⚠WARNING TO THE USERS OF WIRE ROPE SLINGS

The **⚠WARNING** Icon, used in our product information is done to alert sling users to potentially hazardous conditions and situations.

⚠WARNING It is your explicit responsibility to consider all risk factors prior to using any rigging device or product. Read and understand the information contained in this bulletin, in our catalog, on our website www.lift-it.com and follow OSHA and ASME guidelines. Use by untrained persons is hazardous.

The American Society of Mechanical Engineers, in the ASME B30.9 Sling Safety Standard clearly establishes the requirement for training. Section 9-2.1-Training states, "Wire rope sling users shall be trained in the selection, inspection, cautions to personnel, effects of the environment and rigging practices, covered by this chapter."

⚠WARNING All Products provided by Lift-It® Manufacturing Co. Inc. are sold with the express understanding that the purchaser and user are thoroughly familiar with the safe and proper use and application of the product. The user has the responsibility for proper use and application as outlined in all applicable standards and regulations. Use by untrained persons is hazardous. It is important that all sling and rigging users be thoroughly familiar with the manufacturer's recommendations and safety information that accompany the products. The user must have sufficient training and knowledge of all applicable standards to responsibly use our products. If you are unsure whether you are properly trained and knowledgeable or if you are unsure of what the standards and regulations require of you, ask your employer for information and/or training. DO NOT use any sling or rigging device until you are absolutely sure of what you are doing. Remember, when it comes to using slings and rigging devices, lack of skill, knowledge and care can result in severe INJURY or DEATH to you and others.

⚠WARNING Failure to follow proper use, care and inspection criteria could result in severe personal injury or death. Slings and rigging products will fail if damaged, abused, misused, overused or improperly maintained.

Do not inspect a sling by passing bare hands over the wire rope body. Broken wires if present, may puncture hands.

Any hazardous condition disclosed by an inspection shall require sling replacement. Temporary repairs are not permitted. Damage and wear seriously reduce sling Work Load Limits.

Always know the load weight and select the appropriate sling for the load, configuration of lift necessary to ensure load control and any chemical exposure.

Always take into account sling angles to calculate changes in the sling Work Load Limits, when used in choker and non-perpendicular vertical, basket or bridle configurations.

Ensure that the load will not cut the sling during the lift by padding corners, edges, protrusions or abrasive surfaces with suitable materials of sufficient strength, thickness and construction.

The strength of Wire Rope Slings can be affected by chemically active environments. Sling materials may be susceptible to damage from caustic or acid substances or fumes. Strong oxidizing environments attack all common sling materials and components. Consult the manufacturer prior to selection and use. Fiber Core Wire Rope Slings should not be subjected to degreasing or solvents because of possible damage to the core.

Fiber Core wire rope slings of all grades shall not be exposed to temperatures in excess of 180°F/82°C or below -40°F/-40°C. Fiber core slings are less crush resistant and not as strong as IWRC wire rope slings. IWRC Wire Rope Slings shall not be exposed to temperatures in excess of 400°F/204°C or below -40°F/-40°C.

The sling and load shall not be allowed to rotate when hand tucked spices are used in a single leg vertical lift application. Care should be taken to minimize sling rotation. A single leg sling with hand tucked splice can unlay and drop the load if allowed to rotate during a lift. Always use a tag line. Rotation resistant wire rope will not be used in the construction of the slings and assemblies featured in our catalog.

Slings made with wire rope clips shall not be used in a choker hitch.

⚠WARNING

Slings can fail if damaged, misused, or overloaded. Inspect before use. Use only if trained. Observe rated load. ALWAYS protect the sling from damage with materials of sufficient strength, thickness and construction. DEATH or INJURY can occur from improper use or care.

RATED LOAD = RATED CAPACITY = WORK LOAD LIMIT

WIRE ROPE SLINGS

INSTRUCTIONS FOR CARE ♦ USE ♦ INSPECTION ♦ REPAIR.

CARE ♦ Store wire rope slings on a rack away from possible mechanical damage, corrosion, moisture, dust, grit and extreme temperatures or kinking.

