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Construction News Sense

Rigging Gear

The proper use of rigging hardware is overseen by The American Society of Mechanical Engineers (ASME) and the Occupational Safety and Health Administration (OSHA) Regulations. Use of rigging hardware is included in ASME B30.26-2010, *Rigging Hardware* and OSHA 29 CFR 1926.251, *Rigging Equipment for Material Handling*. The DOE 1090 specification is often the document that is used to contractually disseminate this information to us.

ASME B30.26 -2010 addresses the following hardware: shackles; adjustable hardware; compression hardware; links, rings, and swivels; and rigging blocks. For each type of hardware, the standard covers the following: types, materials and assemblies; design factor; rated loads, proof test, identification; effects of environment; inspection, repair and removal; and operating practices.

Inspection and Removal Criteria for Wire Rope Slings (presented in TUFGrip™ Slings and Assemblies)

Both ASME Standard B30.9 and OSHA require the following actions:

- Perform a daily visual inspection consisting of checking for broken wires, kinks, crushing, broken attachments, and severe corrosion.
- Perform an inspection at least annually (by a designated person) and include a record of the inspection.
- Place the sling in a position that enables the inspector to see every part of the sling, and clean off dirt and grease with a wire brush or rag to reveal wires and fittings.
- Find the most damaged or worn part of the sling and check it against removal criteria.
- Label and identify all slings that were inspected and keep records including dates and condition of all slings.
- Store slings to be reused in a safe place away from damaging weather, heat, or dirt.
- Remove a wire rope sling from service if the rated capacity tag is missing or illegible.
- Remove a wire rope sling from service if there are five broken wires in one strand in one rope lay (one complete cycle of a strand) or 10 broken wires in all strands in one rope lay.
- Remove a wire rope sling from service if there is wear or scraping of one-third the original diameter of the outside individual wires.
- Remove a wire rope sling from service if severe distortion such as kinking, crushing, or bird caging is present.

Wire rope "Bird Cage"

- Remove a wire rope sling from service if any metallic discoloration or loss of internal lubrication is caused by exposure to heat.
- Remove a wire rope sling form service if cracked, bent, or damaged fittings are present, or if there is evidence that eye splices have slipped or tucked strands have moved.
- Remove a wire rope sling from service if a hook is bent more than 15% over the normal throat opening or twisted more than 10 degrees from normal.
- Remove a wire rope from service if severe corrosion of the rope or end attachments caused pitting or binding of wires.
- Dispose of a rejected wire rope sling by immediately tagging it out of service and destroy by cutting the eye and fittings from the sling.

Corrosion and broken wires

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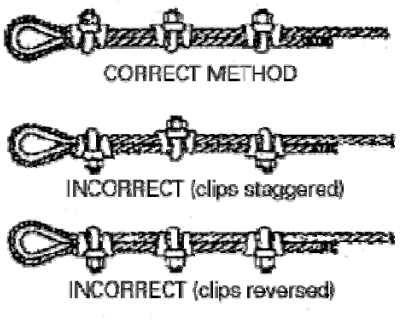
Wire Rope Clips (presented in *Wire Rope User's Manual*, 4th Edition)

- Wire rope clips are used for making end terminations.
- Clips are available in two basic designs: U-bolt clips and double saddle clips.
- Critical, heavy duty, overhead loads, such as support lines, guy lines, towing lines, tie-downs, and scaffolds require the use of forged clips only.
- The U-bolt clip must be applied so the "U" is in contact with the dead end of the rope and the saddle is in contact with the live end of the rope.
- Malleable U-bolt clips (not forged) may be used for light-duty uses with small, applied loads, such as hand rails, fencing, and guard rails. Malleable U-bolt clips are not to be used for lifting. Use only forged U-bolt clips for lifting.

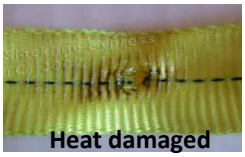


Inspection Criteria for Web Slings (presented in LiftAll® Products for Better Lifting)

- **Surface and Edge Cuts** – Broken fibers of equal length indicate the sling has been cut by a sharp edge. Red core warning yarns may or may not be visible with cuts, and this visibility is not required before removing slings from service.
- **Holes/Snags/Pulls** – These are punctures or areas where fibers stand out from the rest of the sling surface. To prevent or avoid them, avoid sling contact with protrusions, both during lifts and while transporting or storing.
- **Abrasions** – Areas of the sling that look and feel fuzzy and indicate that the fibers have been broken by being subject to contact and movement against a rough surface. To prevent this, never drag slings along the ground, never pull slings from under loads that are resting on the sling, and always use wear pads between slings and the surface loads.


Abrasions

- **Heat and Chemical Damage** – Heat and chemical damage can look similar, and both have the effect of damaging sling fibers and compromising the sling's strength. To prevent this, never expose nylon or polyester slings to temperatures in excess of 200 degrees F and never use them around chemicals without first confirming compatibility with the sling.


Heat damaged

- **Knots** – Knots compromise the strength of the slings by not allowing all fibers to contribute to the lift as designed. To prevent never tie knots in slings and never use knotted slings.


Knotted sling

- **Broken or Worn Stitching** – Broken or worn stitching in the main stitch pattern has an adverse effect on the strength of the sling. To prevent this, never pull slings from beneath loads where stitch patterns can get hung up or snagged.
- **Illegible or Missing Tags** – If you cannot read all the information on a tag or the tag is missing, OSHA requires the sling be taken out of service. To prevent this, never set loads on top of slings or pull a sling from beneath a load if there is resistance. Avoid paint or chemical contact with the tag. Red core yarn showing is a warning of dangerous sling damage.

The preceding information was presented by Industrial Training International, Inc. in the Rigging Gear Inspector level I and II classes attended by Fred Shelly, Organization 4878. This information should be used by SNL contractors/maintenance to determine the appropriate use of rigging gear, when it has reached the end of its useful life, and when it should be taken out of service.

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