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Subject: OSHA Guarding Requirements

To Whom it May Concern,

Please find attached, the following documents that cover the blade guarding requirements for MK Diamond Masonry Cutting Equipment.

OSHA, 1926.303(b)(1)
Cal OSHA, Title 8, 3577(a)
ANSI, B7.1-2000

Thank you,

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Regulations (Standards - 29 CFR)

Abrasive wheels and tools. - 1926.303

OSHA Regulations (Standards - 29 CFR) - Table of Contents

- **Standard Number:** 1926.303
- **Standard Title:** Abrasive wheels and tools.
- **SubPart Number:** I
- **SubPart Title:** Tools - Hand and Power

(a)

Power. All grinding machines shall be supplied with sufficient power to maintain the spindle speed at safe levels under all conditions of normal operation.

(b)

Guarding.

(b)(1)

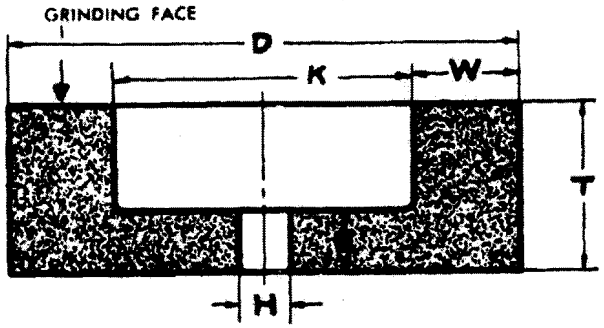
Grinding machines shall be equipped with safety guards in conformance with the requirements of American National Standards Institute, B7.1-1970, Safety Code for the Use, Care and Protection of Abrasive Wheels, and paragraph (d) of this section.

(b)(2)

"Guarding design." The safety guard shall cover the spindle end, nut, and flange projections. The safety guard shall be mounted so as to maintain proper alignment with the wheel, and the strength of the fastenings shall exceed the strength of the guard, except:

(b)(2)(i)

TYPE 6 STRAIGHT-CUP WHEELS



Type 6—Straight-cup Wheel
Side grinding wheel having a diameter,thickness and hole with one side straight or flat and the opposite is derecessed. This type, however, differs from Type 5 in that the grinding is performed on the wall of the abrasive created by the difference between the diameter of the recess and the outside diameter of the wheel. Therefore, the wall dimension "W" takes precedence over the diameter of the recess as an essential intermediate dimension to describe this shape type.

Flanges. Collars, discs or plates between which wheels are mounted and are referred to as adaptor, sleeve, or back up type. See Section 3579.

Off–hand Grinding. The grinding of any material or part which is held in the operator's hand.

Portable Grinding. A grinding operation where the grinding machine is designed to be hand held and may be easily moved from one location to another.

Protection Hood. A protection hood is an enclosure for an abrasive wheel consisting of a peripheral and two side members. Its main function is to effectively retain the pieces of the wheel should the wheel break in operation.

Reinforced Wheels. A class of organic wheels which contain strengthening fabric or filament. The term "reinforced" does not cover wheels using such mechanical additions as steel rings, steel cup backs or wire or tape winding.

Safety Guard. An enclosure designed to restrain the pieces of the abrasive wheel in the event that the wheel is broken while in operation.

Snagging. Grinding which removes relatively large amounts of material without regard to close tolerances or surface finish requirements.

Surface Feet per Minute (s.f.p.m.). The distance in feet any one abrasive grain on the peripheral surface on a grinding wheel travels in 1 minute.

$$\text{Surface Feet Per Minute} = \frac{3.1416 \times \text{diameter in inches} \times \text{r.p.m.}}{12}$$

or

$$.262 \times \text{diameter in inches} \times \text{r.p.m.}$$

Tuck Pointing. Removal of cement, mortar, or other non–metallic jointing material from masonry mortar joints and pointing up the tuck or joint.

Tuck Pointing Wheels. Tuck pointing wheels, usually Type 1, reinforced organic bonded wheels have diameter, thickness and hole size dimension. They are subject to the same limitations of use and mounting as Type 1 wheels.

