

Cranes, Hoists and Slings

Applicable Regulations

29 CFR 1910 Subpart N, Materials Handling and Storage

Applicability

There are significant safety issues to be considered, both for the operators of the diverse "lifting" devices, and for workers in proximity to them. This page is a starting point for finding information about these devices and their operation.

Requirements

Cranes

Cranes shall not exceed the capacity, rating, or scope recommended by the manufacturer.

- All equipment deficiencies shall be repaired; defective parts shall be replaced, before continued use.
- All machinery and equipment shall be inspected prior to each use, and during use, to make sure it is in safe operating condition.
- An illustration of the signals shall be posted at the job site.
- Hand signals to crane and derrick operators shall be those prescribed by the applicable ANSI standard for the type of crane in use.
- Instructions or warnings shall be visible to operators while they are at their control stations.
- Rated load capacities, and recommended operating speeds, special hazard warnings, or instructions, shall be posted on all equipment.

Hoists

Each employee in a hoist area shall be protected from falling 6 feet or more by guardrail systems or personal fall arrest systems. If guardrail systems or chain gate, guardrail or portions thereof must be removed to facilitate hoisting operations, that employee must be protected by a personal fall arrest system.

- If abrasion, scrubbing, flattening, or peening has compromised the outside wires; the wire rope shall be removed from service.
- In hoisting ropes, if six random broken wires are noticed in one rope lay or three broken wires in one strand in one rope lay; the wire rope shall be removed from service.
- If evidence of any heat damage resulting from a torch or any damage caused by contact with electrical wires is identified; the wire rope shall be removed from service.

Hoisting ropes shall be installed in accordance with the manufacturer's specifications.

- The installation of live booms on hoists is prohibited.
- The use of endless belt-type man lifts on construction shall be prohibited.

Slings

Once the sling has been selected based on the load requirements and inspected prior to use, there are four primary factors to take into consideration when safely lifting a load.

- The history of the care and usage of the sling.
- The number of legs and the angle the sling makes with the horizontal line.
- The rated capacity of the sling.
- The size, weight, and center of gravity of the load.

At the beginning of each workday all slings, lifting fasteners, and attachments shall be inspected for damage or defects by a competent person designated by ASU's Department of Environmental Health & Safety.

Equipment Cranes

Hammerhead Tower Cranes

Remember each employee required to perform duties on the horizontal boom of hammerhead tower cranes shall be protected against falling by guardrails or by a personal fall arrest system in conformance with.

Crawler, Locomotive and Truck cranes

Remember all jibs must have positive stops to prevent their movement of more than 5 degree above the straight line of the jib and boom on conventional type crane booms. The use of cable type belly slings does not constitute compliance with this rule.

Overhead and Gantry Cranes

Ensure the rated load of the crane is plainly marked on each side of the crane, each side of the hoist, or the load block; ensure the load marking is clearly legible from the ground or floor.

Hoists

Material Hoists

Operating rules shall be established and posted at the operator's station of the hoist.

Rules and notices shall be posted on the car frame or crosshead in a conspicuous location, including the statement "No Riders Allowed."

- All material hoists shall conform to the requirements of ANSI A10.5-1969, Safety Requirements for Material Hoists.
- Car arresting devices shall be installed to function in case of rope failure.
- No person shall be allowed to ride on material hoists except for the purposes of inspection and maintenance.

Personnel Hoists

- An emergency stop switch shall be provided in the car and marked "Stop."
- Cars shall be provided with a capacity and data plate secured in a conspicuous place on the car or crosshead.
- Doors or gates shall be provided with electric contacts which do not allow movement of the hoist when door or gate is open.
- Hoist doors or gates shall be not less than 6 feet 6 inches high and shall be provided with mechanical locks which cannot be operated from the landing side, and shall be accessible only to persons on the car.
- Hoist towers outside the structure shall be enclosed for the full height on the side or sides used for entrance and exit to the structure.
- Overhead protective covering of 2-inch planking, ¾-inch plywood or other solid material or equivalent strength shall be provided on the top of every personnel hoist.
- Towers inside of structures shall be enclosed on all four sides throughout the full height.

Overhead Hoists

- Air hoists shall be connected to an air supply of sufficient capacity and pressure to safely operate the hoist.
- All air hoses supplying air shall be positively connected to prevent their becoming disconnected during use.
- All overhead hoists in use shall meet the applicable requirements for construction, design, installation, testing, inspection, maintenance, and operation, as prescribed by the manufacturer.
- The hoist shall be installed only in locations that will permit the operator to stand clear of the load at all times.
- The safe working load of the overhead hoist, as determined by the manufacturer, shall be indicated on the hoist, and this safe working load shall not be exceeded.



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- The support shall be arranged so as to provide for free movement of the hoist and shall not restrict the hoist from lining itself up with the load.
- The supporting structure to which the hoist is attached shall have a safe working load equal to that of the hoist.

Additional Information

Contact ASU EHS Office: safety@asu.edu