University of Southampton Health & Safety Risk Assessment

Version: 2.3/2017

Risk Assessment for the activity of	**Group Design Project – 3D Printing Farm**	**Date**	**30/10/2024**
Unit/Faculty/Directorate	**Faculty of Engineering and Physical Sciences**	**Assessor**	**John Walker**
Line Manager/Supervisor	**Ara Khodavirdi**	**Signed off**	

PART A											
(1) Risk identification			**(2) Risk assessment**				**(3) Risk management**				
Hazard	**Potential Consequences**	**Who might be harmed** **(user; those nearby; those in the vicinity; members of the public)**	**Inherent**			**Control measures (use the risk hierarchy)**	**Residual**			**Further controls (use the risk hierarchy)**
			Likelihood	**Impact**	**Score**		**Likelihood**	**Impact**	**Score**	
Poor posture	Poor sitting posture with incorrect support can damage spinal structures and contribute to back pain.	User	3	3	9	Always ensure chair and back support is adjusted to provide the best comfort.	1	3	3	
Electrical shock	Short-circuit to frame from mains would deliver a shock before socket shutter activates if user touches printer.	User	3	4	12	Ensure that printer plug is UK type, and that machine has been inspected for electrical safety. Unplug machine during maintenance servicing.	1	4	4	

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Burn	Touching printer hot end during printing operations would inflict temporary burns on skin and other materials.	User	2	2	4	Never touch the printer hot end or hot bed during printing operations or if the displayed nozzle temperature is too hot or unknown. Display a sign explaining that the nozzles are dangerously hot.	1	2	2	
Tool injury	Incorrect use of a tool may result in the slipping and loss of control of the tool which could result in the injury of the user or others.	User and bystanders	2	3	6	Focused (no distractions) work conditions during the operation of tools. Use of goggles advised while sharp tools are being used.	1	3	3	
Falling items	Dropping the 3D Printers could inflict injuries on lower body (especially feet, ankles and knees) due to the weight of the machines.	User	2	3	6	Lifting plan, focused work conditions during machine lift and use of hard-closed shoes within the workshop.	1	3	3	
Incorrect filament use	If printers are loaded and set to print with ABS then air in workshop can become toxic.	User and bystanders	2	3	6	Never print with ABS or other toxic filaments. Place a sign saying that filament must be checked to usure it's not ABS.	1	3	3	

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Post-processing abrasion	If during post-processing of 3D prints sanding paper is used to smooth print surfaces an abrasion can happen	User	2	2	4	Focused work conditions during print post-processing. Do not perform any sanding close to face, prioritise sanding outdoors as opposed to indoors and use gloves for long periods of sanding.	1	2	2	
Moving parts inflicted injury	If fingers are introduced within the 3D printers' mechanisms during operation, small superficial cuts and/or pinching could take place	User	2	2	4	Ensure that debris is always removed before turning the printers on. Never attempt to remove any debris while printer is operating. Place a sign stating that the belts, motors and other moving parts should not be touched.	1	2	2	

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PART B – Action Plan

Risk Assessment Action Plan

Part no.	Action to be taken, incl. Cost	By whom	Target date	Review date	Outcome at review date

Responsible manager's signature: Print name: Date:				Responsible manager's signature: Print name: Date	

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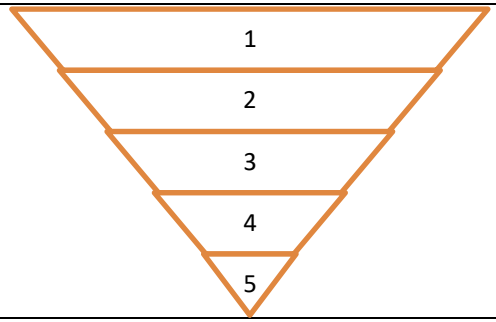
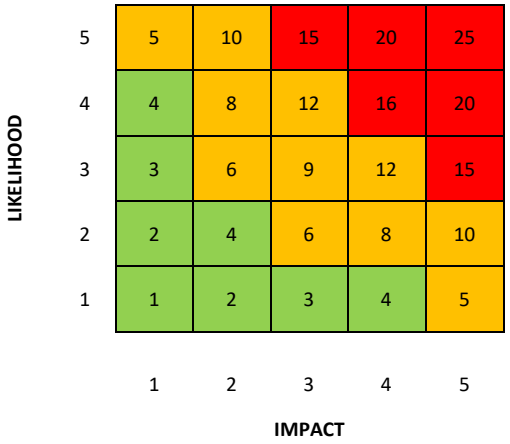
Assessment Guidance

1. Eliminate	Remove the hazard wherever possible which negates the need for further controls	If this is not possible then explain why	
2. Substitute	Replace the hazard with one less hazardous	If not possible then explain why	
3. Physical controls	Examples: enclosure, fume cupboard, glove box	Likely to still require admin controls as well	
4. Admin controls	Examples: training, supervision, signage		
5. Personal protection	Examples: respirators, safety specs, gloves	Last resort as it only protects the individual	



Risk process

1. Identify the impact and likelihood using the tables above.
2. Identify the risk rating by multiplying the Impact by the likelihood using the coloured matrix.
3. If the risk is amber or red – identify control measures to reduce the risk to as low as is reasonably practicable.
4. If the residual risk is green, additional controls are not necessary.
5. If the residual risk is amber the activity can continue but you must identify and implement further controls to reduce the risk to as low as reasonably practicable.
6. If the residual risk is red do not continue with the activity until additional controls have been implemented and the risk is reduced.
7. Control measures should follow the risk hierarchy, where appropriate as per the pyramid above.
8. The cost of implementing control measures can be taken into account but should be proportional to the risk i.e. a control to reduce low risk may not need to be carried out if the cost is high but a control to manage high risk means that even at high cost the control would be necessary.

Impact		Health & Safety
1	Trivial - insignificant	Very minor injuries e.g. slight bruising
2	Minor	Injuries or illness e.g. small cut or abrasion which require basic first aid treatment even in self-administered.
3	Moderate	Injuries or illness e.g. strain or sprain requiring first aid or medical support.
4	Major	Injuries or illness e.g. broken bone requiring medical support >24 hours and time off work >4 weeks.
5	Severe – extremely significant	Fatality or multiple serious injuries or illness requiring hospital admission or significant time off work.

Likelihood	
1	Rare e.g. 1 in 100,000 chance or higher
2	Unlikely e.g. 1 in 10,000 chance or higher
3	Possible e.g. 1 in 1,000 chance or higher
4	Likely e.g. 1 in 100 chance or higher
5	Very Likely e.g. 1 in 10 chance or higher