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WIRE ROPE SLINGS

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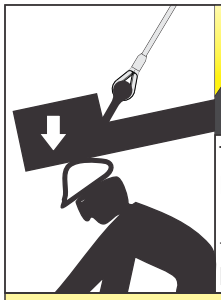


WARNING!

This bulletin contains important safety information about the use of wire rope slings, however; it **DOES NOT** contain all the information you need to know about handling, lifting and manipulating materials and loads safely. Sling use is one part of the lifting system and it is your responsibility to consider all risk factors prior to using and rigging device or product. Failure to do this may result in severe **INJURY** or **DEATH** due to sling failure and/or loss of load

- ALWAYS INSPECT wire rope for WEAR, DAMAGE or ABUSE
- NEVER USE wire rope that is WORN-OUT, DAMAGED or ABUSED
- NEVER OVERLOAD a wire rope sling
- INFORM YOURSELF: Read and understand manufacturer's literature or "Wire Rope * Wire Rope Slings Safety Bulletin"
- REFER TO APPLICABLE CODES, STANDARDS and REGULATIONS for INSPECTION REQUIREMENTS and REMOVAL CRITERIA

1. Wire rope will fail if worn out, overloaded, misused, damaged or improperly maintained.

2. In service, wire rope loses strength and work capability. Abuse and misuse increase the rate of loss.

3. The minimum breaking force, the published catalog strength, of a wire rope applies only to a new, unused rope.

4. The minimum breaking force (published catalog strength) of a wire rope should be considered the straight line pull which will actually break a new, unused rope. The published catalog strength of a wire rope should never be used as its working load.

5. To determine the working load of a wire rope, the minimum breaking force must be reduced by a design factor (formerly called a safety factor). The design factor will vary depending upon the type of machine and installation and the work performed. You must determine the applicable design factor for your use.

For example, a design factor of "5" means that the minimum breaking force of the wire rope must be divided by five to determine the maximum load that can be applied to the rope system.

Design factors have been established by Alberta OH&S, ANSI, ASME and similar government and industrial organizations. No wire rope or wire rope sling should ever be installed or used without full knowledge and consideration of the design factor for the application.

6. Wire ropes wear out. The strength of a wire rope begins to decrease when the rope is put in use and continues to decrease with each use.

7. Never overload a wire rope. This means never use a rope when the load applied to it is greater than the working load, determined by dividing the minimum breaking force of the rope by the appropriate design factor.

8. NEVER "shock load" a wire rope. A sudden application of force or load can cause both visible external damage and internal damage. There is no practical way to estimate the force applied by shock loading a rope. The sudden release of a load can also damage a wire rope.

9. Lubricant is applied to the wires and strands of a wire rope when it is manufactured. This lubricant is depleted when the rope is in service and should be replaced periodically.

10. Regular, periodic inspections of the wire rope, and keeping of permanent records signed by a qualified person, are required by Alberta OH&S for almost every wire rope installation. The purpose of inspection is to determine whether or not a wire rope or wire rope sling may continue to be safely used in that application. Inspection criteria, including number and location of broken wires, wear and elongation, have been established by Alberta OH&S, ANSI, ASME, WRTB and similar organizations.

IF IN DOUBT, REPLACE THE ROPE.

An inspection should include verification that none of the specified removal criteria for this usage are met by checking for such things as:

- surface wear: normal and unusual
- broken wires: number and location
- reduction in diameter
- rope stretch (elongation)
- integrity of end attachments
- evidence of abuse or contact with another object
- heat damage
- corrosion

In addition, an inspection should include the condition of sheaves, drums and other apparatus with which the rope makes contact.

11. When a wire rope has been removed from service because it is no longer suitable for use, it must not be re-used on another application.

12. Every wire rope user should be aware each type of fitting attached to a wire rope has a specific efficiency rating, which can reduce the working load of the rope assembly or rope system. This must be given due consideration in determining the capacity of a wire rope system.

13. Some conditions that can lead to problems in a wire rope system include:

- sheaves that are too small, worn or corrugated cause damage to a wire rope.
- broken wires mean a loss of strength.
- kinks permanently damage a wire rope and must be avoided.
- wire ropes are damaged by knots, and wire ropes with knots must never be used.
- environmental factors, such as corrosive conditions and heat can damage a wire rope.
- lack of lubrication can significantly shorten the useful service life of a wire rope.
- contact with electrical wires and the resulting arcing will damage a wire rope.

Wire Rope Inspection Requirements

There are two industry standards that exist to provide the end-user with guidelines for inspection and criteria that warrants removal from service:

Alberta Occupational Health And Safety Code &
ASME B30.9.

Initial Inspection (prior to initial use): Best practice is to inspect the wire rope sling upon receiving it from the manufacturer. Double-check the sling tag to make sure it's what you ordered and that the rated capacity meets all of your project specifications and lifting requirements.

Frequent (daily or prior to use): Designate a Competent Person to perform a daily visual inspection of slings and all fastenings and attachments for damage, defects, or deformities. The inspector should also make sure that the wire rope sling that was selected meets the specific job requirements it's being used for.

Users can't rely on a once-a-day inspection if the wire rope sling is used multiple times throughout the day. Damage to wire rope can occur on one lift and best practice is to perform a visual inspection before any shift change or changes in lifting application. Because shock loads, severe angles, sharp edges, and excessive heat can quickly cause damage to a lifting sling, the user should inspect the sling prior to each lift.

Periodic Inspection: A periodic inspection is performed by either a professional service provider, or by a Qualified Person, every 12 months (at a minimum) and monthly to quarterly in more severe service conditions. The following are all determining factors in scheduling the frequency of a periodic inspection:

- Frequency of use, Severity of service conditions, Nature of the lifts being performed, Experience gained on the service life of wire rope slings used in similar applications

ASME provides these additional periodic inspection guidelines based on the service of the wire rope sling:

- Normal Service – Yearly
- Severe Service – Monthly to Quarterly
- Special Service – As recommended by a Qualified Person

Depending on the severity of the operating environment and frequency of use, your business may decide that a more thorough sling inspection should occur more often than the minimum yearly requirement.

Periodic inspections are required to be documented per Alberta Occupational Health & Safety Part 21 and ASME B30.9 and records retained. The employer is required to maintain a record of the most recent thorough inspection—however, individual records for each sling that was inspected are not required. Failure to maintain and retain inspection records is one of the most common issues that prevent a company from reaching full OH&S compliance.

Wire Rope Removal From Service Criteria

As per ASME B30.9-2018, 9-2.9.5 Removal Criteria

A wire rope sling shall be removed from service if any of the following conditions are present:

(a) missing or illegible sling identification

(b) broken wires, **(1)** for strand-laid and single-part slings, 10 randomly distributed broken wires in one rope lay, or 5 broken wires in one strand in one rope lay. **(2)** for cable-laid slings, 20 broken wires per lay. **(3)** for less than eight-part braided slings, 20 broken wires per braid length. **(4)** for eight-part or more than eight-part braided slings, 40 broken wires per braid length.

(c) severe localized abrasion or scraping resulting in a reduction from nominal diameter of more than 5%

(d) kinking, crushing, birdcaging, or any other damage resulting in damage to the rope structure

(e) evidence of heat damage

(f) fittings that are cracked, deformed, or worn to the extent that the strength of the sling is substantially affected

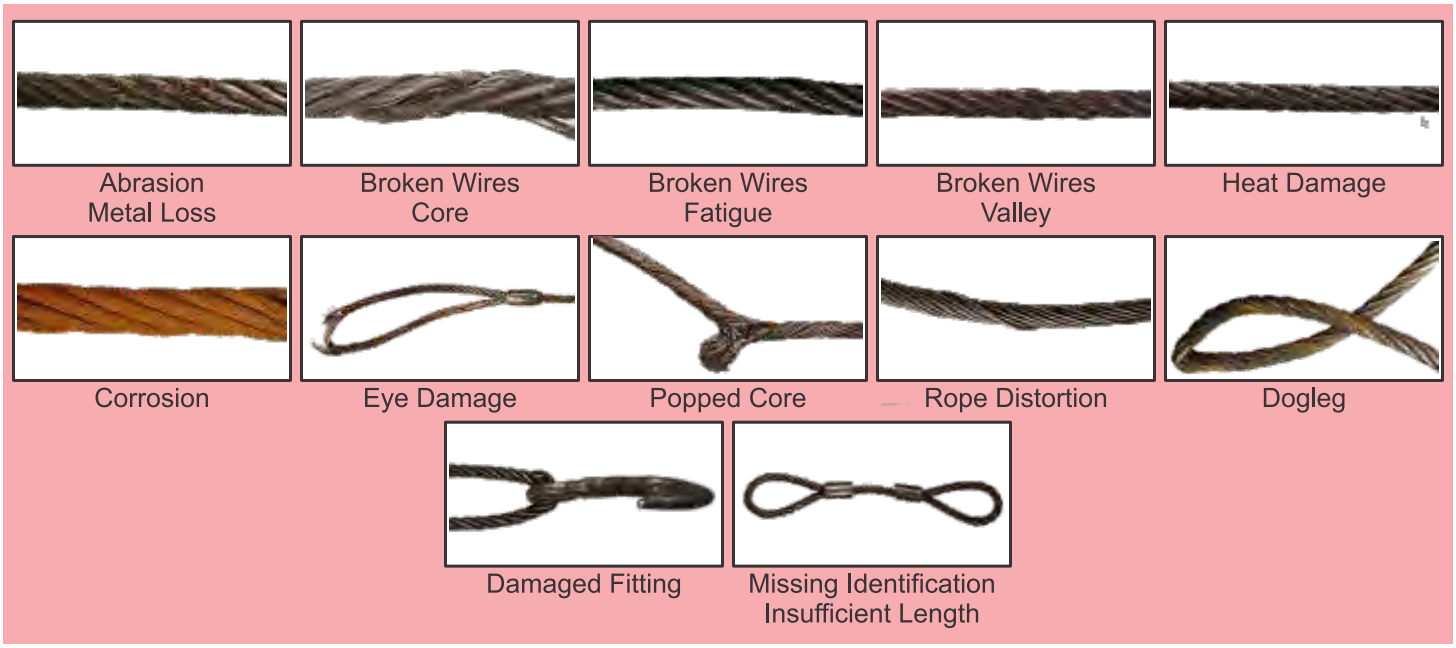
(g) severe corrosion of the rope or fittings

(h) for hooks, removal criteria as stated in ASME B30. 10

(i) for rigging hardware, removal criteria as stated in ASME B30.26

(j) other conditions, including visible damage, that cause doubt as to the continued use of the sling

TYPICAL WIRE ROPE DAMAGE

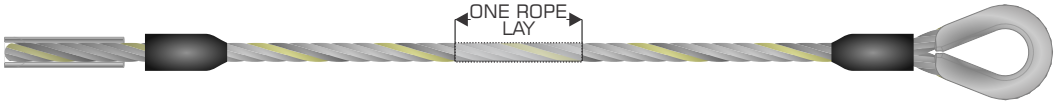


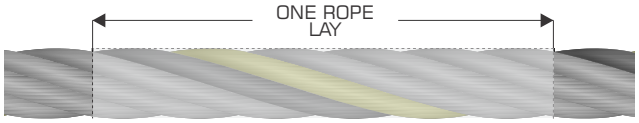
Wire Rope Is A Machine

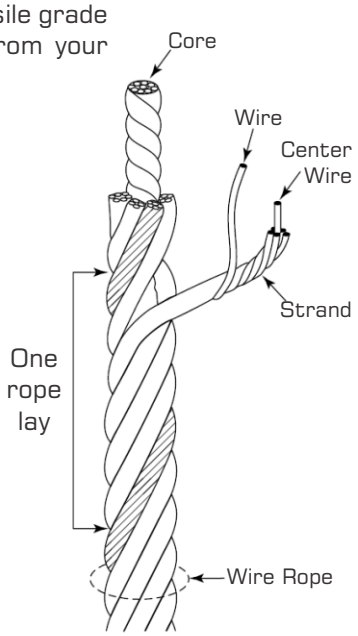
A **wire rope is a machine**, by dictionary definition:
"An assemblage of parts…that transmit forces, motion, and energy one to another in some predetermined manner and to some desired end.
A typical wire rope may contain hundreds of individual wires which are formed and fabricated to operate at close bearing tolerances one to another. When a wire rope bends, each of its many wires slides and adjusts in the bend to accommodate the difference in length between the inside and the outside bend. The sharper the bend, the greater movement.

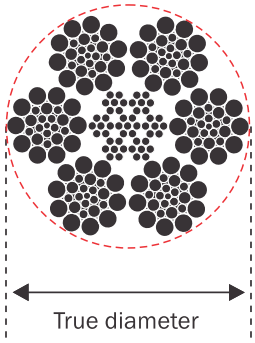
Every wire rope has three basic components:
(1) The wires which form the strands and collectively provide the rope strength;
(2) The strands, which are helically around the core; and,
(3) The core, which forms a foundation for the strands.
The core of wire rope may be an Independent Wire Rope Core (IWRC), which in many cases is actually a smaller wire rope in itself. Only an IWRC or strand core contributes strength to the rope; and an IWRC normally provides only 7.5% of the wire rope's Nominal Strength.

The greatest difference in wire ropes are found in the number of strands, the construction of strands, the size of the core, and the lay direction of the strand versus the core.
The wires of wire rope are made of high-carbon steel. These carbon steel wires come in various grades. The term "Grade" is used to designate the strength of the wire rope.
Wire ropes are usually made of **Extra Improved Plow Steel (EIPS)** or **Extra Extra Improved Plow Steel (EEIPS)** [Approximate equivalents are 1960 N/mm² or 2160 N/mm² steel grades]. **Improved Plow Steel (IPS)** is also used in some instances. One cannot determine the Tensile Grade of a wire rope by its feel or appearance. To properly evaluate a rope's tensile grade you must obtain the Grade from your employer or wire rope supplier.









How To Measure Wire Rope Diameter

The correct diameter of a wire rope is the diameter of a circumscribed circle that will enclose all the strands. It's the largest cross-sectional measurement as shown below. Make the measurement carefully with calipers. Refer to material handling measuring guide illustrations for both correct and incorrect methods of measuring a wire rope's diameter.

Wire Rope Tolerances

Wire rope is always manufactured larger—never smaller—than the nominal diameter when specified in inches. The allowable tolerances are shown in the table. In standard practice, the nominal diameter is the minimum diameter. All tolerances are taken on the plus side when specified in inches. Wire rope is not termed oversize until its diameter exceeds the allowable maximum. For example, a 1" nominal diameter wire rope may vary between 1" and 1.05" in diameter.

Nominal Rope Diameter	Tolerance	
	Under	Over
0" - 1/8"	-0	+ 8%
Over 1/8 - 3/16"	-0	+ 7%
Over 3/16 - 5/16"	-0	+ 6%
Over 5/16"	-0	+ 5%

Wire Rope Physical Properties

Elastic Properties of Wire Rope

The following discussion relates to conventional 6- or 8 strand ropes that have either fiber or steel cores; it is not applicable to rotation-resistant ropes since these constitute a separate case.

Wire rope is an elastic member; it stretches or elongates under load. This stretch derives from two sources:

1) constructional
2) elastic

In actuality, there may be a third source of stretching–a result of the rope rotating on its own axis. Such elongation, which may occur either as a result of using a swivel, or from the effect of a free-turning load, is brought about by the unlaying of the rope strands. Because the third source is a subject that is beyond the scope of this publication, discussion will be directed to constructional and elastic stretch.

Constructional Stretch - When a load is applied to wire rope, the helically-laid wires and strands act in a constricting manner thereby compressing the core and bringing all the rope elements into closer contact. The result is a slight reduction in diameter and an accompanying lengthening of the rope.

