Safety Alert

Incident

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Security Class: PowerNet Employees Only

Battery Powered Grinder – Safety Guard

A recent Safety Observation identified a battery powered grinder with the safety guard removed:



Immediate Actions:

1. Stop work immediately if a grinder has no guard, or the guard is damaged or incorrectly fitted.
2. Remove the grinder from service and prevent its use.
3. Report the issue to your Supervisor
4. Replace the guard or have the tool repaired **before** returning to service

What could happen?

Operating a grinder without the manufacturer-installed guard significantly increases the likelihood of serious injury:

- **Disc Shatter:** Grinding and cutting discs rotate at extremely high speeds. If a disc becomes damaged or fails, fragments can be ejected at high velocity directly towards the operator.
- **Kickback:** The grinder can suddenly kick back if the disc binds or catches on material, causing loss of control and potentially striking the operator.

  Contact with the Rotating Disc: Without the guard, accidental contact with the spinning wheel can result in serious cuts or amputations.

- **Increased Exposure Zone:** The guard is designed to direct sparks and debris away from the operator. Removal of the guard increases the danger area around the worksite.

Required Controls:

- ✓ Always use the grinder with the manufacturer's safety guard correctly fitted and adjusted.
- ✓ Inspect the guard, disc, battery, and grinder prior to use
- ✓ Use only discs that are:
  - Suitable for the grinder and task.
  - The Correct size and speed rating
  - Free from cracks, chips or other damage
- ✓ Wear appropriate PPE:
  - Safety glasses and face shield in combination
  - Hard hat
  - Hearing protection
  - Cut-resistant gloves
  - Neck-to-wrist-to-ankle protective clothing
  - Safety footwear
- ✓ Maintain a secure grip with two hands whenever possible.
- ✓ Keep bystanders clear of the work area and line of fire.
- ✓ -Remove from service and tag any grinder with a missing, damaged, loose, or unsuitable guard.
- **X** Never remove, modify, or bypass safety guards.
- **X** Never use cutting discs for grinding applications unless specifically designed for both uses.

The safety guard is a critical control designed to protect workers from kickback, disc failure, sparks, debris and contact injuries. No task is urgent enough to justify bypassing this protection. Never remove or modify the safety guard.

Safety is everyone's responsibility. Take the time to ensure all guards are fitted, secure, and functional before starting work. If the guard is removed, the grinder must not be used.

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FACT SHEET

FIXED AND HAND-HELD GRINDERS

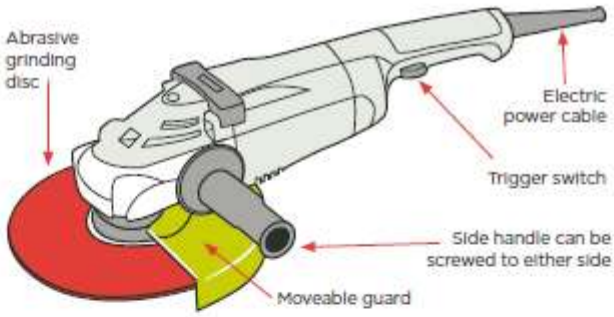
A grinder spins a disc or wheel of bonded abrasive to grind or cut metal. In this factsheet, the terms "disc" and "wheel" are used interchangeably.

An angle grinder is a hand-held tool carried to the work, with the disc secured at an angle to the body of the grinder.

An offhand grinder, which may be fixed to a bench or a pedestal, is usually fitted with one or two abrasive discs revolving at right angles to the spindle turned by a motor. Figure 2 shows a wire wheel on the left, and an abrasive wheel on the right.

Abrasive discs may be replaced by wire brushes for cleaning, or cloth buffs for polishing. Angle grinders used to cut tiles may be fitted with a diamond-tipped blade.

FIGURE 1: ANGLE GRINDER



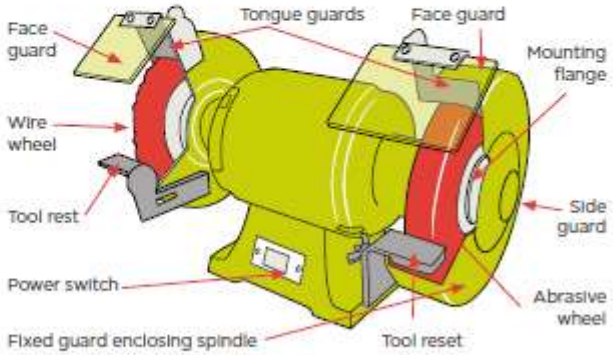
HAZARDS:

- Entanglement with turning wheel or disc
- Projectiles
- Contact with uncontrolled grinder
- Electrical current
- Noise
- Sparks & hot metal
- Fumes & toxic dust
- Slips, trips & falls
- Accidental starting causing projectiles

PPE:



FIGURE 2: BENCH GRINDER



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Hazard	Harm	Controls
Entanglement with turning wheel or disc	> Crushing to body parts > Cuts to body parts > Scalping if hair is caught	> TIE BACK long hair and beards. > WEAR tight fitting clothes, especially tight fitting sleeves, without long ties. > DO NOT WEAR jewellery.

