

## Health and Safety Risk Assessment (BS4163:2007)

LOCATION	ALL	<b>Workshop Health and Safety</b>
<p><b>General Health and Safety</b>                      Whole workshop – Electric shock from machinery, guards and fences on machinery correctly set, machinery used at correct speed settings, Loose clothing not worn, jewellery removed, eye protection (goggles) worn when working, ventilation, extraction, equipment properly adjusted / used when working &amp; emergency stop locations in the workshop.</p> <p><b>Workshop rules and behaviour (safe working practice).</b></p> <ul style="list-style-type: none"> <li>• Aprons and Goggles must be worn at all times when using machinery.</li> <li>• Loose hair tied back and jewellery taken off. Shirt / pullover sleeves pulled up.</li> <li>• Know where the Emergency stops are - locations within the room.</li> <li>• Workshops should be kept clean and tidy. Scrap material should be put in bins.</li> <li>• Never run in a workshop.</li> <li>• Stools under desks if practical work is being undertaken.</li> <li>• Never blow dust – sweep into a bin.</li> <li>• Excess tools and materials put away after use. Carrying tools the correct way.</li> <li>• Main risk when people do not know or understand how to use something correctly – if not sure always ask.</li> </ul>		

LOCATION	ALL	<b>Material Health and Safety</b>	RISK LEVEL	MID
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<p><b>Timber Hazards:</b></p> <ul style="list-style-type: none"> <li>• Wood dust irritates eyes and respiratory tract.</li> <li>• High exposure to wood dust can cause skin, lung and nasal disorders.</li> <li>• High amounts of wood dust can become explosive.</li> <li>• Accumulating wood dust can cause fire hazard.</li> <li>• Wood dust on the floor can be slippery.</li> <li>• Brushing can create airborne dust.</li> </ul> <p><b>Plastic Hazards:</b></p> <ul style="list-style-type: none"> <li>• Dust from hand and machine cutting and shaping of acrylic and other thermoplastics materials can irritate the eyes, nose and throat. Inhalation of dust can present a hazard.</li> <li>• Heat softened plastics can stick to skin.</li> <li>• Work pieces can shatter during manufacture.</li> </ul> <p><b>Metal Hazards:</b></p> <ul style="list-style-type: none"> <li>• Waste materials from processing metals can damage the eyes and skin.</li> <li>• Coolants and cutting oils can irritate the eyes and cause dermatitis.</li> <li>• Falling materials can present a hazard.</li> </ul>	<p><b>Timber Control Measures:</b></p> <ul style="list-style-type: none"> <li>• Sufficient general ventilation should be provided.</li> <li>• Respiratory protective equipment should be worn during any prolonged hand or machine sanding.</li> <li>• Suitable eye protection should be worn.</li> <li>• Machine sanding should be kept to a minimum.</li> <li>• Work areas should be kept clean.</li> </ul> <p><b>Plastic Control Measures:</b></p> <ul style="list-style-type: none"> <li>• Sufficient general ventilation should be provided.</li> <li>• Water should be used as a lubricant to minimise dust. Suitable eye protection and respiratory protective equipment should be worn during machining.</li> <li>• Gloves should be used if work pieces are heat softened.</li> <li>• Work pieces should be securely clamped during machining.</li> </ul> <p><b>Metal Control Measures:</b></p> <ul style="list-style-type: none"> <li>• Proper instruction should be given on safe handling of metals and metal waste.</li> <li>• Suitable eye protection should be worn when machining metals.</li> <li>• Hands should be washed thoroughly after contact with metals and coolants.</li> </ul>	

LOCATION	ALL	<b>Portable Tools and Equipment</b>	RISK LEVEL	MID
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<ul style="list-style-type: none"> <li>• Electric Shock from tools.</li> <li>• Contact with cutters, blades, abrasive wheels and sanding discs can cause injuries.</li> <li>• Broken cutters, blades and abrasive wheels (or particles from cutting operations) can be violently ejected. Dust can be inhaled.</li> <li>• Trailing cables could be tripped over.</li> <li>• Inadvertent operation of portable tools.</li> <li>• Noise can lead to hearing problems.</li> <li>• Batteries can spontaneously combust or explode if incorrectly used. Start up torque can cause the user injuries.</li> </ul>	<ul style="list-style-type: none"> <li>• Portable tools should only be used for the design purpose in accordance with the manufacturers recommendations.</li> <li>• Students should be aware of hazards associated with portable tools and precautions that should be taken during use.</li> <li>• Portable tools should be immobilized when changing cutters, blades, etc.</li> <li>• If the machine has moving parts or is likely to produce hazardous material, long hair and loose clothing should be secured, dangling jewellery should be removed, suitable gloves and eye protection worn.</li> </ul>	

LOCATION	ALL	Portable Drills	RISK LEVEL	LOW
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<ul style="list-style-type: none"> <li>Loose hair and clothing which can become entangled in moving parts of the drill should be tied back. Electric shock from tools.</li> <li>Be aware of chuck keys, broken drill bits, swarf and work pieces that could be violently ejected.</li> <li>Be aware of sharp edges on drill bits, work pieces and swarf which can cause cuts.</li> <li>Leads could cause a trip hazard.</li> <li>Drill jamming could produce a torque reaction.</li> <li>Dust produced could be inhaled and other particles could be ejected.</li> </ul>	<ul style="list-style-type: none"> <li>Trailing leads should not become entangled with the operator or others in the vicinity or the drill.</li> <li>Long hair and loose clothing should be tied back and jewellery taken off.</li> <li>Suitable eye protection should be worn.</li> <li>The chuck key should only be used to tighten and loosed the chuck, and otherwise kept safely away from the drill.</li> <li>Training should be given on how to remove burrs from material.</li> </ul>	