USE ♦ Know the weight of load. ♦ Check tag to confirm that sling is rated adequately for the load (see load angle chart). ♦ Sling shall not be twisted, tied into knots or joined by knotting. ♦ Be sure that the load can't cut the sling during the lift by padding corners, edges, protrusions or abrasive surfaces; ***use materials of sufficient strength, thickness and construction.*** ♦Center sling eye in the base (bowl) of sling hook unless sling hook is designed for point loading. ♦ Balance the load. ♦ Maintain load control. ♦ Avoid jerking the load. ♦ Be alert for snagging of load. ♦ Do not pull on stuck objects. ♦ Avoid dragging sling over rough surfaces and from under the load. ♦ Choker hitch must choke on sling body, never on a splice or end fitting. ♦Stand clear of load at all times. ♦ Persons are not to ride on sling or load. ♦ For use in abnormal conditions of heat, cold, chemical activity, consult the manufacturer. ♦ Do not use fiber core wire rope slings at temperatures above 180°F or below -40°F. Do not use steel core wire rope slings at temperatures above 400°F or below -40°F.

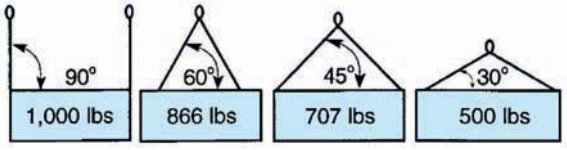
♦***Important:*** A single leg sling with hand tucked splice can unlay and drop the load if allowed to rotate during a lift. Always use a tag line. If any load is allowed to rotate during lifting, moving, lowering or placement, DO NOT use a hand tucked sling.

INSPECTION ♦Before each use: Inspect for broken wires, severe localized abrasion or scraping, kinking, crushing, bird caging or other damage to rope structure, heat damage or severe corrosion. Inspect the end attachments and fittings for cracks, wear or deformation; hooks with twists or a throat opening increase or severe corrosion. ♦ For strand laid and single part slings, no more than ten randomly distributed broken wires in a one rope lay, or five broken wires in one strand in one rope lay. For cable laid and braided broken wire inspection criteria, consult the manufacturer. **If this wear or damage is present or if rated load tag is missing or illegible, remove from service and replace.** Frequent inspection is done by the person handling the sling before each use and must include all of the before use items. Periodic Inspections are required at least annually for normal service, quarterly or more frequently if in severe service or nearly constant use. Periodic inspections are performed by designated person(s) who are trained and a written record of the most periodic inspection shall be maintained. The inspector shall determine when further use would be hazardous.

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

LOAD ANGLE CHART

Angle factor must be applied to calculate the reduced sling capacity when lifting force is not at 90° to the plane of the load!



Multiply angle factor x sling's vertical rated load to calculate the reduced capacity at the angle.

Angle	Factor
90°	1.0000
80°	0.9848
75°	0.9659
70°	0.9397
65°	0.9063
60°	0.8660
55°	0.8192
50°	0.7660
45°	0.7071
40°	0.6248
35°	0.5736
30°	0.5000

Rated capacity of slings are decreased when D/d ratio (see Fig. 6) will be smaller than that cited in ASME B30.9 chapter 2. Consult the sling manufacturer for specific data or refer to the WRTB Wire Rope Sling Users Manual.

GENERAL NOTE:
When D is 25 Times the component rope diameter (d) the D/d is expressed as 25/1.

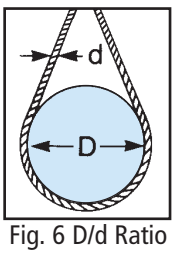
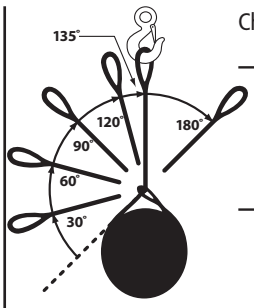


Fig. 6 D/d Ratio



Choker Angle (Degrees)	Rated Capacity, % [Note (1)]
Over 120	100
90 - 120	87
60 - 89	74
30 - 59	62
0 - 29	49

NOTE: (1) Percent of sling rated capacity in a choker hitch.

Because of the reduced lifting capacity, use extra care when the sling to load angle, also known as the horizontal angle, is less than 45° and do not make lifts of less than 30° load angle. Example: A sling with adequate capacity could be broken because of increased tension resulting from angles of less than 30 degrees. When possible, use longer slings to minimize angular tension by increasing the angle.

WIRE ROPE SLING INSPECTION

A specific procedure for sling inspection is the best safeguard against injury, death and property damage. It is important that you employ a three stage level of inspection to ensure that slings are inspected with appropriate frequency. It is also important that all inspections must be done by trained and qualified personnel. Please refer to page 134 for more information.

To detect possible damage, you should perform a visual inspection of the entire sling by making all parts of the sling readily visible. If necessary, remove dirt and grime so wires and components are visible. Look for any of the conditions listed in the Removal from Service Criteria. The examples on page 134 depict some of the types of damage, but note that they are relatively extreme examples provided for illustration purposes only.

