

Workplace Health and Safety Queensland

Metal product manufacturing industry – Bench grinders

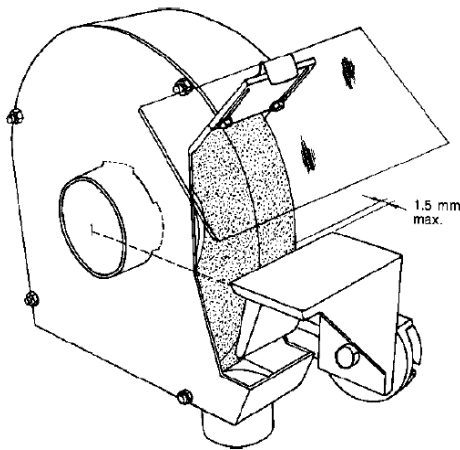
What are the problems associated with bench grinders?

Bench grinders are one of the most commonly used tools in metal product manufacturing. Generally they are safe and reliable, if care is taken with the grinding wheels. Bench grinder wheels can shatter into dangerous projectiles through lack of regular inspection and maintenance or improper use.

How can you address the problem?

- Ensure that you always check that a grinding wheel's RPM (revolutions per minute) rating is consistent with the speed of the grinding machine.
- Before mounting a grinding wheel on a machine, make sure the grinder is isolated from energy sources (i.e. power is turned off at the power point and the plug is removed).
- Visually inspect and resonance test all new wheels before fixing them to the spindle. To do this, tap the side of the wheel with a tool. It should have a clear ring. If there is a dull noise, the wheel is potentially flawed.
- Ensure the hole in the grinding wheel fits closely around the spindle.
- When a wheel has been newly fitted, rotate it by hand to check the balance before switching on the power.
- Unless flanges and washers are evenly seated on either side of the wheel before the locking nut is tightened, the wheel can crack and shatter. Always ensure that the wheel has a soft washer on either side to distribute clamping pressure when the nut is tightened.
- Avoid over-tightening the locking nut as it can exert hazardous forces on the wheel.
- Always use the appropriate type of grinding wheel for the material to be ground. For example, using plastic or aluminium on grinding wheels designed for steel will clog the pores between the abrasive particles.
- Unless the wheel is 'dressed' with a special tool, when pores become blocked or it loses its cutting surface, the operator will have to press harder to achieve the same cutting effect. These additional forces may cause the wheel to shatter. Dressing the wheel is a high risk activity and should only be performed by a trained and competent operator.
- Although personal protective equipment (PPE) is generally considered the last line of defence, appropriate PPE is important if grinders are used. As a minimum, PPE should include:
 - wide vision goggles or safety glasses,
 - ear muffs (or ear plugs, depending on the noise reduction required)
 - safety boots with steel toecaps
 - overalls or other close-fitting clothing.
 As an extra precaution, a face shield should be worn to protect the soft front area of the neck from projectiles that may come from the grinding operation.
- Guards should never be removed from a bench grinder. The guards on a bench grinder provide protection in the event of wheel failure, and protect hands and fingers from injury.

- The grinder should always be securely fastened to a solid surface to prevent movement during its use.
- Wheels should never be run in excess of the maximum speed recommended by the manufacturer.
- The work rest on a bench grinder should be securely fixed and close enough to the grinding wheel to prevent the job slipping off (gap should be no greater than 1.5mm). It should be adjusted as the disc becomes smaller through wear and dressing.
- Typical guarding and job rest configuration – fixed guards, covering a majority portion of the wheel, adjustable perspex adjustable guard and job rest at 1.5mm from the grinding wheel.



Source: AS 1788.2 - Abrasive Wheels Part 2
- Selection, Care and Use

- Abrasive wheels should be discarded when the:
 - diameter approaches that of the driving flanges
 - work rest can no longer be correctly adjusted to the wheel diameter
 - wheel no longer cuts efficiently due to reduced peripheral speed.

Refer to AS 4024, which provides detailed information about machinery use and safeguarding.

For further information on plant and equipment and other workplace health and safety issues call 1300 369 915 or visit www.deir.qld.gov.au.

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