LOCATION	ALL	Portable Biscuit Cutters	RISK LEVEL	MID
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<ul style="list-style-type: none"> <li>Electric Shock from tools.</li> <li>Leads could cause a trip hazard.</li> <li>Rotating parts can cause cuts.</li> <li>Long hair and clothing can become entangled.</li> <li>Dust produced could be inhaled and other particles could be ejected.</li> <li>Jamming or 'kick back' of the biscuit cutter could cause an injury.</li> </ul>	<ul style="list-style-type: none"> <li>Respiratory protective equipment should be worn.</li> <li>Trailing leads should not become entangled with the operator or others in the vicinity or the portable biscuit cutter.</li> <li>The peripheral speed of the saw blade should match the speed of the machine.</li> <li>The blade should be securely fitted to the machine and inspected for damage prior to each use.</li> <li>Long hair and loose clothing should be tied back and jewellery taken off.</li> <li>Suitable eye protection should be worn.</li> <li>The operator should have sufficient strength to with stand any 'kick back' that may occur if the machine becomes jammed.</li> </ul>	

LOCATION	ALL	Portable Sanding Machines	RISK LEVEL	LOW
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<ul style="list-style-type: none"> <li>Electric Shock from tools.</li> <li>Leads could cause a trip hazard.</li> <li>Rotating or moving parts can cause injuries.</li> <li>Dust produced could be inhaled.</li> <li>Jamming of the sanding belt.</li> </ul>	<ul style="list-style-type: none"> <li>Respiratory protective equipment should be worn.</li> <li>Trailing leads should not become entangled with the operator or others in the vicinity or the portable sanding machine.</li> <li>Long hair and loose clothing should be tied back and jewellery taken off.</li> <li>Suitable eye protection should be worn.</li> <li>The operator should have sufficient strength to with stand the turning moment of the sanding disc or belt if it becomes jammed.</li> </ul>	

LOCATION	ALL	Portable Planning Machines	RISK LEVEL	MID
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<ul style="list-style-type: none"> <li>Electric Shock from tools.</li> <li>Leads could cause a trip hazard.</li> <li>Rotating parts can cause injuries.</li> <li>Dust produced could be inhaled.</li> <li>Jamming or 'kick back' of the machine.</li> </ul>	<ul style="list-style-type: none"> <li>Respiratory protective equipment should be worn.</li> <li>Trailing leads should not become entangled with the operator or others in the vicinity or the planer.</li> <li>Long hair and loose clothing should be tied back and jewellery taken off.</li> <li>The planer blades should be checked for damage.</li> <li>Suitable eye protection should be worn.</li> <li>The operator should have sufficient strength to with stand any 'kick back' the machine produces.</li> </ul>	

LOCATION	ALL	Portable Routers	RISK LEVEL	MID
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<ul style="list-style-type: none"> <li>• Electric Shock from tools.</li> <li>• Leads could cause a trip hazard.</li> <li>• Rotating parts can cause cuts.</li> <li>• Long hair and clothing can become entangled.</li> <li>• Dust produced could be inhaled and other particles could be ejected.</li> <li>• Jamming, 'kick back' or biting of the router could cause an injury.</li> <li>• Distraction of the user.</li> </ul>	<ul style="list-style-type: none"> <li>• Respiratory protective equipment should be worn.</li> <li>• Trailing leads should not become entangled with the operator or others in the vicinity or the cutter.</li> <li>• The peripheral speed of the router cutter should match the speed of the machine.</li> <li>• The cutter should be securely fitted to the machine and inspected for damage prior to each use.</li> <li>• Long hair and loose clothing should be tied back and jewellery taken off.</li> <li>• Suitable eye protection should be worn.</li> <li>• The operator should have sufficient strength to withstand any 'kick back' or biting that may occur when the router is in use.</li> <li>• A router should not be used when there is a likelihood of the operator being distracted when using the tool.</li> </ul>	

LOCATION	IC7	Soldering Irons	RISK LEVEL	LOW
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<ul style="list-style-type: none"> <li>• Electric Shock from tools.</li> <li>• Leads could cause a trip hazard.</li> <li>• Hot soldering iron tips can cause burns.</li> <li>• Splashes of flux and solder can cause injury and damage to clothing.</li> </ul>	<ul style="list-style-type: none"> <li>• Extra-low voltage soldering irons are preferred if practicable.</li> <li>• Supply leads for soldering irons should be heat resistant. Care should be taken to ensure that trailing leads do not become entangled with the operator, others in the vicinity or the hot soldering iron.</li> <li>• Soldering should be carried out where distractions to the user can be minimized.</li> <li>• Suitable eye protection should be worn.</li> </ul>	

LOCATION	ALL	Hot Melt Glue Gun	RISK LEVEL	LOW
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<ul style="list-style-type: none"> <li>• Electric Shock from tools.</li> <li>• Leads could cause a trip hazard.</li> <li>• Hot glue nozzle tips can cause burns.</li> <li>• Splashes of glue can cause burns.</li> </ul>	<ul style="list-style-type: none"> <li>• Supply leads for glue guns should be heat resistant. Care should be taken to ensure that trailing leads do not become entangled with the operator, others in the vicinity or the hot glue nozzle.</li> <li>• Suitable eye protection should be worn.</li> </ul>	

