

**2X ULTIMAKER +2 CONNECT 3D Printer
RISK ASSESSMENT**

Date of Assessment	March 2023	Version	2.0
Activity	3d printing from various filaments.		
Equipment	Ultimaker 2+ Connect FDA printer		
Induction / Role Required	Training & Certification Required before unsupervised use		

Risk Rating	Action
LOW	Ensure current control measures are in place and continue with activity
MED	Control measures may be adequate, co-supervision is recommended
HIGH	Do not undertake activity without further consultation with Makerspace specialists

Risk Assessment

Identify Hazards	Who/what may be harmed and how	Severity	Control Measures	Likelihood	Risk Rating
<i>Something with the potential to cause harm</i>	<i>Users, bystanders or particular at risk groups</i>	<i>Low / Medium / High</i>	<i>What is in place to reduce the harm or likelihood.</i>	<i>Low / Medium / High</i>	<i>Low / Medium / High</i>
The machine extrudes plastic at high temperatures on to a hot glass bed.	User, machine.	LOW	The risk of burning is fairly obvious and the machines are well labelled. However the risk should be highlighted when training users.	LOW	LOW

The machine moves with a stepper motor with some force, a user could trap fingers or damage the machine.	User, machine.	LOW	Training of users should include briefing on this risk.		
Fire. The process involves high temperatures and electrical machines.	User bystanders and building.	HIGH	Users to be instructed to ensure they are familiar with the fire precautions in the building. Training should include the following instructions. "In the event of fire, if it is safe to do so turn off the power. Then if it is safe to do so and only if you can maintain a safe exit use an appropriate fire extinguisher (if the power is still on, it must be suitable for electrical fires), otherwise, or if in doubt, raise the alarm, leave the building and call the fire brigade.	LOW	LOW

Emissions 3d FDA (filament) printing is a relatively new technology and it involves melting various plastic filaments. There are some emissions and long term issues may emerge	Anyone present during printing.	MED	Filaments generally give off Volatile Organic Compounds, which are heavier than air. Ventilation is required, particularly at the beginning of the printing process. Windows are to be open.	LOW	MED
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Dust The process of extrusion also creates ultra fine particles of plastic which can, with prolonged exposure, be carcinogenic.	Anyone present during printing and other users if dust is allowed to build up.	MED	All users trainees and observers to be advised to wear FFP2 dust masks. Usage to be monitored so that high volume users, if any, can be required to do so. Users to be advised to monitor the room for signs of a build up of dust and ensure cleaning occurs as necessary. When under age young people are present during printing all present are required to use masks.	MED	MED or When young people present HIGH
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Specific filaments can create specific additional risks and there are known to be manufacturers whose safety information is lacking sufficient detail and may therefore have unknown risks associated with them either for the user or the machine, particularly in the event of fire.	The machine may be damaged	LOW	A list of approved filaments to be maintained, and only filaments which have provided full COSHH safety data sheets can be approved. Any additional safety requirements, including PPE, and fire risks, must be determined before any filament is approved. Where additional safety measures are required users should also have the requirement to change the filament, to one which does not require such measures, before leaving the machine highlighted to them. Some filaments are abrasive, particularly those with metal particles included. The standard nozzle on the Ultimaker is not suitable for such filaments. Approval should only be given for such filaments where the user has access to a suitable nozzle and is competent to change nozzles.	MED	LOW
Consuming food and drink in the presence of fumes and dust.	Users and bystanders	LOW	The room should not be used for consuming food and drink, notices to be placed in the room.	LOW	LOW

Some plastics are unsuitable for use in food consumption and preparation and users must, unless specifically advised, assume that the objects manufactured should not be used with food.	Those using the completed object.	MED	No items to be used in connection with food stuffs and eating are to be manufactured on these machines, due to cross contamination risk.	LOW	MED
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