Constructional stretch is influenced by the following factors:

1) type of core (fiber or steel),
2) rope construction
   (6x7, 6x25 FW, 6x41 WS, 8x19 S, etc.),
3) length of lay,
4) material.

Ropes with wire strand core (WSC) or independent wire rope core (IWRC) have less constructional stretch than those with fiber core (FC). The reason for this is the fact that the steel cannot compress as much as the fiber core.

Usually, constructional stretch will cease at an early stage in the rope's life. However, some fiber core ropes, if lightly loaded (as in the case of elevator ropes), may display a degree of constructional stretch over a considerable portion of their life.

A definite value for determining constructional stretch cannot be assigned since it is influenced by several factors.

Rope Construction	Approx Stretch
6 Strand FC	1/2%-3/4%
6 Strand IWRC	1/4%-1/2%
8 Strand FC	3/4%-1%

The following table gives some idea of the approximate stretch as a percentage of rope under load.

Elastic Stretch - Elastic stretch results from recoverable deformation of the metal itself. Here, again, a quantity cannot be precisely calculated. However, the following equation can provide a reasonable approximation for a good many situations.

$$\text{Changes in length (ft)} = \frac{\text{Change in load (lb) x Length (ft)}}{\text{Area (inches2) x Modulus of Elasticity (psi)}}$$

Approximate Modulus of Elasticity (lbs. per quare Inch)

Rope Classification	Zero through 20% Loading	21 to 65% Loading*
6 x 7 with fibre core	11,700,000	13,000,000
6 x 19 with fibre core	10,800,000	12,000,000
6 x 37 with fibre core	9,900,000	11,000,000
8 x 19 with fibre core	8,100,000	9,000,000
6 x 19 with IWRC	13,500,000	15,000,000
6 x 37 with IWRC	12,600,000	14,000,000

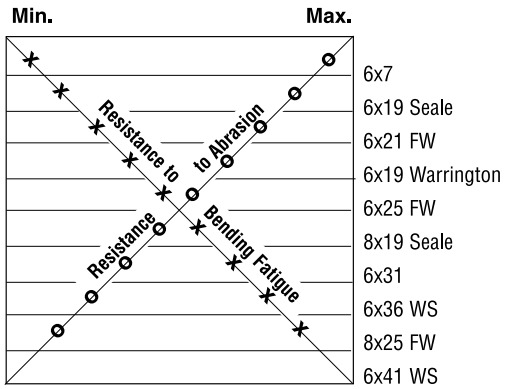
Fatigue Resistance

Smaller wires are the key to bending performance when wire ropes are subjected to repeated bending over sheaves or drums. The more outer wires for a given size wire rope, the better the resistance to bending fatigue. The relative bending life factors of typical wire rope constructions are indicated in the following table. Ropes having a large number of small wires, however, should not be used where over wrapping on a drum takes place because they do not provide sufficient crush resistance.

Relative bending life factors of typical ropes	
Rope Construction	Factor
6x7	.57
19x7	.67
6x19 S	.80
6x21 FW	.92
Dyform-18 and 6 x 25 FW	1.00
6x31 WS	1.09
Dyform-6 and 6 x 36 WS	1.31
8x25 FW	1.39
6x41 WS	1.39
6x49 SWS	1.54

Abrasion Resistance

Lang lay and large outer wires provide resistance to abrasion. The relationship between abrasion resistance and fatigue resistance is illustrated.



Crush Resistance

An IWRC (Independent Wire Rope Core) and large outer wires will provide best crush resistance. SuperFlex rope provides the best crush resistance of any wire rope.

Flexibility

Fiber core, lang lay and smaller wires provide a more flexible wire rope. In general wire ropes with a higher quantity of wires are more flexible and better suited for applications where bending occurs.

Basic Factors Concerning Use of Wire Rope Slings

1. RATED CAPACITY (Rated Load, WLL) of a wire rope sling is based upon the Nominal Breaking Strength of the wire rope used in the sling, AND FACTORS which affect the overall strength of a sling. These factors include ATTACHMENT or SPLICING EFFICIENCY, the number of parts of rope in the sling, type of hitch (see above), **DIAMETER AROUND WHICH THE BODY OF THE SLING IS BENT,** and the diameter of pin (or hook) over which the eye of the sling is rigged.

2. RATED CAPACITY of a sling is different for each of the three basic methods of rigging (see above). These rated loads are listed in this catalogue. The RATED CAPACITIES apply to Super Slings Inc slings ONLY and may be indicated on optional tags (if requested).

3. WARNING: A hand tucked (hand spliced) eye sling can unlay (unravel) and FAIL if the sling is allowed to rotate during use.

4. NEVER "SHOCK LOAD" a sling. There is no practical way to estimate the actual force applied by shock loading. The rated capacity of a wire rope sling can easily be exceeded by a sudden application of force, and damage can occur to the sling. The sudden release of a load can also damage a sling.

5. The **BODY** of a wire rope sling should be protected with corner protectors, blocking or padding against damage by sharp edges or corners of a load being lifted. Sharp bends that distort the sling body damage the wire rope and reduce its strength.

6. ANY ANGLE other than vertical at which the sling is rigged, increases the loading (tension) on the sling.

7. A sling should be given a VISUAL INSPECTION BEFORE EACH LIFT OR USAGE to determine if it is capable of safely making the intended lift.

An inspection should include such things as:

- Broken wires
- Kinks or distortions of the sling body
- Condition of eyes and splices, & any attachment hardware
- Reduction in diameter of the rope
- Any damage
- Corrosion

8. Whenever a sling is found to be deficient, the eyes must be cut, or other end attachments or fittings removed to prevent further use, and the sling body discarded.

9. A SLING EYE should never be used over a hook or pin with a body diameter larger than the natural width of the eye. NEVER FORCE AN EYE ONTO A HOOK. The eye should always be used on a hook or pin with at least the diameter of the rope.

10. If any hazardous condition is disclosed during an inspection, the sling shall be removed from service. Repair is not an option.

11. SLING IDENTIFICATION as per ASME B30-9, Section 9-2.7.1.

1) Name or trademark of manufacturer
2) Rated load for at least one hitch and the angle upon which it is based.
3) Diameter or size.
4) Number of legs, if more than one.

Sling identification should be maintained during the life of the sling by the sling user.

Environmental Considerations

Effects of Environment

(a) Slings should be stored in an area where they will not be subjected to mechanical damage, corrosive action, moisture, extreme temperatures, or kinking

(b) Fibre core wire rope slings should not be subjected to de-greasing or a solvent because of possible damage to the core.

Chemically Active Environments

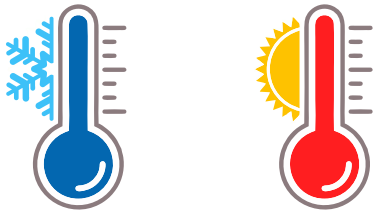
The strength of wire rope slings may be degraded by chemically active environments. This includes exposure to chemicals in the form of solids, liquids, gases, vapours, or fumes. The sling manufacturer or a qualified person should be consulted before slings are used in chemically active environments.

Temperature

(a) Fibre core wire rope slings of all grades shall not be exposed to temperatures in excess of 180°F (82°C).

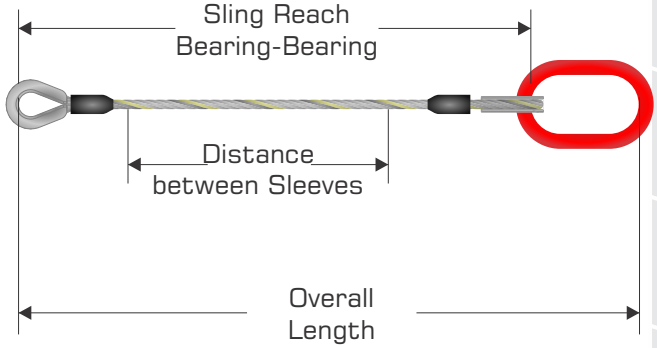
(b) When fibre core wire rope slings are to be used at temperatures below −40°F (−40°C), the sling manufacturer should be consulted.

(c) When IWRC wire rope slings are to be used at temperatures above 204°C or below −40°C, the sling manufacturer should be consulted.



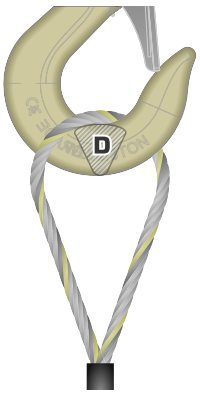
Sling Length

Sling lengths are typically measured from the bearing point to bearing point of the sling. Overall lengths area measured from the bearing point of any attached hardware.



Minimum Sling Length

This is the length of wire rope between splices, sleeves or fittings. Generally, the minimum body length is equal to fifteen (15) times the sling body diameter. This allows approximately one and one half (1-1/2) rope lays between splices. For Multi-part slings, the minimum body length between splices is equal to forty (40) times the component rope diameter.



Sling Eye Design

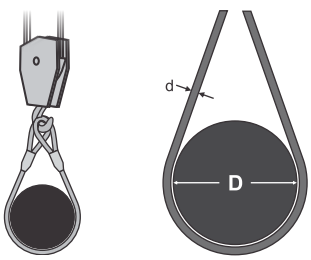
Sling eyes are designed to provide what amount to "small inverted slings" at the ends of the sling body. Therefore, the width of the eye opening will be affected by the same general forces which apply to legs of a sling rigged as a basket.

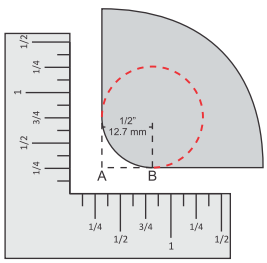
A sling eye should never be used over a hook or pin with a body diameter larger than the natural width of the eye. Never force an eye onto a hook.

The eye should always be used on a hook or pin with at least the nominal diameter of the rope—since applying the D/d Ratio shows an efficiency loss of approximately 50% when the relationship is less than 1/1.

D/d RATIO:

D/d is the ratio of the diameter around which the sling is bent divided by the body diameter of the sling. This ratio has an effect on the rated capacity of slings. When a wire rope is bent around any sheave or other object there is a loss of strength due to this bending action. As the D/d ratio becomes smaller this loss of strength becomes greater and the rope becomes less efficient. This curve relates the efficiency of a rope diameter to different D/d ratios. This curve is based on static loads and applies to 6-strand class 6×19 and 6×37 wire rope.





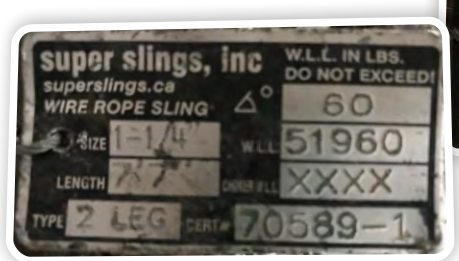
D/d Ratio	Strength Efficiency	D/d Ratio	Strength Efficiency
25/1	100%	6/1	80%
20/1	92%	4/1	75%
15/1	88%	2/1	65%
10/1	86%	1/1	50%
8/1	84%		

SLING IDENTIFICATION

as per ASME B30-9, Section 9-2.7.1.

1) Name or trademark of manufacturer
2) Rated load for at least one hitch and the angle upon which it is based.
3) Diameter or size.
4) Number of legs, if more than one.

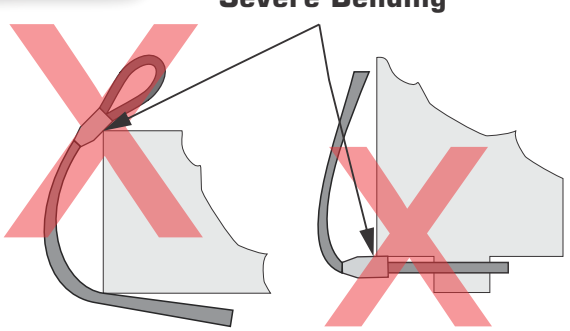
Sling identification should be maintained during the life of the sling by the sling user.

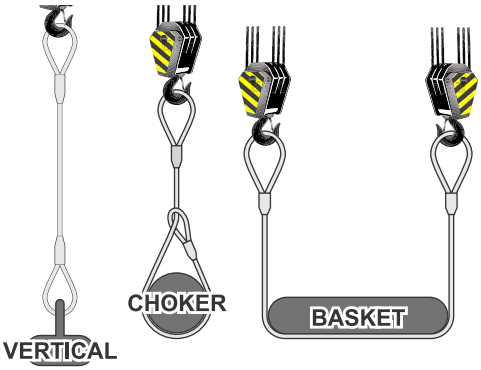


Do Not Permit Bending Near Any Splice or Attached Fitting

• Avoid bending the eye section of wire rope slings around corners. The bend will weaken the splice or swaging. There must be no bending near any attached fitting.

Severe Bending





Every Lift Uses 1 of 3 Basic Hitches

1. Vertical, a simple straight attachment connecting a lifting hook or other device to a load. Full rated load of the sling may be used, but never exceeded. A tagline should be used on such a lift to prevent rotation which can damage the sling. A sling with a hand-tucked splice can unlay and fail if the sling is allowed to rotate.

2. Choker hitches reduce lifting capability of a sling, since this method of rigging affects the ability of the wire rope components to adjust during the lift, places angular loading on the body of the sling, and creates a small diameter bend in the sling body at the choke point.

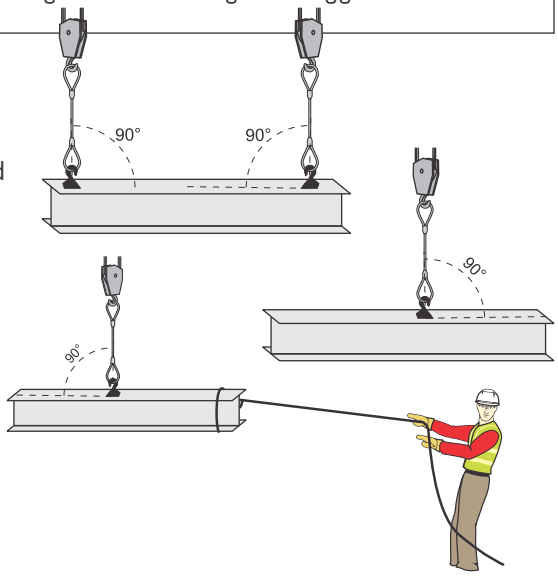
3. Basket hitches distribute a load equally between the two legs of a sling, within limitations imposed by the angles at which legs are rigged to the load.

Vertical Hitch

A vertical hitch, or straight hitch, is the most basic hitch used to directly connect a load to a lifting device. On a vertical hitch, the eye of a single chain sling, wire rope sling, or synthetic sling is connected to the crane or hoist hook, while the other eye is connected to an attachment point on the load. The Vertical Hitch will utilize 100% of the lifting capacity of the sling.

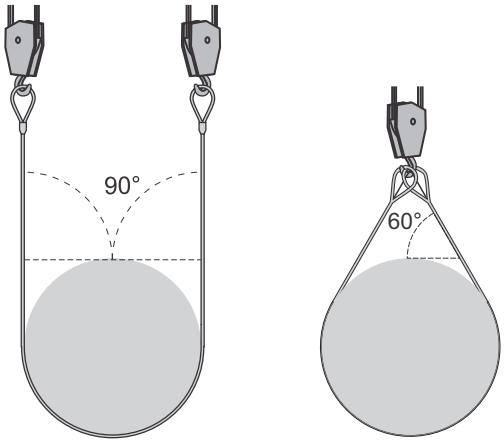
A single vertical hitch should never be used for lifting loose materials, long loads, or unbalanced loads.

WARNING: A sling with a hand-tucked splice may unlay and fail if the sling is allowed to rotate during use. Use of a tagline is recommended to prevent the load from spinning. Always use caution when controlling a load, ensure no persons are in an area where they can be struck by the load or attached rigging.