LOCATION	ALL	Hand Tools	RISK LEVEL	LOW
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<ul style="list-style-type: none"> <li>• Sharp tools, falling tools, tools breaking or coming apart in use, slipping tools (which can occur when pressure is applied to them) can all cause injury.</li> </ul>	<ul style="list-style-type: none"> <li>• Hand tools should be stored at a suitable height for access. Hand tools should not be left projecting from a bench.</li> <li>• Faces of hammer heads and hammer shafts should be frequently inspected.</li> <li>• Edged tools should be kept sharp and in good condition. Sharp or pointed tools should be handled with care (with cutting edges protected or pointing downwards).</li> <li>• Bench hooks should be maintained in good condition.</li> <li>• Tools should not be carried in pockets or under belts.</li> </ul>	

LOCATION	IC5 & D1	Mortising Machine	RISK LEVEL	MID
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>• Work pieces in the mortising machine can become loose and can be ejected.</li> <li>• Hands or clothing can become entangled with the cutting tool.</li> <li>• Inadvertent starting of the machine can present a hazard.</li> <li>• Wood dust can be inhaled.</li> </ul>		<ul style="list-style-type: none"> <li>• A means of electrical isolation using a fused switch-disconnector on or adjustment to the machine, and that it is controlled by a starter incorporating overload protection.</li> <li>• A conveniently positioned mushroom headed stop button or other suitable control device that can quickly stop the machine in an emergency.</li> <li>• Fixed guards, or alternatively interlocked guards that enclose the drive mechanisms.</li> </ul>		

LOCATION	IC4 & PREP	Planner and Thicknesser	RISK LEVEL	HIGH
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>• The work piece in planning and thickening machines can be 'kicked back' towards the operator.</li> <li>• Hands or clothing can become entangled with the cutting tool.</li> <li>• Inadvertent starting of the machine can present a hazard.</li> <li>• Noise can cause permanent hearing damage.</li> <li>• Wood dust can be inhaled.</li> </ul>		<ul style="list-style-type: none"> <li>• A means of electrical isolation using a fused switch-disconnector on or adjustment to the machine, and that it is controlled by a starter incorporating overload protection.</li> <li>• A conveniently positioned mushroom headed stop button or other suitable control device that can quickly stop the machine in an emergency.</li> <li>• Fixed guards, or alternatively interlocked guards that enclose the drive mechanisms.</li> <li>• The upper part of the machine, including the infeed and outfeed rollers, should be guarded to prevent accidental access to the cutter block and feed rollers.</li> <li>• It should be possible to lock the machine 'off' when not in use.</li> <li>• A 'push stick' should be used to push short work pieces into the machine.</li> </ul>		

LOCATION	IC5 & D1,2,5	Disk Sanding / Belt Sanding Machines	RISK LEVEL	MID
<b>Hazards</b>		<b>Risk Control Measures</b>		
<p><b>General Health and Safety</b></p> <ul style="list-style-type: none"> <li>• Work can become jammed in the machine.</li> <li>• Hands or clothing can become jammed in the sanding machine.</li> <li>• Wood dust can be inhaled.</li> <li>• Inadvertently starting the machine.</li> <li>• The belt can break and lash out.</li> <li>• Hands can come in to contact with the abrasive surface.</li> </ul>		<ul style="list-style-type: none"> <li>• The machine has a means of isolation, emergency stop.</li> <li>• Fixed or locked guards to enclose the drive mechanism.</li> <li>• Belt should be narrower than the belt support plate and pulleys, to protect the user from the belt edges. Belt should be set in the correct direction of rotation.</li> <li>• The standing table on the vertical belt sander should be of rigid metal construction. The gap between the table and the belt should be sufficient to clear the debris but small enough to ensure sufficient support for the timber.</li> <li>• For angled sanding it should only be possible to tilt downwards away from the belt to avoid jamming between the table and the belt.</li> <li>• Eye protection (goggles) should be worn when the machine is in operation. Long hair should be protected from entanglement.</li> <li>• Abrasive belts should be examined before use, torn belts should be discarded. Fingers should be kept 40mm away from the sanding belt.</li> </ul>		

LOCATION	IC4 & PREP	Band Saws	RISK LEVEL	HIGH
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>• Work pieces can become jammed in band sawing machines.</li> <li>• Bench mounted band saws can become detached from the bench.</li> <li>• Hands or fingers can come into contact with the blade.</li> <li>• Clothing can become entangled with the blade.</li> <li>• Wood dust can be inhaled.</li> <li>• Noise can cause permanent hearing damage.</li> <li>• Inadvertent starting of the machine can present a hazard.</li> <li>• Withdrawing the wrk piece with the machine running can present a hazard.</li> <li>• Blunt or damaged blades can present a hazard.</li> </ul>		<ul style="list-style-type: none"> <li>• A means of electrical isolation using a fused switch-disconnector on or adjustment to the machine, and that it is controlled by a starter incorporating overload protection.</li> <li>• A conveniently positioned mushroom headed stop button or other suitable control device that can quickly stop the machine in an emergency.</li> <li>• It should be possible to lock the machine 'off' when not in use.</li> <li>• Suitable eye protection should be worn, long hair should be tied back and protected from entanglement.</li> <li>• Saw blades should be of the correct pattern, sharp and distortion free.</li> <li>• The guide blocks and table should be maintained in good condition.</li> <li>• Ensure that users keep their fingers clear of the saw line and do not make adjustments to the machine set-up until it stops.</li> </ul>		