Loose clothing, long hair, or jewellery can wrap around spinning wheels.

Projectiles from incorrectly used wheels or discs	> Can pierce, causing injury or death	> USE the wheel or disc as per manufacturer's instructions. > DO NOT spin discs faster than specified. > NEVER use a worn disc from a large grinder in a small grinder, where they will spin faster.

Users must know whether discs are designed to be used on the side or on the edge. Working against the wrong surface will damage the disc. Centrifugal forces may break the bonding materials apart, with broken discs forming projectiles. These projectiles have caused serious harm and death.

Projectiles from damaged discs	> Can pierce, causing injury or death	> KEEP wheels and discs stored correctly to avoid moisture and impact damage. > FOLLOW INSTRUCTIONS when a wheel is allowed to be used wet. > DISPOSE of damaged discs or wheels. > WATCH YOUR SPEED – read the label and match the speed of wheel or disc to the grinder. > SIZE MATTERS – match the wheel or disc to the grinder. > APPLY the "ring test" before fitting wheels. > MINIMISE the gap between tool rests and abrasive wheels. > ANTICIPATE movement of the workpiece when using an angle grinder.

Discs and wheels MUST avoid moisture damage. Workpieces and hand-held grinders move unexpectedly. Workpieces may jam against wheels or discs, breaking them and stopping them from spinning freely, resulting in damage to the disc. Discs and wheels of the wrong size may fly apart by turning at the wrong speed.

Projectiles from wire breaking off brushes	> Wire bristles can contact or pierce eyes	> PUT eye shields in place, or WEAR face shields. > GLOVES MAY be worn, but NEVER close to a turning wheel or brush.

Wire breaks from brushes and is thrown towards the operator.



Loosely held workpieces may be thrown from the wheel or disc.



When an angle grinder is put down before the disc stops turning it can spin out of control. There may be contact when an angle grinder kicks back. Discs MUST be securely mounted within the flanges of the grinder. Proper mounting hardware MUST be fitted at the spindle of the grinder and the arbour of the disc. For hand-held grinders, guards MUST be fixed between the wheel and the operator. The handle MUST be screwed in securely on the appropriate side of the wheel.

OTHER (NON-MECHANICAL) HAZARDS



Electrical hazards may make metal components live, especially when wet.



A safe level of noise over an eight hour day is 85dB(A). A grinder may exceed this noise intensity. Noisy angle grinders can also interfere with spoken communication.



Sparks and hot metal may ignite combustible material.

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Fumes and toxic dust – fire and explosion	> Harm to breathing and lung damage	> EXTRACT dust by ventilation. > CONTAIN and CONTROL metal dust. > CLEAN UP surface dust as soon as possible. > Vacuum cleaners MUST be designed for cleaning metal dust. > DO NOT blow metal dust with compressed air – this will only move it elsewhere. > ALWAYS USE respiratory protection.
Slips trips and falls	> Cuts > Bruising > Fractures	> KEEP up-to-date housekeeping procedures. > KEEP the work area clear of slip and trip hazards.

TASK - MAINTENANCE, CLEANING & REPAIRS

Hazard	Harm	Controls
Accidental starting causing projectiles	> Potential piercing injuries > Eye irritation or damage	> LOCK-OUT ALL power supplies before maintenance, cleaning and repairs. > Keep tools well maintained. > Test abrasive wheels BEFORE mounting. > Correctly adjust guards.

Abrasive wheels for fixed grinders MUST be tested before mounting by hitting with a piece of wood. If the wheel makes a ringing sound it is safe to use, otherwise it is probably cracked and MUST be discarded. Newly fitted abrasive wheels MUST be run for a minute or so to ensure that they do not fly apart. The path of any projectile MUST be clear of people. For fixed bench or pedestal grinders, tool rests, tongue guards and eye shields MUST be in place.

References, current standards and further information can be found on the Safe Use of Machinery project page at: **www.worksafe.govt.nz**

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