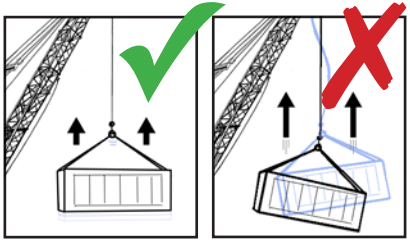
MUNCY INDUSTRIES

Heavy Lifting Reference Guide

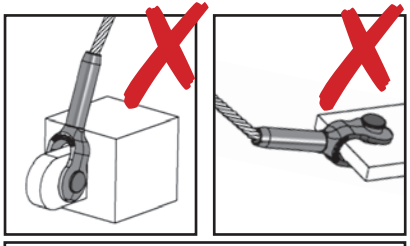
Courtesy Of:

Proper Loading

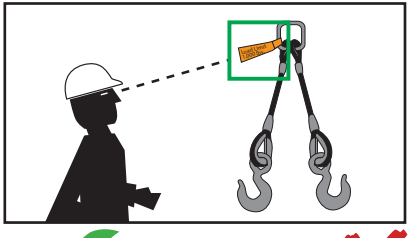
DON'T
Shockload



DON'T
Back or side load

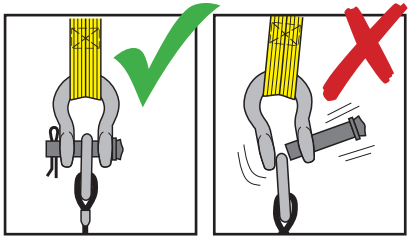


DON'T
Overload

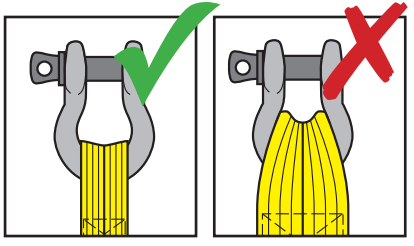


DON'T
Stand under a load

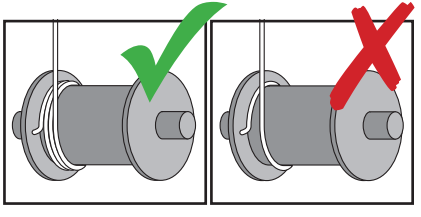
DON'T
Use without pin fully inserted



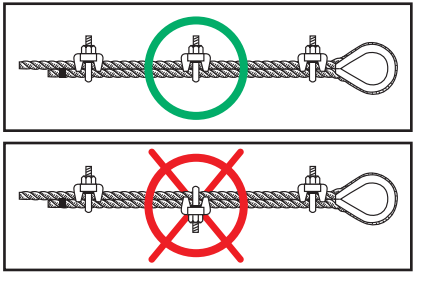
DON'T
Use undersized shackles



DON'T
Use less than 3 wraps around smooth or 2 wraps around grooved drums



DON'T
Stagger or install clips backward



Proper Wedge Buttoning

Step 1

1. Secure the wire rope in a vise and slip the wedge button over the rope.

Step 2

2. Carefully spread strands with a marlin spike or screwdriver and slip 1 wedge at a time between strands.

Step 3

3. Make sure both wedges are evenly inserted between the wire rope strands.

Step 4

4. Gently tap top of wedges until they are even with the ends of wire rope strands.

Step 5

5. Loosen vise to allow the wire rope to drop down into wedge button. Using a hammer and a small tube that fits between the strands (e.g. a Flemish Eye Sleeve), drive wedges into button until the tops of the wedges and button are even.

Step 6

6. The strands of the wire rope should protrude roughly ¼" past the top of the wedge button. Once the first load is applied, the wedge will seat firmly into the wedge button.

Source: Muncy Industries, 2011

Proper Use of Shackles

Safe Working Loads for Shackles

Material Size (inches)	Pin Diameter (inches)	Safe Working Load (2,000 lb tons)
1/2"	5/8"	1.4
5/8"	3/4"	2.2
3/4"	7/8"	3.2
7/8"	1"	4.3
1"	1-1/8"	5.6
1-1/8"	1-1/4"	6.7
1-1/4"	1-3/8"	8.2
1-3/8"	1-1/2"	10.0
1-1/2"	1-5/8"	11.9
1-3/4"	2"	16.2
2"	2-1/4"	21.2

Safe Working Load Limits in this table are based on testing performed by OSHA, and are provided for reference only. Safe Working Load Limits can vary between shackle materials and manufacturers. Always consult the manufacturer's recommendations.