LOCATION	IC4 & PREP	Table Circular Saws	RISK LEVEL	HIGH
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>• The work piece can become jammed in the circular sawing machine or can 'kick back'.</li> <li>• Hands or clothing can become entangled with the blade.</li> <li>• Inadvertent starting of the machine can present a hazard.</li> <li>• Noise can cause permanent hearing damage.</li> <li>• Wood dust can be inhaled.</li> <li>• Blunt or damaged blades can present a hazard.</li> </ul>		<ul style="list-style-type: none"> <li>• A means of electrical isolation using a fused switch-disconnector on or adjustment to the machine, and that it is controlled by a starter incorporating overload protection.</li> <li>• A conveniently positioned mushroom headed stop button or other suitable control device that can quickly stop the machine in an emergency.</li> <li>• Fixed guards, or alternatively interlocked guards that enclose the drive mechanisms.</li> <li>• It should be possible to lock the machine 'off' when not in use.</li> <li>• There should be sufficient space around the saw bench so that the timber can be handled safely.</li> <li>• The riving knife should be securely fixed below the surface of the table.</li> <li>• A 'push stick' should be used to push short work pieces into the machine.</li> <li>• Suitable eye protection should be worn, long hair should be tied back and protected from entanglement.</li> <li>• Saw blades should be of the correct pattern, sharp and distortion free.</li> </ul>		

LOCATION	IC4 & D3,5	Powered Fret Saws	RISK LEVEL	LOW
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>• Hands or fingers can come in to contact with blade.</li> <li>• The fret saw can become detached from the bench,</li> <li>• Inhaling wood dust – proper extraction should be in place and on.</li> <li>• Inadvertently starting the machine.</li> </ul>		<ul style="list-style-type: none"> <li>• A means of electrical isolation using a fused switch-disconnector on or adjustment to the machine, and that it is controlled by a starter incorporating overload protection.</li> <li>• Machine has means of isolation, emergency stop.</li> <li>• Eye protection (goggles) worn when operating the machine, long hair should be tied back and protected from entanglement. Loose clothing and jewellery should be tucked in / removed.</li> <li>• Blades should be sharp and distortion free.</li> </ul>		

LOCATION	IC4 & PREP	Chop / Radial Arm Saw	RISK LEVEL	HIGH
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>• Hands or clothing can become entangled with the blade.</li> <li>• The saw blade can become loose.</li> <li>• The blade can move forward inadvertently.</li> <li>• Inadvertent starting of the machine can present a hazard.</li> <li>• Wood dust can be inhaled.</li> <li>• Blunt or damaged blades can present a hazard.</li> </ul>		<ul style="list-style-type: none"> <li>• A means of electrical isolation using a fused switch-disconnector on or adjustment to the machine, and that it is controlled by a starter incorporating overload protection.</li> <li>• A conveniently positioned mushroom headed stop button or other suitable control device that can quickly stop the machine in an emergency.</li> <li>• It should be possible to lock the machine 'off' when not in use.</li> <li>• Eye protection (goggles) worn when operating the machine, long hair should be tied back and protected from entanglement. Loose clothing and jewellery should be tucked in / removed.</li> <li>• Blades should be sharp and distortion free.</li> </ul>		

LOCATION	IC5 & D4	Wood Turning Lathes	RISK LEVEL	MID
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>• Long hair and loose clothing can become entangled in moving parts of the lathe.</li> <li>• Hand held wood turning tools can become trapped between the rest and the work piece.</li> <li>• Work pieces can fly off if not correctly mounted to a face plate, chuck or between centres.</li> <li>• Timber particles can fly off poorly selected or prepared wood.</li> <li>• Inadvertent starting of the machine can present a hazard.</li> <li>• Wood dust can be inhaled.</li> <li>• Lack of space around the machine can lead to the operator being pushed by passers by.</li> <li>• Slippery floor surfaces or loose items around the machine can cause slips that result in contact with moving parts.</li> </ul>		<ul style="list-style-type: none"> <li>• A means of electrical isolation using a fused switch-disconnector on or adjustment to the machine, and that it is controlled by a starter incorporating overload protection.</li> <li>• A conveniently positioned mushroom headed stop button or other suitable control device that can quickly stop the machine in an emergency.</li> <li>• It should be possible to lock the machine 'off' when not in use.</li> <li>• Fixed guards, or alternatively interlocked guards that enclose the drive mechanisms.</li> <li>• Eye protection (goggles) worn when operating the machine, long hair should be tied back and protected from entanglement. Loose clothing and jewellery should be tucked in / removed.</li> <li>• Blades should be sharp and distortion free.</li> <li>• There should be sufficient space around the machine to prevent the operator from being accidentally pushed by passers-by.</li> <li>• Only one person at a time should operate the machine.</li> <li>• Timber should be inspected carefully to ensure it is free from any defect.</li> <li>• Care should be taken to ensure that work mounted to a faceplate, a chuck or between centres is properly secured and balanced to prevent excessive vibration.</li> </ul>		

LOCATION	IC5 & D2	Centre Lathes	RISK LEVEL	MID
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>• Long hair and loose clothing can become entangled in moving parts of the lathe.</li> <li>• Work pieces, chuck keys, broken cutting tools and swarf can be violently ejected from the lathe.</li> <li>• Centre lathes can present a hazard of electrical shock.</li> <li>• Sharp edges on tools, work pieces and swarf can cause cuts. Contact with cutting fluids, oil and grease can irritate the skin.</li> <li>• Swarf can jam or be ejected if allowed to build up.</li> </ul>		<ul style="list-style-type: none"> <li>• A means of electrical isolation using a fused switch-disconnector on or adjustment to the machine, and that it is controlled by a starter incorporating overload protection.</li> <li>• A conveniently positioned mushroom headed stop button or other suitable control device that can quickly stop the machine in an emergency.</li> <li>• Fixed guards, or alternatively interlocked guards that enclose the drive mechanisms.</li> <li>• The machine should be fitted with a chuck guard.</li> </ul>		

