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|  | MRAT 035 | <p align="center">Metal surface and tool grinding</p> | Applicable to: cast, high speed or tool steels; mild steel - surface only | See also: 034 042 |
| Process(es) covered: | | <p><i>Surface grinding:</i> the completion of a workpiece to a very high standard of surface finish and flatness to close tolerance.</p> <p><i>Tool grinding:</i> The profiling and sharpening of tool bits for metal turning and shaping operations and the sharpening of twist drills.</p> | | |

Control Measures

- Wear eye protection, in addition to any shields fitted to the machine. Tie back long hair, remove or cover jewellery, and cover loose clothing a secure apron or overall.
- Grinding wheels should be surrounded by a guard that is only open at the front in order to allow access for the workpiece. The gap between the rest and the wheel should not exceed 3 mm. The guard should also cover the spindle ends and protect against flying debris
- When grinding, use the rest to minimise the risk of losing control of the workpiece. Small tools may need to be held in a suitable jig to avoid any temperature rise.
- Provide sufficient space around a grinding machine to ensure that the user is not pushed into the machine by a passer-by and the floor surface should not be slippery to avoid accidental slips while using the machine.
- Only those who are trained should mount grinding wheels.

Immediate Remedial Measures:

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| Dust is in the eye | Irrigate immediately with water for several minutes, telling the casualty to hold eyelids apart. |
| 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 | 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. |

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| Storage | |
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| Disposal | |
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Risk Assessment

Hazards:

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| Flying debris or workpiece. | Abrasive wheels can break and parts can be ejected violently if they are damaged, incorrectly mounted or run too fast. |
| Other physical injury. | Workpieces can be ejected violently if not held correctly or if the machine starts unexpectedly. |
| Entanglement | Human contact with the rotating wheel can cause cuts or abrasions. Fingers can be jammed between the wheel and the rest. Long hair, dangling jewellery or loose clothing can become entangled with the rotating wheel, dragging the user onto it. |

Risks:

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| Wheel break up | Most grinding machines used in education have a fixed speed so that a wheel suitable for that speed, properly mounted will only break if damaged. |
| Flying workpiece | A hand-held workpiece may be released if it becomes too hot to hold or if excessive pressure causes it to be pulled from the user's hand. |
| User injury | An unguarded wheel presents considerable risks of injury. |
| Entanglement | Entanglement is most likely to occur if the spindle ends are exposed. |

Further Information:

- The low-speed grinders used to sharpen woodworking tools present minimal risks.
- High speed grinding machines should only be used to sharpen tools. Mild steel and other soft metals should not be ground on these machines.
- Grinding machines should be included in the planned annual maintenance programme.
- Useful guidance is available from HSE Books in HSG 17, *Safety in the Use of Abrasive Wheels* but there is a charge for this publication.