Source: OSHA 1926, Table H-19

OSHA Regulations for Shackle Use

Employers must not use shackles with loads in excess of the rated capacities (i.e., working load limits) indicated on the shackle by permanently affixed and legible identification markings prescribed by the manufacturer.

The manufacturer's recommendations shall be followed in determining the safe working loads of the various sizes and types of specific and identifiable shackles. All shackles for which no applicable manufacturer's recommendations are available shall be tested to twice the intended safe working load before they are initially put into use. The employer shall maintain a record of the dates and results of such tests.

Screw Pin Anchor

Round Pin Anchor

Bolt, Nut & Cotter

Source: OSHA 1926.251(f)

Wire Rope Eye Efficiency Table

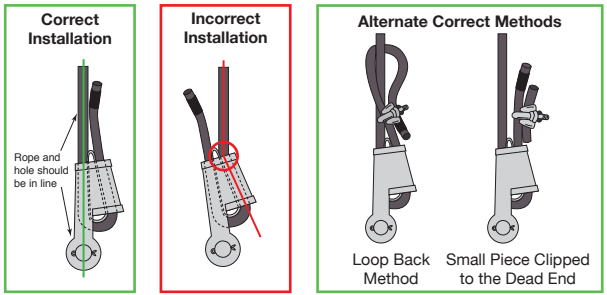
Clip Size	Rope Size	Minimum No. of Clips *	Amount of Rope to Turn Back	Torque in ft. lbs. **	Clipped Eye Efficiency	Flemish Eye Efficiency***
1/8"	1/8"	2	3-1/4"	4.5	80%	--
3/16"	3/16"	2	3-3/4"	7.5	80%	--
1/4"	1/4"	2	4-3/4"	15	80%	95%
5/16"	5/16"	2	5-1/4"	30	80%	95%
3/8"	3/8"	2	6-1/2"	45	80%	95%
7/16"	7/16"	2	7"	65	80%	95%
1/2"	1/2"	3	11-1/2"	65	80%	95%
9/16"	9/16"	3	12"	95	80%	95%
5/8"	5/8"	3	12"	95	80%	95%
3/4"	3/4"	4	18"	130	80%	95%
7/8"	7/8"	4	19"	225	80%	95%
1"	1"	5	26"	225	80%	95%
1-1/8"	1-1/8"	6	34"	225	80%	92.5%
1-1/4"	1-1/4"	7	44"	360	80%	92.5%
1-3/8"	1-3/8"	7	44"	360	80%	92.5%
1-1/2"	1-1/2"	8	54"	360	80%	92.5%
1-5/8"	1-5/8"	8	58"	430	80%	92.5%
1-3/4"	1-3/4"	8	61"	590	80%	92.5%
2"	2"	8	71"	750	80%	92.5%
2-1/4"	2-1/4"	8	73"	750	80%	90%
2-1/2"	2-1/2"	9	84"	750	80%	90%
2-3/4"	2-3/4"	10	100"	750	80%	90%
3"	3"	10	106"	1200	80%	90%
3-1/2"	3-1/2"	12	149"	1200	80%	90%

* If a greater number of clips are used than shown in the table, the amount of turnback should be increased proportionately. The number of clips shown also applies to rotation resistant right regular lay wire rope, 8 x 19 classification, and 19 x 8 classification, IPS, EIP, and EEIP sizes 1-1/2 inch and smaller.

** The tightening torque values shown are based upon the threads being clean, dry, and free of lubrication.

*** For IWRC IPS

Proper Use of Wedge Sockets



Sources: *Wire Rope Users Manual*. 4th ed. Alexandria, VA: Wire Rope Technical Board, 2005.
Wire Rope Sling Users Manual. 3rd ed. Alexandria, VA: Wire Rope Technical Board, 2007.

Proper Use of Clips (Refer to table on opposite page)

1. Turn back specified amount of rope from thimble or loop. Apply first clip 1 base width from dead end of rope. Apply U-Bolt over dead end (live end rests in saddle). Tighten nuts evenly, alternating until reaching recommended torque.