LOCATION	IC5 & D2	Centre Lathes continued...	RISK LEVEL	MID
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>• Inadvertent starting of the machine can present a hazard.</li> <li>• Lack of space around the machine can lead to the operator being pushed by passers-by.</li> <li>• Slippery floor surfaces or loose items around the machine can cause slips that result in contact with moving parts.</li> </ul>		<ul style="list-style-type: none"> <li>• There should be sufficient space around the machine to prevent the operator from being accidentally pushed by passers-by. Only one person at a time should operate the machine.</li> <li>• Eye protection (goggles) worn when operating the machine, long hair should be tied back and protected from entanglement. Loose clothing and jewellery should be tucked in / removed.</li> <li>• The machine should be electrically isolated before any internal mechanisms are adjusted.</li> <li>• Care should be taken to ensure that work mounted to a faceplate, a chuck or between centres is properly secured and balanced to prevent excessive vibration.</li> <li>• Coolant nozzles should not be adjusted while the machine is in operation.</li> <li>• Swarf should not be allowed to accumulate as it can become entangled or ejected by the chuck or work piece. Swarf should not be removed while the machine is operating.</li> <li>• Contact with the skin should be kept to a minimum. Hands should be washed thoroughly after using the machine.</li> </ul>		

LOCATION	IC5	Milling Machine	RISK LEVEL	MID
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>• Contact with revolving cutters can present a hazard.</li> <li>• Long hair and loose clothing can become entangled in moving parts of the machine.</li> <li>• Broken cutters, swarf and work pieces can be violently ejected.</li> <li>• Sharp edges on tools, work pieces and swarf can cause cuts. Contact with cutting fluids, oil and grease can irritate the skin.</li> <li>• Milling machines can present a hazard of electrical shock.</li> <li>• Closing movement between parts, under power feed, can result in finger trapping.</li> <li>• Heavy objects such as vices and index fixtures can fall from the table.</li> <li>• Inadvertent starting of the machine can present a hazard.</li> <li>• Lack of space around the machine can lead to the operator being pushed by passers-by.</li> <li>• Slippery floor surfaces or loose items around the machine can cause slips that result in contact with moving parts.</li> </ul>		<ul style="list-style-type: none"> <li>• A means of electrical isolation using a fused switch-disconnector on or adjustment to the machine, and that it is controlled by a starter incorporating overload protection.</li> <li>• A conveniently positioned mushroom headed stop button or other suitable control device that can quickly stop the machine in an emergency.</li> <li>• Fixed guards, or alternatively interlocked guards that enclose the drive mechanisms.</li> <li>• Handles or hand wheels to operate the table mechanism should be set up so that they do not rotate when the power drive is engaged.</li> <li>• There should be sufficient space around the machine to prevent the operator from being accidentally pushed by passers-by.</li> <li>• Eye protection (goggles) worn when operating the machine, long hair should be tied back and protected from entanglement. Loose clothing and jewellery should be tucked in / removed.</li> <li>• The machine should be electrically isolated before any internal mechanisms are adjusted.</li> <li>• Coolant nozzles should not be adjusted while the machine is in operation.</li> <li>• Suitable implements should be used to remove swarf to avoid hand contact.</li> <li>• Swarf should not be allowed to accumulate as it can become entangled or ejected by the chuck or work piece. Swarf should not be removed while the machine is operating.</li> <li>• Contact with the skin should be kept to a minimum. Hands should be washed thoroughly after using the machine.</li> </ul>		

LOCATION	ALL	Drilling Machines	RISK LEVEL	MID
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<ul style="list-style-type: none"> <li>• Chuck keys, broken drills, work pieces, etc. can be violently ejected. The chuck key should be removed immediately after use and before starting using the machine. The machine should be fitted with a spindle guard.</li> <li>• Unexpected spinning of hand held work pieces could cause injuries to hands. The work piece should be prevented from spinning around by using a vice, hand grips or clamping to the table.</li> <li>• The drill table can slip down and heavy objects can fall from the table.</li> <li>• Machine presents an electric shock hazard.</li> <li>• Closing movements between parts can lead to trapping, sharp edges on drills, work pieces and swarf can cause cuts.</li> <li>• Inadvertently starting of the machine can present a hazard.</li> <li>• Lack of space around the machine can lead to the operator being pushed by passers-by, slippery floors or loose items around the machine can result in contact with the moving parts.</li> </ul>	<ul style="list-style-type: none"> <li>• The machine has a means of isolation, emergency stop.</li> <li>• A foot operated emergency stop so the machine can be stopped quickly in an emergency with the operator not having to let go of the spindle feed or work piece.</li> <li>• Fixed guards should enclose the pulleys and belts.</li> <li>• Eye protection (goggles) should be worn whilst operating the machinery. Long hair and loose clothing should be secured so as not to come in to contact with moving parts. Dangling jewellery should be removed.</li> <li>• Gloves or bandages should not be worn whilst operating the machine.</li> <li>• Manual handling tasks of lifting materials and the table should be reduced as can be beyond the physical capabilities of some persons.</li> <li>• Coolant nozzles should not be adjusted while the machine is in operation.</li> <li>• Suitable implements should be used to remove swarf to avoid hand contact.</li> </ul>	