Basket Hitch

A basket hitch is formed when both eyes of the sling are placed on the lifting hook, thereby forming a circular basket of the sling. This type of hitch distributes the load equally between the two legs of the sling, within limitations. A basket hitch has twice the capacity of a single leg only if D/d ratio is 25/1 and the sling to load angle is 90°. When the **sling to load angle** are less than 90°, increased tension is applied and must be accounted for.



Lifting Bridles

When you attach two or more slings to the same lifting hook, or are connected to a link rigged onto the hook, the total hitch becomes a lifting bridle, distributing the load among the individual slings. When using two or more slings as a lift-ing bridle, remember that the sling angle affects the slings' rated capacities. Also, the location of the lift's centre of gravity will affect the load on each sling leg.

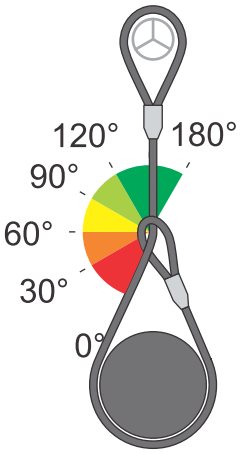
Choker Hitches:

Whenever a sling is used in a choker hitch and results in a Choker Hitch Angle less than 120 degrees, Choker Working Load Limits must be adjusted. Determine the Choker Hitch Angle and multiply the Choker Hitch Work Load Limit by th appropriate Reduction Factor. The result is the actual, reduced Choker Work Load Limit.

Example:

A wire rope sling with a capacity of 4,000 lbs total at 90°, when used at a choke angle of 120° has a reduction factor of 0.87. The resultant choker capacity is 3,480 lbs total at 120°

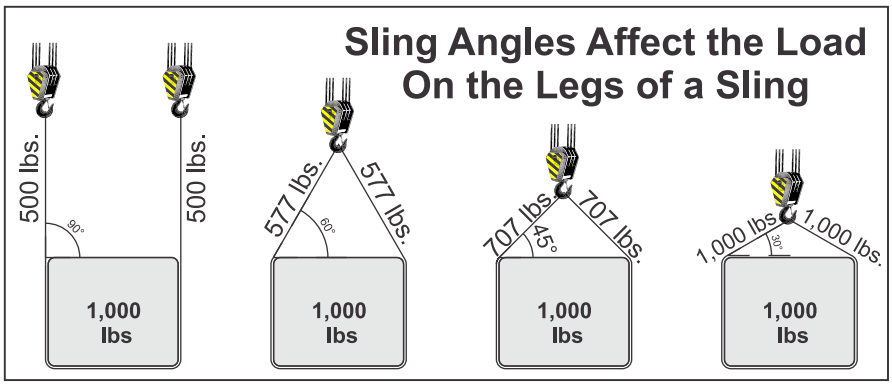
Choker Hitches	
Angle of Choke (degrees)	Sling rated capacity factor as percentage of single leg choker hitch capacity
120-180	100%
105-120	82%
90-105	71%
60-90	58%
0-60	50%



SLING TO LOAD ANGLE

Sling Angles Affect The Load On The Legs Of a Sling:

SLING ANGLE (also called Angle of Loading) is the angle measured between a horizontal line and the sling leg or body. This angle is very important and can have a dramatic effect on the rated load of a sling. As illustrated here, when this angle **decreases,** the load on each leg **increases.** This principle applies whether one sling is used with legs at an angle in a basket hitch, or for multi-leg bridle slings. Angles less than 30 degrees should not be used.



Sling Tension	
Angle/Deg Horizontal	Tension Factor
90	1.000
80	1.015
70	1.064
60	1.155
50	1.305
45	1.414
35	1.742
30	2.000

Effect of Angle - Sling tensions are affected by angle of lift (sling angle), measured from the horizontal, when used with multi-legged web slings or basket hitches. The effect of this angle may be determined by using either of these two methods:

• **Sling Tension Method** (Recommended Method)

Example:

A two-leg sling lifting a 2,000 lbs object at 30° has a tension factor of 2.0. The resultant tension per leg is 2,000 lbs.

• **Reduced Sling Capacity** Method (Alternative Method)

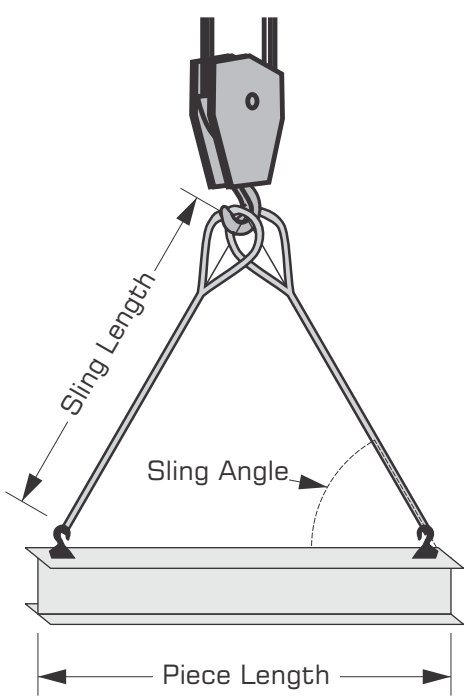
Example:

A two-leg sling with a capacity of 4,000 lbs total at 90° (4,000 lbs per leg) When used at an angle of 30° has a reduction factor of 0.5. The resultant capacity is 2,000 lbs total at 30°

Capacity Reduction	
Angle/Deg Horizontal	Loss Factor
90	1.000
80	0.985
70	0.940
60	0.866
50	0.766
45	0.707
35	0.574
30	0.500

Sling-to-Load Angle Quick Reference

Piece Length	60 Degrees		45 Degrees		30 Degrees	
	Sling Length	Pick Height	Sling Length	Pick Height	Sling Length	Pick Height
1	1	0.9	0.7	0.5	0.6	0.3
2	2	1.7	1.4	1.0	1.2	0.6
3	3	2.6	2.1	1.5	1.7	0.9
4	4	3.5	2.8	2.0	2.3	1.2
5	5	4.3	3.5	2.5	2.9	1.4
6	6	5.2	4.2	3.0	3.5	1.7
7	7	6.1	4.9	3.5	4.0	2.0
8	8	6.9	5.7	4.0	4.6	2.3
9	9	7.8	6.4	4.5	5.2	2.6
10	10	8.7	7.1	5.0	5.8	2.9
11	11	9.5	7.8	5.5	6.3	3.2
12	12	10.4	8.5	6.0	6.9	3.5
13	13	11.3	9.2	6.5	7.5	3.8
14	14	12.1	9.9	7.0	8.1	4.0
15	15	13.0	10.6	7.5	8.7	4.3
16	16	13.9	11.3	8.0	9.2	4.6
17	17	14.7	12.0	8.5	9.8	4.9
18	18	15.6	12.7	9.0	10.4	5.2
19	19	16.5	13.4	9.5	11.0	5.5
20	20	17.3	14.1	10.0	11.5	5.8
21	21	18.2	14.8	10.5	12.1	6.1
22	22	19.1	15.6	11.0	12.7	6.4
23	23	19.9	16.3	11.5	13.3	6.6
24	24	20.8	17.0	12.0	13.8	6.9
25	25	21.7	17.7	12.5	14.4	7.2
26	26	22.5	18.4	13.0	15.0	7.5
27	27	23.4	19.1	13.5	15.6	7.8
28	28	24.2	19.8	14.0	16.2	8.1
29	29	25.1	20.5	14.5	16.7	8.4
30	30	26.0	21.2	15.0	17.3	8.7
31	31	26.8	21.9	15.5	17.9	9.0
32	32	27.7	22.6	16.0	18.5	9.2
33	33	28.6	23.3	16.5	19.0	9.5
34	34	29.4	24.0	17.0	19.6	9.8
35	35	30.3	24.7	17.5	20.2	10.1
36	36	31.2	25.5	18.0	20.8	10.4
37	37	32.0	26.2	18.5	21.3	10.7
38	38	32.9	26.9	19.0	21.9	11.0
39	39	33.8	27.6	19.5	22.5	11.3
40	40	34.6	28.3	20.0	23.1	11.6
41	41	35.5	29.0	20.5	23.7	11.8
42	42	36.4	29.7	21.0	24.2	12.1
43	43	37.2	30.4	21.5	24.8	12.4
44	44	38.1	31.1	22.0	25.4	12.7
45	45	39.0	31.8	22.5	26.0	13.0
46	46	39.8	32.5	23.0	26.5	13.3
47	47	40.7	33.2	23.5	27.1	13.6
48	48	41.6	33.9	24.0	27.7	13.9
49	49	42.4	34.6	24.5	28.3	14.2
50	50	43.3	35.4	25.0	28.9	14.5

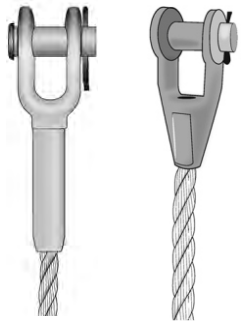


Wire Rope Assembly Terminations & Efficiencies

Wire Rope ends must be fastened to the mechanism so that force and motion are transferred efficiently. End terminations thus become items of great importance for transferring these forces. Each basic type of termination has its own individual characteristic. Hence, one type will usually fit the needs of a given installation better than the others.

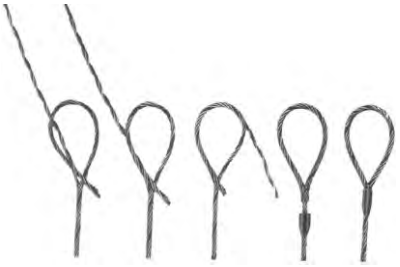
It should be noted that not all end terminations will develop the full strength of the wire rope used. To lessen the possibility of error, the wire rope industry has determined terminal efficiencies for various types of end terminations. Holding power calculations can be made for the more popular end terminations based on efficiency factors in Table 5.

Wire Rope Sockets - Poured Resin & Swage



Poured Resin Sockets are assembled using a specific resin designed for use with steel wire rope. The individual wires are "fanned" and a resin is poured into the cone of the socket. This creates an assembly that retains 100% of the catalogue breaking strength of the wire rope.
Swaged Sockets are mechanically pressed using precision dies. With the correct socket and fabrication, swaged sockets retain 100% of the catalogue breaking strength of the wire rope.

Flemish Eye Splice



The Flemish Eye Splice is formed by opening or unlaying the rope body into two parts. One part having three of the strands and the other having the remaining strands along with the core. The rope is unlayed far enough back to allow the loop or eye to be formed by looping one part in one direction, and the other part in the other direction, then laying the rope back together. The strands are then rolled back around the rope body, a metal sleeve is then slipped over the ends of the splice and pressed (swaged) to secure the ends to the body of the sling.

Hand Spliced Wire Rope Slings (Loading Sling)

Hand spliced wire rope slings, commonly known as "Loading Slings" are generally used in winching and trucking applications. Because there are no steel fittings, loading slings are more flexible better suited to be used over rollers.

Carbon Steel Duplex Sleeve - Fold-Back Eye

The fabrication of this splice involves forming a loop eye and pressing a steel sleeve over both rope parts. With this method, the rope loops back into a swaged sleeve, forming a permanent load-bearing bond between the two parts of the rope.

Aluminum Sleeve Fold-Back Splice

The fabrication of this splice involves forming a loop eye and pressing an aluminum sleeve over both rope parts. As for strength, this is dependent on the pressed sleeve's integrity.

Steel Ferrules (Buttons)

Steel Ferrules, Also known as Swage Buttons are designed to be pressed on to the end of a wire rope and are often used in conjunction with other connecting hardware such as Dee Sockets and tail chains.

Wedge Ferrules

Wedge ferrules are made of high strength alloy steel and feature a two-piece wedge that is rifled to provide more gripping surface on the wire rope strands and greater holding power. Machined wedge-type ferrules permit the make up or repair of chokers and winch lines in minutes – no molten socket metal or swaging equipment is required.

Aluminum Sleeves

Aluminum sleeves come in a variety of configurations, including figure 8, oval and button styles. These fittings (up to 3/8") can be pressed by hand using a hand swaging tool, or for larger sizes and a more uniform press, they can be pressed using a swaging machine and proper dies.

Wire Rope Clips / Fist Grips

A wire rope clip, also called a clamp, cable clamp, wire rope clamp, U-Clip, U-Bolt Clip, is used to fix the loose end of the loop back to the wire rope. It usually consists of a U-shaped bolt, a forged or cast saddle and two nuts. The two layers of wire rope are placed in the U-bolt.
Fist Grips are another form of "clip" that utilize a saddle on either side.

Wedge Sockets

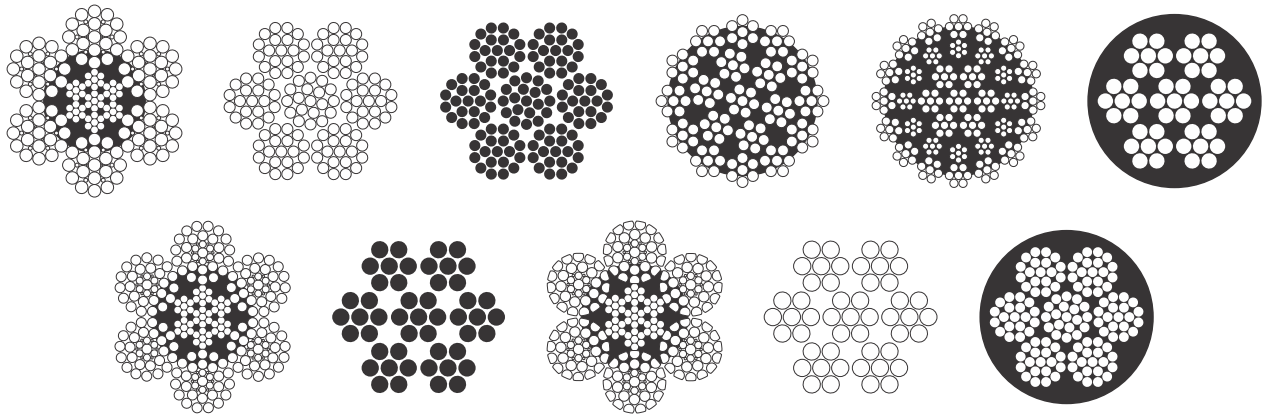
The wedge and body act as a vice which grips the wire rope and locks it in place. Wedge sockets are made in a few different configurations.

Wire Rope End-Termination Efficiencies - Table 5

Termination	Efficiency	
	EIPS IWRC	EIPS Fibre Core
Wire Rope Socket:		
Spelter or Resin	100%	100%
Swage	100%	Not Recommended
Mechanical Splice w/ Sleeve (Flemish Eye)**:**		
1/4" – 1" Diameter	95%	92%
1-1/8" – 2" Diameter	92%	90%
Hand Tucked (Loading Sling) Splice:		
1/4" – 2"	80%	80%
Carbon Steel Duplex – Fold Back Eye		
3/8" – 1-1/8"	94%	Not Recommended
Carbon Steel Ferrules (Buttons)		
Mechanical Swage	98%	Not Recommended
Wedge Ferrules (Buttons)		
Mechanical Swage	98%	Not Recommended
Aluminum Sleeve – Fold Back (Oval, Figure 8, Button):		
Hand Swage Press		
3/64" – 3/8"	80%	Not Recommended
Mechanical Swage Press		
1/4" – 1"	90%	Not Recommended
1-1/8" – 2"	80%	Not Recommended
Wire Rope Clips / Fist Grips:		
Number Of Clips Varies With Size Of Rope	80%	80%
Wedge Sockets		
Depending on Design	80%	75%

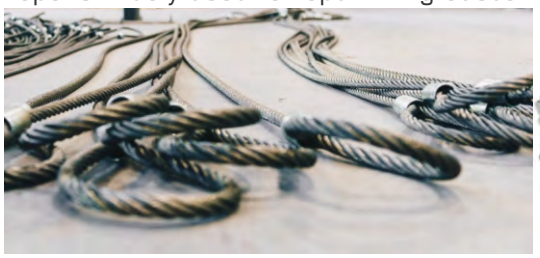
Wire Rope Types

Wire Ropes come in a variety of configurations, constructions, grades and sizes. The classifications of wire rope provide the total number of strands, as well as a nominal or exact number of wires in each strand. These are general classifications and may or may not reflect the actual construction of the strands. However, all wire ropes of the same size and wire grade in each classification will have the SAME strength and weight ratings. Following is a list of the most common wire rope types sold at Super Slings.