Figure 1

2. When 2 clips are required, apply the second clip as close to the loop or thimble as possible. Tighten nuts evenly, alternating until reaching the recommended torque.

Figure 2

3. When 3 or more clips are required, apply the second clip as close to the loop or thimble as possible. Turn nuts on second clip firmly, but do not tighten. Space additional clips equally between the first 2 clips. Take up rope slack. Tighten nuts on U-bolt evenly, alternating until reaching recommended torque.

Figure 3

4. If a sheave (pulley) is used in place of a thimble, add one additional clip. Clip spacing should be as shown in Figure 4.

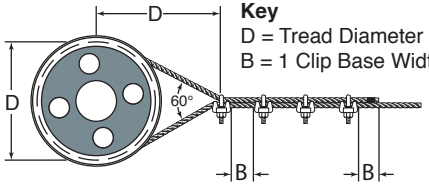


Figure 4

Source: *Wire Rope Users Manual*. 4th ed. Alexandria, VA: Wire Rope Technical Board, 2005.

Rigging Hardware Capacities

Forged Steel

Size in inches	Turnbuckle Type 1, Form 1 Jaw, eye, or stub end pulls	Turnbuckle Type 1, Form 1 Hook end pulls	Shackle Type IV Carbon Steel (Grade A)	Shackle Type IV Alloy Steel (Grade B)
1/4	500	300	710	2,000
5/16	700	500	1,060	3,120
3/8	1,040	700	1,590	3,800
7/16	------	------	2,170	5,180
1/2	1,800	1,040	2,830	6,500
9/16	------	------	3,580	-----
5/8	2,700	1,600	4,420	10,000
3/4	4,000	2,000	6,360	13,800
7/8	5,800	2,400	8,650	18,700
1	------	2,900	11,310	24,400
1-1/8	------	------	13,360	28,600
1-1/4	12,000	4,600	16,500	36,000

Source: Fed. Spec. FF-T-791B, Fed. Spec. RR-C-271D

Type VII Forged Swivels			
Size (inches)	Working Load Limit Class 1	Class 2	Class 3
3/8	2,200	2,200	2,200
1/2	3,500	3,500	3,500
5/8	5,200	5,200	5,200
3/4	7,100	7,100	7,100
7/8	—	9,200	9,200
1	—	11,600	11,600

D/d Ratios	
30:1 = .94	8:1 = .83
20:1 = .92	5:1 = .77
15:1 = .89	2:1 = .65
10:1 = .86	1:1 = .50

Source: Fed. Spec. RR-C-271D

Conversions

Length

1 inch (in.) = 0.08 feet = 0.03 yard = 2.54 cm = 0.03 m
1 foot (ft.) = 0.33 yard = 30.48 cm = 0.305 m
1 yard (yd.) = 36 in. = 3 ft. = 91.44 cm = .914 m
1 mile (mi.) = 5,280 ft. = 1,760 yd. = 1.61 km
1 centimeter (cm) = 0.393 in. = 0.03 ft. = 0.011 yd. = .01 m
1 meter (m) = 39.37 in. = 3.28 ft. = 1.09 yd. = 100 cm = .001 km
1 kilometer (km) = .62 miles = 3,281 ft. = 1,000 m

Weight

1 ton (Short, US) = .891 long ton = .91 metric ton = 2,000 lbs. = 907 kg
1 ton (Long, UK) = 1.12 short ton = 1.02 metric ton = 2,240 lbs. = 1,016 kg
1 ton (Metric, tonne) = 1.1 short ton = .98 long ton = 2204 lbs. = 1000 kg
1 pound (lb) = 16 oz = 453.6 grams = .45 kg
1 kilogram (kg) = 1000 grams = 35 oz. = 2.2 lbs.