Note: Wheels used for tuck pointing should be reinforced, organic bonded.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

HISTORY

1. Repealer and new Article 21 (Sections 3575 through 3581 and Figures A–1 through A–23 and Tables A–1 through A–6) filed 10–25–74; effective thirtieth day thereafter (Register 74, No. 43).
2. Amendment filed 3–28–75; effective thirtieth day thereafter (Register 75, No. 13).
3. Repealer and new section filed 7–26–78; effective thirtieth day thereafter (Register 78, No. 30).
4. Amendment filed 11–22–85; effective thirtieth day thereafter (Register 85, No. 48).

§ 3576. General Machine Requirements.

(a) Stationary grinding machines shall be sufficiently heavy and rigid so as to prevent dangerous vibration and shall be securely mounted on substantial floors, benches, foundations or other adequate and safe structures.

(b) Portable grinders shall not be used as bench grinders unless they are securely clamped in place, having ample clearance between the wheels and the bench, and are equipped with standard wheel and arbor end guards and tool rests. "C" clamps shall not be used to secure grinders to benches. Special band clamps or other equivalent means shall be used which encircle the machine and are secured by means of bolts.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

HISTORY

1. Amendment of subsection (b) filed 11–22–85; effective thirtieth day thereafter (Register 85, No. 48).

§ 3577. Protection Devices.

(a) Abrasive wheel machinery guards shall meet the design specifications of the American National Standard Safety Requirements for the Use, Care, and Protection of Abrasive Wheels, ANSI B 7.1–1978. This requirement shall not apply to natural sandstone wheels or metal, wooden, cloth, or paper discs having a layer of abrasive on the surface.

(b) Abrasive wheels shall be provided with protection hoods or safety guards which shall be of such design and construction as to effectively protect the employee from flying fragments of a bursting wheel insofar as the operation will permit.

EXCEPTIONS: This requirement does not apply to the following classes of wheels and conditions.

1. Wheels used for internal work while within the work being ground.
2. Special precision tool room grinders under the supervision of expert mechanics.
3. Type 1 wheels not larger than 2 inches in diameter and not more than 1/2–inch thick, operating at peripheral speeds less than 1800 SFPM when mounted on mandrels driven by portable drills.
4. Type 1 Reinforced wheels not more than 3 inches in diameter and 1/4–inch in thickness, operating at peripheral speeds not exceeding 9,500 SFPM, provided that safety glasses and face shield protection are worn.
5. Types 16, 17, 18, 18R and 19 cones and plugs and threaded hole pot balls where the work offers protection or where the size does not exceed 3 inches in diameter by 5 inches long.
6. Metal centered diamond lapidary wheels either notched, segmented or continuous rim used with a coolant deflector, when operated at speeds up to 3,500 SFPM.
7. Mounted wheels 2 inches and smaller in diameter used in portable operations.
8. Valve seat grinding wheels.

(c) The hood guard shall cover the spindle end, nut, and flange projections. The safety guard shall be mounted so as to maintain proper alignment with the wheel, and the strength of the fastenings shall exceed the strength of the guard.

EXCEPTIONS:

1. Protection hoods on cylindrical grinding machines, in all operations where the work provides a suitable measure of protection to the operator, may be so constructed that the spindle end, nut, and flanges are exposed; and where the nature of the work is such as to entirely cover the side of the wheel, the side covers of the guard may be omitted.
2. The spindle end, nut, and outer flange may be exposed on machines designed as portable saws.

(d) Cup wheels shall be protected by:

(1) Band type guards of such design and construction as to effectively protect the employee.

(2) Special "Revolving Cup Guards" which mount behind the wheel and turn with it. They shall be made of steel or other material of adequate strength and shall enclose the wheel sides upward from the back for one–third of the wheel thickness. The mounting features shall conform with all requirements of this section. It is necessary to maintain clearance between the wheel side and the guard. This clearance shall not exceed one–sixteenth inch.

(See Figures A–26, A–27, A–28 of Appendix G.)

American National Standard

ANSI B7.1-2000
Revision of B7.1-1995

Safety Requirements for the Use, Care and Protection of Abrasive Wheels

UNIFIED ABRASIVES MANUFACTURERS' ASSOCIATION

SPONSOR
Unified Abrasives Manufacturers' Association

DEVELOPER
Bonded Division

Approved April 27, 2000

Approved American National Standard
ANSI

4.3.9 Masonry saws

On machines specifically designed and used for masonry sawing (see section 1.3.12, page 13), the maximum angular exposure of the cutting-off wheel periphery for safety guards shall not exceed 180°. (See figures 28, 29 and illustration 56).