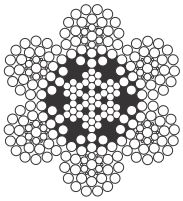
General Purpose Wire Rope

ropes are applied for general purpose such as crane, shipping, mining, fishing, logging, slings etc. And this rope is widely used for optimizing customer's



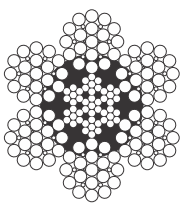
6 X 36 EIPS IWRC (6X37 Classification)

6X36(WS)+IWRC
Generally Available in 5/8" - 1 1/2", offers excellent fatigue resistance
~galvanized available upon request



6 X 26 EIPS IWRC (6X19 Classification)

6X26(WS)+IWRC
Generally Available in 1/4" - 7/8", offers excellent abrasion resistance
~galvanized available upon request



6 x 26 & 6 x 36 Wire Rope

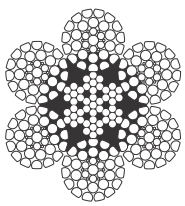
Diameter	Minimum Breaking Strength Tons (2,000 lbs)				Weight lbs / ft.	
[in]	IPS IWRC	IPS FC	EIPS IWRC	EIPS FC	IWRC	Fibre Core
1/4	2.94	2.74	3.4	3.02	0.12	0.11
5/16	4.58	4.26	5.27	4.69	0.18	0.16
3/8	6.56	6.1	7.55	6.71	0.26	0.24
7/16	8.89	8.27	10.2	9.09	0.35	0.32
1/2	11.5	10.7	13.3	11.8	0.46	0.42
9/16	14.5	8.5	16.8	14.9	0.59	0.53
5/8	17.9	16.7	20.3	18.3	0.72	0.66
3/4	26.2	23.8	29.4	26.2	1.04	0.95
7/8	34.6	32.2	39.8	35.4	1.42	1.29
1	44.9	41.8	51.7	46	1.85	1.68
1 1/8	-------	-------	58.415	-------	2.34	2.13
1 1/4	56.5	52.6	65	57.9	2.89	2.63
1 3/8	69.4	64.6	79.9	85.4	3.50	3.18
1 1/2	83.5	77.7	96.8	85.4	4.16	3.78
1 5/8	98.9	92	140	101	4.88	4.44
1 3/4	115	107	132	118	5.67	5.15
1 7/8	133	124	153	136	6.50	5.91
2	152	141	174	155	7.39	6.72
2-1/4	-------	-------	247.0	-------	9.36	-------
2-1/2	-------	-------	302.0	-------	11.16	-------

SPECIAL ORDER

Compact Wire Rope

As wire rope flattening the surface of outer wires of each strand, it has higher breaking load than round rope having same diameter. With the surface of strand and rope being flattened to have wider contact area between sheave and rope, it results in an intense resistance against abrasion and an extension of rope life. It is widely used in diversified applications such as crane, mining, fishing.

Compak® 6 X 36 EIPS IWRC (6X37 Classification)

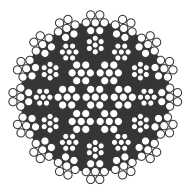


- 6X36(WS)+IWRC
- Generally Available in 7/8" - 1 1/4",
- Superior bending fatigue life when compared with conventional six strand ropes
- Reduced elongation results from increased steel content and the compact process

Spin Resistance Rope

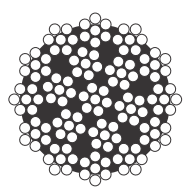
The characteristic of round wires of multi-spin resistance rope is that the outer layer is twisted in the opposite direction of their inner layers.
These ropes have many more outer strands which can distribute the radial pressures onto the reverse lay inner strands. It is mainly selected for larger mobile and all tower cranes.

35 X 7 EIPS IWSC



- 35X7+IWSC
- High structural stability
- Excellent resistance to deformation
- High breaking strength
- Excellent life time
- Applicable rope to lifting crane

19 X 7 EIPS IWSC



- 19X7+IWSC
- High quality Rotation Resistant hoist rope
- Consistent performance
- Recommended for single-part hoisting applications

Compak® 6x36 EIPS IWRC

Wire Rope Dia	Weight	Type
inch	lb/ft	EIPS(Tons)
3/8	0.28	8.3
7/16	0.38	11.2
1/2	0.50	14.6
9/16	0.63	18.5
5/8	0.78	22.7
3/4	1.13	32.4
7/8	1.53	43.8
1	2.00	56.9
1 1/8	2.54	71.5
1 1/4	3.13	87.9
1 3/8	3.79	106
1 1/2	4.51	125
1 5/8	5.29	146
1 3/4	6.13	169
1 7/8	7.04	192
2	8.01	217
2 1/8	9.05	243
2 1/4	10.14	272

SPECIAL ORDER

To convert to pound (Lbs), multiply tons by 2000.

35x7 EIPS IWSC Non-Rotating

Wire Rope Dia	Weight	Type
inch	lb/ft	EIPS(Tons)
7/16	0.43	11.8
1/2	0.56	15.5
9/16	0.71	19.6
5/8	0.89	24.5
3/4	1.25	34.6
7/8	1.69	47.2
1	2.22	61.8
1 1/8	2.79	78.4
1 1/4	3.49	96.9
1 3/8	4.24	117

SPECIAL ORDER

To convert to pound (Lbs), multiply tons by 2000.

19x7 EIPS IWSC Non-Rotating

Wire Rope Dia	Weight	Type
inch	lb/ft	EIPS(Tons)
1/4"	0.11	2.8
5/16"	0.18	4.3
3/8"	0.25	6.2
7/16"	0.35	8.3
1/2"	0.45	10.8
9/16"	0.58	13.6
5/8"	0.71	16.8
3/4"	1.02	24.0
7/8"	1.39	32.5
1"	1.82	42.2

SPECIAL ORDER

To convert to pound (Lbs), multiply tons by 2000.

Galvanized Aircraft Cable

GAC is applied for excellent general purpose steel cable, flexible and wear resistant. And it meets applicable Federal Specification RR-W-410

7X7 GAC

- 7X7 Construction
- Utility Winch lines, Garage door cable, Railing and Agriculture industry

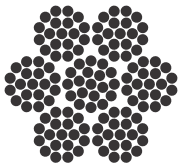
7x7 GAC

Wire Rope Dia	Weight	Type
inch	lb/ft	GAC(Tons)
1/16	0.8	0.24
3/32	1.6	0.46

To convert to pound (Lbs), multiply tons by 2000.

7X19 GAC

- 7X19 Construction
- Utility Winch lines, Garage door cable, Railing and Agriculture industry



7x19 GAC

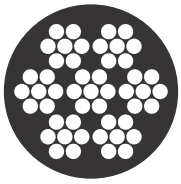
Wire Rope Dia	Weight	Type
Inch	lb/ft	GAC(Tons)
1/8"	2.9	1.00
5/32"	4.5	1.40
3/16"	6.5	2.10
1/4"	11.0	3.50
5/16"	17.3	4.90
3/8"	24.3	7.20

To convert to pound (Lbs), multiply tons by 2000.

PVC Coated Galvanized Aircraft Cable

7X7 GAC

- 7X7 Construction
- Utility Winch lines, Garage door cable, Railing and Agriculture industry



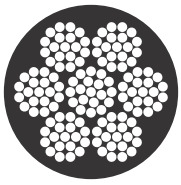
7x7 GAC PVC Coated

Wire Rope Dia	Weight	Type
inch	lb/ft	GAC(Tons)
3/32" - 1/8"	2.00	0.46
1/8" - 3/16"	3.90	0.85

To convert to pound (Lbs), multiply tons by 2000.

7X19 GAC

- 7X19 Construction
- Utility Winch lines, Garage door cable, Railing and Agriculture industry



7x19 GAC PVC Coated

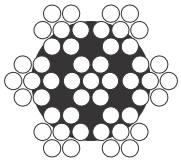
Wire Rope Dia	Weight	Type
inch	lb/ft	GAC(Tons)
1/8" - 3/16"	3.9	1.00
3/16" - 1/4"	7.8	2.10
1/4" - 5/16"	12.5	3.50
5/16" - 3/8"	19.6	4.90

To convert to pound (Lbs), multiply tons by 2000.

Stainless Steel Aircraft Cable

7X7 SS AC

- 7X7 Construction
- Utility Winch lines, Garage door cable, Railing and Agriculture industry



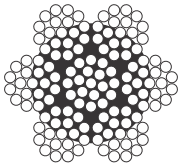
7x7 Stainless Steel

Wire Rope Dia	Weight	Type
inch	lb/ft	SS(Tons)
3/32" - 1/8"	2.00	0.46
1/8" - 3/16"	3.90	0.85

To convert to pound (Lbs), multiply tons by 2000.

7X19 SS AC

- 7X19 Construction
- Utility Winch lines, Garage door cable, Railing and Agriculture industry



7x19 Stainless Steel

Wire Rope Dia	Weight	Type
inch	lb/ft	SS(Tons)
1/8" - 3/16"	3.9	1.00
3/16" - 1/4"	7.8	2.10
1/4" - 5/16"	12.5	3.50
5/16" - 3/8"	19.6	4.90

To convert to pound (Lbs), multiply tons by 2000.

Eye - Eye Wire Rope Slings

A mechanical-spliced wire rope sling is constructed when eyes are formed using the Flemish eye splice. Ends are then secured by pressing a metal sleeve over the ends of the strands of the splice. Pull is directly along the centerline of rope and eye. This splicing method gives the most efficient use of rope capacity and proves to be economical.

HOW TO ORDER EYE & EYE WIRE ROPE SLINGS

Rope Diameter
(One to three digits
1-1/4 " shown in example

Sling Length (ft.)
(One to three digits
25' shown in example

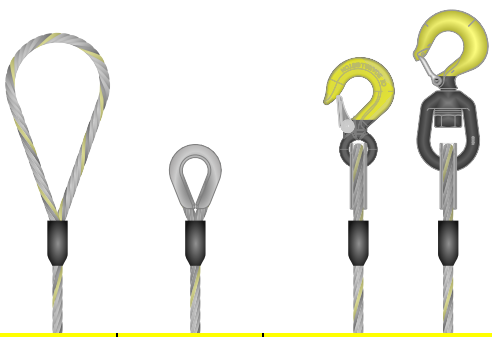
114 25 636 THIM

Rope Construction
6x26 or 6x36
6x36 shown in example

End Termination
THIM,
STD,
THIM/STD

Note:
- **Compliance Certificates can be provided upon request**
- **Proof Testing with certification is available for all slings at an additional charge**

Length tolerance for wire rope slings is +/- two rope diameters or +/- 0.5% of the sling length, whichever is greater. Bridle or matched slings are +/- one rope diameter



Rope Dia.	Working Load Limit 5:1						Std Eye Dimension		Thim Eye Dimension		Eye Hook Dimension		
	Vertical	Choker	Basket										
(in)	90°	120°	90°	60°	45°	30°	W	L	W	L	WLL	E	R
EIPS 6x26													
1/4	1,300	960	2,600	2,200	1,820	1,300	2	4	0.88	1.63	3/4	0.89	3.34
5/16	2,000	1,480	4,000	3,400	2,800	2,000	2.5	5	1.06	1.88	1	0.91	3.81
3/8	2,800	2,200	5,600	5,000	4,000	2,800	3	6	1.13	2.13	1 1/2	1.00	4.14
7/16	3,800	2,800	7,600	6,800	5,400	3,800	3.5	7	1.25	2.38	2	1.09	4.69
1/2	5,000	3,800	10,000	8,800	7,200	5,000	4	8	1.5	2.75	3	1.36	5.77
9/16	6,400	4,800	12,800	11,000	9,000	6,400	4.5	9	1.5	2.75	5	1.61	7.37
5/8	7,800	5,800	15,600	13,600	11,000	7,800	5	10	1.75	3.25	5	1.61	7.37
3/4	11,200	8,200	22,400	19,400	15,800	11,200	6	12	2	3.75	7 1/2	2.08	9.07
7/8	15,200	11,200	30,400	26,000	22,000	15,200	7	14	2.25	4.25	10	2.27	10.08
EIPS 6x36													
1	19,600	14,400	39,200	34,000	28,000	19,600	8	16	2.5	4.5	10	2.27	10.08
1-1/8	24,000	18,200	48,000	42,000	34,000	24,000	9	18	2.88	5.13	15	3.02	12.53
1-1/4	30,000	22,000	60,000	52,000	42,000	30,000	10	20	2.88	5.13	15	3.02	12.53
1-3/8	36,000	26,000	72,000	62,000	50,000	36,000	11	22	3.5	6.25	22	3.02	12.53
1-1/2	42,000	32,000	84,000	74,000	60,000	42,000	12	24	3.5	6.25	22	3.02	12.53
1-3/4	56,000	42,000	112,000	98,000	80,000	56,000	13	26	4	8	30	3.25	14.06
2	74,000	56,000	148,000	126,000	104,000	74,000	14	28	4.5	9	37	3	18.19
2-1/4	88,000	70,000	176,000	154,000	126,000	88,000	16	32	-	-	-	-	-
2-1/2	108,000	84,000	216,000	188,000	154,000	108,000	18	36	-	-	-	-	-
3	154,000	138,000	308,000	266,000	216,000	154,000	20	40	-	-	-	-	-

WARNING! **NEVER EXCEED THE WORKING LOAD LIMIT.**
ALWAYS CHECK THE IDENTIFICATION TAG TO DETERMINE THE SLINGS RATED CAPACITY IS APPROPRIATE FOR THE APPLICATION. RATINGS LISTED ARE VALID FOR NEW SLINGS ONLY. ALWAYS INSPECT BEFORE USE

Multi-Leg Wire Rope Slings

Multi-Leg Bridle Slings are constructed of two, three or four wire rope assemblies that are attached to an Oblong Ring. The lifting ends of the wire rope legs can be fitted with a variety of hooks, eyes, or rings to allow attachment to nearly any object. These are designed for general lifting when the attachment can be made directly to the load. Wire Rope Slings are constructed of strong, high quality steel that is resistant to corrosion, heat, sunlight and most chemicals. Multi-Leg Wire Rope slings are custom built to meet your specific needs for any application.