Volume

1 gallon (Liquid, US) = 4 qt = 8 pt = 3.8 L = 0.134 ft^3 = 0.004 m^3
1 liter (Liquid, Metric) = .264 gal. = 1.06 qt = 2.12 pt = 0.035 ft^3 = 0.001 m^3
1 cubic foot = 7.5 gal. = 29.92 qt = 28.32 L = 0.03 m^3
1 cubic yard = 202 gal. = 808 qt. = 1,616 pt. = 765 L = 27 Cubic ft^3 = 0.76 m^3
1 cubic meter = 264 gal = 1,057 qt. = 2,113 pt = 1000 L = 35.3 ft^3

Temperature

°F = 1.8 × (°C + 32) **°C =** .556 × (°F - 32)

Useful Formulas

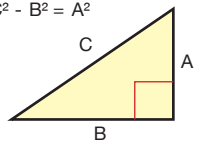
- Area of a Square = L × W
- Area of a Triangle = L × W / 2
- Volume of a Box = L × W × H
- Estimated Weight= (Volume in Cu. Ft) x (Material Pounds/cubic foot)

Key

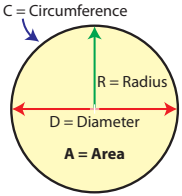
L = length **H** = height **W** = width ∞ = infinity **π** = 3.14159

Right Triangles

$A^2 + B^2 = C^2$
$C^2 - A^2 = B^2$
$C^2 - B^2 = A^2$



Circles

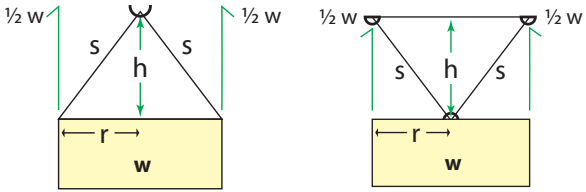


$R = 1/2 \times D$
$C = \pi \times D = 2\pi \times R$
$A = (\pi \times R^2)$
$A \approx (D^2 \times .8)$

When D doubles, A quadruples.

Load Factors & Weight Distribution

Symmetrical Distribution

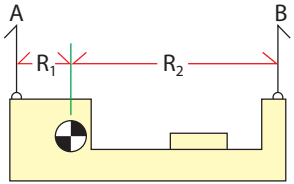


Key
h = head height **s** = sling length **r** = run **w** = load weight

$$\text{Tension in s} = \frac{\text{length s}}{\text{length h}} \times \text{share of load weight}$$

$$\text{Load Factor} = \frac{\text{s}}{\text{h}} \times \text{share of load weight}$$

Non-symmetrical Distribution



$P_A = \frac{R_2}{TS}$ $P_B = \frac{R_1}{TS}$

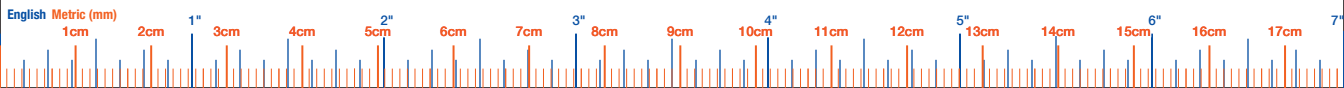
$P_A \times W$ = Share of Load Wt. @ A

$P_B \times W$ = Share of Load Wt. @ B

Key
R1 = Run, side 1
R2 = Run, side 2
TS = Total Span = R1 + R2
P = Percentage of Load Weight
W = Load Weight
◔ = Center of Balance

Rigger's Reference

Angle from Horizontal	Sling Length to Height Ratio Length : Height : Run	% of Grade $100 \times \left(\frac{H}{R}\right)$	Sling Load Factor (rounded up) $\left(\frac{L}{H}\right)$	Full Included Angle	Block Load Factor (FIA)
90	1.000 : 1 : 0.000	∞	1.0	0	2.00
85	1.004 : 1 : 0.090	1111.1	1.1	10	1.99
80	1.015 : 1 : 0.174	574.7	1.1	20	1.97
75	1.035 : 1 : 0.269	371.7	1.1	30	1.93
70	1.064 : 1 : 0.363	275.5	1.1	40	1.87
65	1.104 : 1 : 0.467	214.1	1.2	50	1.81
60	1.155 : 1 : 0.578	173.0	1.2	60	1.73
55	1.221 : 1 : 0.701	142.7	1.3	70	1.64
50	1.305 : 1 : 0.838	119.1	1.4	80	1.53
45	1.414 : 1 : 1.000	100.0	1.5	90	1.41
40	1.555 : 1 : 1.191	83.9	1.6	100	1.29
35	1.742 : 1 : 1.426	70.1	1.8	110	1.15
30	2.000 : 1 : 1.732	57.7	2.0	120	1.00
25	2.364 : 1 : 2.142	46.7	3	130	.84
20	2.924 : 1 : 2.748	36.4	3	140	.68
15	3.861 : 1 : 3.729	26.8	4	150	.52
10	5.747 : 1 : 5.659	17.1	6	160	.35
5	11.490 : 1 : 11.446	8.7	12	170	.17
0	∞ : 0 : ∞	0.0	∞	180	0