LOCATION	IC4 & PREP	Grinding Machines	RISK LEVEL	MID
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<ul style="list-style-type: none"> <li>• Over speeding, damaged or incorrectly mounted abrasive wheels can break while rotating and be violently ejected from the grinding machine.</li> <li>• Contact with the wheel can cause cuts.</li> <li>• Long hair and loose clothing can become entangled in moving parts of the machine.</li> <li>• Work pieces can be violently ejected.</li> <li>• Fingers or work pieces can be ejected from the machine. Sharp edges can cause cuts.</li> <li>• Hot work pieces can cause burns.</li> <li>• Grinding machines can present a hazard of electrical shock. Inadvertent starting of the machine can present a hazard. Dust can be inhaled.</li> <li>• Lack of space around the machine can lead to the operator being pushed by passers-by.</li> </ul>	<ul style="list-style-type: none"> <li>• A means of electrical isolation using a fused switch-disconnector on or adjustment to the machine, and that it is controlled by a starter incorporating overload protection.</li> <li>• A conveniently positioned mushroom headed stop button or other suitable control device that can quickly stop the machine in an emergency.</li> <li>• There should be sufficient space around the machine to prevent the operator from being accidentally pushed by passers-by.</li> <li>• Eye protection (goggles) worn when operating the machine, long hair should be tied back and protected from entanglement. Loose clothing and jewellery should be tucked in / removed.</li> </ul>	

LOCATION	IC4 & D2	Polishing (Buffering) Machines	RISK LEVEL	LOW
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<ul style="list-style-type: none"> <li>• Long hair and loose clothing can become entangled in moving parts of the machine.</li> <li>• Work pieces, wires from brushes and particles from the polishing process can be ejected from the machine. Sharp edges can cause cuts.</li> <li>• Hot work pieces can cause burns.</li> <li>• Polishing machines can present a hazard of electrical shock. Inadvertent starting of the machine can present a hazard.</li> <li>• Dust can be inhaled.</li> <li>• Lack of space around the machine can lead to the operator being pushed by passers by.</li> <li>• Slippery floor surfaces or loose items around the machine can cause slips that result in contact with moving parts.</li> </ul>	<ul style="list-style-type: none"> <li>• A means of electrical isolation using a fused switch-disconnector on or adjustment to the machine, and that it is controlled by a starter incorporating overload protection.</li> <li>• A conveniently positioned mushroom headed stop button or other suitable control device that can quickly stop the machine in an emergency.</li> <li>• There should be sufficient space around the machine to prevent the operator from being accidentally pushed by passers-by.</li> <li>• Eye protection (goggles) worn when operating the machine, long hair should be tied back and protected from entanglement. Loose clothing and jewellery should be tucked in / removed.</li> <li>• Wire brushes and mops should be suitable.</li> </ul>	

LOCATION	IC4 & PREP	Powered Hacksaws	RISK LEVEL	MID
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>• Long hair and loose clothing can become entangled in moving parts of the saw.</li> <li>• Closing movements between parts can result in trapping.</li> <li>• Forward motion of the saw arm can result in trapping or cuts.</li> <li>• Sawing machines can present a hazard of electrical shock.</li> <li>• The bar stock projecting from the vice can present a tripping hazard.</li> <li>• Sharp edges on tools and work pieces can cause cuts.</li> <li>• Blunt or damaged blades can present a hazard.</li> <li>• Contact with cutting fluids, oil and grease can irritate the skin.</li> <li>• Inadvertent starting of the machine can present a hazard.</li> <li>• Lack of space around the machine can lead to the operator being pushed by passers-by.</li> <li>• Slippery floor surfaces or loose items around the machine can cause slips that result in contact with moving parts.</li> </ul>		<ul style="list-style-type: none"> <li>• A means of electrical isolation using a fused switch-disconnector on or adjustment to the machine, and that it is controlled by a starter incorporating overload protection.</li> <li>• A conveniently positioned mushroom headed stop button or other suitable control device that can quickly stop the machine in an emergency.</li> <li>• Fixed guards, or alternatively interlocked guards that enclose the drive mechanisms.</li> <li>• There should be sufficient space around the machine to prevent the operator from being accidentally pushed by passers-by.</li> <li>• Eye protection (goggles) worn when operating the machine, long hair should be tied back and protected from entanglement. Loose clothing and jewellery should be tucked in / removed.</li> <li>• Blade guides should be correctly adjusted.</li> <li>• Badly worn or damaged blades should not be used.</li> <li>• Measures should be taken to prevent persons tripping over long bars being sawn.</li> <li>• Work pieces should be securely held in the vice and properly supported.</li> <li>• Contact with the skin should be kept to a minimum. Hands should be washed thoroughly after using the machine.</li> </ul>		

LOCATION	IC5	Guillotines, Shears, Folding and Rolling Machine	RISK LEVEL	LOW
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>• Closing movement between surfaces and other parts can result in trapping and serious injury.</li> <li>• Sharp edges on cut materials can cause cuts.</li> <li>• Lack of space around the machine can lead to the operator being pushed by passers-by.</li> <li>• Slippery floor surfaces or loose items around the machine can cause slips that result in contact with moving parts.</li> <li>• Manual handling of sheet materials and operating levers or treadles can present a hazard.</li> <li>• Entanglement of long hair and loose clothing in moving parts can present a hazard.</li> </ul>		<ul style="list-style-type: none"> <li>• These machines should be secured to a bench or stand specifically designed for the purpose.</li> <li>• There should be sufficient space around the machine to prevent the operator from being accidentally pushed by passers-by.</li> <li>• Loose clothing and jewellery should be tucked in / removed.</li> <li>• When the machine is not in use it should be made safe by locking the action.</li> </ul>		

LOCATION	IC5	Injection and Extrusion Moulding Machine	RISK LEVEL	LOW
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>• Hot or molten plastics discharges from injection moulding machines can cause burns.</li> <li>• Fumes can be inhaled.</li> <li>• The machine can become unstable and cause injuries.</li> <li>• Absorption of moisture by hygroscopic material can present a risk of explosive discharge.</li> </ul>		<ul style="list-style-type: none"> <li>• The machine must be provided with a means of electrical isolation.</li> <li>• The machine should be fitted with safety guards around the nozzle area to provide protection in all directions from possible ejection of hot material.</li> <li>• Appropriate personal protective equipment should be worn. Eye protection (goggles) worn when operating the machine.</li> </ul>		