IWRC (Independent Wire Rope Core)

Note:

- Compliance Certificates can be provided upon request
- Proof Testing with certification is available for all slings at an additional charge
- Length tolerance for wire rope slings is +/- two rope diameters or +/- 0.5% of the sling length, whichever is greater. Bridle or matched slings are +/- one rope diameter

HOW TO ORDER WIRE ROPE BRIDLE SLINGS

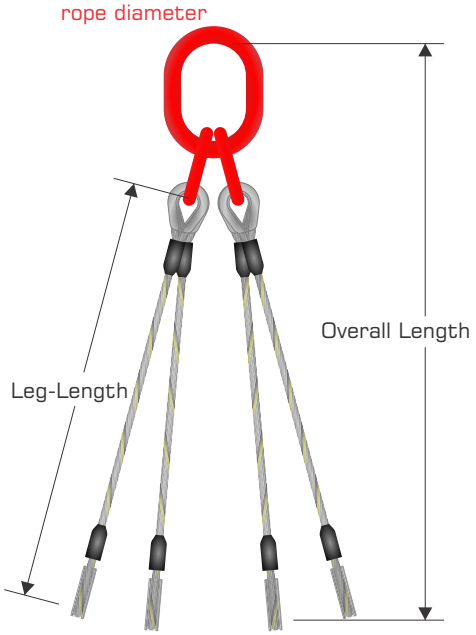
Number of Legs
One Digit -
(4-Leg shown)

4LB 1/2 X 10 THIM

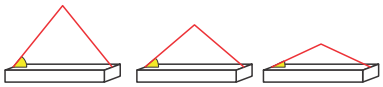
Leg Length
(10' shown in example)

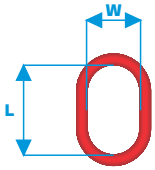
Rope Diameter
One to three digits
(1/2" shown in example)

End Termination
(Thimble Eye shown in example)



2-Leg Wire Rope Slings





Rope Dia [in]	Working Load Limit [lbs]			Oblong Masterlink		
	60°	45°	30°	D	L	W
EIPS 6x26						
1/4	2,200	1,820	1,300	1/2	2.75	4.72
5/16	3,400	2,800	2,000	1/2	2.75	4.72
3/8	5,000	4,000	2,800	5/8	3.15	5.50
7/16	6,800	5,400	3,800	3/4	3.75	6.30
1/2	8,800	7,200	5,000	3/4	3.75	6.30
9/16	11,000	9,000	6,400	1	4.33	7.50
5/8	13,600	11,000	7,800	1	4.33	7.50
3/4	19,400	15,800	11,200	1	4.33	7.50
7/8	26,000	22,000	15,200	1-1/4	5.10	9.00
EIPS 6x36						
1	34,000	28,000	19,600	1-1/2	5.90	10.80
1 1/8	42,000	34,000	24,000	1-1/2	5.90	10.80
1 1/4	52,000	42,000	30,000	1-3/4	7.10	13.40
1 3/8	62,000	50,000	36,000	1-3/4	7.10	13.40
1 1/2	74,000	60,000	42,000	2	7.50	13.75
1 3/4	98,000	80,000	56,000	2-1/8	7.87	13.78
2	126,000	104,000	74,000	2-3/8	8.27	14.76

WARNING! **NEVER EXCEED THE WORKING LOAD LIMIT.**
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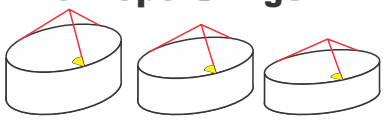
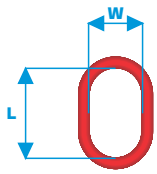
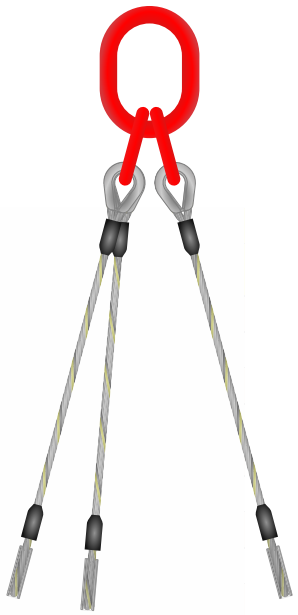
3-Leg Wire Rope Slings

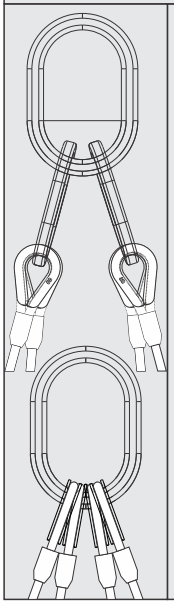






Rope Dia [in]	Working Load Limit [lbs]			Oblong Masterlink		
	60°	45°	30°	D	L	W
EIPS 6x26						
1/4	3,400	2,800	1,940	1/2	2.75	4.72
5/16	5,200	4,200	3,000	5/8	3.15	5.50
3/8	7,400	6,000	4,400	3/4	3.75	6.30
7/16	10,000	8,200	5,800	3/4	3.75	6.30
1/2	13,200	10,800	7,600	1	4.33	7.50
9/16	16,600	13,600	9,600	1	4.33	7.50
5/8	20,000	16,600	11,800	1-1/4	5.10	9.00
3/4	30,000	24,000	16,800	1-1/2	5.90	10.80
7/8	40,000	32,000	22,000	1-1/2	5.90	10.80
EIPS 6x36						
1	52,000	42,000	30,000	1-3/4	7.10	13.40
1 1/8	62,000	52,000	36,000	1-3/4	7.10	13.40
1 1/4	76,000	62,000	44,000	2-1/8	7.87	13.78
1 3/8	92,000	76,000	54,000	2-1/8	7.87	13.78
1 1/2	110,000	90,000	64,000	2-1/8	7.87	13.78
1 3/4	148,000	120,000	84,000	2-3/4	9.84	17.72
2	190,000	156,000	110,000	3-1/8	10.24	17.72

Sub-Assemblies vs. Masterlinks

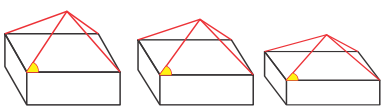


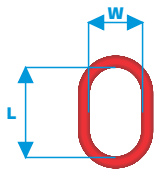
Super Slings recommends the use of a masterlink sub-assembly for 3 & 4-leg wire rope assemblies.

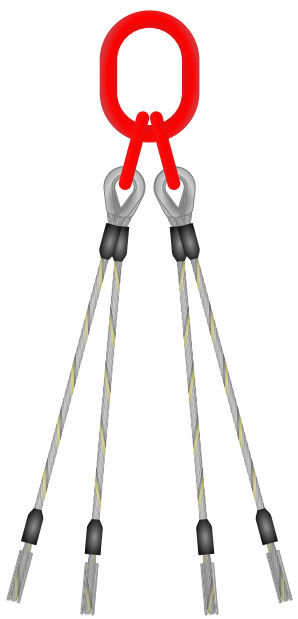
The use of sub-assemblies can aid in the avoidance of "bunching" of hardware in the masterlink which may cause premature wear or failure.

The use of sub-assemblies also increases the ability to maintain equilibrium of load and avoid unbalanced loading which may cause an unanticipated increase in tensions, resulting in premature damage or failure.

4-Leg Wire Rope Slings







Rope Dia [in]	Working Load Limit [lbs]			Oblong Masterlink		
	60°	45°	30°	D	L	W
EIPS 6x26						
1/4	4,400	3,600	2,600	5/8	3.15	5.50
5/16	7,000	5,600	4,000	3/4	3.75	6.30
3/8	10,000	8,200	5,800	1	4.33	7.50
7/16	13,400	11,000	7,800	1	4.33	7.50
1/2	17,600	14,200	10,200	1-1/4	5.10	9.00
9/16	22,000	18,000	12,800	1-1/4	5.10	9.00
5/8	28,000	22,000	15,600	1-1/2	5.90	10.80
3/4	38,000	32,000	22,000	1-1/2	5.90	10.80
7/8	52,000	42,000	30,000	1-3/4	7.10	13.40
EIPS 6x36						
1	68,000	56,000	40,000	2	7.50	13.75
1 1/8	84,000	68,000	48,000	2-1/8	7.87	13.78
1 1/4	102,000	84,000	60,000	2-1/8	7.87	13.78
1 3/8	124,000	100,000	72,000	2-3/8	8.27	14.76
1 1/2	146,000	120,000	84,000	2-3/4	9.84	17.72
1 3/4	196,000	160,000	114,000	3-1/8	10.24	17.72

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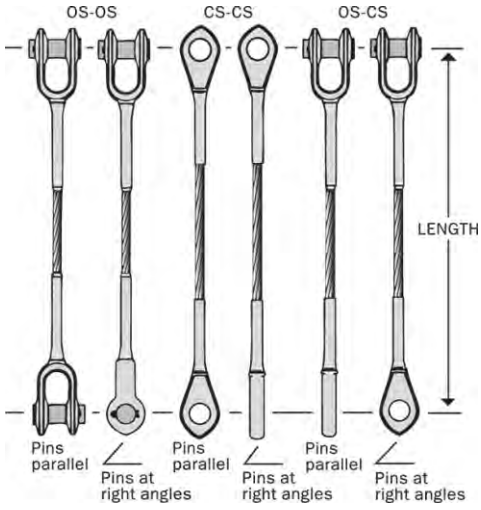
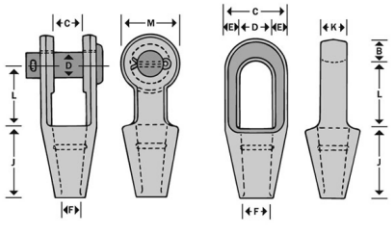
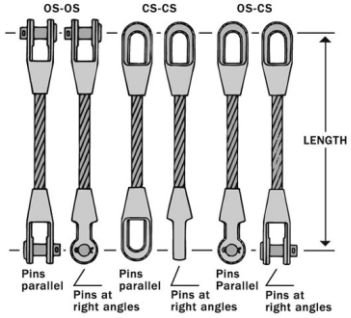
Socket Assemblies

Swaged Sockets are mechanically pressed onto the rope using special dies. With the correct fitting design and fabrication, swaged sockets develop 100% of the rope's strength. Normally, only regular lay rope is used. Swaged assemblies are interchangeable with spelter sockets up through 2" rope diameter. Assembly length is measured from center line of pins for both open and closed sockets.

Poured Resin Sockets are typically used for boom pendants, guylines, raising lines, backstays, lifting bridles and more. Those are the uses of our wire rope assemblies, offered in both poured (spelter) sockets and mechanically swaged sockets. A design factor of five has been used to establish the rated capacities seen in the charts.
Steel forgings are used on rope sizes 1/2" through 1-1/2" and cast steel fittings are used for larger sizes. The assembly lengths are measured from the centerline point of the pin for open sockets and the bearing point for closed sockets.







Size	Working Load Limit	C	D	E	AS Max After Swage Dia	LS Max After Swage Dia
1/4	1,360	1.38	0.75	0.5	0.46	3.75
5/16	2,200	1.62	0.88	0.67	0.71	4.75
3/8	3,000	1.62	0.88	0.67	0.71	4.75
7/16	4,000	2	1.06	0.86	0.91	6
1/2	5,400	2	1.06	0.86	0.91	6
9/16	6,800	2.38	1.25	1.13	1.16	7.75
5/8	8,200	2.38	1.25	1.13	1.16	7.75
3/4	11,800	2.88	1.44	1.31	1.42	9.25
7/8	16,000	3.12	1.69	1.5	1.55	10.75
1	20,000	3.63	2.06	1.75	1.8	12.25
1 1/8	26,000	4	2.31	2	2.05	13.5
1 1/4	32,000	4.5	2.56	2.25	2.3	15.25
1 3/8	38,000	5	2.56	2.25	2.56	16.75
1 1/2	46,000	5.5	2.81	2.5	2.81	18
1 3/4	62,000	6.25	3.56	3	3.06	21.25
2	80,000	7.25	3.81	3.25	3.56	24.25
2 1/4	98,000	-	-	-	-	-
2 1/2	120,000	-	-	-	-	-

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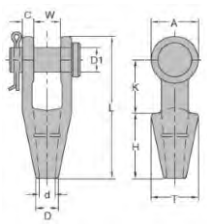
8-734 / Forged Open Spelter Wire Rope Socket

Application

- YOKE Spelter Sockets are forged from special bar quality carbon steel with very finest hardness controlled.
- YOKE Spelter Sockets properly applied have an efficiency rating of 100% based on the catalog strength of wire rope.
- Socket size 1/4" thru 3/4" use one groove, 7/8" thru 1-1/2" use 2 grooves.
- Open Spelter Sockets meet the performance requirements of Federal Specification RR-S-550E,Type A. ★ S.C. = Self Colored.
- In accordance with ASME B30.9 all assembly slings with poured Spelter Sockets, shall be proof loaded.

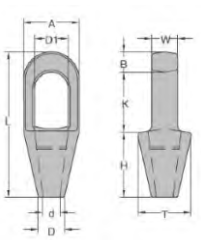


Item Code	Wire Rope Size	Dimensions [in]										Weight Ea.
	[in]	A	C	D	D1	D	H	K	L	T	W	[lbs]
8-733-06	1/4	4.53	0.91	0.67	0.31	0.71	1.54	2.24	1.57	1.30	0.35	1.54
8-733-10	5/16-3/8	4.84	0.83	0.79	0.51	0.83	1.73	2.24	1.77	1.50	0.43	1.98
8-733-13	7/16-1/2	5.59	0.98	0.98	0.59	0.98	1.97	2.48	2.13	1.89	0.51	3.53
8-733-16	9/16-5/8	6.77	1.26	1.18	0.71	1.14	2.24	2.99	2.52	2.28	0.55	4.85
8-733-19	3/4	7.95	1.50	1.38	0.87	1.26	2.64	3.62	2.99	2.64	0.63	7.50
8-733-22	7/8	9.25	1.77	1.61	0.94	1.50	3.35	4.02	3.50	3.15	0.79	11.90
8-733-26	1	10.55	2.05	2.01	1.14	1.73	3.74	4.49	4.02	3.78	0.91	18.74
8-733-28	1-1/8	11.81	2.24	2.20	1.26	2.01	4.13	5.00	4.61	4.13	0.98	25.57
8-733-36	1-1/4-1-3/8	13.19	2.52	2.44	1.50	2.24	4.72	5.51	5.00	4.76	1.14	35.27
8-733-38	1-1/2	15.12	2.99	2.76	1.61	2.76	5.24	5.98	5.98	5.39	1.18	52.91

8-735 / Forged Closed Spelter Wire Rope Socket

Application

- YOKE Spelter Sockets are forged from special bar quality carbon steel with very finest hardness controlled.
- YOKE Spelter Sockets properly applied have an efficiency rating of 100% based on the catalog strength of wire rope.
- Socket size 1/4" thru 3/4" use one groove, 7/8" thru 1-1/2" use 2 grooves.
- Open Spelter Sockets meet the performance requirements of Federal Specification RR-S-550E,Type A. ★ S.C. = Self Colored.
- In accordance with ASME B30.9 all assembly slings with poured Spelter Sockets, shall be proof loaded.



