

Risk Assessment MM01: Milling Machines

ESTABLISHMENT	University of Cambridge, Dept of Engineering, Dyson Centre for Engineering Design
DEPARTMENT	Dept of Engineering
WORK ACTIVITY	MILLING MACHINES (VERTICAL)
HAZARDS	<ul style="list-style-type: none"> • Contact with revolving cutters can present a hazard • Long hair, loose clothing can become entangled in the moving parts of the milling machine • Work pieces, broken cutting tools, swarf etc can be violently ejected from the milling machine • Milling machines can cause electric shock • Closing movements of parts under power can result in finger trapping • Closing movements between the table and fixed structures can result in body crushing • Heavy objects such as vices and index fixtures can fall from the table • Sharp edges on cutters, work pieces and swarf can cause cuts • Contact with cutting fluids, oil and grease can irritate skin • Swarf can jam the machine or be ejected if allowed to build up • Accidental starting of the machine can cause a hazard • Lack of sufficient space around the machine can lead to the operator being pushed by passers by resulting in injury • Slippery floors or loose items around the machine can cause slips that result in contact with the moving parts of the machine • Manual handling of heavy items such as vices and index fixtures can be a hazard
THOSE AT RISK	<ul style="list-style-type: none"> • Anybody working in or checking on the progress of projects in the Student Machine Tool Section of the Dyson Centre for Engineering Design
WHO IS ALLOWED TO USE THE MACHINES	<ul style="list-style-type: none"> • Only fully recognised trained and qualified persons can use the machines and will instruct Students in the safe use of the machines, long term Student users may also be deemed competent to use the machines. Machines must not be left with work 'set up' unless necessary as this stops others from using the machine, teaching 'Labs' must be given priority. Certification can be issued to Students that

	<p>are competent as recognition of their ability.</p>
<p>RISK CONTROL MEASURES</p>	<p>Switchgear</p> <ul style="list-style-type: none"> • The machine must be provided with a means of isolation using a fused switch disconnecter on or adjacent to the machine, and that it is controlled by a starter incorporating overload protection and no-volt release. Machines in this area will be isolated 'out of hours' to stop unauthorised use. <p>Emergency Switchgear</p> <p>The machine must be provided with:</p> <ul style="list-style-type: none"> • A conveniently positioned mushroom headed stop button or other suitable control device such as fitted to older machines that can bring the machine to rest within 10 seconds in an emergency, must be fitted. <p>Cabling</p> <ul style="list-style-type: none"> • All cabling should be armoured to protect it from damage. <p>Flooring and Space</p> <ul style="list-style-type: none"> • There must be sufficient space around the machine to prevent the operator being accidentally pushed by passers-by causing contact with moving parts of the machine. Student numbers in this area must be controlled. • The floor surface must not be slippery and must be kept free of loose items and swarf. • There must be a space of at least 500 mm between the machine table at the extreme ends of its travel and any fixed object. <p>Fixed and Interlocked Guards</p> <ul style="list-style-type: none"> • The machines in the Student Machine Tool Section of the Dyson Centre for Engineering Design are fitted with recognised guarding. Because of Student accessibility to this area this guarding must be in place a not removed. <p>Operator Safety and Personal Protective Equipment</p> <ul style="list-style-type: none"> • Only one person at a time may operate the machine, unless training is being given. • The operators must wear eye protection when on the workshop floor at all times and when using the machine. • Substantial, non-slip, flat-heeled shoes that cover

	<p>the whole of the foot, should be worn when using any machine. Open toed and light canvas shoes are not acceptable, anyone wearing these not be allowed into the D.C.E.D.</p> <ul style="list-style-type: none">• Long hair and loose clothing must be secured and dangling jewellery must not be worn when operating the machine.• Gloves must not be worn when using the machine. <p>Manual Handling of Heavy Vices and Indexing Heads</p> <ul style="list-style-type: none">• An assessment must be made of the manual handling tasks associated with changing heavy vices and indexing heads etc that can be beyond the physical ability of some people.• Measures must be implemented to minimise the risks associated with lifting heavy items by the use of lifting aids, team lifts and correct lifting techniques. <p>Adjustment and Setting Up of Machine</p> <ul style="list-style-type: none">• Handles and wheels used to operate the table mechanism must be set up so that they do not rotate when the power drive is engaged.• The machine must be electrically isolated before any internal mechanisms are adjusted.• Cutters must be stopped when positioning the work piece, clearing swarf, adjusting coolant pipes, measuring or gauging.• Hands must be kept well away from the table when it is traversing under power to minimise the risk of trapping fingers.• Coolant nozzles must not be adjusted whilst the machine is in operation.• When using CNC machines the operator must be sure of that the 'program' is safe, by doing a 'dry run' with the cutter away from the work piece. <p>Removal of Swarf</p> <ul style="list-style-type: none">• Swarf must not be allowed to accumulate as it can become entangled or ejected.• Swarf must never be removed whilst the machine is in operating.• Suitable implements such as pliers must be used to remove swarf so as to avoid hands coming into contact with swarf. <p>Metalworking Fluids</p>
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	<ul style="list-style-type: none"> • If metalwork fluids are used they must be mixed and changed in accordance with the manufacturer's instructions. • Supplier's hazard data sheets (COSHH) and risk assessments for metalworking fluids must be available. • Contact of metal work fluids with the skin must be minimised • Hands must always be washed thoroughly after the use of metalworking fluids. <p>Maintenance of Machine</p> <ul style="list-style-type: none"> • The machine to be repaired as and when needed with any possible safety issues reported immediately <p>Manufacturer's Instructions</p> <ul style="list-style-type: none"> • A copy of the manufacturer's instruction book should be kept in the departmental office. Where these are not available due to the passage of time a working knowledge of the machine must be known by a skilled operator.
FURTHER ACTION REQUIRED TO CONTROL RISK	<ul style="list-style-type: none"> • Machine operators and Student must ensure that they are in a fit state of health to use the machine, and any possible condition of concern must be reported, if the operator is feeling unwell, they must report to their line manager
ACTION BY PERSON	<ul style="list-style-type: none"> • To ensure that they are responsible for the health and safety of themselves and others.
ASSESSED BY	
DATE	

Signed by trainee/inductee to confirm they are happy they have read and understood this document	
Date	