

MSHA Guarding Considerations and Recommendations

- Do the design, construction, selection of materials and guard installation prevent contact with **all** moving machine part hazards?
- Does the guard provide protection by itself, and not rely on visual or tactile awareness of a hazard, administrative controls or procedures such as warnings, signs, lights, training, supervision or personal protective equipment?
- Are the guard material(s), fastening methods, and construction suitable to withstand the wear, corrosion, vibration and shock of normal operations?
- If drive belts inside a guard fail, will the whipping action of broken belts be contained?
- Is the guard recognizable as a guard?
- Is the guard installed securely?
- Is the guard design adequate for the application and specific hazard(s)?
- Are openings in the guard material such that contact with the hazard is prevented by the distance between the guard and the hazard?
- Does the guard interfere with the normal operation, inspection, lubrication or servicing of the equipment?
- Is the guard designed and constructed so that adjustments to the guarded components can be made without loss of protection or modifying the guard?
- Do the design, materials and guard construction prevent the guard from being a hazard itself (i.e. free of burrs, sharp edges, pinch points, etc.)?
- Is the guard of a size, shape, weight and balance which permits safe manual handling when it is removed or replaced?
- Alternately, if it is too large for manual handling, is it accessible and amenable for safe handling with mechanical tools or equipment?
- Is the guard constructed so that it cannot be circumvented, by passed or overcome?
- Can the guarded components be inspected without removing the guard?
- Is the guard constructed and located so as not to hinder clean-up efforts?
- Is the guard maintained in serviceable condition?

OSHA Occupational Safety & Health Administration

OSHA 1926.555 (a) (5)	Helicopters, Hoists, Elevators, and Conveyors (1626.555 Conveyors): Where a conveyor passes over work areas, aisles, or throughfares, suitable guards shall be provided to protect employees required to work below the conveyors.
OSHA 1910.212 (a) (1)	Machinery and Machine Guarding: Types of guarding. One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks.
OSHA 1910.219 (c) (2) (1)	Machinery and Machine Guarding: All exposed parts of horizontal shafting seven (7) feet or less from floor or working platform, excepting runways used exclusively for oiling or running adjustments, shall be protected by a stationary casing enclosing shafting completely or by a trough enclosing sides and top or sides and bottom of shafting as location requires.
OSHA 1910.219 (c) (4) (i)	Machinery and Machine Guarding: Projecting shaft ends shall present a smooth edge and shall not project more than ½ the diameter of the shaft unless guarded by non rotating caps or safety sleeves.
OSHA 1910.219 (d) (1)	Machinery and Machine Guarding: Guarding, Pulleys and any parts which are (7) feet or less from the floor or working platform shall be guarded in accordance with the standards specified in paragraphs (m) and (o) of this section. Pulleys serving as balance wheels (e.g., punch presses) on which the point of contact between belt and pulley is more than six feet inches (6ft 6in) from the floor or platform may be guarded with a disk covering the spokes.
OSHA 1910.219 (m) (1) (i)	Machinery and Machine Guarding: Materials. Standard conditions shall be secured by the use of the following conditions shall be secured by the use of the following materials. Expanded metal, perforated or solid sheet metal, wire mesh on a frame of angle iron, or iron pipe securely fastened to floor or frame of machine
OSHA 1910.219 (m) (1) (ii)	Machinery and Machine Guarding: All metal shall be free from burrs and sharp edges.
OSHA 1910.219 (o) (1)	Machinery and Machine Guarding: Minimum requirements. The materials and dimensions specified in this paragraph shall apply to all guards, except horizontal overhead belts, rope, cable or chain guards more than seven (7) feet above floor or platform.
OSHA 1910.219 (o) (3)	Machinery and Machine Guarding: Guards for overhead belts shall run the entire length of the belt and follow the line of the pulley to the ceiling or be carried to the nearest wall, thus enclosing the belt effectively. Where belts are so located as to make it impracticable to carry the guard to wall or ceiling, construction or guard shall be such as to enclose completely the top and bottom runs of belt and face of pulleys.
OSHA 1910.219 (f) (1) (i) & (ii)	Machinery and Machine Guarding: Gears. By a complete enclosure: or by a standard guard as described in paragraph (o) of this section, at least seven (7) feet high extending six (6) inches above the mesh point of the gears.
OSHA 1910.219 (f) (3)	Machinery and Machine Guarding: Sprockets and chains. All sprockets and chains shall be enclosed unless they are more than seven (7) feet above the floor or platform. Where the drive extends over other machine or working area, protection against falling shall be provided.
OSHA 1910.219 (g)	Machinery and Machine Guarding: Guarding friction drives. The driving point of all friction drives when exposed to contact shall be guarded, all arm or friction drives and all web friction drives with holes in the web shall be entirely enclosed, and all protecting belts on friction drives where exposed to contact shall be guarded.
OSHA 1910.219 (k) (2)	Machinery and Machine Guarding: Guards, Clutches, cutoff couplings, or clutch pulleys having projecting parts, where such clutches are located (7) feet or less above the floor or working platform, shall be enclosed by a stationary guard constructed in accordance with this section. A "U" type guard is permissible.

Other Sources of Reference

ANSI 7.1.2	ANSI B11.19-2003	Performance Criteria for Safeguarding - Construction - free from sharp edges etc.
ANSI 7.1.3	ANSI B11.19-2003	Performance Criteria for Safeguarding - Construction - unable to reach over under or around.
ANSI 7.1.4	ANSI B11.19-2003	Performance Criteria for Safeguarding - Construction - ease of use.
ASME 5.9.2 (c)	ASME B20.1-2009	Safety Standard for Conveyors and Related Equipment - when a conveyor passes over a walkway
ASME 5.9.2 (d)	ASME B20.1-2009	Safety Standard for Conveyors and Related Equipment - overhead conveyors
ASME 5.9.3	ASME B20.1-2009	Safety Standard for Conveyors and Related Equipment - guarding nip and shear points
ASME 6.1.1	ASME B20.1-2009	Safety Standard for Conveyors and Related Equipment - safety considerations when guarding conveyors

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