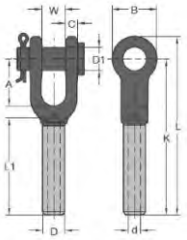
Item Code	Wire Rope Size	Dimensions [in]										Weight Ea.
	[in]	L	B	A	D1	d	D	T	H	W	K	[lbs]
8-735-06	1/4	4.49	0.51	1.50	0.87	0.39	0.71	1.50	2.24	0.51	1.73	0.66
8-735-10	5/16-3/8	4.88	0.63	1.69	0.98	0.51	0.83	1.69	2.24	0.71	2.01	0.88
8-735-13	7/16-1/2	5.43	0.71	2.01	1.18	0.55	0.98	1.97	2.52	0.87	2.24	1.54
8-735-16	9/16-5/8	6.30	0.83	2.64	1.42	0.71	1.10	2.48	2.99	0.98	2.52	2.65
8-735-19	3/4	7.56	1.06	2.99	1.61	0.83	1.26	2.76	3.50	1.26	2.99	4.41
8-735-22	7/8	8.74	1.26	3.62	1.89	0.94	1.50	3.46	3.98	1.50	3.50	7.94
8-735-26	1	9.88	1.38	4.09	2.28	1.14	1.77	3.78	4.49	1.77	4.02	10.58
8-735-28	1-1/8	10.98	1.50	4.49	2.56	1.26	2.01	4.13	5.00	1.97	4.49	15.21
8-735-36	1-1/4-1-3/8	12.13	1.61	5.31	2.80	1.50	2.24	4.76	5.51	2.24	5.00	22.71
8-735-38	1-1/2	13.94	1.93	5.31	3.19	1.61	2.76	5.24	5.98	2.52	5.98	30.86

8-731 / Forged Open Swage Socket(with Round Pin)

Application

- YOKE 8-731 Opened Swage Sockets are forged from special bar quality carbon steel with very finest hardness controlled by spheroidize annealing.
- YOKE Swage Sockets properly applied have an efficiency rating of 100% based on the catalog strength of wire rope. YOKE Swage Sockets are recommended for use with 6x19, 6x37, and IWRC wire rope. They are approved for use with galvanized bridge rope. YOKE Swage Sockets are not recommended for use on fiber core or lang lay rope.
- All slings swaged with Sockets shall be proof loaded in accordance with ANSI B30.9

Item Code	Wire Rope Size	Dimensions [in]										Min After Swage Dim	Weight Ea.
	[in]	A	B	C	D	D1	d	K	L	L1	W	[in]	[lbs]
8-731-06	1/4	1.50	1.38	0.35	0.50	0.69	0.27	4.02	4.80	2.17	0.67	0.46	0.7
8-731-08	5/16	1.77	1.65	0.47	0.77	0.81	0.34	5.31	6.26	3.15	0.79	0.71	1.5
8-731-10	3/8	1.77	1.65	0.47	0.77	0.81	0.41	5.31	6.26	3.15	0.79	0.71	1.3
8-731-11	7/16	1.96	2.00	0.55	0.98	1.00	0.48	6.85	7.83	4.33	1.00	0.91	2.6
8-731-13	1/2	1.96	2.00	0.55	0.98	1.00	0.55	6.85	7.83	4.33	1.00	0.91	2.4
8-731-14	9/16	2.25	2.36	0.68	1.25	1.19	0.62	8.27	9.45	5.31	1.22	1.16	4.6
8-731-16	5/8	2.25	2.36	0.68	1.25	1.19	0.67	8.27	9.45	5.31	1.22	1.16	4.6
8-731-19	3/4	2.75	2.75	0.79	1.55	1.38	0.82	10.07	11.61	6.34	1.50	1.42	8.4
8-731-22	7/8	3.23	3.15	0.94	1.70	1.63	0.94	11.81	13.39	7.44	1.77	1.55	11.9
8-731-26	1	3.86	3.94	1.02	1.98	2.00	1.06	13.58	15.55	8.50	2.00	1.80	17.8
8-731-28	1 1/8	4.26	4.06	1.19	2.25	2.20	1.19	15.08	17.40	9.37	2.25	2.05	27.5
8-731-32	1 1/4	4.72	4.45	1.34	2.53	2.25	1.33	16.50	19.06	10.59	2.48	2.30	38.5
8-731-36	1 3/8	5.20	5.00	1.38	2.80	2.50	1.45	18.23	21.02	11.69	2.52	2.56	46.0
8-731-38	1 1/2	5.75	5.51	1.69	3.08	2.52	1.61	19.75	22.88	12.40	3.00	2.81	66.0

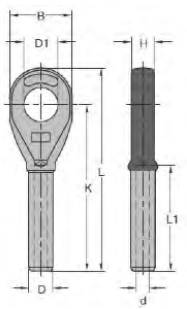


8-732 / Forged Closed Swage Wire Rope Socket

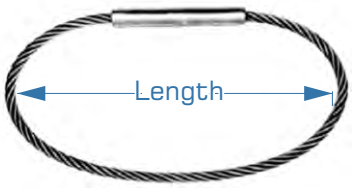
Application

- YOKE 8-732 Closed Swage Sockets are forged from special bar quality carbon steel with very finest hardness controlled by spheroidize annealing.
- YOKE Swage Sockets properly applied have an efficiency rating of 100% based on the catalog strength of wire rope. YOKE Swage Sockets are recommended for use with 6x19, 6x37, and IWRC wire rope. They are approved for use with galvanized bridge rope. YOKE Swage Sockets are not recommended for use on fiber core or lang lay rope. S.C. = Self Colored.
- All slings swaged with Sockets shall be proof loaded in accordance with ANSI B30.9

Item Code	Wire Rope Size	Dimensions [in]								Min After Swage Dim	Weigh t Ea.
	[in]	B	D	D1	d	H	K	L	L1	[in]	[lbs]
8-732-06	1/4	1.38	0.50	0.75	0.27	0.50	3.50	4.33	2.13	0.46	0.4
8-732-08	5/16	1.63	0.77	0.89	0.34	0.67	4.50	5.50	3.15	0.71	0.7
8-732-10	3/8	1.63	0.77	0.89	0.41	0.67	4.50	5.50	3.15	0.71	0.7
8-732-11	7/16	2.00	0.98	1.06	0.48	0.89	5.75	6.93	4.25	0.91	1.5
8-732-13	1/2	2.00	0.98	1.06	0.55	0.89	5.75	6.93	4.25	0.91	1.3
8-732-14	9/16	2.40	1.25	1.26	0.62	1.14	7.28	8.70	5.31	1.16	3.1
8-732-16	5/8	2.40	1.25	1.26	0.67	1.14	7.28	8.70	5.31	1.16	2.9
8-732-19	3/4	2.87	1.55	1.44	0.82	1.31	8.54	10.20	6.38	1.42	5.1
8-732-22	7/8	3.11	1.70	1.70	0.94	1.50	10.16	11.97	7.44	1.55	6.8
8-732-26	1	3.62	1.98	2.05	1.06	1.77	11.54	13.46	8.50	1.80	10.6
8-732-28	1 1/8	4.02	2.25	2.32	1.19	2.00	12.72	15.04	9.57	2.05	14.7
8-732-32	1 1/4	4.50	2.53	2.56	1.33	2.25	14.33	16.97	10.63	2.30	21.6
8-732-36	1 3/8	5.00	2.80	2.56	1.45	2.25	15.83	18.70	11.69	2.56	28.6
8-732-38	1 1/2	5.50	3.08	2.81	1.61	2.52	17.01	20.12	12.75	2.81	28.1



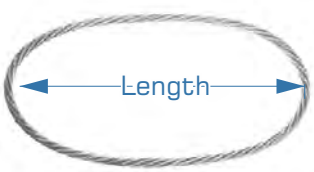
Mechanical Splice Grommet Slings



Mechanical Splice Grommets are constructed with a single piece of 6x36 wire rope connected with a steel sleeve. Highly flexible, they resist kinks and are easy to handle. **Minimum circumference of the sling is 96 times** the grommet body diameter. Rated capacities based on pin diameter no smaller than 5 times the body diameter. Horizontal sling angles less than 30 degrees shall not be used

Wire Rope Dia	Vertical	Choker	Basket Hitch			
	90°	120°	90°	60°	45°	30°
1/4	1,880	1,320	3,800	3,200	2,600	1,880
5/16	3,000	2,000	5,800	5,000	4,200	3,000
3/8	4,200	3,000	8,400	7,200	6,000	4,200
7/16	5,600	4,000	11,400	9,800	8,000	5,600
1/2	7,400	5,200	14,600	12,800	10,400	7,400
9/16	9,200	6,400	18,600	16,000	13,200	9,200
5/8	11,400	8,000	22,000	19,800	16,200	11,400
3/4	16,400	11,400	32,000	28,000	24,000	16,400
7/8	22,000	15,400	44,000	38,000	32,000	22,000
1	28,000	20,000	58,000	50,000	40,000	28,000
1 1/8	36,000	24,000	70,000	62,000	50,000	36,000
1 1/4	42,000	30,000	86,000	74,000	60,000	42,000
1 3/8	50,000	36,000	102,000	88,000	72,000	50,000
1 1/2	60,000	42,000	120,000	104,000	84,000	60,000
1 5/8	68,000	48,000	138,000	120,000	98,000	68,000
1 3/4	80,000	56,000	158,000	138,000	112,000	80,000
1 7/8	90,000	62,000	178,000	154,000	126,000	90,000
2	100,000	70,000	202,000	174,000	142,000	100,000

Spliced Grommet Slings



Cable Laid Grommets have six ropes laid helically around a wire rope core with ends joined by a hand tuck to form an endless body. Highly flexible, they resist kinks and are easy to handle. **Minimum circumference of the sling is 96 times** the grommet body diameter. Rated capacities based on pin diameter no smaller than 5 times the body diameter. Horizontal sling angles less than 30 degrees shall not be used.

Wire Rope Dia	Vertical	Choker	Basket Hitch			
	90°	120°	90°	60°	45°	30°
1/4	2,200	1,480	4,200	3,600	3,000	2,200
5/16	3,200	2,400	6,600	5,600	4,600	3,200
3/8	4,800	3,200	9,400	8,200	6,600	4,800
7/16	6,400	4,400	12,800	11,000	9,000	6,400
1/2	8,200	5,800	16,600	14,400	11,800	8,200
9/16	10,400	7,400	20,000	18,200	14,800	10,400
5/8	12,800	9,000	26,000	22,000	18,200	12,800
3/4	18,400	12,800	36,000	32,000	26,000	18,400
7/8	24,000	17,400	50,000	44,000	36,000	24,000
1	32,000	22,000	64,000	56,000	46,000	32,000
1 1/8	40,000	28,000	82,000	70,000	58,000	40,000
1 1/4	50,000	34,000	100,000	86,000	70,000	50,000
1 3/8	60,000	42,000	120,000	104,000	84,000	60,000
1 1/2	72,000	50,000	142,000	124,000	100,000	72,000
1 5/8	82,000	58,000	164,000	142,000	116,000	82,000
1 3/4	96,000	66,000	190,000	166,000	136,000	96,000
1 7/8	108,000	76,000	218,000	188,000	154,000	108,000
2	124,000	86,000	248,000	214,000	174,000	124,000

WARNING! **NEVER EXCEED THE WORKING LOAD LIMIT.**
ALWAYS CHECK THE IDENTIFICATION TAG TO DETERMINE THE SLINGS RATED CAPACITY IS APPROPRIATE FOR THE APPLICATION. RATINGS LISTED ARE VALID FOR NEW SLINGS ONLY. ALWAYS INSPECT BEFORE USE

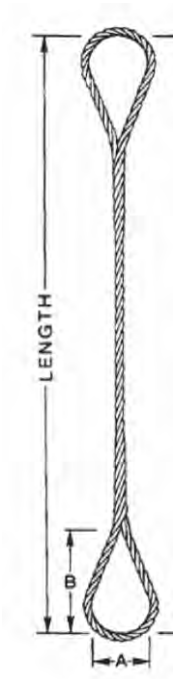
Hand Spliced Wire Rope Slings (Loading Slings)

Hand spliced wire rope slings (commonly known as "Loading Slings") are typically used in heavy haul winching applications. These slings are spliced without a steel sleeve, making them ideal for use with the roller on a large winch truck. Loading slings come with 36" eyes in order to fit a large selection of equipment and are made with 6x36 EIPS wire rope for the best combination of flexibility and strength. Standard lengths for loading slings are 24', 26' and 28', customer lengths are available upon request. Eye Size for Loading Slings is typically 36" x 10"

Warning: Hand-spliced slings should not be used in lifts where the sling may rotate and cause the wire rope to unlay.

Wire Rope Dia	Vertical	Basket Hitch			
	90°	90°	60°	45°	30°
EIPS IWRC Wire Rope					
1/2	7,100	14,200	10,500	8,600	6,100
9/16	8,900	17,800	13,300	10,800	7,700
5/8	10,900	21,800	16,400	13,400	9,500
3/4	15,700	31,400	23,500	19,200	13,600
7/8	21,200	42,400	31,800	26,000	18,400
1	27,500	55,000	41,300	33,700	23,900
1 1/8	34,700	69,400	52,100	42,500	30,100
1 1/4	42,600	85,200	64,000	52,300	37,000
1 3/8	51,200	102,400	77,000	62,900	44,500
1 1/2	60,800	121,600	91,200	74,500	52,700
IPS IWRC (Special Order)					
1/2	6,100	12,200	10,500	8,600	6,100
9/16	7,700	15,400	13,300	10,800	7,700
5/8	9,500	19,000	16,400	13,400	9,500
3/4	13,600	27,200	23,500	19,200	13,600
7/8	18,400	36,800	31,800	26,000	18,400
1	23,900	47,800	41,300	33,700	23,900
1 1/8	30,100	60,200	52,100	42,500	30,100
1 1/4	37,000	74,000	64,000	52,300	37,000
1 3/8	44,500	89,000	77,000	62,900	44,500
1 1/2	52,700	105,400	91,200	74,500	52,700

SPECIAL ORDER



Design Factor 3:1
NOT FOR OVERHEAD LIFTING

WARNING! NEVER EXCEED THE WORKING LOAD LIMIT.
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Swivel Dee Rope Sockets

The No. 154 Swivel Dee is made from cast alloy steel. Ideal for general logging and winching purposes, the dees have proven their value many times over. They may be used in any situation where an "in-line" pull or swivel action is required

Item No.	Item Description	Type
12-600-154-A	3/4"-7/8" SWIVEL DEE ROPE SOCKET L360	6 lb Light
12-600-154-B	1" - 1 1/8" SWIVEL DEE ROPE SOCKET L361	12 lb Junior
12-600-154-C	1-1/4" - 1-3/8" SWIVEL DEE ROPE SOCKET L362	17 lb Standard

Wedge Type Ferrules

Wedge Type ferrules are made of high strength alloy steel and feature a two-piece wedge that is rifled to provide more gripping surface on the wire rope strands and greater holding power. Machined wedge-type ferrules permit the make up or repair of chokers and winch lines in minutes – no molten socket metal or swaging equipment is required. Wedge type ferrules may be applied with Socket resin.

Item No.	Description
12-L-790	3/8" SILVER QUICK WAY FERRULE
12-L-791	1/2" BROWN QUICK WAY FERRULE
12-L-794	9/16"-5/8" PINK QUICK WAY FERRULE
12-L-798	1/2" CREAM QUICK WAY FERRULE - H.D.
12-L-801	5/8" MAROON QUICK WAY FERRULE - H.D.
12-L-802	3/4" GREY QUICKWAY FERRULE
12-L-804	7/8" BLACK QUICK WAY FERRULE
12-L-805	1" GREEN QUICK WAY FERRULE
12-L-806	7/8" RED QUICK WAY FERRULE - H.D.
12-L-807	1" BLUE QUICK WAY FERRULE - H.D.
12-L-808	1 1/8" YELLOW QUICK WAY FERRULE
12-L-809	1 1/4" ORANGE QUICK WAY FERRULE
12-L-810	1 1/4 PURPLE QUICK WAY FERRULE HD
12-L-811	1 3/8" GOLD QUICK WAY FERRULE

1. Insert Cable through the ferrule and spread the strands to insert wedge halves over the core of the wire rope.

2. Position individual strands into the proper grooves around the wedge halves and tap wedges until they are flush with strand ends.

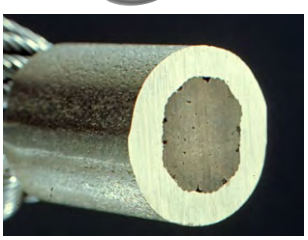
3. Slide the ferrule back over the wedge into the ferrule with a hammer and a short pipe which fits inside the strands and over the core.

4. The first load will seat the cable and wedge securely in the ferrule and the strands project about 1/4" above the wedge. Strands must not finishe below the wedge

Wedge-type ferrules are intended only for use with new 6 x 19 class or 6 x 37 class, right regular lay, EIP, IWRC rope made to North American specifications.

Screwy® Drumline Ferrules

CAST SCREWY DRUMLINE FERRULES Screwy drumline ferrules incorporate the cast Screwy design in a shorter ferrule, designed specifically for attaching winch lines to winch drum pockets. Note: Drumline ferrules develop less holding power than choker ferrules and should only be used to attach wire rope to winch drums. Never load drumline ferrules directly. Always leave at least three wraps on the drum when it's under a load.