Sling Capacities

in Pounds

	Size in Inches or no. of Plies	Vertical (1.00)	Choker (.80)	90° 2-Legs or Basket (2.00)	60° (1.73)	45° (1.41)	30° (1.00)	3-Legs Only if 1/3 each leg 60°	Diameter or Width
Wire Rope Mechanical Splice, EIPS IWRC	1/4	1,300	960	2,600	2,200	1,820	1,300	3,300	6.4mm
	5/16	2,000	1,480	4,000	3,400	2,800	2,000	5,100	8.0mm
	3/8	2,800	2,200	5,800	5,000	4,000	2,800	7,400	9.6mm
	7/16	3,800	2,800	7,800	6,800	5,400	3,800	10,000	11.0mm
	1/2	5,000	3,800	10,200	8,800	7,200	5,000	13,200	13.0mm
	9/16	6,400	4,800	12,800	11,000	9,000	6,400	16,500	14.0mm
	5/8	7,800	5,800	15,600	13,600	11,000	7,800	20,000	16.0mm
	3/4	11,200	8,200	22,400	19,400	15,800	11,200	29,100	19.0mm
	7/8	15,200	11,200	30,400	26,000	22,000	15,200	39,000	22.0mm
	1	19,600	14,400	39,200	34,000	28,000	19,600	51,000	25.4mm
	1-1/8	24,000	18,000	48,000	42,000	34,000	24,000	62,000	28.5mm
	1-1/4	30,000	22,500	60,000	52,000	42,000	30,000	76,000	32.0mm
Chain G-100	3/8	8,800	7,100	17,600	15,200	12,400	8,800	22,900	10mm
	1/2	15,000	12,000	30,000	26,000	21,200	15,000	39,000	13mm
	5/8	22,600	18,100	45,200	39,100	32,000	22,600	58,700	16mm
	3/4	35,300	28,300	70,600	61,100	49,900	35,300	91,700	20mm
Chain G-80	3/8	7,100	5,700	14,200	12,300	10,000	7,100	18,400	10mm
	1/2	12,000	9,600	24,000	20,800	17,000	12,000	31,200	13mm
	5/8	18,100	14,500	36,200	31,300	25,600	18,100	47,000	16mm
	3/4	28,300	22,600	56,600	49,000	40,000	28,300	73,500	20mm
Web Class 5	1-ply	1,100	880	2,200	1,900	1,600	1,100	—	1"
	1-ply	2,200	1,760	4,400	3,800	3,100	2,200	—	2"
	1-ply	3,300	2,640	6,600	5,700	4,700	3,300	—	3"
	1-ply	4,400	3,520	8,800	7,600	6,200	4,400	—	4"
	2-ply	6,600	5,280	13,200	11,400	9,300	6,600	—	3"
	2-ply	8,200	6,560	16,400	14,200	11,600	8,200	—	4"
Web Class 7	1-ply	1,600	1,280	3,200	2,800	2,300	1,600	—	1"
	1-ply	3,100	2,480	6,200	5,400	4,400	3,100	—	2"
	1-ply	4,700	3,760	9,400	8,100	6,600	4,700	—	3"
	1-ply	6,200	4,960	12,400	10,700	8,800	6,200	—	4"
	2-ply	8,800	7,040	17,600	15,200	12,400	8,800	—	3"
	2-ply	11,000	8,800	22,000	19,100	15,600	11,000	—	4"
			MULTIPLIER =		1.00	.75	.60		

Total distance between pick points × Multiplier = Sling Length

Sources: *Wire Rope Sling Users Manual*. 3rd ed. Alexandria, VA: Wire Rope Technical Board, 2007. Guidance on safe sling use. (n.d.). Retrieved from http://www.osha.gov/dsg/guidance/slings/tables-figures.html

Level & Incline Planes

Key

W = Weight of Load (lbs.) **CF** = Coefficient of Friction (see table)
H = Height (ft.) **R** = Run (horizontal distance, ft.)
L = Ramp Length (ft.) = $\sqrt{(H^2 + R^2)}$
F = Force required to move load (lbs.)

