

MATERIAL HANDLING STORAGE, USE AND DISPOSAL



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MATERIALS HANDLING, STORAGE, USE AND DISPOSAL

INTRODUCTION

The Occupational Safety and Health Act under 29 CFR 1926 Subpart H establishes requirements to address the hazards relating to materials handling, storage, use and disposal. In response to the regulatory mandate Steingass Mechanical Contracting, Inc. has developed and will maintain the Materials Handling Program to provide the proper and safe procedures for all applicable employees.

PURPOSE

This document is primarily intended to outline the methods of protecting employees engaged in materials handling. In addition, it is intended that Steingass Mechanical Contracting, Inc. will be in full compliance with 29 CFR 1926 Subpart H.

RESPONSIBILITY

Steingass Mechanical Contracting, Inc. shall instruct all applicable employees in the necessity to work in a safe manner and the contents of this document. It will be the responsibility of Steingass Mechanical Contracting, Inc. to continually monitor the Materials Handling Program to ensure that all the requirements of these procedures are being followed and that any deviations or inadequacies are corrected.

GENERAL REQUIREMENTS

1. All materials stored in tiers will be stacked, racked, blocked interlocked or otherwise secured to prevent sliding, falling or collapse.
2. Maximum safe load limits of floors within buildings and structures in pounds per square foot will be conspicuously posted in all storage areas except for floor or slab on grade. Maximum safe loads shall not be exceeded.
3. Aisles and passageways shall be kept clear to provide for free and safe movement of material handling equipment or employees. Aisles and passageways shall be kept in good repair.
4. When a difference in road or working levels exists, ramps, blocking or grading shall be used to ensure the safe movement of vehicles between the two levels.

MATERIAL STORAGE

1. Material stored inside buildings under construction shall not be placed within 6 feet of any hoistway or inside floor openings, or within 10 feet of an exterior wall, which does not extend above the material stored.
2. All employees required to work on stored material in silos, hoppers, tanks and other similar storage areas should be equipped with personal fall arrest systems.
3. No compatible materials shall be segregated in storage.
4. Bagged materials shall be stacked by stepping back the layers and crosskeying the bags at least every 10 bags high.
5. Materials shall not be stored on scaffold or runways in excess of supplies needed for immediate operations.

6. Brick stacks shall not be more than 7 feet in height. When a loose brick stack reaches a height of 4 feet, it shall be tapered back 2 inches in every foot of height above the 4-foot level.
7. When masonry blocks are stacked higher than 6 feet, the stack shall be tapered back one-half block per tier above the 6-foot level.
8. For lumber:
 - a) Used lumber shall have all nails withdrawn before stacking.
 - b) Lumber shall be stacked on level and solidly supported sills.
 - c) Lumber shall be so stacked as to be stable and self-supporting.
 - d) Lumber piles shall not exceed 20 feet in height provided that lumber to be handled manually shall not be stacked more than 16 feet high.
9. Structural steel, poles, pipe, bar stock and other cylindrical materials shall be stacked and blocked to prevent spreading or tilting, unless racked.
10. Storage areas shall be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion or pest harborage. Vegetation control will be exercised when necessary.
11. Dockboards (bridge plates):
 - a) Portable and powered dockboards shall be strong enough to carry the load imposed on them.
 - b) Portable dockboards shall be secured in position, either by being anchored or equipped with devices, which will prevent their slipping.
 - c) Handholds or other effective means shall be provided on portable dockboards to permit safe handling.
 - d) Positive protection shall be provided to prevent railroad cars from being moved while dockboards or bridge plates are in position.

CRITERIA FOR RIGGING EQUIPMENT

This section applies to slings used in conjunction with other material handling equipment for the movement of material by hoisting. The types of slings covered are those made from alloy steel chain, wire rope, metal mesh, and natural or synthetic fiber rope (conventional three strand construction, and synthetic web (nylon, polyester and polypropylene).

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.
2. Rigging equipment shall not be loaded in excess of its recommended safe working load for the specific equipment.
3. Rigging equipment, when not in use, shall be removed from the immediate work area so as not to prevent a hazard to employees.
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% of their rated load.
5. Each day before being used, a competent person shall inspect the sling and all fastenings and attachments for damage or defects. Damaged or defective slings shall be immediately removed from service.
6. Alloy steel chains:
 - a) Welded alloy steel chain slings shall be permanently affixed durable identification stating size, grade, rated capacity and sling manufacturer.
 - b) Hooks, rings, oblong links, pear-shaped links, welded or mechanical coupling links or other attachments when used with alloy steel chains, shall have a rated capacity at least equal to that of the chain.
 - c) Job or shop hooks and links, or makeshift fasteners formed from bolts, rods, etc., shall not be used.
 - d) Rated capacity (working load limit) for alloy steel chain slings shall conform to the values shown in Table H-1.