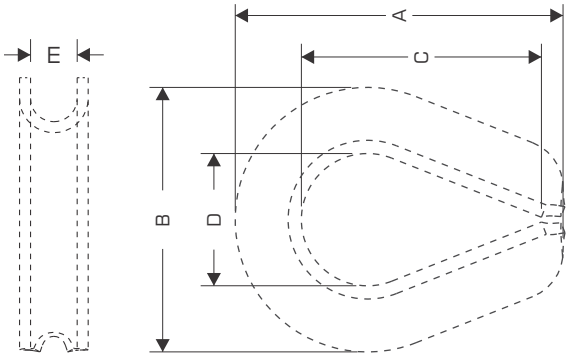
Item No.	Description
47-L6DL34	3/4" SCREWY DRUMLINE FERRULE
47-L7DL78	7/8" SCREWY DRUMLINE FERRULE
47-J8DL1	1" SCREWY DRUMLINE FERRULE
47-J9DL118	1 1/8" SCREWY DRUMLINE FERRULE
47-J10DL	1 1/4"SCREWY DRUMLINE FERRULE

Wire Rope Thimbles

Thimbles are used to protect steel wire rope, fibre rope or synthetic rope. They are available in various models and sizes. All indicated types of thimbles in this catalogue can be used in combination with the above mentioned types of ropes.

Thimbles must be regularly inspected in accordance with the standards given in the country of use. This is required because the products in use may be affected by wear, misuse, overloading which may lead to deformation and/or alteration of the steel structure.

Make sure that the (wire) rope fits properly into the groove of the thimble you use. The nominal size of the thimble represents the diameter of the (wire) rope for which it is intended to be used. If there is no thimble available with a nominal size that meets the size of your (wire) rope, the next larger size of thimble must be used.
Before use, check if the thimble is free from impurities, sharp edges, cracks or other irregularities which may damage the wire rope and therefore affect the performance of the wire rope.



Heavy Duty Wire Rope Thimbles

Wire Rope Size	Weight / 100 pcs	Dimensions [in]						Qty / Box	Item Code
[in]	lbs	A	B	C	D	E	Thickness		
1/4	6.50	2.19	1.50	1.63	0.88	0.28	0.41	1000	47-1037639
5/16	11.80	2.50	1.81	1.88	1.06	0.34	0.50	500	47-1037657
3/8	21.60	2.88	2.13	2.13	1.13	0.41	0.63	250	47-1037675
7/16	34.70	3.25	2.38	2.38	1.25	0.47	0.72	150	47-1037693
1/2	51.00	3.63	2.75	2.75	1.50	0.53	0.81	100	47-1037719
5/8	75.70	4.25	3.13	3.25	1.75	0.66	0.97	80	47-1037755
3/4	158.1	5.00	3.81	3.75	2.00	0.78	1.22	50	47-1037773
7/8	177.8	5.50	4.25	4.25	2.25	0.94	1.38	30	47-1037791
1	313.9	6.13	4.94	4.50	2.50	1.06	1.56	20	47-1037817
1 1/8 -1 1/4	400.0	7.00	5.88	5.13	2.88	1.31	1.81	15	47-1037835
1 1/4 -1 3/8	811.0	9.00	6.81	6.25	3.50	1.44	2.19	6	47-1037853
1 3/8 -1 1/2	1,295	9.06	7.13	6.50	3.50	1.56	2.56	5	47-1037871
1 3/4	1,775	12.19	8.50	9.00	4.50	1.84	2.84	4	47-1037915
2	2,775	15.13	10.38	12.00	6.00	2.09	3.09	2	47-1037933

Light Duty Wire Rope Thimbles

Wire Rope Size	Weight / 100 pcs	Dimensions [in]					Item Code
[in]	lbs	A	B	C	D	E	
1/8	3.50	1.94	1.06	1.31	0.69	0.16	47-1037256
3/16	3.50	1.94	1.06	1.31	0.69	0.22	47-1037274
1/4	3.50	1.94	1.06	1.31	0.69	0.28	47-1037292
5/16	4.00	2.13	1.25	1.50	0.81	0.34	47-1037318
3/8	6.70	2.38	1.47	1.63	0.94	0.41	47-1037336
1/2	12.50	2.75	1.75	1.88	1.13	0.53	47-1037354
5/8	34.50	3.50	2.38	2.25	1.38	0.66	47-1037372
3/4	47.10	3.75	2.69	2.50	1.63	0.78	47-1037390
7/8	84.60	5.00	3.19	3.50	1.88	0.94	47-1037416

Aluminum Oval Sleeves "Figure 8"

Wire Rope Size	Weight / 100 pcs	Dimensions [in]			O.D After Swage	Item Code
[in]	lbs	Length	Depth	Width	[in]	
1/16	0.10	3/8	11/64	1/4	0.187	47-116AS
3/32	0.30	1/2	9/32	13/32	0.281	47-332AS
1/8	0.66	5/8	11/32	1/2	0.312	47-18AS
5/32	0.88	11/16	3/8	9/16	0.375	47-532AS
3/16	1.6	1	7/16	21/32	0.437	47-316AS
1/4	2.8	1-1/8	17/32	13/16	0.563	47-14AS
5/16	4.6	1-1/4	11/16	1-1/32	0.687	47-516AS
3/8	5.9	1-7/16	3/4	1-5/32	0.812	47-38AS
7/16	12	1-11/16	15/16	1-7/16	1.000	47-716AS
1/2	17	2	1-1/16	1-5/8	1.120	47-12AS

Aluminum Button Stops

Wire Rope Size	Weight / 100 pcs	Dimensions [in]		O.D After Swage	Item Code
[in]	lbs	Outside Dia	Inside Dia	[in]	
1/16	0.06	1/4	3/32	0.187	47-116AB
3/32	0.25	11/32	1/8	0.245	47-332AB
1/8	0.24	11/32	5/32	0.245	47-18AB
5/32	0.38	7/16	3/16	0.325	47-532AB
3/16	0.35	7/16	7/32	0.325	47-316AB
1/4	2.06	11/16	9/32	0.508	47-14AB
5/16	1.74	11/16	3/8	0.508	47-516AB

Copper Oval Sleeves "Figure 8"

Wire Rope Size	Weight / 100 pcs	Dimensions [in]			O.D After Swage	Item Code
[in]	lbs	Length	Depth	Width	[in]	
1/16	0.3	25/64	11/64	1/4	0.190	47-116CS
3/32	0.65	29/64	15/64	3/8	0.265	47-332CS
1/8	1.6	9/16	21/64	1/2	0.353	47-18CS
5/32	2.3	5/8	3/8	19/32	0.390	47-532CS
3/16	5.1	7/8	7/16	43/64	0.475	47-316CS
1/4	7.5	1-1/8	13/16	1/2	0.585	47-14CS
5/16	11.8	1-1/8	21/32	1-1/64	0.730	47-516CS
3/8	17	1-1/2	23/32	1-1/8	0.795	47-38CS

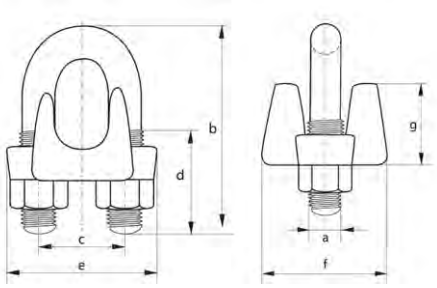
Green Pin Wire Rope Clips

Product details

Productcode: G-6240
Material: Bridge: drop forged high tensile steel SAE 1045U-bolt: SAE 1015
Finish: Hot dipped galvanized U-bolt and/or nuts for diameter bow 5, 6, 8 and 10 mm are electro-galvanized
Certification: 2.1
Standard: Generally to EN 13411-5 Type BFormerly US Federal Specification FF-C-450D

Description

The Green Pin® Wire Rope Clip is a wire rope clip, generally to EN 13411-5 Type B. This wire rope clip is safer to work with as the ribs on the bearing surface of the clip prevent sliding of the wire rope. Furthermore, the wire rope clip is made from high tensile steel, while galvanization ensures its long-term durability. The Green Pin® Wire Rope Clip is available in a range for wire rope diameters of 4 up to 78 mm.



Highlights

- High tensile steel
- Ribs prevent sliding of wire rope
- Galvanization assures long-term durability
- Generally to EN 13411-5 Type B
- Superior stock availability of 99%

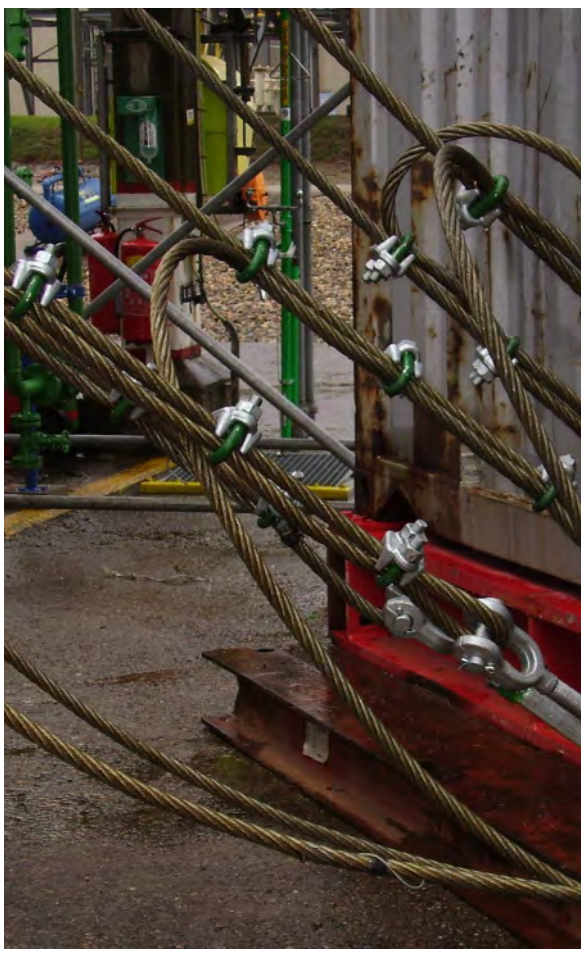
Item Code	Diameter Wire Rope	Diameter	Length Bow	Width Inside	Length Thread	Length Base	Height Base	Net Weight
	[in]	A	B	C	D	E	G	LBS
88-CLGRP03	1/8	0.20	0.94	0.47	0.43	0.94	0.39	0.07
88-CLGRP05	3/16	0.24	1.22	0.59	0.51	1.14	0.51	0.15
88-CLGRP06	1/4	0.31	1.34	0.75	0.51	1.46	0.71	0.18
88-CLGRP08	5/16	0.39	1.77	0.87	0.75	1.69	0.75	0.26
88-CLGRP10	3/8	0.43	1.93	1.02	0.75	1.93	0.98	0.46
88-CLGRP11	7/16	0.47	2.36	1.18	0.98	2.28	1.02	0.73
88-CLGRP12	1/2	0.51	2.40	1.18	0.98	2.28	1.22	0.73
88-CLGRP14	9/16	0.55	2.83	1.30	1.26	2.48	1.22	1.01
88-CLGRP16	5/8	0.55	2.91	1.30	1.26	2.52	1.42	1.01
88-CLGRP19	3/4	0.63	3.39	1.50	1.46	2.83	1.50	1.41
88-CLGRP22	7/8	0.75	3.86	1.77	1.61	3.15	1.57	2.12
88-CLGRP25	1	0.75	4.25	1.89	1.81	3.46	1.85	2.54
88-CLGRP28	1 1/8	0.75	4.61	2.01	2.01	3.58	1.89	2.80
88-CLGRP32	1 1/4	0.87	5.12	2.32	2.13	4.13	2.20	4.34
88-CLGRP35	1 3/8	0.87	5.51	2.36	2.32	4.25	2.28	4.56
88-CLGRP38	1 1/2	0.87	5.79	2.60	2.36	4.41	2.52	5.60
88-CLGRP42	1 5/8	0.98	6.34	2.76	2.64	4.76	2.64	7.10
88-CLGRP45	1 3/4	1.14	6.85	3.07	2.76	5.28	2.99	9.22
88-CLGRP50	2	1.26	7.68	3.39	3.07	5.91	3.35	13.27
88-CLGRP56	2 1/4	1.26	8.39	3.86	3.19	6.38	3.94	17.11
88-CLGRP64	2 1/2	1.26	8.94	4.13	3.43	6.61	4.45	19.00
88-CLGRP69	2 3/4	1.26	9.57	4.41	3.58	6.85	4.88	22.49
88-CLGRP75	3	1.50	10.67	4.76	3.86	7.64	5.35	28.00

Green Pin Wire Rope Clips

Applications
Wire rope clips are used on wire rope eye-loop connections or complete loops, end-to-end connections where socketing or splicing is not feasible or when a temporary joint is required.

Range
Green Pin® offers a wide range of wire rope clips in specifically standardized models such as EN 13411-5 and DIN wire rope clips. Van Beest also offers a wide range of other wire rope clips to complement the Green Pin® assortment.

Design
Green Pin® wire rope clips are drop forged and have a bridge with grooves to tighten the wire rope properly in the clip; the DIN wire rope clips have a malleable base, without grooves.
Wire rope clips are generally marked with:
- manufacturer's symbol - e.g. GP
- wire rope diameter in mm or inches - e.g. 13mm or 1/2"
- traceability code - e.g. A1



Finish
The finish can be electro-galvanized or hot dipped galvanized.

Certification
Specific details of certificate availability can be found on each product page. Please verify your certification requirements with Green Pin® at the time of order.

Instructions for use
Wire rope clips should be inspected before use to ensure that:
- all markings are legible;
- a wire rope clip with the correct dimensions has been selected;
- the nuts or any other locking system cannot vibrate out of position;
- the wire rope clip is free from nicks, gouges and cracks;
- never modify, repair or reshape a wire rope clip by machining, welding, heating or bending as this may affect their performance.

The wire rope clip should be fitted to the wire rope as shown in below figures. The bridge of the wire rope clip should always be placed on the load bearing part of the rope. The U bolt of the clip should be placed on the rope tail, also known as the dead end of the rope. Turn back enough wire rope length so that the required minimum number of clips can be installed according to the instructions below.

The first clip must be placed one bridge width from the turned-back rope tail or dead end of the rope, according to figure 1. Tighten the nuts to the specified torque.

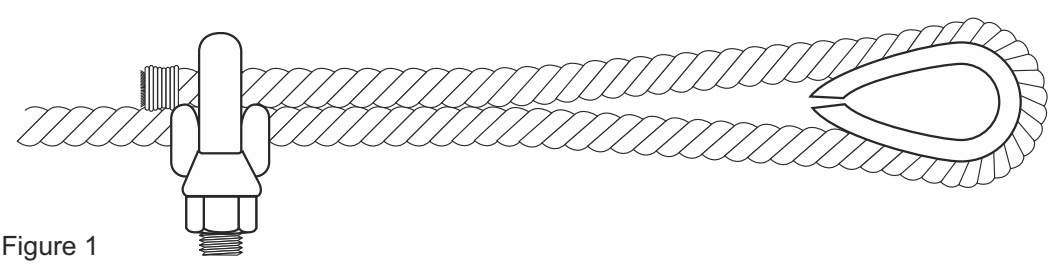


Figure 1

Green Pin Wire Rope Clips

The second clip must be placed immediately against the thimble. Take care that the correct tightening of the clip does not damage the outer wires of the wire rope (figure 2). Tighten the nuts firmly but not yet to the specified torque.