If you identify ANY of these types of damage, remove slings from service immediately, even if the damage you see is not as extensive as shown. Slings that are removed from service must be destroyed and rendered completely unusable. Never ignore sling damage or attempt to perform temporary field repairs of damaged slings. It is very important that slings are regularly and properly inspected. If you are not sure whether or not a sling is damaged, DO NOT USE IT.

SLING TAG REQUIREMENTS

Identification Requirements- ASME B30-9, Section 9-2.7.1 states: Each sling shall be marked to show:

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.

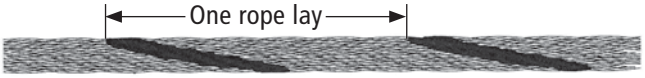
WIRE ROPE SLING REMOVAL FROM SERVICE CRITERIA

⚠WARNING Do not inspect Wire Rope slings by passing bare hands over the wire rope body. Broken wires, if present, may puncture hands.

Slings shall be inspected throughout their entire length for evidence of damage. Wire Rope Slings shall be removed from service if any of the following is visible:

A) Missing or Illegible Sling Tag.

B) Broken Wires
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.

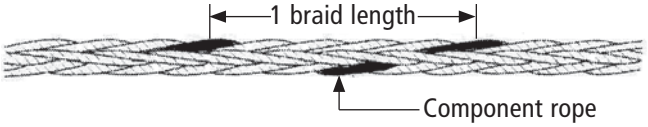


For cable-laid slings: 20 broken wires per lay.

For 6 part braided slings: 20 broken wires per braid.

For eight part braided slings: 40 broken wires per braid.

Either the broken wire or broken strand count shall apply separately to the one braid length or one lay length in cable-laid slings.



C) Severe localized abrasion and scraping.

D) Kinking, crushing, birdcaging or any other damage resulting in damage to the rope structure.

E) Evidence of heat damage, usually manifested by metallic discoloration or the presence of internal lubricant.

F) End attachments that are cracked, deformed or worn to the extent that the strength of the sling is substantially affected.

G) Severe corrosion of the rope, end attachments or fittings.

H) For hooks, removal criteria, as stated in ASME B30.10.

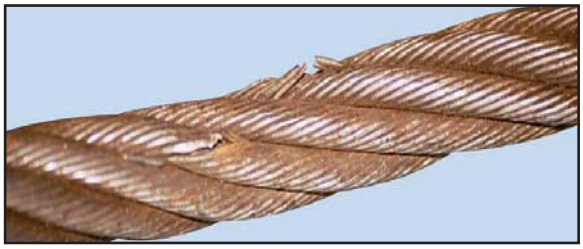
I) For other applicable hardware, removal criteria as stated in ASME B20.36.

J) Other conditions, including visible damage that cause doubt as to the continued use of the sling.

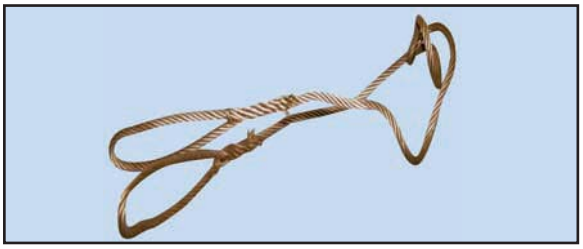
SLING DAMAGE EXAMPLES

If you identify ANY of these types of damage in a sling, remove it from service immediately, even if the damage is not as extensive as shown. Slings that are removed from service must be destroyed and rendered completely unusable. Never ignore sling damage or attempt to perform temporary field repairs of damaged slings. It is very important that slings are regularly and properly inspected. If you are not sure whether or not a sling is damaged, DO NOT USE IT.