LOCATION	IC5 & D1	Vacuum Forming Machines	RISK LEVEL	LOW
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>Fumes can be inhaled.</li> <li>Overheated plastics can cause burns or a fire.</li> <li>The pressure tank can fail and cause injury.</li> </ul>		<ul style="list-style-type: none"> <li>The heater system should be shielded or guarded against accidental contact. The moving heater system should be mechanically attached to the machine.</li> <li>It should be possible to regulate the output from the heater system.</li> <li>Vacuum forming machines should not be left unattended when plastics are being heated.</li> </ul>		

LOCATION	ALL	Strip Heaters and Line Bending Heaters	RISK LEVEL	LOW
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>Fumes can be inhaled.</li> <li>Hot plastics and hot surfaces can cause burns.</li> <li>Unstable equipment or work pieces can cause injury.</li> <li>Strip heaters present an electric shock hazard.</li> </ul>		<ul style="list-style-type: none"> <li>Simple heat output controls should be provided.</li> <li>Guarding should be provided.</li> <li>Heat resistant gloves should be worn.</li> </ul>		

LOCATION	IC5 & D4	Oven	RISK LEVEL	LOW
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>Fumes can be inhaled.</li> <li>Hot surfaces can cause burns.</li> </ul>		<ul style="list-style-type: none"> <li>The oven chamber should be kept clean at all times.</li> <li>Heat resistant gloves should be worn.</li> </ul>		

LOCATION	IC5	Blow Moulder	RISK LEVEL	LOW
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>Fumes can be inhaled.</li> <li>Hot plastics and hot surfaces can cause burns.</li> <li>Unstable equipment or work pieces can cause injury.</li> </ul>		<ul style="list-style-type: none"> <li>The appropriate material should be used at all times.</li> </ul>		

LOCATION	IC5 & D2	Forging and Brazing	RISK LEVEL	MID
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>Care should be taken when carrying hot metals.</li> <li>Clay bricks should not be heated as they can disintegrate violently.</li> <li>Ceramic chips remain hot for a considerable time after the heat source has been removed.</li> <li>Quenching of hot metals, particularly tubular components can present a risk of scalding.</li> </ul>		<ul style="list-style-type: none"> <li>Firebrick or other refractory materials should be used for the brazing base.</li> <li>Appropriate personal protective equipment should be used. Fire resistant aprons, gloves, face protection and sturdy protective footwear should be used.</li> <li>Hot metal should be held using appropriately shaped tongs.</li> </ul>		

LOCATION	IC5 & D2	Welding and welding Installations	RISK LEVEL	HIGH
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>Compressed oxygen cylinders if damaged or involved in a fire can explode violently.</li> <li>Oxygen leaks make fires burn quicker and more violently.</li> <li>Cylinders of acetylene gas can explode violently if involved in a fire. Acetylene gas leaks can form an explosive mixture inside buildings.</li> <li>Welding equipment can present an electric shock hazard.</li> </ul>		<ul style="list-style-type: none"> <li>Welding areas must be separated from other work areas by fixed or portable screens.</li> <li>Welding areas should be kept free of combustible materials and flammable liquids.</li> <li>A good level of general ventilation should be provided.</li> <li>Welded materials should be put in a safe place to cool.</li> <li>Appropriate goggles or shields should be worn.</li> </ul>		

LOCATION	IC5 & D2	Welding and welding Installations cont...	RISK LEVEL	HIGH
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>Sparks can cause burns to skin, eyes and clothes.</li> <li>Hot metal components can cause burns.</li> <li>Chipping or cleaning welds can lead to eye injuries.</li> <li>Ultraviolet and infra red radiation can cause 'arc eye'.</li> <li>Welding can present a fire hazard.</li> <li>Explosive vapours can form inside containers that have contained flammable liquids.</li> <li>Hazardous fumes can be produced.</li> </ul>		<ul style="list-style-type: none"> <li>Appropriate personal protective equipment should be used. Fire resistant aprons, gloves, face protection and sturdy protective footwear should be used.</li> </ul>		

LOCATION	IC5 & D2	Casting	RISK LEVEL	HIGH
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>Hot molten metal can present a hazard.</li> <li>Molten metal in contact with moisture on moulds and equipment can cause an explosion.</li> <li>A violent reaction can occur between molten aluminium and various metallic oxides.</li> <li>Degassing tablets cause fumes that can be harmful if inhaled.</li> <li>Some molten metals can give off harmful fumes.</li> </ul>		<ul style="list-style-type: none"> <li>Appropriate personal protective equipment should be used. Fire resistant aprons, gloves, face protection and sturdy protective footwear should be used.</li> <li>Crucibles should be preheated before use to avoid cracking and to remove moisture.</li> </ul>		

LOCATION	ALL	Low Temperature Casting	RISK LEVEL	LOW
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>Molten metal in contact with moisture on moulds and equipment can cause an explosion.</li> <li>Some molten metals can give off harmful fumes.</li> <li>Hot metal can cause burns.</li> <li>Unstable equipment or work pieces can cause injury.</li> <li>The equipment can present an electric shock hazard.</li> </ul>		<ul style="list-style-type: none"> <li>Appropriate personal protective equipment should be used.</li> <li>Crucibles should be preheated before use to avoid cracking and to remove moisture.</li> </ul>		

