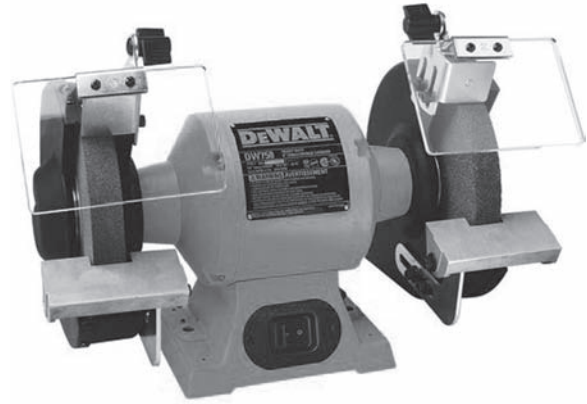


Abrasive wheel grinder

Abrasive wheels and grinding machines come in many styles, sizes, and designs. Both bench-style and pedestal (stand) grinders are commonly found in many industries. These grinders often have either two abrasive wheels, or one abrasive wheel and one special-purpose wheel such as a wire brush, buffing wheel, or sandstone wheel.

These types of grinders normally come with the manufacturer's safety guard covering most of the wheel, including the spindle end, nut, and flange projection. These guards must be strong enough to withstand the effects of a bursting wheel. In addition, a tool/work rest and transparent shields are often provided.

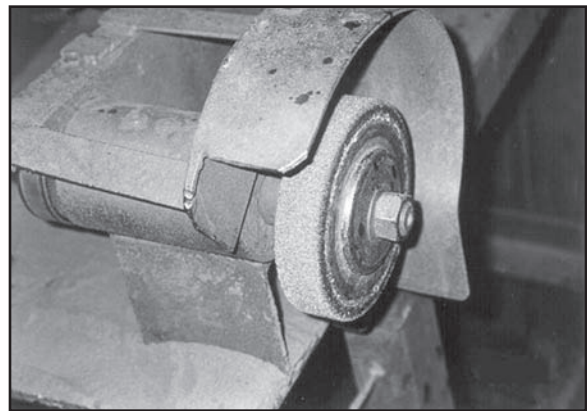


DEWALT Industrial Tool Co.

Hazard

Bench-style and pedestal grinders create special safety problems due to the potential of the abrasive wheel shattering; exposed rotating wheel, flange, and spindle end; and a naturally occurring nip point that is created by the tool/work rest. This is in addition to such concerns as flying fragments, sparks, air contaminants, etc. Cutting, polishing, and wire buffing wheels can create many of the same hazards.

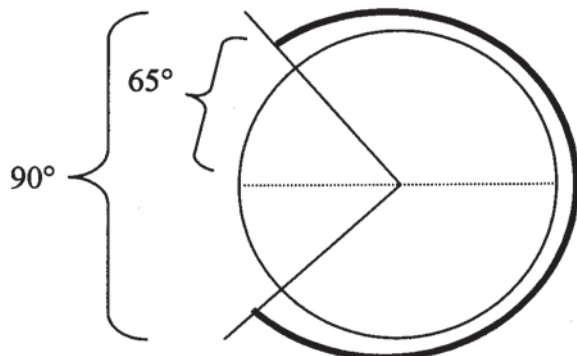
Grinding machines are powerful and are designed to operate at very high speeds. If a grinding wheel shatters while in use, the fragments can travel at more than 300 miles per hour. In addition, the wheels found on these machines (abrasive, polishing, wire, etc.) often rotate at several thousand rpms. The potential for serious injury from shooting fragments and the rotating wheel assemblies (including the flange, spindle end, and nut) is great. To ensure that grinding wheels are safely used in your workplace, know the hazards and how to control them.



Exposed spindle end, flange, and nut.
No tool/workrest.

Solution

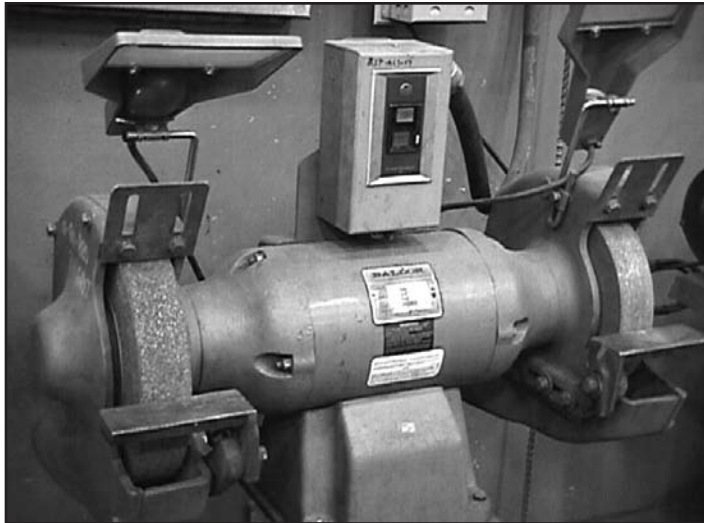
Abrasive wheels used on bench and pedestal grinding machines must be equipped with safety guards. The safety guard encloses most of the wheel — covering the flange, spindle end, and nut projection — while allowing maximum exposure of the wheel periphery. The exposure of the wheel should not exceed 90 degrees or one-fourth of the periphery (see diagram below).



This exposure begins at a point not more than 65 degrees above the horizontal plane of the wheel spindle. Wherever the nature of the work requires contact with the wheel below the horizontal plane of the spindle, the exposure must not exceed 125 degrees.

Because the safety guard is designed to restrain the pieces of a shattered grinding wheel, the distance between the safety guard and the top periphery of the wheel must not be more than 1/4-inch. If this distance is greater because of the decreased size of the abrasive wheel, then a “tongue guard” must be installed to protect workers from flying fragments in case of wheel breakage. This “tongue guard” should be adjustable to maintain the maximum 1/4-inch distance between it and the wheel.

An adjustable tool/work rest must also be installed and maintained at a maximum clearance of 1/8-inch between it and the face of the wheel. In addition to offering a stable working position, this small clearance must be maintained to prevent the operator’s hands or the work from being jammed between the wheel and the rest, which may cause serious injury or wheel breakage.



- Proper exposure angle (90°)
- Adjustable “tongue guards” (1/4”)
- Adjustable tool/work rest (1/8”)

Plastic glass (Plexiglas) shields are optional. They are not a substitute for eye/face protection and are not included as a part of the guard (unless they are adjusted accordingly and have strength equal to that of the safety guard).

All abrasive wheels must be closely inspected and ring-tested before mounting to ensure that they are free from cracks or other defects. Wheels should be tapped gently with a light, nonmetallic instrument. A stable and undamaged wheel will give a clear metallic tone or “ring.” If a wheel sounds cracked (dead), do not use it. This is known as the “ring test.”

The spindle speed of the machine must also be checked before mounting the wheel to be certain that it does not exceed the maximum operating speed marked on the wheel.

Always follow the manufacturer’s recommendations.

References

■ General Industry

Oregon OSHA Division 2/Subdivision O 29 CFR 1910.215

■ Construction

Oregon OSHA Division 3/Subdivision I 29 CFR 1926.300(b)(7) & 29 CFR 1926.303

■ Agriculture

Oregon OSHA Division 4/Subdivision O OAR 437-004-2100

■ ANSI B7.1 *Safety Code for the Use, Care, and Protection of Abrasive Wheels*

■ ANSI B11.9 *Safety Requirements for Grinding Machines*