

Bristol Hackspace Risk Assessment

Bench Grinder 2015-08-13

Place of assessment: BV studios room G10
Date and time of assessment: 2015-08-13 approximately 20:30
Assessors: John Willis, David Henshall, David Smith.

Assessment Background:

David Smith requested induction for the grinder. No one was available to carry out inductions, but as work has started to risk assess tools and formalise the induction process and David is a competent practical engineer with experience of using grinders, it was decided to risk assess the grinder and verbally agree induction notes.

Caveat:

The assessment was done on a best endeavours basis by unpaid volunteers who have not had formal training for machine tool risk assessment. This assessment is advisory and the assessors will not accept liability for errors or omissions. Nothing in this assessment should be taken as permission or instruction to work in an unsafe manner. This assessment does not replace or reduce a grinder user's common law duty of care to work in a way that does not endanger themselves or others.

Grinder background

A 6 in bench grinder is kept under the metalwork bench in G10 and clamped to the bench when used. The grinder is used infrequently. Users of the workshop range from highly competent technologists to inexperienced users who would not be expected to know about the dangers of grinder

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use.
The workshop is not generally supervised and lone working is allowed.
Workshop users generally show a lack of awareness of adjacent activity.
Induction is required before use but the induction process unclear and record keeping is poor.
There is no maintenance schedule for the item.
Another grinder was in use until recently with missing tool rests and spark shields and had poorly adjusted spark arrestors. This state was commented on several occasions but no action taken.

Risk	Description	Recommendation
Electric Shock	<p>The cable could become dislodged or abraded during use or storage exposing 240 volt mains conductors or making the machine case live.</p> <p>The grinder is usually powered through an extension lead which may be daisy chained. There is a risk of a poor earth which would allow the case to be live without blowing the fuse.</p>	<p>Visually check the cable and grinder for damage before use.</p> <p>Report equipment problems and put a "do not use" note on it if there is a fault that cannot be fixed immediately.</p> <p>Periodically carry out an electrical check.</p> <p>Mount the grinder in a permanent location that is not used for other purposes.</p> <p>Fit sufficient permanent sockets to remove the need for extension leads.</p>
Injury from high speed debris from a burst grinding wheel	<p>A burst grinding wheel will probably send bits of broken grinding wheel at high speed over most of G10. People in G10 at the time would be lucky to escape serious injury.</p> <p>The wheel could be knocked and damaged during storage or</p>	<p>Visually check the grinder for damage before use.</p> <p>Check for deep grinding marks on the side of the wheel.</p> <p>Before plugging in the grinder, rotate the wheels by hand</p>

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Risk	Description	Recommendation
	<p>moving or could have been abused by the previous user.</p> <p>Grinding on the side of the wheel will weaken the wheel which could burst.</p> <p>Poorly adjusted grinding rests could allow work to become trapped between the wheel and casing will probably damage the wheel and could cause the wheel to burst during use.</p> <p>A grinding wheel with lower speed rating than the grinder could burst during use.</p> <p>The grinder could vibrate or be pushed off the bench</p>	<p>through an entire revolution, checking there is a gap between the tool rest and wheel, and spark arrestor and wheel, and it is less than 3mm.</p> <p>Locate the grinder in a position that limits the extent of ejected material.</p> <p>Stand to one side when switching the machine on.</p> <p>Do not turn the grinder on if other people are standing in front of it.</p> <p>Wear eye protection while using the grinder.</p> <p>Mount the grinder in a permanent location that is not used for other purposes.</p> <p>Locate the grinder in a position that limits the extent of ejected material.</p> <p>Maintenance tasks such as changing grinding wheels must only be carried out by a limited number of people.</p> <p>Only new wheels of the correct rating will be fitted.</p> <p>Report equipment problems and put a "do not use" note on it if there is a fault that cannot be fixed immediately.</p>