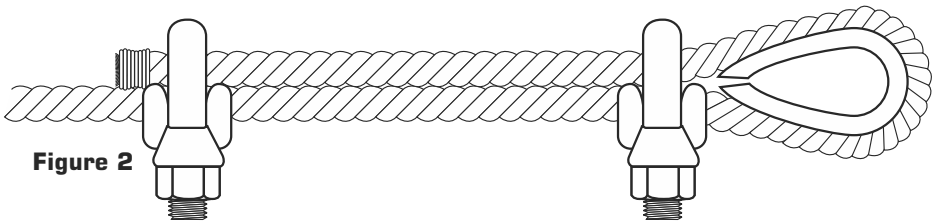


Figure 2

The following clips should be placed on the wire rope between the first and second clip in such a way that they are separated by at least 1½ times the clip-width with a maximum of 3 times the clip-width, according to figure 3.

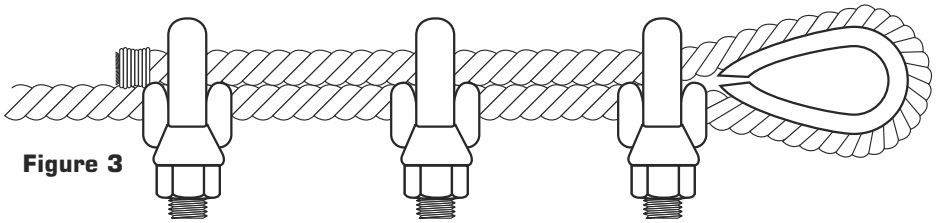


Figure 3

Apply light tension on the rope and tighten all nuts evenly, alternating until reaching the specified torque. After assembly and before the rope is taken into service, the nuts must be tightened further to the prescribed torque. After the load has been applied to the assembly for the first time, the torque value must be checked and corrected if necessary. Re-tightening of the nuts must be done at 10.000 cycles (heavy usage), 20.000 cycles (moderate usage) or 50.000 cycles (light usage). If cycles are unknown, a competent person could fix a time period, e.g. every 3 months, 6 months, annually. The torque values and the minimum number of clips to be applied for a particular rope size are given in the following tables.

The efficiency of a wire rope termination made with wire rope clips depends on the correct placement of the clips on the rope and on correct fitting and tightening of the clips. With inadequately tightened nuts or with an insufficient number of wire rope clips the rope end may slide through the clips during use. The fitting of the clips on the ropes may be affected by various circumstances, such as:

- the nut may be tight on the thread, yet not tight against the bridge;
- contamination of the thread by dirt, oil or corrosion products, which may prevent correct tightening of the nut.

Forged wire rope clips provide greater bearing surface and more consistent strength than malleable cast iron clips.

Suitable applications of wire rope clips to EN 13411-5 standards include suspending static loads and single use lifting operations which have been assessed by a competent person taking into account appropriate safety factors.

Wire rope clips should not be used in following applications:

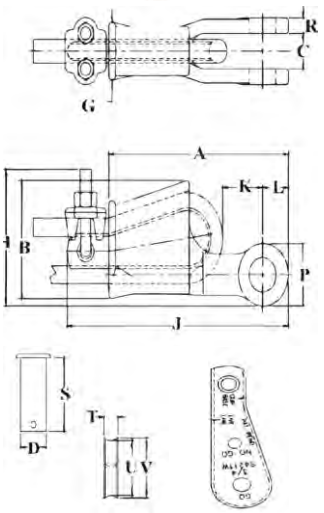
- hoist ropes in mines;
- rope drives for cranes in steel works and rolling mills;
- permanent fastening of ropes in other rope drives;
- rope terminations for load suspension devices in the operation of lifting appliances, except in the case of lifting tackles where these are produced for a special application and used only once.

Wire rope clips must be regularly inspected in accordance with the safety standards given in the country of use. This is required because the products in use may be affected by wear, misuse, overloading etc. which may lead to deformation and alteration of the material structure. Inspection should take place at least every six months and more frequently when the products are used in severe operating conditions.

Wire Rope Size		Number of Clips Required	Length of Wire Rope Turnback		Torque Required	
in	mm		mm	in	Nm	ft/lbs
1/8	3-4	2	85	3.35	6.1	4.5
3/16	5	2	95	3.74	10.2	7.5
1/4	6-7	2	120	4.72	20.3	15
5/16	8	3	133	5.24	40.7	30
3/8	9-10	3	165	6.50	61	45
7/16	11	3	178	7.01	88	65
1/2	12-13	3	292	11.50	88	65
9/16	14-15	3	305	12.01	129	95
5/8	16	3	305	12.01	129	95
3/4	18-20	4	460	18.11	176	130
7/8	22	4	480	18.90	305	225
1	24-26	5	660	25.98	305	225
1-1/8	28-30	6	860	33.86	305	225
1-1/4	32-34	7	1120	44.09	488	360
1-3/8	36	7	1120	44.09	488	360
1-1/2	38-40	8	1370	53.94	488	360
1-5/8	41-42	8	1470	57.87	583	430
1-3/4	44-46	8	1550	61.02	800	590
2	48-52	8	1800	70.87	1017	750
2-1/4	56-58	8	1850	72.83	1017	750
2-1/2	62-65	9	2130	83.86	1017	750
2-3/4	68-72	10	2540	100.00	1017	750
3	75-78	10	2690	105.91	1627	1200

Table 1, Green Pin® wire rope clips generally to EN 13411-5 Type B, required number and torque value

S-421T Wedge Sockets



Product details

- Wedge socket terminations have an efficiency rating of 80% based on the catalog strength of XXIP wire rope
- Meets or exceeds all requirements of ASME B30.26 including identification, ductility, design factor, proof load and temperature requirements Importantly, these sockets meet other critical performance requirements including fatigue life, impact properties and material traceability, not addressed by ASME B30.26.
- Type Approval and certification in accordance with ABS 2007 Steel Vessel Rules1-1-177, and ABS Guide for Certification of Cranes
- Basket is cast steel and individually magnetic particle inspected
- Pin diameter and jaw opening allows wedge and socket to be used in conjunction with closed swage and spelter sockets
- Secures the tail or "dead end" of the wire rope to the wedge, thus eliminates loss or "Punch out" of the wedge
- Eliminates the need for an extra piece of rope, and is easily installed
- The TERMINATOR™ wedge eliminates the potential breaking off of the tail due to fatigue
- The tail, which is secured by the base of the clip and the wedge, is left unreformed and available for reuse
- Incorporates Crosby's patented QUIC-CHECK® "Go" and "No-Go" feature cast into the wedge. The proper size rope is determined when the following criteria are met: 1) The wire rope should pass thru the "Go" hole in the wedge 2) The wire rope should NOT pass
- The 3/8" thru 1-1/8" standard S-421 wedge socket can be retrofitted with the new style TERMINATOR™ wedge
- Available with Bolt, Nut, and Cotter Pin
- US patent 5,553,360, Canada patent 2,217,004 and foreign equivalents
- Meets the performance requirements of EN 13411-6: 2003
- Wedge sockets meet the performance requirements of Federal Specification RR-S-550E, Type C, except those provisions required of the contractor

Wire Rope Dia.		S-421T Stock No.	API 2C S-421T Stock No.	Weight Each	S-421TW Stock No. Wedge Only	Wedge Only Weight Each	API 2C S-421TW Stock No. Wedge Only	Optional G-4082 API 2C Bolt, Nut & Cotter		API 2C S-421TW Stock No. Wedge Only	Optional G-4082 Bolt, Nut & Cotter	
								G-4082 Stock No.	Weight Each		G-4082 Stock No.	Weight Each
in	mm			lbs		lbs			lbs			lbs
3/8	9-10	1035000	1035005	3.18	1035555	.50	1092230	1092227	.38	1092230	1092227	.38
1/2	11-13	1035009	1035014	6.15	1035564	1.05	1092248	1092236	.69	1092248	1092236	.69
5/8	14-16	1035018	1035023	9.70	1035573	1.79	1092257	1092254	1.15	1092257	1092254	1.15
3/4	18-19	1035027	1035032	14.50	1035582	2.60	1092293	1092281	1.91	1092293	1092281	1.91
7/8	20-22	1035036	1035041	21.50	1035591	4.00	1092319	1092307	3.23	1092319	1092307	3.23
1	24-26	1035045	1035050	30.75	1035600	5.37	1092337	1092325	5.40	1092337	1092325	5.40
1-1/8	28	1035054	1035059	45.30	1035609	7.30	1092364	1092343	7.50	1092364	1092343	7.50
1-1/4	30-32	1035063	1035068	64.90	1035618	10.60	1092375	1092372	10.34	1092375	1092372	10.34

Wire Rope Dia.		S-421T Stock No.	API 2C S-421T Stock No.	Dimensions (in.)														
in	mm			A	B	C	D	G	H	J*	K*	L	P	R	S	T	U	V
3/8	9-10	1035000	1035005	5.69	2.72	.81	.81	1.38	3.06	7.80	1.88	.88	1.56	.44	2.13	.44	1.25	1.38
1/2	11-13	1035009	1035014	6.88	3.47	1.00	1.00	1.62	3.76	8.91	1.26	1.06	1.94	.50	2.56	.53	1.75	1.88
5/8	14-16	1035018	1035023	8.25	4.30	1.25	1.19	2.12	4.47	10.75	1.99	1.22	2.25	.56	3.25	.69	2.00	2.19
3/4	18-19	1035027	1035032	9.88	5.12	1.50	1.38	2.44	5.28	12.36	2.41	1.40	2.63	.66	3.63	.78	2.34	2.56
7/8	20-22	1035036	1035041	11.25	5.85	1.75	1.63	2.69	6.16	14.37	2.48	1.67	3.13	.75	4.31	.88	2.69	2.94
1	24-26	1035045	1035050	12.81	6.32	2.00	2.00	2.94	6.96	16.29	3.04	2.00	3.75	.88	4.70	1.03	2.88	3.28
1-1/8	28	1035054	1035059	14.38	6.92	2.25	2.25	3.31	7.62	18.34	2.56	2.25	4.25	1.00	5.44	1.10	3.25	3.56
1-1/4	30-32	1035063	1035068	16.34	8.73	2.62	2.50	3.56	9.39	20.48	2.94	2.34	4.50	1.06	6.13	1.19	4.62	4.94

Nominal NOTE: For intermediate wire rope sizes, use next larger size socket. The S-423T Super TERMINATOR wedge is designed to be assembled only into the Crosby S-421T TERMINATOR socket body. IMPORTANT: The S-423TW for sizes 5/8" through 1-1/8" (14mm through 28mm) will fit respective size standard Crosby S-421T basket. The 1-1/4" (30-32mm) S-423TW will only fit the Crosby S-421T 1-1/4" basket marked with TERMINATOR.

Green Pin® Open Wedge Socket BN

Product details

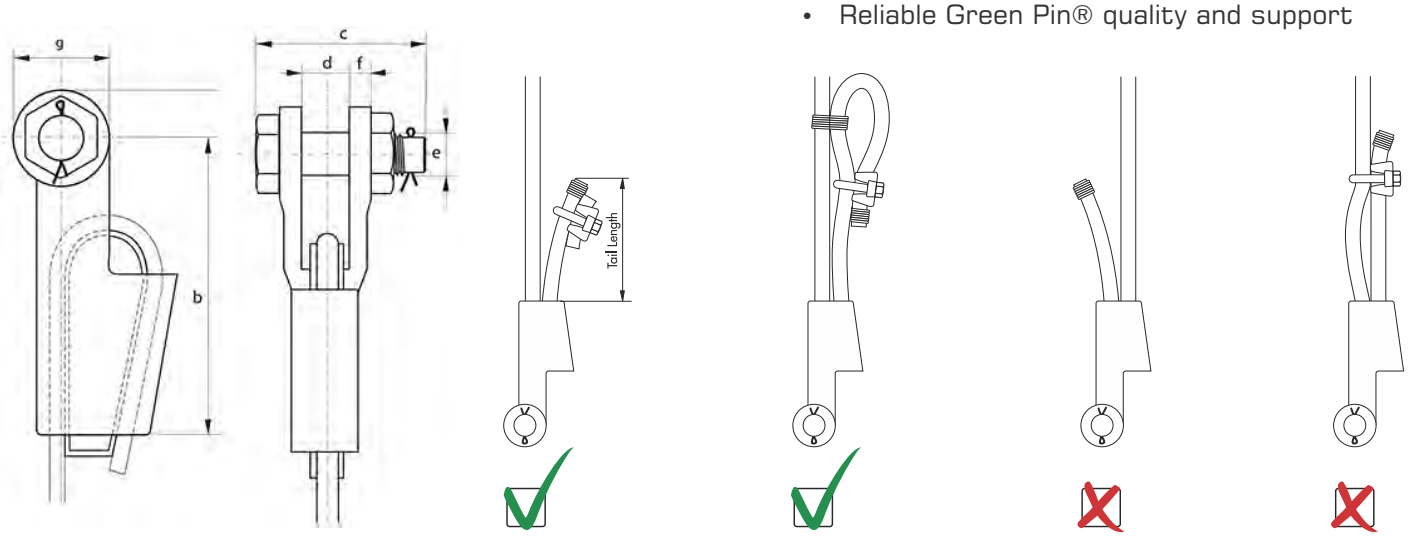
Product Code:	G-6423
Material	High Tensile Steel
Finish	Hot dipped galvanized
Temp. range	-20°C up to +200°C
Certification	2.1, 2.2, 3.1, CE
Standard	Generally to EN 13411-6

Description

The Green Pin® Open Wedge Socket BN is an open wedge socket with a safety bolt. The socket offers a double safety (split pin and safety bolt) which prevents accidental unscrewing of the pin. The socket is made from high tensile steel, while galvanization ensures its long-term durability. The Green Pin® Open Wedge Socket BN is available for wire rope with a diameter from 7-8 up to 40-42 mm.

Highlights

- Double safety (cotter pin & safety bolt)
- High tensile steel
- Galvanization assures long-term durability
- Superior stock availability of 99%
- Reliable Green Pin® quality and support



Item Code	NO. ()	Minimum Breaking Load	Diameter Wire Rope		Dimension (IN)							Net Weight
		tonne	in	mm	A	B	C	D	E	F	G	lbs
SKGOW008SB	0.25	8	5/16	7 - 8	5.04	4.33	2.01	0.71	0.63	0.35	1.42	1.92
SKGOW010SB	0.5	12	3/8	9 - 10	6.50	5.59	2.44	0.81	0.83	0.43	1.81	3.97
SKGOW013SB	1	20	1/2	11 - 13	6.89	5.75	2.60	0.98	0.98	0.47	2.24	5.91
SKGOW016SB	2	25	5/8	14 - 16	8.31	6.93	3.23	1.22	1.18	0.59	2.76	10.36
SKGOW019SB	3	40	3/4	18 - 19	9.92	8.35	3.74	1.50	1.38	0.63	3.15	17.86
SKGOW022SB	4	55	7/8	20 - 22	11.34	9.45	4.33	1.73	1.61	0.75	3.74	26.46
SKGOW025SB	5	75	1	24 - 26	12.95	10.79	5.12	2.01	2.01	0.87	4.33	39.46
SKGOW028SB	6	90	1 1/8	27 - 29	14.76	12.20	5.67	2.24	2.24	0.98	5.12	52.25
SKGOW032SB	7	110	1 1/4	30 - 32	16.65	13.78	6.10	2.48	2.52	1.10	5.75	72.75
SKGOW035SB	8	125	1 3/8	34 - 36	18.66	15.75	6.42	2.72	2.52	1.10	5.83	92.59
SKGOW038SB	9	150	1 1/2	37 - 39	20.75	17.72	7.01	2.99	2.76	1.18	6.02	114.64
SKGOW040SB	10	170	1 5/8	40 - 42	22.83	19.69	7.36	2.99	2.99	1.30	6.30	160.94