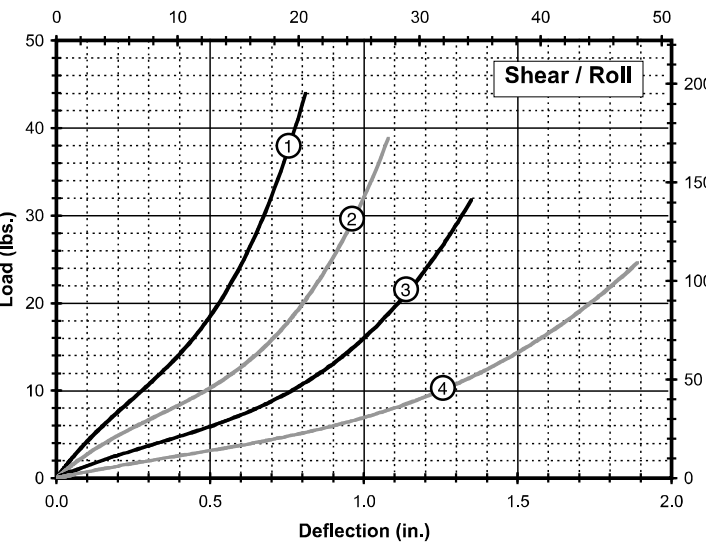
Technical Data



Curve	Model	Max Static Load Lbs. (N)	Max Deflection in. (mm)	Kv (vibration) Lbs./in. (kN/m)	Ks (shock) Lbs./in. (kN/m)
1	CR6-100	32 (142)	0.87 (22,1)	180 (32)	90 (16)
2	CR6-200	21 (93)	1.16 (29,5)	115 (20)	55 (9,6)
3	CR6-300	15 (67)	1.48 (37,6)	85 (15)	30 (5,3)
4	CR6-400	8.0 (36)	2.03 (51,6)	45 (7,9)	15 (2,6)



Curve	Model	Max Static Load Lbs. (N)	Max Deflection in. (mm)	Kv (vibration) Lbs./in. (kN/m)	Ks (shock) Lbs./in. (kN/m)
1	CR6-100	9.0 (40)	0.9 (22,9)	90 (16)	45 (7,9)
2	CR6-200	7.5 (33)	1.2 (30,5)	55 (9,6)	30 (5,3)
3	CR6-300	5.0 (22)	1.5 (38,1)	45 (7,9)	16 (2,8)
4	CR6-400	3.0 (13)	2.1 (53,3)	20 (3,5)	7 (1,2)



Curve	Model	Max Static Load Lbs. (N)	Max Deflection in. (mm)	Kv (vibration) Lbs./in. (kN/m)	Ks (shock) Lbs./in. (kN/m)
1	CR6-100	9.0 (40)	0.81 (20,6)	45 (7,9)	45 (7,9)
2	CR6-200	7.0 (31)	1.08 (27,4)	25 (4,4)	25 (4,4)
3	CR6-300	5.0 (22)	1.35 (34,3)	15 (2,6)	15 (2,6)
4	CR6-400	3.5 (16)	1.89 (48,0)	9 (1,6)	9 (1,6)

Note: Do not extrapolate plotted curves.