- e) Whenever wear at any point of any chain link assembly exceeds that shown in Table H-2, the assembly shall be removed from service.
- f) A thorough periodic inspection of alloy steel chain slings in use shall be made on a regular basis, to be determined on the basis of:
 - i) Frequency of sling use;
 - ii) severity of service conditions;
 - iii) nature of lift being made;
 - iv) experience gained on the service life of slings used in similar circumstances;
 - v) Such inspections shall be at intervals of no more than once every 12 months.

7. Wire rope slings.

- a) Tables H-3 through H-14 shall be used to determine the safe working loads of various sized and classifications of improved plow steel wire rope and wire rope slings with various types of terminals. For sizes, classifications and grades not included in these tables, the safe working load recommended by the manufacturer for specific identifiable products shall be followed provided that safety factor of not less than 5 is maintained.
- b) Protruding ends of strands in splices on slings/bridles shall be covered or blunted.
- c) Wire rope shall not be secured by knots, except on haul back lines on scrapers.
- d) The following limitations shall apply to the use of wire rope:
 - i) An eye splice made in any wire rope shall have not less than three full tucks.
 - ii) Except for eye splices in the ends of wires and for endless rope slings, each wire rope used in hoisting or lowering or in pulling loads, shall consist of one continuous piece without knot or splice.
 - iii) Eyes in wire rope bridles, slings, or bull wires shall not be formed by wire rope clips or knots.
 - iv) Wire rope shall not be used if, in any length of eight diameters, the total number of visible broken wires exceed 10% of the total number of wires or if the rope shows other signs of excessive wear, corrosion or defect.

- e) When U-bolt wire rope clips are used to form eyes, Table H-20 shall be used to determine the number and spacing of clips.
 - i) When used for eye splices, the U-bolt shall be applied to that the “U” section is in contact with the dead end of the rope.
- f) Slings shall not be shortened with knots or bolts or other makeshift devices.
- g) Sling legs shall not be kinked.
- h) Slings used in a basket hitch shall have the loads balance to prevent slippage.
- i) Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.
- j) Shock loading is prohibited.
- k) A sling shall not be pulled from under a load when the load is resting on the sling.
- l) Minimum slings lengths:**
 - i) Cable laid and 6 x 19 and 6 x 37 slings shall have a minimum clear length of wire rope 10 times the component rope diameter between splices, sleeves or end fittings.
 - ii) Braided slings shall have a minimum clear length of wire rope 40 times the component rope diameter between the loops or end fittings.
 - iii) Cable laid grommets, strand laid grommets and endless slings shall have a minimum circumferential length of 96 times their body diameter.
- m) Safe operating temperatures:**
 - i) Fiber core wire rope slings of all grades shall be permanently removed from service if they are exposed to temperatures in excess of 200 degrees F.
 - ii) When nonfiber core wire rope slings of any grade are used at temperatures above 400 degrees F or below minus 60 degrees F, recommendations of the sling manufacturer regarding use at that temperature shall be followed.
- n) End attachments:**
 - i) Welding of end attachments, except covers to thimbles, shall be performed prior to the assembly of the sling.
 - 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. Steingass Mechanical Contracting, Inc. shall retain a certificate of the proof test and make it available for examination.

8. Natural rope and synthetic fiber slings:

- a) When using natural or synthetic fiber rope slings, Table H-15, 16, 17 and 18 shall apply.
- b) All splices in rope slings provided by Steingass Mechanical Contracting, Inc. shall be made in accordance with fiber rope manufacturer's recommendations.
 - i) In manila rope, eye splices 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).
 - ii) In layed synthetic fiber rope, eye splices 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).
 - iii) Strand end tails shall not be trimmed short (flush with the surface of the rope) immediately adjacent to the full tucks. This precaution applies to both eye and short splices and all types of fiber rope. For fiber ropes under 1 inch diameter, the tails shall project at least six rope diameters beyond the last full tuck. For fiber ropes in inch diameter or larger, the tails shall project at least 6 inches beyond the last full tuck. Where projecting tails interfere with the use of the sling, the tails shall be tapered and spliced into the body of the rope using at least two additional tucks.
 - iv) For all eye splices, the eye shall be sufficiently large to provide an included angle of not greater than 60 degrees at the splice when the eye is placed over the load or support.
 - v) Knots shall not be used in lieu of splices.
- c) Natural and synthetic fiber rope slings, except for wet frozen slings, may be used in a temperature range from minus 20 degrees F to plus 180 degrees F without decreasing the working load limit. For operations outside this temperature range and for wet, frozen slings, the sling manufacturer's recommendations shall be followed.
- d) Spliced fiber rope slings shall not be used unless they have been spliced in accordance with the following minimum requirements and any additional recommendations of the manufacturer.
 - i) In manila rope, eye splices shall consist of at least three full tucks and short splices shall consist of at least six full tucks (three on each side of the splice centerline).