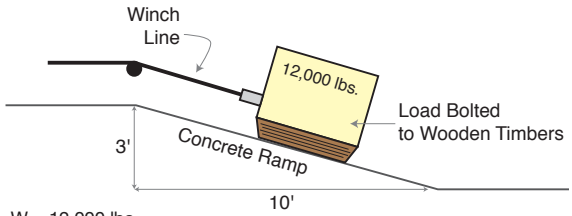
Formulas

Level: $CF \times W = F$
Uphill: $(CF \times W \times (R/L)) + ((H/L) \times W) = F$
Downhill: $(CF \times W \times (R/L)) - ((H/L) \times W) = F$

Coefficients of Friction

Concrete on Concrete	.65	Continuous Lubricated Surface	.15
Metal on Concrete	.60	Steel on Steel	.10
Wood on Wood	.50	Load on Wheels	.05
Wood on Concrete	.45	Load on Ice	.01
Wood on Metal	.30	Load on Air	.002
Cast Iron on Steel	.25		

Example:



W = 12,000 lbs
CF = .45 (Wood on Concrete)
H = 3 ft
R = 10 ft
L = $\sqrt{(3^2 + 10^2)}$ = 10.44 ft

Force Required for Pulling Uphill:

(.45 × 12,000 lbs × (10 ft/10.44 ft)) + ((3 ft/10.44 ft) × 12,000 lbs) = F
5,172 lbs + 3448 lbs = F
8,620 lbs = F

Use of Grommets

Rated capacity in tons of 2,000 lbs.

Rope Diameter (Inches)	Vertical		Choker		Vertical Basket		60° Basket		45° Basket		30° Basket	
	Mech. Spliced	Hand Spliced	Mech. Spliced	Hand Spliced	Mech. Spliced	Hand Spliced	Mech. Spliced	Hand Spliced	Mech. Spliced	Hand Spliced	Mech. Spliced	Hand Spliced
1/4	1.1	.94	0.74	0.66	2.1	1.9	1.8	1.6	1.5	1.3	1.1	0.94
5/16	1.6	1.5	1.2	1.0	3.3	2.9	2.8	2.5	2.3	2.1	1.6	1.5
3/8	2.4	2.1	1.6	1.5	4.7	4.2	4.1	3.6	3.3	3.0	2.4	2.1
7/16	3.2	2.8	2.2	2.0	6.4	5.7	5.5	4.9	4.5	4.0	3.2	2.8
1/2	4.1	3.7	2.9	2.6	8.3	7.3	7.2	6.4	5.9	5.2	4.1	3.7
9/16	5.2	4.6	3.7	3.2	10	9.3	9.1	8.0	7.4	6.6	5.2	4.6
5/8	6.4	5.7	4.5	4.0	13	11	11	9.9	9.1	8.1	6.4	5.7
3/4	9.2	8.2	6.4	5.7	18	16	16	14	13	12	9.2	8.2
7/8	12	11	8.7	7.7	25	22	22	19	18	16	12	11
1	16	14	11	10	32	29	28	25	23	20	16	14
1-1/8	20	18	14	12	41	35	35	31	29	25	20	18
1-1/4	25	21	17	15	50	43	43	37	35	30	25	21
1-3/8	30	25	21	18	60	51	52	44	42	36	30	25
1-1/2	36	30	25	21	71	60	62	52	50	42	36	30
1-5/8	41	34	29	24	82	69	71	60	58	49	41	34
1-3/4	48	40	33	28	95	79	83	69	68	56	48	40
1-7/8	54	45	38	31	109	89	94	77	77	63	54	45
2	62	50	43	35	124	101	107	87	87	71	62	50
2-1/8	69	56	48	39	138	112	119	97	98	79	69	56
2-1/4	77	62	54	43	154	124	133	107	109	88	77	62
2-3/8	85	68	60	48	171	137	148	118	121	97	85	68
2-1/2	94	75	66	52	188	149	163	129	133	106	94	75
2-5/8	103	82	72	57	207	164	179	142	146	116	103	82
2-3/4	113	89	79	62	225	177	195	154	159	125	113	89
2-7/8	122	95	86	67	245	191	212	165	173	135	122	95
3	133	104	93	73	265	207	230	180	188	147	133	104

Rated capacities only apply to 6x19 and 6x36 classification strand laid wire rope.

