

**WAC 296-78-750 Chains, wire rope, cables and fiber rope. (1)**

Ropes, cables, slings, and chains.

(a) Safe usage. Ropes, cables, slings, and chains must be used in accordance with safe use practices recommended by the manufacturer or within safe limits recommended by the equipment manufacturer when used in conjunction with it.

(b) Work by qualified persons. Installation, inspection, maintenance, repair, and testing of ropes, cables, slings, and chains must be done only by persons qualified to do such work.

(c) Proof testing. You must ensure that before use, each new, repaired, or reconditioned alloy steel chain sling, including all welded components in the sling assembly, is proof tested by the sling manufacturer or equivalent entity, in accordance with paragraph 5.2 of the American Society of Testing and Materials Specification A391.65 (ANSI G61.1-1968). You must retain the certificate of the proof test and must make it available for examination. When a chain sling assembly is made up of segments of proof tested alloy chain and proof tested individual components such as mechanical coupling links, hooks and similar devices; it is not necessary to test the assembled unit, when appropriate test certification of individual components is available and the assembled sling is appropriately tagged by the manufacturer or equal entity. The sling must not be used in excess of the rated capacity of the weakest component.

(d) Slings and their fittings and fastenings, when in use, must be inspected daily for evidence of overloading, excessive wear, or damage. Slings found to be defective must be removed from service.

(2) Proper storage must be provided for slings while not in use.

(3) Protection must be provided between the sling and sharp unyielding surfaces of the load to be lifted.

(4) Hooks. No open hook must be used in rigging to lift any load where there is hazard from relieving the tension on the hook from the load or hook catching or fouling.

(5) Ropes or cables. Wire rope or cable must be inspected when installed and once each day thereafter, when in use. It must be removed from hoisting or load-carrying service when kinked or when one of the following conditions exist:

(a) When three broken wires are found in one lay of 6 by 6 wire rope.

(b) When six broken wires are found in one lay of 6 by 19 wire rope.

(c) When nine broken wires are found in one lay of 6 by 37 wire rope.

(d) When eight broken wires are found in one lay of 8 by 19 wire rope.

(e) When marked corrosion appears.

(f) Wire rope of a type not described herein must be removed from service when four percent of the total number of wires composing such rope are found to be broken in one lay.

(g) Condemned. When wire rope, slings or cables deteriorate through rust, wear, broken wires, kinking or other conditions, to the extent there is a reasonable doubt that the necessary safety factor is maintained, the use of such equipment must be discontinued.

(6) Wire rope removed from service due to defects must be plainly marked or identified as being unfit for further use on cranes, hoists, and other load-carrying devices.

(7) The ratio between the rope diameter and the drum, block, sheave, or pulley tread diameter must be such that the rope will ad-

just itself to the bend without excessive wear, deformation, or injury. In no case must the safe value of drums, blocks, sheaves, or pulleys be reduced when replacing such items unless compensating changes are made for rope used and for safe loading limits.

(8) Drums, sheaves, and pulleys must be smooth and free from surface defects liable to injure rope. Drums, sheaves, or pulleys having eccentric bores or cracked hubs, spokes, or flanges must be removed from service.

(9) Connections, fittings, fastenings, and other parts used in connection with ropes and cables must be of the quality, size and strength recommended by the manufacturer for the use intended. These connections must be installed in accordance with the manufacturer's recommendations.

(10) Socketing, splicing, and seizing.

(a) Socketing, splicing, and seizing of cables must be performed only by qualified persons.

(b) All eye splices must be made in a manner recommended by the manufacturer and wire rope thimbles of proper size must be fitted in the eye, except that in slings the use of thimbles will be optional.

(11) Wire rope clips attached with U-bolts must have these bolts on the dead or short end of the rope. The U-bolt nuts must be retightened immediately after initial load carrying use and at frequent intervals thereafter. The number and spacing of clips must be as follows:

Improved Plow Steel Diameter of Rope	Number of Clips (Drop Forged)	Required Other Material	Minimum Space Between Clips
3/8 to 5/8"	3	4	3-3/4 "
3/4"	4	5	4-1/2 "
7/8"	4	5	5-1/4 "
1"	5	6	6 "
1-1/8"	6	6	6-3/4 "
1-1/4"	6	7	7-1/2 "
1-3/8"	7	7	8-1/4 "
1-1/2"	7	8	9 "

(a) When a wedge socket-type fastening is used, the dead or short end of the cable must be clipped with a U-bolt or otherwise made secure against loosening.

(b) Fittings. Hooks, shackles, rings, pad eyes, and other fittings that show excessive wear or that have been bent, twisted, or otherwise damaged must be removed from service.

(12) Running lines. Running lines of hoisting equipment located within six feet six inches of the ground or working level must be boxed off or otherwise guarded, or the operating area must be restricted.

(13) Preventing abrasion. The reeving of a rope must be so arranged as to minimize chafing or abrading while in use.

(14) Sheave guards. Bottom sheaves must be protected by close fitting guards to prevent cable from jumping the sheave.

(15) There must not be less than two full wraps of hoisting cable on the drums of cranes and hoists at all times of operation.

(16) Where the cables are allowed to pile on the drums of cranes, the drums must have a flange at each end to prevent the cables from slipping off the drum.

(17) Chains used in load carrying service must be inspected before initial use and weekly thereafter.

If at any time any three-foot length of chain is found to have stretched one-third the length of a link it must be discarded.

(18) Chains must be spliced in compliance with the requirements of the general safety and health standard, WAC 296-24-29413.

(19) Wherever annealing of chains is attempted, it must be done in properly equipped annealing furnaces and under the direct supervision of a competent person thoroughly versed in heat treating.

Chains must be normalized or annealed periodically as recommended by the manufacturer.

(20) Fiber rope.

(a) Frozen fiber rope must not be used in load carrying service.

(b) Fiber rope that has been subjected to acid must not be used for load carrying purposes.

(c) Fiber rope must be protected from abrasion by padding where it is fastened or drawn over square corners or sharp or rough surfaces.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. WSR 17-16-132, § 296-78-750, filed 8/1/17, effective 9/1/17. Statutory Authority: Chapter 49.17 RCW. WSR 96-17-056, § 296-78-750, filed 8/20/96, effective 10/15/96. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. WSR 81-18-029 (Order 81-21), § 296-78-750, filed 8/27/81.]