LOCATION	IC7	Electronic Circuit Board Etching	RISK LEVEL	MID
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>Ferric chloride is irritant and harmful.</li> <li>Sodium persulfate is an oxidising agent and an irritant.</li> </ul>		<ul style="list-style-type: none"> <li>Appropriate personal protective equipment should be used.</li> <li>Skin contact should be avoided.</li> </ul>		

LOCATION	IC3 & D7	Laser Cutters	RISK LEVEL	LOW
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>The equipment can present an electric shock hazard.</li> <li>Leads could be tripped over.</li> <li>Fumes from materials being cut might be harmful.</li> <li>Looking into the light source when working on reflective materials might be harmful.</li> <li>Moving parts might present a tripping hazard.</li> </ul>				

LOCATION	IC6	CNC Controlled Router	RISK LEVEL	MID
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<ul style="list-style-type: none"> <li>Contact with revolving cutters can present a hazard.</li> <li>Long hair and loose clothing can become entangled with rotating cutters or arbors.</li> <li>Broken cutters, waste and work pieces can be violently ejected.</li> <li>Wood dust can be inhaled.</li> <li>Closing movement between parts, under power feed, can result in finger trapping.</li> <li>Heavy objects such as vices and index fixtures can fall from the table.</li> <li>CNC routing machines can present a hazard of electrical shock.</li> <li>Sharp edges on tools, work pieces and swarf can cause cuts.</li> <li>Inadvertent starting of the machine can present a hazard.</li> <li>Lack of space around the machine can lead to the operator being pushed by passers-by.</li> <li>Slippery floor surfaces or loose items around the machine can cause slips that result in contact with moving parts.</li> <li>Contact with cutting fluids, oil and grease can irritate the skin.</li> </ul>	<ul style="list-style-type: none"> <li>A means of electrical isolation using a fused switch-disconnector on or adjustment to the machine, and that it is controlled by a starter incorporating overload protection.</li> <li>A conveniently positioned mushroom headed stop button or other suitable control device that can quickly stop the machine in an emergency.</li> <li>Fixed guards, or alternatively interlocked guards that enclose the drive mechanisms.</li> <li>There should be sufficient space around the machine to prevent the operator from being accidentally pushed by passers-by.</li> <li>Eye protection (goggles) worn when operating the machine, long hair should be tied back and protected from entanglement. Loose clothing and jewellery should be tucked in / removed.</li> <li>The machine should be electrically isolated before any internal mechanisms are adjusted.</li> <li>Suitable implements should be used to remove swarf to avoid hand contact.</li> </ul>	

LOCATION	IC6	CNC Controlled Centre Lathe	RISK LEVEL	MID
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<ul style="list-style-type: none"> <li>Long hair and loose clothing can become entangled with rotating cutters or arbors.</li> <li>Work pieces, chuck keys, broken cutters, waste and work pieces can be violently ejected.</li> <li>Closing movement between parts, under power feed, can result in finger trapping.</li> <li>CNC routing machines can present a hazard of electrical shock.</li> <li>Sharp edges on tools, work pieces and swarf can cause cuts.</li> <li>Inadvertent starting of the machine can present a hazard.</li> <li>Lack of space around the machine can lead to the operator being pushed by passers-by.</li> <li>Slippery floor surfaces or loose items around the machine can cause slips that result in contact with moving parts.</li> <li>Contact with cutting fluids, oil and grease can irritate the skin.</li> </ul>	<ul style="list-style-type: none"> <li>A means of electrical isolation using a fused switch-disconnector on or adjustment to the machine, and that it is controlled by a starter incorporating overload protection.</li> <li>A conveniently positioned mushroom headed stop button or other suitable control device that can quickly stop the machine in an emergency.</li> <li>Fixed guards, or alternatively interlocked guards that enclose the drive mechanisms.</li> <li>There should be sufficient space around the machine to prevent the operator from being accidentally pushed by passers-by.</li> <li>Eye protection (goggles) worn when operating the machine, long hair should be tied back and protected from entanglement. Loose clothing and jewellery should be tucked in / removed.</li> <li>The machine should be electrically isolated before any internal mechanisms are adjusted.</li> </ul>	

LOCATION	ALL	Adhesives	RISK LEVEL	LOW
		<b>Hazards</b>	<b>Risk Control Measures</b>	
		<ul style="list-style-type: none"> <li>Adhesives in contact with the eyes can cause permanent injury.</li> <li>Adhesives in contact with the skin can cause irritation. Hot adhesives can cause burns.</li> <li>Inhalation of solvents, fumes and vapours can present a hazard and can cause respiratory sensitization. Adhesives containers can spill or leak. Adhesives vapours can be highly flammable.</li> </ul>	<ul style="list-style-type: none"> <li>Adhesives should be used in accordance with the manufacturer's instructions.</li> <li>Sufficient ventilation should be provided, in accordance with the manufacturers recommendations.</li> <li>Local exhaust ventilation should be provided if required.</li> </ul>	

LOCATION	ALL	Acrylic Cement	RISK LEVEL	LOW
<b>Hazards</b>		<b>Risk Control Measures</b>		
<ul style="list-style-type: none"> <li>• Inhalation of acrylic cement vapour can present a hazard. Vapours can irritate the eyes, skin and respiratory tract.</li> <li>• Methyl methacrylate is a respiratory sensitizer.</li> <li>• Acrylic cement vapour is flammable and potentially explosive in air.</li> </ul>		<ul style="list-style-type: none"> <li>• Sufficient ventilation should be provided.</li> <li>• Suitable eye protection should be worn. Students with sensitive skin should wear gloves.</li> <li>• Acrylic cement should only be used for a short time.</li> <li>• Work should be carried out well away from any source ignition.</li> </ul>		