



Wire Rope Slings

WIRE ROPE SLING USE:

Know the capacities, proper usage, rigging methods & condition of all your slings. Mishandling and misusing slings are the leading cause of sling-related accidents. Most injuries and accidents, however, can be avoided by becoming familiar with the essentials of proper sling inspection, use, and care.

ISSUES:

Improper use of wire rope slings can lead to many dangers, including severe injury, death, and damage to the sling itself: Damage to sling: Wire rope slings can be damaged by kinks, wire damage (flattening or stretch), and weather. These can occur if the sling is snagged on something sharp or greater than 180-degree rigging configuration, rubbed against a sharp edge, or dragged along a rough surface. Slings can fail if they are damaged, misused, overloaded, or not properly cared for.

OSHA WIRE ROPE SLING USE REQUIREMENTS:

OSHA Standard Subpart H Material Handling - 1926.251(c)(1) Employers must not use improved plow-steel wire rope and wire-rope slings with loads in excess of the rated capacities.

OSHA Standard Subpart H Material Handling - 1926.251(c)(2) Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

OSHA Standard Subpart H Material Handling - 1926.251(c)(3) Wire rope shall not be secured by knots, except on haul back lines on scrapers.

OSHA Standard Subpart H Material Handling - 1926.251(c)(4) The following limitations shall apply to the use of wire rope: 1926.251(c)(4)(iv), Wire rope shall not be used if, in any length of eight diameters, the total number of visible broken wires exceeds 10 percent of the

total number of wires, or if the rope shows other signs of excessive wear, corrosion, or defect, 1926.251(c)(5) When U-bolt wire rope clips are used to form eyes, Table H-2 shall be used to determine the number and spacing of clips, 1926.251(c)(5)(I) When used for eye splices, the U-bolt shall be applied so that the "U" section is in contact with the dead end of the rope 1926.251(e)(2) - Rated capacity shall not be exceeded, 1926.251(c)(6) Slings shall not be shortened with knots or bolts or other makeshift devices.

OSHA Standard Subpart H Material Handling -USE- 1926.251(c)(9) Slings shall be padded or protected from the sharp edges of their loads, 1926.251(c)(10) Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load, 1926.251(c)(12) A sling shall not be pulled from under a load when the load is resting on the sling.

OSHA Standard Subpart H Material 1926.251(c)(15) End attachments: 1926.251(c)(15)(i) Welding of end attachments, except covers to thimbles, shall be performed prior to the assembly of the sling, 1926.251(c)(15)(ii) All welded end attachments shall not be used unless proof tested by the manufacturer or equivalent entity at twice their rated capacity prior to initial use. The employer shall retain a certificate of the proof test, and make it available for examination. 1926.251(c)(16), Wire rope slings shall have permanently affixed, legible identification markings stating size, rated capacity for the type(s) of hitch(es) used and the angle upon which it is based, and the number of legs if more than one.

APPLICATION SUMMARY OF OSHA WIRE ROPE SLING REQUIREMENTS:

Slings are marked by the manufacturer to show:

- The rated load for the types of hitches, and the angle upon which they are based.

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- The core material and the cover material if different from the core material. Some wire rope slings have an inner and outer core.

A qualified person needs to perform at a minimum daily and additional periodic inspections: where service conditions are warranted: ASME (B30.9, B30.10, B30.20)

Listed as follows:

- Frequency of sling use, severity of service conditions, nature of lifts being made, and experience gained during the service life of slings used in similar circumstances.

Required cautions to personnel:

- Ensure that all portions of the human body are kept away from the areas between the sling and the load and between the sling and the crane or hoist hook.
- Ensure that personnel never stand in line with or next to the legs of a sling that is under tension.
- Ensure that personnel do not stand or pass under the failure zone of the load.

Required sling removal from service:

- Missing or illegible sling identification,
- ASME B30.30 – Wire ropes with no – Kinking, Doglegs, Birdcages, Severe Wear, Broken Wires, or Corrosion
- Broken or damaged core yarns,
- Welding splatter that exposes core yarns,
- Knots in the round sling body, except for core yarn knots inside the cover,
- Discoloration and brittle or stiff areas on any part of the sling,
- Pitted, corroded, cracked, bent, twisted, gouged, or broken fittings, and
- Other conditions that cause doubt as to the continued use of the sling.

FOCUS POINTS YOU NEED TO KNOW:

1. Get trained. Never use or allow others to use a wire rope sling without training.
2. Inspect the sling before use. Look for no-Kinking, Doglegs, Birdcages, Severe Wear, Broken Wires, or Corrosion.
3. Know the load. Always know the weight of the load.
4. Protect the point of contact with sheaves (where the rope bends repeatedly) and near the termination point (where the rope is secured).
5. Never let a wire rope under a load for extended periods of time.
6. Never remove a wire rope when the load is resting/bearing on it.

7. Proper storage is especially critical with wire rope slings – they need to be stored out of the weather. Wire ropes can occasionally be oiled lightly with standard motor oil.
8. As with any other type of sling, wire rope sling capacities are significantly reduced at lower angles.
9. CANNOT use wire rope slings on the forks of a pettibone, boom lift, or forklift.
10. If the same size sling is longer than others of that size – it probably has stress fatigue.
11. You are required to get documented rigger training on anybody rigging on your site.

REVIEW – GENERAL RIGGING:

1926.251(a) General. 1926.251(a)(1) Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service. 1926.251(a)(2) Employers must ensure that rigging equipment: 1926.251(a)(2)(i) Has permanently affixed and legible identification markings as prescribed by the manufacturer that indicate the recommended safe working load; 1926.251(a)(2)(ii) Not be loaded in excess of its recommended safe working load as prescribed on the identification markings by the manufacturer; and 1926.251(a)(2)(iii) Not be used without affixed, legible identification markings, required by paragraph (a)(2)(i) of this section. 1926.251(a)(3) Rigging equipment, when not in use, shall be removed from the immediate work area so as not to present a hazard to employees. 1926.251(a)(4) Special custom design grabs, hooks, clamps, or other lifting accessories, for such units as modular panels, prefabricated structures, and similar materials, shall be marked to indicate the safe working loads and shall be proof tested prior to use to 125 percent of their rated load.

MCMag. "Sling Safety in Marine Construction – Marine Construction® Magazine." marineconstructionmagazine.com, 2024, marineconstructionmagazine.com/blog/sling-safety-in-marine-construction/. Accessed 29 Oct. 2024.

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"1910.184 - Slings. | Occupational Safety and Health Administration." www.osha.gov, www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.184.

"Guidance on Safe Sling Use - Synthetic Web Slings | Occupational Safety and Health Administration." www.osha.gov, www.osha.gov/safe-sling-use/synth-web. Accessed 30 Mar. 2022.

"Guidance on Safe Sling Use - Synthetic Round Slings | Occupational Safety and Health Administration." www.osha.gov, 2024, www.osha.gov/safe-sling-use/synth-round.

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