Source: *Wire Rope Sling Users Manual*. 3rd ed. Alexandria, VA: Wire Rope Technical Board, 2007.

Estimating Load Weights

Pounds / cubic foot			
Aluminum	165	Iron Casting	450
Asbestos	153	Lead	708
Asphalt	81	Lumber - Fir	32
Brass	524	Lumber - Oak	62
Brick	120	Lumber - RR Ties	50
Bronze	534	Oil, Motor	58
Coal	56	Oil, Hydraulic	55
Concrete, Reinf.	150	Paper	58
Crushed Rock	95	Portland Cement	94
Diesel	52	River Sand	120
Dry Earth, Loose	75	Rubber	94
Wet Earth, Excavated	108	Steel	480
Gasoline	45	Water	63
Glass	162	Zinc	437

Pounds / square foot		
Material	**Thickness**	**lbs./sq. ft.**
Steel Plate	1/8"	5
Steel Plate	1/4"	10
Steel Plate	1/2"	20
Steel Plate	1"	40
Aluminum Plate	1/8"	1.75
Aluminum Plate	1/4"	3.50
Lumber, Fir	3/4"	2
Lumber, Oak	3/4"	4

Pounds/gallon	
Gasoline	6.0
Diesel	7.0
Hydraulic Oil	7.2
Water	8.3

Useful Conversions
7.5 gal. liquid = 1 cu. ft.
27 cu. ft. = 1 cu. yd.
2,000 lbs. = 1 U.S. ton
2,204 lbs. = 1 Metric ton

Nylon Inspection

Always inspect web slings for the following types of damage before use:

Abrasion Damage

Caused by friction between the sling and an abrasive surface. Can also result from the sling being pulled from under the load.

Cut Damage and Tensile Break

A clean break in the webbing caused by contact with a sharp edge. If the cut exposes the inner red safety core yarns, remove the sling from service. Sling overload can stretch the sling to its breaking point. A Tensile Break is identified by fraying at the point of failure.

Acid Damage

Acid or caustic vapors break down the nylon filaments, destroying their integrity. Slings should be promptly discarded if they show any signs of acid damage.

Snags & Punctures

Sharp objects can cause damage to sling webbing by snagging or puncturing it. Though this type of damage may appear minor, it is impossible to determine the true amount of sling loss. The sling should be discarded.

Heat Damage

Temperatures above 194° F (90° C) damage a sling's structure and cause it to lose its efficiency. If a sling is exposed to this temperature, it should be removed from service.

Broken or Worn Stitches

Web sling splices rely on thread and the stitch pattern to carry the load properly. Remove slings from service if splice stitches are broken or worn.

Source: OSHA 1910.184(i)

Wire Rope Inspection

Abrasion

Core Protrusion (Shockloading)

Corrosion

Crushing

Fatigue (Reverse Bend)

Fatigue (Undersized Sheave)

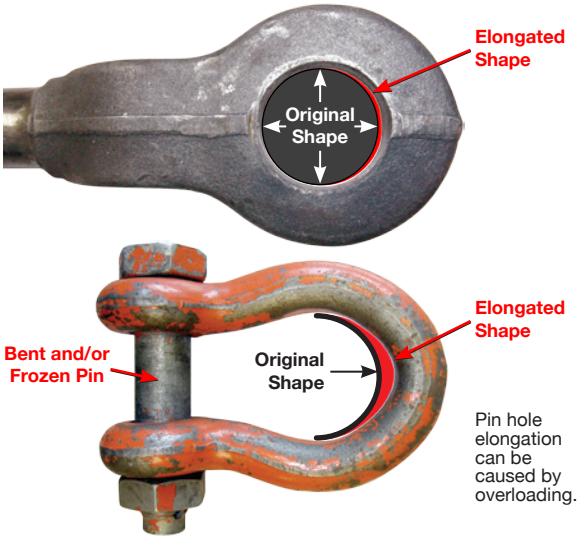
Source: Wirerope Works, Inc., Manufacturers of Bethlehem Wire Rope

Hardware Inspection Guide

Shackle/Socket/Clevis Inspection

Discard if any of the following is apparent:

- Any parts worn more than 10% of original dimension.
- Bent, Twisted, distorted, stretched, elongated, cracked, or broken load bearing components.
- Pin is frozen in place.
- Excessive pitting or corrosion, nicks or gouges.
- Indication of heat damage.
- Missing or illegible manufacturer's name, trademark or tractability information.
- Any weld repairs.
- Pin hole is elongated to more than 5% of original dimensions. (see diagram below)



Pin hole elongation can be caused by overloading.

