

Assembly	Failure & Effect	S1	O1	D1	RPN before	Preventing measures	S2	O2	D2	RPN after
Injury while cutting PDMS	Can result in minor to deep cuts on the hands	3	5	1	15	Additional grooves (knife guide) in mould to guide the scalpel in the correct direction.	3	4	1	12
Glass microscope slides	Will break upon falling to the ground or hitting a surface, any shards are a sharp cutting hazard.	3	5	1	15	Care will be taken while handling the slides. A slide rotator has been developed to hold and rotate several slides at a time.	3	3	1	9
Environmental contamination by PDMS	PDMS in its liquid form is extremely sticky and can adhere to most surfaces.	1	7	1	7	Wear double layer of gloves and change the outer layer after any contact with PDMS.	1	5	1	5
Needle stabbing	Failure to pierce PDMS could result in the user stabbing themselves with the needle.	3	5	1	15	The needles and PDMS are all sterile in case of injury. Needles are not reused. Needles are capped whilst not in use. Care will be taken with the positioning of the fingers around the chip.	3	4	1	12
3D printing: Photopolymer resin	The uncured material and the fumes exuded are highly toxic. Inhalation can lead to respiratory irritation and possible long-term problems. The resin may cause an allergic reaction if it comes into contact with skin or is inhaled. Resin is highly harmful to the environment.	6	3	3	54	Use of Nitrile gloves when handling any type of resin. The printer has a filtered enclosure and continuous ventilation which prevents fumes from escaping. Masks must be worn when handling resin. Unused resin is cured with UV light before discarding. The printer is PAT tested.	6	1	3	18
3D printing: Filament (PLA)	The heating element is heated to 200°C and can cause severe burns ranging from 1 <sup>st</sup> to 3 <sup>rd</sup> degree depending on duration of contact with skin. It also poses a fire risk.	5	3	3	45	The hot end of the printer is enclosed. Do not touch the printer while in operation. The printer has been PAT tested.	5	1	2	10