Introduction to Abrasive Wheels — study guide

An abrasive wheel spins fast and shatters without mercy if it is mistreated. This guide covers preparation, guarding, PPE, the hazards and the care of the wheel itself.[1][2]

Before you grind

Several steps must be taken before grinding begins: **1)** "sound" the wheel (where appropriate); **2)** ensure the wheel is properly clamped to the machine; **3)** "dress" and "true" the wheel.

Preparations and precautions

Before using portable grinding equipment, always ensure an appropriate **guard** is in place, consider the electrical dangers from equipment cables or plugs, and carry out a visual check of the equipment for signs of damage. Watch for common problems: wheel flaking, slow grinding speed, excessive run-out or "wobble", and rapid disc wear or short blade life.

Safe working practices

To minimise the risk of bursting, abrasive wheels must always be run within the specified **maximum rotation speed**. On wheels large enough for it, the maximum rotation speed is marked on the wheel itself; for smaller wheels, a notice highlights the maximum speed for each size. Guards must be provided on all types of wheel to contain fragments that may fly off if the wheel bursts, and relevant information and training must be given to everyone involved in grinding.

Hazards

The main hazards of grinding are loss of eyesight from flying shards, trapped or crushed fingers, and serious friction burns from contact with the wheel.

Types and construction

A **cylinder wheel** has a long, wide surface with no centre mounting support or hollow. Abrasive wheels are bonded together using organic or inorganic substances, such as resin, to form a solid circular shape. Unlike a saw, which has teeth only on its edge, the grinding wheel has abrasive grains distributed **throughout** the wheel; thousands of these hard grains move against the workpiece to cut away tiny chips of material.

Guarding

Guarding has two main functions: to **contain** the wheel parts if the wheel **breaks**, and to prevent anyone from coming into **contact** with the wheel. The wheel should be guarded so that only the area needed for the work is exposed. Guards must be securely anchored to the machine frame; on a portable grinder, an **adjustable face guard**

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must be worn.

PPE

The minimum PPE for grinding operations is earmuffs, goggles and a dust mask.

Care of the wheel

Store wheels in a cool, dry area where there is no risk of them rolling or falling over. Only one person should use a wheel at any one time, and it should always be switched off after use. Select a wheel suitable for its purpose; mount wheels only on a machine they are designed for and only by someone trained and competent; inspect the wheel for damage before each use (with a "sounding" test on pedestal grinders); keep the wheel guarded; and make sure machines are stable, with bench machines bolted or otherwise securely fastened.

Key facts to remember

- Before grinding: sound the wheel (if appropriate), clamp it properly, dress and true it.
- Run within the marked maximum rotation speed; use guards on all wheel types.
- Hazards: flying shards (eyesight), trapped/crushed fingers, friction burns.
- Guarding: contain fragments if the wheel breaks and prevent contact.
- Minimum PPE: earmuffs, goggles, dust mask.
- Care: cool dry storage, one user at a time, switch off after use, correct selection/mounting/inspection, stable machines.

Sources

1. Provision and Use of Work Equipment Regulations (PUWER) 1998 (UK) — guarding, training and safe use of abrasive wheels.
2. EN 12413 — Safety requirements for bonded abrasive products (maximum speed marking and guarding).