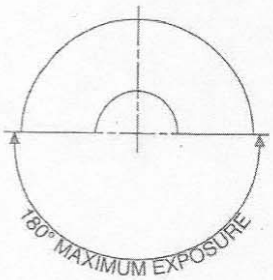


Figure 28 – Acceptable configuration

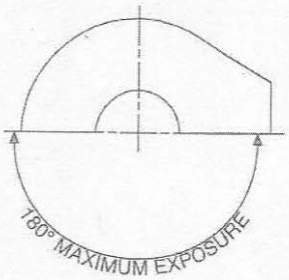


Figure 29 – Preferred configuration (clockwise direction of rotation)

Guards for these machines specifically designed for masonry sawing, using only steel centered diamond cutting-off wheels not exceeding 16,000 SFPM, shall use steel guards of at least 12 gauge (.105") thickness for wheels of all diameters.

4.3.10 Concrete saws

On machines specifically designed and used for concrete sawing (see section 1.3.4, page 12) the maximum angular exposure of the cutting-off wheel periphery for safety guards shall not exceed 180°. (See figures 28, 29 and illustration 57.)

Machines specifically designed for concrete sawing, using only steel centered diamond cutting-off wheels not exceeding 16,000 SFPM, shall use steel guards of at least to 12 gauge (.105") thickness for wheels of all diameters.

E 4.3.9 Masonry saws

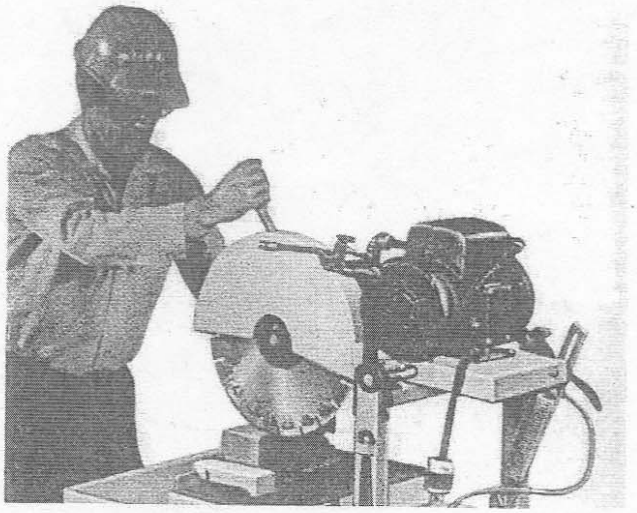


Illustration 56 – Cutting common brick with a metal centered segmental diamond abrasive wheel on a masonry saw

It is recognized that advancements in material science may allow machine guards to be developed with strength characteristics equal to, if not greater than, the 12 gauge (.105") thick steel required.

E 4.3.10 Concrete saws

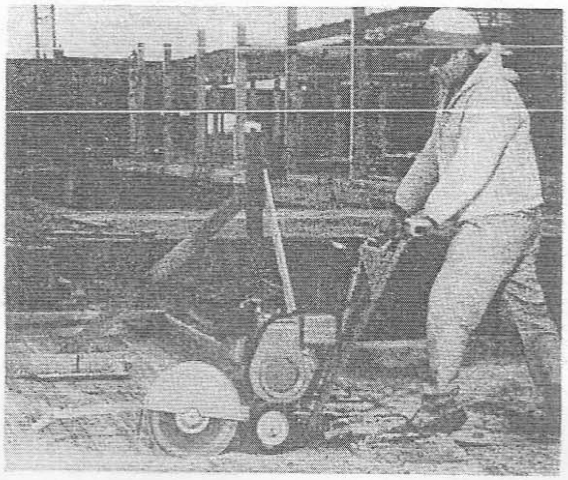


Illustration 57 – Cutting a concrete deck with a gasoline-powered concrete saw

It is recognized that advancements in material science may allow machine guards to be developed with strength characteristics equal to, if not greater than, the 12 gauge (.105") thick steel required.