

7.2: Rigging Equipment for Material Handling

Rigging Equipment for Material Handling

General

The requirements contained in Subpart H apply to rigging equipment used in conjunction with other material handling equipment for the movement of material by hoisting.

Inspection

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 not be used.

Load considerations

Rigging equipment shall not be used for loads rated in excess of the equipment's safe working load. Safe working loads are listed in Tables H-1 through H-20 in Subpart H.

If the type of installation requires that special hooks, grabs, clamps, etc. must be used, they shall be marked to indicate their maximum safe working loads and they shall be proof-tested prior to their use to 125% of their rated load.

Types of slings

Slings used for hoisting shall be made from alloy steel chain, wire rope metal mesh, natural or synthetic fiber rope, and synthetic web. Each day before use, the slings shall be inspected for damage or defects by a competent person.

Alloy Steel Chains

Marking

Welded alloy steel chains must be marked with a permanent identifiable tag stating size, grade, rated capacity and manufacturer.

Capacity

Hooks, rings, links and other attachments used with alloy steel chains shall have a rated capacity at least equal to that of the chain.

Types not permitted

Shop or job made hooks, links, fasteners, etc., formed from bolts, rods etc., shall not be used.

Inspection

Alloy steel chains shall be inspected on a regular basis. The frequency of the inspection is determined by the frequency of the use, severity of the conditions of use, the nature of the lifts being made, and previous experience with the use of the chains.

Wire Ropes

Rated capacity

The safe working loads of wire ropes shall be determined from Tables H-3 through H-14 of Subpart H. For sizes, classifications, and grades which are not included in the Tables, the safe working load recommended by the manufacturer shall be followed provided a safety factor of not less than five is maintained.

Work techniques

Protruding ends of strands in wire rope shall be covered or blunted. Wire rope shall not be secured by knots, except on haul back lines and scrapers. Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load. A sling shall not be pulled from under a load when the load is resting on the sling.

Natural Rope and Synthetic Fiber

Eye splices

Eye splices in manila rope shall contain at least three full tucks, and short splices shall contain at least six full tucks, three on each side of the centerline of the splice.

Eye splices in synthetic fiber rope shall contain at least four full tucks and short splices shall contain at least eight full tucks, four on each side of the centerline of the splice.

For all eye splices, the eye shall be large enough to provide for an angle not greater than 60 degrees at the splice when the eye is placed over the load or support.

Work conditions

Natural and synthetic fiber rope slings shall be permitted when used in a temperature range of minus 20 degrees F to plus 180 degrees F, without decreasing the working load limit, unless the sling is wet and frozen. Wet and frozen slings must be used in accordance with manufacturer's recommendations.

Splicing

Knots shall not be used in lieu of splices. Clamps for splicing fiber ropes shall not be used unless the clamps are designed specifically for such use.

Removal from service

Natural and synthetic rope slings shall be immediately removed from service if any of the following conditions exist:

1. Abnormal wear.
2. Powdered fiber between strands.
3. Broken or cut fibers.
4. Variations in the size or roundness of strands.
5. Discoloration or rotting.
6. Distortion of hardware in the sling.

Synthetic Webbing

Marking

When synthetic web slings are used, the employer must mark or code each sling to show all of the following:

1. Name or trademark of manufacturer.
2. Rated capacities for the type of hitch.
3. Type of material.

Rated capacity

The rated capacity of synthetic web slings shall not be exceeded. Synthetic webbing shall be of uniform thickness and width and selvage edges shall not be split from the webbings width.

Fittings

Fittings for synthetic web slings shall have a minimum breaking strength equal to that of the sling.-Fittings shall be free of all sharp edges that might damage the webbing.

Attachment

Stitching is the only permissible method for attaching end fittings to the webbing and to form eyes in the webbing.

Work environments

Nylon web slings shall not be used where fumes, vapors, sprays, mists or liquids of acids or phenolics are present. Polyester and polypropylene web slings shall not be used where fumes vapors, sprays, mists, or liquids of caustics are present.

Removal from Service

Synthetic web slings shall be immediately removed from service if any of the following conditions exist:

1. Acid or caustic burns.
2. Melting or charring of any part of the sling surface.

3. Broken or worn stitches.
4. Snags, punctures, tears or cuts.
5. Distortion of fittings.

Shackles and Hooks

Loading considerations

Table H-19 of Subpart H is used to determine the safe working loads of the various sizes of shackles. Higher safe working loads may be permitted where recommended by the manufacturer for specific use provided that a safety factor of not less than five is maintained.

Manufacturer's recommendations

The manufacturer's recommendations shall be followed in determining the safe working loads of the various sizes and types of hooks. Hooks for which no manufacturer's data is available, shall be tested to twice the intended safe working load before they are first put into use.

Disposal of Waste Material

Chute requirement

Whenever materials are dropped more than 20 ft. to any point lying outside the exterior walls of the building, a chute constructed of wood or equivalent materials shall be used.

Dropped through holes in floors

When debris is dropped through holes in the floor without the use of chutes, the area onto which the material is dropped shall be completely protected with barricades not less than 42 inches high and not less than six ft. back from the projected edge of the opening above.

Signs warning of the hazard of falling materials shall be posted at each level.

Combustible materials

All scrap lumber, waste material, and rubbish shall be removed from the immediate work area as work progresses. Solvent waste and oily rags etc., shall be stored in fire resistant containers until removed from the job.

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