- ii) In synthetic fiber rope, eye splices shall consist of at least four full tucks and short splices shall consist of at least eight full tucks (four on each side of the splice centerline).
- iii) Strand end tails shall not be trimmed flush with the surface of the rope immediately adjacent to the full tucks. This applies to both eye and short splices and all types of fiber rope. For fiber rope under 1 inch diameter, the tails shall project at least six rope diameters beyond the last full tuck. For fiber ropes in inch diameter or larger, the tails shall project at least 6 inches beyond the last full tuck. Where projecting tails interfere with the use of the sling, the tails shall be tapered and spliced into the body of the rope using at least two additional tucks.
- iv) Fiber rope slings shall have a minimum clear length of rope between eye splices equal to 10 times the rope diameter.
- v) Knots shall not be used in lieu of splices.
- vi) Clamps not designed specifically for fiber ropes shall not be used for splicing.
- vii) For all eye splices, the eye shall be of such size to provide an included angle of not greater than 60 degrees at the splice when the eye is placed over the load or support.
- e) Fiber rope slings shall not be used if end attachments in contact with the rope have sharp edges or projections..
- f) Natural and synthetic fiber rope slings shall be immediately removed from service if any of the following conditions are present:
 - i) Abnormal wear.
 - ii) Powdered fiber between strands.
 - iii) Broken or cut fibers.
 - iv) Variations in the size or roundness of strands.
 - v) Discoloration or rotting.
 - vi) Distortion of hardware in the sling.
- 9. Synthetic webbing (nylon, polyester, and polypropylene) slings:
 - a) Steingass Mechanical Contracting, Inc. shall have each synthetic web sling marked or coded to show:
 - i) Name or trademark of manufacturer.
 - ii) Rated capacities for the type of hitch.

- iii) Type of material.
- b) Rated capacity shall not be exceeded.
- c) Synthetic webbing shall be of uniform thickness and width and selvage edges shall not be split from the webbing's width.
- d) Fittings shall be:
 - i) Of a minimum breaking strength equal to that of the sling; and
 - ii) Free of all sharp edges that could in any way damage the webbing.
- e) Stitching shall be the only method used to attach end fitting to webbing and to form eyes. The thread shall be in an even pattern and contain a sufficient number of stitches to develop the full breaking strength of the sling.
- f) When synthetic web slings are used the following precautions shall be taken:
 - i) Nylon web slings shall not be used where fumes, vapors, sprays, mists or liquids of acids or phenolics are present.
 - ii) Polyester and polypropylene web slings shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present.
 - iii) Web slings with aluminum fittings shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present.
- g) Synthetic web slings of polyester and nylon shall not be used at temperatures in excess of 180 degrees F. Polypropylene web slings shall not be used at temperatures in excess of 200 degrees F.
- h) Synthetic web slings shall be immediately removed from service if any of the following conditions are present:
 - i) Acid or caustic burns;
 - ii) Melting or charring of any part of the sling surface;
 - iii) Snags, punctures, tears or cuts;
 - iv) Broken or worn stitches; or
 - v) Distortion of fittings.

10. Shackles and hooks:

- a) Table H-19 shall be used to determine the safe working loads of various sizes of shackles, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products, provided a safety factor of not less than 5 is maintained.
- b) The manufacturer's recommendations shall be followed in determining the safe working loads of the various sizes and types of specific hooks. All hooks for which no applicable manufacturer's recommendations are available shall be tested to twice the intended safe working load before that are initially put into use. Steingass Mechanical Contracting, Inc. shall maintain a record of the dates and results of such tests.
- c) Latches will be in place on all hooks, eliminating the hook throat opening.

11. Tag lines shall be used.

12. All employees shall be kept clear of loads about to be lifted and no employee will be allowed under suspended loads.

13. DISPOSAL OF WASTE MATERIALS

1. When materials are dropped more than 20 feet to any point lying outside the exterior walls of the building, an enclosed chute of wood or its equivalent, shall be used.
2. 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 enclosed with barricades not less than 42 inches high and not less than 6 feet back from the projected edge of the opening above. Signs warning of the hazard falling materials shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.
3. All scrap lumber, waste material and rubbish shall be removed from the immediate work area as work progresses.
4. Disposal of waste materials or debris by burning shall comply with local fire regulations.
5. All solvent waste, oily rags and flammable liquids shall be kept in fire resistant covered containers until removed from the work site.