Technology: Risk Assessment Title: **Pillar Drill** OCTOBER2015

**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.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **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. Hand, Hair orClothing Entanglement2. Contact FromEjected Pieces3. Contact FromSpinning Work Pieces4. Contact FromFalling Objects5. Electric Shock6. Closing MovementsTrap Fingers7. Contact WithSharp Edges8. Skin IrritationFrom Fluids9. Contact FromInadvertent Starting10. Unauthorised Use11. Operator Pushed12. Falling OnSlippery Floor13. PCB Drilling14. Inadequate Lighting | Technology teachers, technicians and pupilsTechnology teachers, technicians and pupilsTechnology teachers, technicians and pupilsTechnology teachers, technicians and pupilsTechnology teachers, technicians and pupilsTechnology teachers, technicians and pupilsTechnology teachers, technicians and pupilsTechnology teachers, technicians and pupilsTechnology teachers, technicians and pupilsUserTechnology teachers, technicians and pupilsTechnology teachers, technicians and pupilsTechnology teachers, technicians and pupilsTechnology teachers, technicians and pupils | **Long hair, loose clothing etc, can become entangled in moving parts of the drilling machine.****Chuck keys, broken drills, swarf, work pieces, etc, can be violently ejected.****Unexpected spinning of hand held work pieces could cause injuries to hands.****The drill table can slip down or heavy objects fall from the table.****Drilling machines present an electric shock hazard.****Closing movements between parts can lead to trapping.****Sharp edges on drills, work pieces and swarf can cause cuts.****Contact with metalworking fluids, oil and grease can irritate the skin.****Inadvertent starting of the machine can present a hazard.****Unauthorised use.****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.****Injury is possible due to poor lighting and an inability to see the workpiece or drill bit clearly.****Injury can occur due to an inability to see the drill bit or work piece.** | Drilling materialDrilling materialDrilling materialDrilling materialDrilling materialDrilling materialDrilling materialDrilling materialDrilling materialDrilling materialDrilling materialDrilling materialDrilling materialDrilling material | Long hair and loose clothing should be secured so as to not come into contact with moving parts. Jewellery should be removed.Gloves or bandages should not be worn whilst operating this machine.PPE including suitable eye protection conforming to BS EN 166:2002 1B (medium energy impact), should be used whilst operating the machine. Substantial footwear should be worn.The drilling machine should be fitted with a suitable guard that extends to the bottom of the drill bit when it is in the uppermost position. The table should be adjusted so that, as the drill bit leaves the guard, it enters the work piece.Where appropriate, the work piece should be prevented from spinning around by use of a machine vice or hand vice, or by clamping it to the table.The Pillar Drill should have a foot operated emergency stop device so that the machine can be quickly stopped in an emergency, without requiring the operator to let go of the spindle feed or vice/work piece.If no rack and pinion rise and fall mechanism is provided for table adjustment, the safety collar stop under the table should be used. If the head is adjustable, the safety collar underneath it should be secure.Measures must be implemented to minimise risks associated with lifting heavy items (e.g. use of lifting aids, team lifts, and correct lifting techniques).The Pillar Drill should be provided with a means of electrical isolation using a fused isolating switch on or adjacent to the machine, and it is controlled by a starter incorporating overload protection and no-volt release.The machine should be included in a planned maintenance programme that should include electrical safety inspections and tests.Fixed guards (removable only with the use of a tool) or alternatively interlocked guards that enclose the drive pulleys and belts (guards should prevent access to dangerous in-running nips on the pulleys).The machine should be electrically isolated before the position of the drive belt is changed. The chuck key, preferably spring loaded, should be removed immediately after use and before starting the machine.The Pillar Drill must have a guard that encloses the drill chuck and which extends to the bottom of the drill bit.A brush should be provided to remove swarf, which removes the risk of hand contact.If metalworking fluids are used, they should be mixed and changed in accordance with the manufacturer’s instructions. Where a coolant tank and pump is fitted the tank and system should be drained every 12 months, the system flushed through with clean water and the tank refilled with fresh coolant. Contact with the skin should be kept to a minimum and hands should be washed thoroughly after use.Coolant nozzles should not be adjusted whilst the machine is in operation.The Pillar Drill should be interlocked and powered off when not in use.Only authorised Technology teachers and technicians should be in possession of the power key. The power key must be removed when not in use. Supervision should be present for students using the Pillar Drill.There should be sufficient space around the machine to prevent the operator from being accidently pushed by passers-by.The floor surface should not be slippery and should be kept free of loose items.When using a specialist printed circuit board drilling machine, the need for a guard should be ascertained by a specific risk assessment.Supplementary lighting should be provided for machine tools and equipment if the main room lighting is not sufficient. Supplementary lighting should conform to BS EN 60204-1. Lamps should not operate at more than 50 V a.c. If the switch for the supplementary light is not easily accessible to the machine tool operator, another switch should be provided adjacent to the light source. Lighting should be provided with a deep shade to prevent glare from polished surfaces. | Reference BS 4163:2014Manufacturer’s instructions and guidelines must be read through and retained before using this machine.The Pillar Drill speed should be adjusted to suit the drill piece diameter and the material to be drilled. A drill speed/diameter chart should be placed next to the machine.A machine vice or hand vice might not be required if a small diameter drill is used. In this case it might be sufficient to hold the work piece by hand. School departments should decide if this practice is allowed as it increases the risk of drill bit contact with the hand.Manual handling tasks associated with changing/moving heavy drill tables and vices etc, can be beyond the physical capabilities of some persons.The risk of electric shock is reduced by good maintenance and the use of double insulated machines.A high proportion of accidents at drilling machines occur when the work piece is being put into position, with the drill at its uppermost point. |
|  |  |  |  |  |  |



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.)