For reference only. Follow hardware manufacturer's inspection recommendations.

Wire Rope Selection

APPLICATION	GENERAL CONDITIONS
Drop Ball Load Line	6x25 RR IWRC
Gantry Cranes	
Main Hoist	6x25 RR IWRC; 6x36 Class RR IWRC
Auxilary Hoist	6x25 RR IWRC
Overhead Traveling Crane	
Hoist Lines	6x19 RR IWRC; 6x36 Class RR IWRC
Rough Terrain, All Terrain, Telescopic and Lattice Boom Truck Cranes, Lattice Boom Hydraulic Crawlers and Lattice Boom Friction Crawlers	
Boom Hoists	6x25 RR IWRC; 6x36 Class RR IWRC; 6x26 Alternate Lay
Hoist Lines	6x25 RR IWRC; 6x36 Class RR IWRC
Auxiliary Lines	8x19 RR IWRC; 19x7
Boom Pendants	6x25 RR IWRC
Side Boom Tractors	
Hoist Lines	6x25 RR IWRC
Boom Hoists	6x25 RR IWRC
Stiff Leg Derricks and Revolving Derrick Cranes	
Hoist Lines	6x25 RR IWRC
Auxilary Lines	6x25 RR IWRC
Boom Hoists	6x25 RR IWRC
Tower Cranes	
Load Lines	SFP 19
Trolley Lines	6x25 RR IWRC
Whirley Cranes	
Main Hoist	6x25 RR IWRC
Auxiliary Hoist	6x25 RR IWRC
Boom Hoists	6x25 RR IWRC
Hoists and Winches	
Construction Hoists	6x19 RR IWRC; 6x36 Class RR IWRC
Electric and Air Hoists	6x19 Warrington Seale RR FC; 6x36 Class RR FC; 19x7; SFP 19
Winches	6x19 Class RR IWRC;6x36 Class RR IWRC
Oilfield	
Coring, Sand & Swabbing Lines	6x7 FC
Marcellus Shale Drill Lines	6x21 LR FC
Rotary Drill Lines	6x19 Seale RR IWRC; 6x26 Warrington Seale RR IWRC
Tubing Lines	6x26 Warrington Seale RR IWRC
Work Wire, Chain Chasers	6x19 Seale RR IWRC; 6x36 RR IWRC

Sources: *Wirerope Works, Inc. General Purpose Catalog,* 2010.
Bridon American General Purpose Wire Ropes Catalog, Jan 1, 2009

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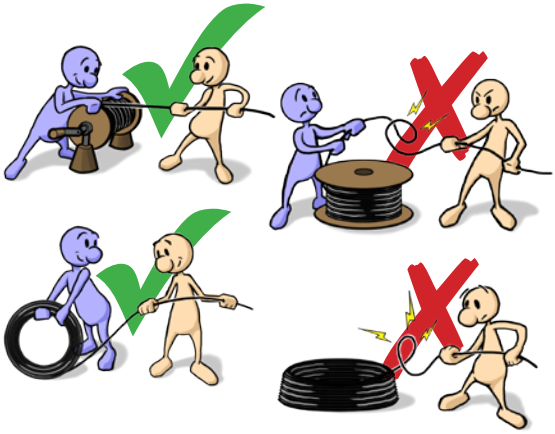
Heavy Lifting Reference Guide

Wire Rope Uncoiling



For an expanded version of this guide, scan the barcode to the left with your mobile phone or device, or visit **www.MuncyIndustries.com**.

WARNING

This Muncy™ Guide is for reference purposes only and should only be used by trained, experienced professionals at their own risk. Improper use of rigging equipment and information contained can result in injury, damage and even death. Consult other materials to supplement this guide.

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