Technology: Risk Assessment Title: **Bench & Pedestal Grinding Machines** MAY2015

**This is a generic Risk Assessment that must be modified to suit your place of work**. The Risk Assessment modifications should take into consideration the activity, age/stage/pupil ability, department/working environment and the experience of the teacher in charge. If Control Measures Required as described are implemented the risk is reduced to an acceptable level for mainstream students.

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| **Identify the Hazards** | **Who is at Risk?** | **What is the Harm?** | **Activity Taking Place** | **Control Measures Required** | **Additional Information** |
| Employees and learners should be made aware of the following hazards;1. Ejected Abrasive Wheels2. Contact with the Wheel3. Hand, Hair or Clothing Entanglement4. Impact FromEjected Pieces5. Trapped Fingersor Work Pieces6. Skin Burns7. Electric Shock8. Skin Cuts9. Inadvertent Starting10. Inhalation of Dust11. Operator PushedWhilst Working12. Falling OnSlippery Floor13. Falling Bench Grinder14. Unauthorised Use | Operator and others nearbyOperatorOperatorOperator and others nearbyOperatorOperatorOperatorOperatorOperatorOperator and others nearbyOperatorOperatorOperatorUser | **Overspeeding, damaged or incorrectly mounted abrasive wheels can break while rotating and be violently ejected from the grinding machine.****Contact with the wheel can cause serious cuts.****Long hair, loose clothing etc, can become entangled with the spindle or wheel.****Work pieces can be ejected from the machine.****Fingers or work pieces can become jammed between the wheel and work rest.****Hot work pieces can cause skin burns.****Grinding machines can present a hazard of electric shock.****Sharp edges can cause skin cuts.****Inadvertent starting of the machine can present a severe hazard.****Dust can be inhaled during grinding tasks and affect respiratory system.****Lack of space around the machine can lead to the operator being pushed by passers-by.****Slippery floor surfaces or loose items around the machine can cause slips that result in contact with moving parts.****The vibration during each use can cause the bench grinder to loosen and fall from the work surface.****Unauthorised use.** | Grinding operationGrinding operationGrinding operationGrinding operationGrinding operationGrinding operationGrinding operationGrinding operationGrinding operationGrinding operationGrinding operationGrinding operationGrinding operationGrinding operation | **Learners should only use Grinding Machines when they have been assessed and the assessment has shown that they are competent, and that they are under the appropriate supervision of specifically trained employees.**All Grinding Machines should be included in a planned maintenance programme that should include electrical safety inspections and tests.**The school or similar establishment should decide which machinery is suitable for use by each group of learners. The decision should be based on student maturity and competence, the level of supervision, and local authority/employer and national guidelines.**Wheels should be suitable for the material of the work piece and should be mounted correctly by a competent person in accordance with the manufacturer’s instructions. The maximum operating speed marked on the wheel should not be exceeded. The spindle speed should be marked on the machine. Any wheel that has a chip should not be used. If a wheel becomes glazed it should be dressed with a grinding wheel dresser to restore the surface.Suitable eye protectors must be worn at all times when using any grinding machine.Grinding should not be undertaken on the sides of a grinding wheel. The competent person should be trained in accordance with the Health and Safety Training Standards in Design and Technology [N1], or hold other recognized qualifications to industry standards.Long hair and loose clothing should be secured so as not to come into contact with moving parts. Jewellery should be removed.No multiples should be used in the grinder. Work piece should be securely held when used. All safety guards should be used when grinding at all times.The work rest should be adjusted as close as possible to the wheel without touching to prevent fingers and work pieces from being jammed. The gap between the work rest and wheel should not exceed 3mm. Spark arrester(s) (where fitted) should be adjusted to the manufacturer’s specification.The ground surface of the work piece should not be touched immediately after work. Gloves should not be worn when grinding as they increase the risk of snagging and skin contact.The machine should be provided with a means of electrical isolation using a fused isolating switch on or adjacent to the machine, and that it is controlled by a starter incorporating overload protection and no-volt release; and a conveniently positioned and accessible, emergency stop switch (which could be the normal “off” switch) or other suitable control device that can quickly stop the machine in an emergency; a suitable guard to enclose the wheels and spindles. The guard should be able to contain debris from a wheel breaking in motion and should prevent entanglement with the threaded spindle ends (the only gap in the guard should be at the front to allow access for the work piece).Most grinding machines in schools have wheels fitted that are intended for the sharpening of metalworking tools made from hardened steel and the correct grinding wheel should be fitted for the material to be ground. Fingers and hands should be kept away from the wheel, even when stationary.The machine should be electrically isolated and padlocked when not in use.A risk assessment should be carried out on dust inhalation at the machine. There should be sufficient space around the machine as shown below to prevent the operator from being accidently pushed by passers-by.The floor surface should not be slippery and the area surrounding the machine should be kept free of loose items.A portable bench grinder should be correctly secured on a flat worktop surface. This should be checked before each use.Unauthorised use can mean unsupervised or unqualified usage. The pedestal grinder should be padlocked off when not in use and only qualified staff should possess a key to unlock. | Although the Abrasive Wheels Regulations 1970 have been superseded by the Provision and Use of Work Equipment Regulations 1998, the sections covering training of persons to mount abrasive wheels, on guarding of wheels, and on measures to prevent wheels over speeding, are still recognized as good practice guidelines. These are also detailed in the Health and Safety Executive publication HSG17, Safety in the Use of Abrasive Wheels [N7].Reference BS 4163:2014Health & Safety ExecutiveHSG 17 Safety in the Use of Abrasive Wheels (2000)The changing of wheels should be recorded and kept within the department as part of a regular maintenance programme.Only suitably qualified teaching or technician staff should replace the wheels of Grinding Machines.Eye protection PPE should conform to BS EN 166:2002 1B (medium energy impact)If any safety guards are damaged, the machine must be locked off immediately and reported for repair.If a small container of water is kept close by for cooling tools after grinding it must be kept away from any mains or electrical supply.The risk of electric shock is reduced by good maintenance and the use of double insulated machines.Only authorised Technology teachers and technicians should be able to unlock the machine. The bench grinder must only be used whilst under appropriate and constant supervision.Normal room ventilation is likely to be sufficient for dust from grinding machines but, depending on the materials and scale of use, additional LEV or RPE measures might be required.Pupils in the craft room must also be instructed on the dangers of distracting or bumping into a machine operator. G-clamps must be regularly checked when used to secure a bench grinder to a flat work surface. |
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from Design and Technology Accommodation in Secondary Schools – A Design Guide (DfES 2004)

The green area is an overlap of space allocated to machines only (250mm unless otherwise stated.)