

Risk assessment RA23 FDM 3D Printers

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Faculty / Service Area	Faculty of Health Sciences and Sport	Location	Pathfoot B27 Workshop, Cottrell 4B65
Description of work task / equipment /area being assessed			
Use of 3d printers, finishing of parts with hand tools including files, screwdrivers and craft knives.			
Change log	Version 1.1	29 Aug 2022	Expanded this section
	Version 1.2	11 July 2023	Referenced regulations and SOPs
Head of faculty	Prof Jayne Donaldson	Safety officer	Dr Nidia Rodriguez Sanchez
Completed by	Chris Grigson	Date	24 Jun 2020
Reviewed by	Dr Nidia Rodriguez Sanchez	Date	11 July 2023
	Chris Grigson	Date of next review	August 2024
Equipment used	Flashforge Creator Pro, Robox 3d Printer		
Categories of people involved	Staff, UG, PG, Visitors		
Duration of activity	< 3hrs	Frequency of activity	Daily
Legal compliance to standards and regulations required	Health and Safety at Work act 1974 (HASAWA) https://www.hse.gov.uk/legislation/hswa.htm Management of Health and Safety at Work Regulations 1999 (MHSWR) https://www.legislation.gov.uk/uksi/1999/3242/contents/made Provision of Work Equipment Regulations 1998 (PUWER) https://www.hse.gov.uk/work-equipment-machinery/puwer.htm		

		The Control of Substances Hazardous to Health Regulations 2004 (COSHH) https://www.hse.gov.uk/coshh							
What are the hazards?	Hazard category	Who might be harmed and how?	What are you already doing to control the risks?	*Risk rating	What additional controls (if any) are required to reduce the risks?	*Risk rating	Action by who?	Action by when?	Date of completion
Burns	F4	Operator Contact with heated parts of the printer	SOP with clear instruction to keep body parts away from hot components of printing chamber Only trained operators allowed to use machine Regular inspection of machine Pre use check Clear signage to indicate risks. Allow 30 minutes after printing to allow the printer to cool before removing 3D print. Any burns should be irrigated immediately with copious amounts of cold running water. And advice sought	1x2=2					

What are the hazards?	Hazard category	Who might be harmed and how?	What are you already doing to control the risks?	*Risk rating	What additional controls (if any) are required to reduce the risks?	*Risk rating	Action by who?	Action by when?	Date of completion
			<p>from a first aider.</p> <p>First aid box close by</p>						
Headaches/nausea / long term health effects from styrene fumes and particulates which may be liberated when printing ABS and other materials	F4	<p>Operator, others in vicinity</p> <p>Inhalation</p>	<p>Print with other filament such as PLA</p> <p>Increase ventilation to disperse any fumes</p> <p>ABS printing should only be undertaken with the area unoccupied</p> <p>Pinter located next window</p> <p>Use filaments only from known suppliers</p> <p>Use the lowest practicable nozzle temperature</p> <p>Keep the enclosure shut when operating and for a time for emissions to clear when finished</p>	1x1=1					

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Sharp finishing tools	F4	Operator Cuts and lacerations from sharps	Cut resistant gloves, eye protection and lab coat Operator instructed in safe use of finishing tools Sharps disposed of in sharps bin Any more serious cuts and lacerations to be reported to line manager First aiders and first aid box close by	2x2=4					
Mains electricity	F4	Operator Electric shock from exposed wires or earth fault.	Regular PAT testing Pre use visual inspection	1x3=3					
References and Further reading	Measuring and controlling emissions from polymer filament desktop 3D printers (2019) https://www.hse.gov.uk/research/rrpdf/rr1146.pdf Laboratory Risk Assessments RA89 Electro Mechanical Workshop								

COSHH Risk assessment

Anything in category F.6 (Chemical and biological hazards) should go here

Manufacturers COSHH data sheets are required for all chemical hazards and should be attached

The Substance What are the hazards and *classification? *Route of exposure	*WEL mg/m ³	Who might be harmed and how?	What are you already doing to control the risks?	*Risk rating	What additional controls (if any) are required to reduce the risks?	*Risk rating	Action by who?	Action by when?	Date of completion	Health monitoring
Styrene fumes Irritant Inhalation	100	All persons in the vicinity Potential headaches / nausea / Long term health effects Fumes are potentially liberated when printing in ABS	Avoid using ABS if possible Remove all persons from area when printing ABS Increase ventilation by opening windows.	1x1=1						No
Plastic particulates Irritant Inhalation		All persons in the vicinity Potential Long term health effects Particulates are potentially liberated when printing	Use filaments only from known suppliers Use the lowest practicable nozzle temperature Keep the enclosure shut when operating and for a time for emissions to clear when finished	1x1=1						No