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Fire due to sparks	Sparks can set light to inflammable material or start a wood dust explosion.	Before using the grinder check that there is no flammable material in the area that sparks might reach and that no one else using inflammable solvents or gasses in the room, there should be no smell of solvent in the room. If using extraction equipment make sure it dos not contain wood dust.
Eye damage from sparks and dust	Generally sparks and particulate matter are thrown downwards or kept in the machine guard but some may go up towards the operators face. The grinder has openings the rear of and tangential to the wheel. Sparks and material will be ejected through that at high speed.	Make sure the spark arrestors are correctly adjusted before using the grinder Check that there is adequate eye wash in the first aid kit before using the grinder Do not use the grinder where someone can get behind the rear openings. Wear eye protection while grinding Use the spark guard (plastic window) Do not get put your face near the grinder for a closer look.
Injury due to contact with the moving wheel	If the work slips hands could contact the rotating wheel If clothing is caught in the rotating wheel, fingers, hands, or other body parts could get dragged into the wheel.	Do not use the grinder when tired or under the influence of drugs or alcohol. Be aware that some prescription drugs and over the counter remedies may make you drowsy or inattentive.

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	<p>If the grinder is plugged into the wall socket with the switch in the on position the wheel will rotate.</p> <p>Someone could push or knock a grinding operator into the wheel or cause a lapse of attention by talking to them.</p>	<p>Do not wear gloves, loose clothing, jewellery</p> <p>Tie back long hair</p> <p>Check the grinder switch is off before plugging it in.</p> <p>Concentrate on grinding and do not carry out a conversation when grinding.</p> <p>Do not use the grinder when others could bump into you or cause a distraction.</p> <p>Turn the grinder off with its switch and check the switch is off before plugging in.</p> <p>Do not leave the grinder until the wheels have stopped rotating.</p> <p>Mount the grinder is a position where people will not normally use the work area as a through route.</p>
Breathing Dust	<p>The grinder does not have extraction and grinding will produce fine dust</p> <p>Dust produced by the grinder has not been measured.</p>	<p>Run the room filter on the high setting when grinding and for 30min after to clear dust from the air.</p> <p>Do not use the grinder for long periods of time. The 15 minute exposure limit is approximately 3 times the level allowed for 8 hours.</p>

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Risk	Description	Recommendation
		<p>Use of a dust mask is advised but an operation requiring a dust mask must not be carried out while others are in the room and not wearing them.</p> <p>Do not grind materials with 8 hour dust exposure limits less than inhalable dust 10 mg m^{-3} Respirable dust 4 mg m^{-3} Aluminium, Aluminium oxide, Silicon carbide, emery and Foundry dust (mixture of steel and silicates) are acceptable. Check before using anything else.</p> <p>Wear a dust mask if another dust producing process is going on while grinding. The $10/4 \text{ mg m}^{-3}$ 8 hour limit is the maximum allowed under COSHH regulations for all dust in the atmosphere, not each individual component.</p>
Dirt contamination	<p>Grinding dust can cause skin problems such as dermatitis and could cause problems if transferred to food.</p> <p>Another person using dirty equipment will not be aware of the type of contamination and may be sensitive to material that has been ground</p>	<p>Clean the floor, bench, grinder, and any tools and materials that have been contaminated by the grinding operation when finishing the grinding session.</p> <p>Wash hands after the grinding session.</p>
Noise	Noise generated by the grinding operation may damage hearing	The user, and anyone in close vicinity, must wear hearing protection.
Hand-Arm Vibration Disease	Use of the grinder for long periods puts the user at risk of Hand-Arm Vibration (HAV) disease.	Users must take frequent breaks to rest their hands, and regular users should consult the HAV guidance on the HSE website.

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Lack or awareness of grinder risk	Lack of awareness of risk associated with grinder use will increase the probability of a grinder related safety incident. People could use the grinder without being aware of the risks for reasons including: Not aware of the risk assessment Not read the risk assessment Not had Grinder induction Grinder induction was incomplete Not understood or forgotten about some or all of the risks	Include a statement in the Hackspace safety policy that places a requirement on the user to read & understand relevant risk risk assessments before using equipment, on the user.. Include the risk assessment in Induction notes Make the risk assessment available on the Wiki and make a printed copy available in the workshop. Put a clear notice by the grinder stating that it needs induction and giving the location of the risk assessment.