Broken Wires



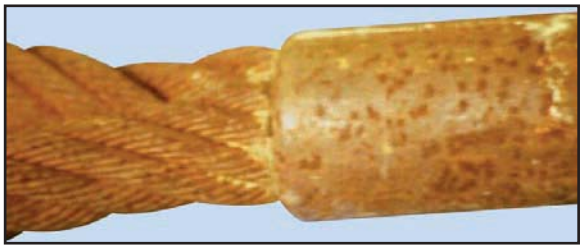
Kinked Wire



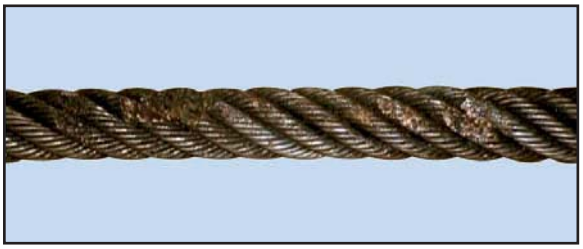
Abraded/Worn Wire

Popped Core

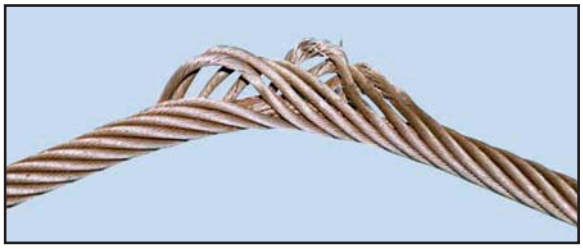
Corrosion



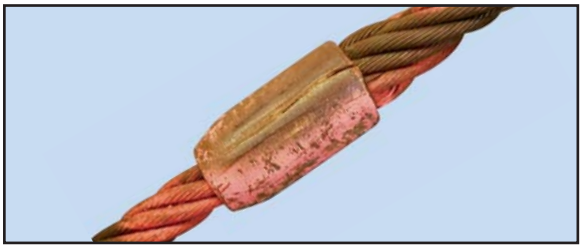
Heat Damage



Bird Caging



Damaged Fittings



WIRE ROPE SLING CONSIDERATIONS

⚠ WARNING Follow OSHA, ASME, Association, Industry and Manufacturer Guidelines. Be sure to read and understand the following information relative to proper sling usage:

Lift-Planning & Evaluation- Page 16
Repair and Testing- Pages 36-37
Sling Care and Storage- Page 37
Sling Protection- Pages 43-52 and 140
Mechanical Considerations Pages 39-40
Purchase & Use Considerations- Pages 17-18
Hitches, Angles and Tension- Pages 19-22
Sling Training- Pages 5-10
Rigging & Hitch Information- Pages 23, 24 and 135-140
Sling Inspection Systems- Page 33

RIGGER'S CHECK LIST

1. Analyze and Measure — Determine the total weight to be moved, as well as exactly how far it is to move and how high it must be lifted.

2. Determine the Hitch — Decide how the load will be rigged and how the sling will grip or be attached to the load.

3. Select the Sling — In addition to adequate Work Load for the angles and hitch involved, slings should be the most suitable for handling the specific load. Select slings with proper end fittings, eye protection, as well as attachment hardware.

4. Inspect the Sling — Thoroughly inspect the sling to determine if it is in acceptable condition and capable of making the lift. Refer to prevailing OSHA and ASME regulations for inspection criteria.

5. Rig Up, Not Down — Always attach the sling to the load first, then attach slings to the lifting device.

6. Check Everything — Before attempting a lift, take a light strain on the rigging to determine that blocking, sling, protection and all safety devices are in place.

7. Stand Clear and Lift — Let the lifting device and rigging do the job—don't use brute strength to prevent swinging or movement. Use a tagline to control any movement. Keep away from the load when it is suspended.

8. Don't Shock Load — Lift, move and lower slowly and with a steady application of power.

9. Put It Away! — After you've completed the job, check slings and gear for any damage. If damage is present, red tag items immediately and advise the rigging inspector. If the gear is in acceptable condition, return it to storage for safekeeping.

CARE OF SLINGS

The amount of care and proper maintenance slings receive will go a long way in determining service life. The following are guidelines which have shown helpful:

STORAGE

Proper storage requires slings be kept in an area where they will not be exposed to water, extreme heat or corrosive fumes, liquids and sprays or be kinked.

Slings should never be left beneath loads or lying around where they may be damaged or run over. All slings, when not in use, should be kept on a rack. Use of a rack minimizes accidental damage and allows easier monitoring of sling condition between regular inspections. A rack will also save time by allowing larger slings to be picked up and returned by crane, thereby reducing handling time.

EFFECTS OF TEMPERATURE

All wire rope slings should be protected from temperature extremes. The accepted rules are: Fiber Core Slings should never be exposed to temperatures in excess of 180°F or below minus 40°F. IWRC Wire Rope slings should never be exposed to temperatures above 400°F or below minus 40°F.

It is not always easy to detect when wire rope has been damaged by heat. The most common visual signs are loss of lubrication and discoloration of wires.

The best practice to follow is that if there is the slightest suspicion that slings were subjected to high temperatures, they should be taken out of service immediately.

LUBRICATION

Wire rope is thoroughly lubricated at time of manufacture. Normally, for sling use under ordinary conditions, no additional lubrication is required. However, if a sling is stored outside or in an environment which would cause corrosion, lubrication should be applied during the service life to prevent rusting or corrosion.

If additional lubrication is required, consult the sling manufacturer for information on the type of lubricant to be used and best method of application.