

	<b>MRAT 042</b>	<h2 style="text-align: center;">Angle grinders</h2>	<b>Applicable to:</b> most resistant materials	<b>See also:</b> 034
<b>Process(es) covered:</b>		<p>Used to remove small amounts of waste material and for cleaning up of welded joints. Normally an impregnated cutting or abrasive disc is used, rather than a conventional grinding wheel.</p> <p>Most portable power tools are electrically operated but pneumatic tools are used where compressed air is available. The use of tools with integral low-voltage battery packs is increasing.</p>		

### Control Measures

- Portable grinders should only be used under the supervision of suitably experienced staff.
- Wear eye protection. Tie back long hair, cover or remove jewellery, and cover loose clothing by a secure apron or overall.
- Use heat resistant gloves to handle any material that might be hot.
- It is impracticable to guard all the hazardous areas when using portable power tools. The tool should be used so that sparks are not directed towards others in the vicinity.
- Use guards around rotating parts to reduce the risk of hand or finger injury but training and experience are essential in reducing risks.
- Provide LEV, good ventilation, or a dust mask (FFP3 Refer to GL310 - A guide to the use of Respiratory Protective Equipment (RPE) in school D&T and science) .
- Route power leads and pipes to minimise the tripping hazard. Battery-powered tools avoid this problem.
- Two persons should handle heavy items to reduce the risk of back injury. Assess the strength of young persons before allowing them to use portable power tools like these.
- Immature pupils should not use portable power tools.
- Learners may only use portable grinders when they have been assessed as competent and are under appropriate supervision by specifically trained employees.

### Immediate Remedial Measures:

A particle could be in the eye	<p>Tell the casualty not to rub the eye, sit him/her down facing the light with the head leaning back. Stand behind the casualty to look for the particle in the eye. If it is over the iris or pupil, DO NOT ATTEMPT TO MOVE IT. Tell the casualty to hold a gauze pad over the eye and close the other one. Send for an ambulance to take the casualty to hospital.</p> <p>If the particle is visible over the white of the eye, the corner of a moistened handkerchief can be used to remove it. Call 111 and seek medical attention.</p>
Injury to the eye	<p>If there is any sign of injury to the eye, tell the casualty to hold a gauze pad over the eye and close the other one. Take the casualty to hospital as quickly as possible.</p>
Other injury	<p>Apply pressure on or as close to the cut as possible, using fingers or a pad of cloth. Leave any embedded large bodies and press round them. Lower the casualty to the floor and raise the wound as high as possible. Protect yourself from contamination by blood.</p>
Coolant is in the eyes	<p>Irrigate immediately with water for at least ten minutes, holding eyelids apart. Call 111 and seek medical attention.</p>
Minor back pain	<p>Help the casualty to lie down, either on the ground or on a firm mattress, and instruct him/her to rest until the pain eases. Obtain medical attention if symptoms persist.</p>
Back injury resulting in loss of control of, or sensation in, limbs	<p>Keep the head, neck and spine aligned while supporting the casualty's head. Send for an ambulance.</p>

## Risk Assessment

### Hazards:

Flying materials Physical injury Tripping Entanglement Manual handling Burns	<p>Off-cuts or broken discs can be ejected violently. Sparks can be ejected when working on mild steel.</p> <p>Human contact with rotating parts and swarf can cause cuts or abrasions. Wrist sprains can result from jammed tools.</p> <p>Power leads or compressed air pipes present a tripping hazard.</p> <p>Long hair, dangling jewellery or loose clothing can become entangled with rotating parts, dragging the user onto them.</p> <p>Heavy workpieces and the gyroscopic effect of rotating motors can present a manual-handling hazard.</p> <p>Workpieces cut with a grinder can become hot.</p>
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### Risks:

Flying material	Flying off-cuts are unlikely to occur but streams of hot sparks can make the user jump and cause injury.
User injury	There is a high risk that trainees will put hands or fingers in hazardous places and experienced users may attempt short cuts. If a grinding disc jams, some users may not be able to restrain the tool.
Tripping	Trailing leads or pipes present a risk of tripping.
Entanglement	Entanglement is most likely to occur if rotating parts are exposed.
Manual handling	Handling heavy components or awkward manipulation will not occur frequently but will present a real risk. Novices may have difficulty controlling the tool.
Burns	Burns from grinding are usually superficial.

### Further Information:

- Precautions to be taken with compressed air supplies are listed in MRAT 000.
- For general requirements on electrical supplies including a discussion on the use of 110 V, see MRAT 000.
- Portable tools should be examined before use and should have regular formal inspections and tests. The frequency depends on use but half-termly would be typical.
- Useful guidance on grinding is available from HSE Books in HSG 17, *Safety in the Use of Abrasive Wheels* but there is a charge for this publication.