

# Risk Assessment Form

(This is an active document and must be maintained)



UNIVERSITY OF  
CAMBRIDGE

## Materials Science and Metallurgy

Date: 26<sup>th</sup> March 2020

Supervisor of Room/Area: **Prof. Ruth Cameron & Prof. Serena Best**

Room or area: **2\_014 (CCMM Labs)**  
(Describe location)

Name of Assessor(s): **Wayne Skelton-Hough**

**Title of Activity / Experiment / Work Area:**

**Using the DSM injection molding machine**

**Description of Activity / Experiment / Work Area:**

Manufacture of test samples by injection molding using the DMS micro 5,5 cc injection molding machine

**SECTION 1:** Identify all significant hazards, who or what may be affected by each individual hazard and controls in place to reduce risk to a minimum.

Hazard Description	Hazard to whom or what	Controls in place to reduce risk to a minimum
Electrocution	Person using the injection moulding machine	<ul style="list-style-type: none"><li>• Inspect all electrical equipment and power cables before use and do not use any equipment that shown any signs of damage.</li><li>• Ensure electrical equipment carries an up to date PAT test label before using it. Wipe up any spillages nearby.</li></ul>
Trapped fingers	Person using the injection moulding machine	<ul style="list-style-type: none"><li>• Never place fingers inside the protective guard when operating the injection moulding machine.</li></ul>
Hot mould or hopper	Person using the injection moulding machine	<ul style="list-style-type: none"><li>• Wear protective gloves when removing the mould from the hot mould heater.</li><li>• Ensure the hopper is placed in the storage bracket when not in use.</li><li>• Do not leave mould or hopper heaters switched on when not in use.</li></ul>

Hazard Description	Hazard to whom or what	Controls in place to reduce risk to a minimum
Molten polymer	Person using the injection moulding machine and other bystanders	<ul style="list-style-type: none"> <li>• ALWAYS wear a correctly fastened lab coat and safety eyewear when operating the injection moulding machine or when watching the equipment being used.</li> <li>• Ensure that the mould is empty before attempting to inject polymer</li> <li>• Only use correctly designed moulds that fit securely in the mould heater.</li> <li>• Ensure the mould has a countersunk inlet that locates the hopper nozzle in the end of the mould.</li> <li>• Allow the mould to cool down sufficiently for the polymer to solidify before splitting the mould.</li> <li>• NEVER bypass the safety cut out and operate the injection moulding machine with the safety guard open.</li> <li>• Never place fingers inside the protective cover when operating the injection moulding machine.</li> </ul>
Heavy objects	Person using the injection moulding machine and bystanders	<ul style="list-style-type: none"> <li>• Always wear stout, closed toe shoes when using the injection moulding machine</li> <li>• Always use the correct drift to remove the mould from the mould heater and support the mould during removal.</li> </ul>
Fumes	All laboratory users	<ul style="list-style-type: none"> <li>• Ensure that the polymer being moulded will not deteriorate at the hopper or mould temperature (<b>note:</b> the temperature of these components may be slightly higher than the indicated or set temperature).</li> <li>• If degrading polymer can be smelt, switch off the injection moulding machine, allow to cool completely and then check all temperature sensors are working correctly</li> </ul>

Hazard Description	Hazard to whom or what	Controls in place to reduce risk to a minimum
Compressed air	Person using the injection moulding machine	<ul style="list-style-type: none"> <li>• Only use hoses designed to withstand a pressure up to 10 bar</li> <li>• Ensure that the compressed air hose has no damage before plugging it into the compressed air supply.</li> <li>• Check all fittings are secure and any hose clips are tight</li> <li>• Ensure the compressed air supply regulator is set to the minimum pressure possible required to operate the machine.</li> <li>• If compressed air can be heard escaping from the injection moulding machine at all, switch off the equipment, disconnect it from the compressed air supply and bring to the attention of the group laboratory technician.</li> </ul>
Heat	Person using the injection moulding machine	<ul style="list-style-type: none"> <li>• The hopper and mould can get extremely hot, always handle using the heat resistant gloves provided.</li> <li>• Do not leave hot items in contact with the bench or any flammable items.</li> <li>• Only handle the hopper by the plastic handle and when not in the injection moulding machine store the hopper assembly in the bracket provided.</li> <li>• Allow the mould to cool completely before attempting to remove the moulded sample</li> </ul>

## SECTION 2: Emergency Procedures

If anyone sustains a burn, the affected area should be run under cold water for at least 15 mins until pain subsides. If symptoms continue, if the burn area is greater than 1% of the body surface (an area the size of the palm of the hand) or if the burn affects the face, hands, feet or genital area, medical attention must be sought.

If the operator sustains a cut, it should be cleaned out and medical attention sought.

If the operator or other laboratory user shows signs of exposure to fumes from a sample, the appropriate MSDS and/or COSHH assessment should be consulted for appropriate emergency action.

In order to shut the equipment down in case of an emergency, switch the equipment off at the plug and disconnect from the compressed air supply.

<b>Signature of Assessor(s)</b>	<i>Wayne Mullins</i>	<b>Date:</b> 26/03/2020
<b>Signature of Supervisor</b>		<b>Date:</b>

**SECTION 3: Review** - This assessment must be reviewed every 12 months or earlier if the basis of the original assessment is altered.

Review Date	Reviewed by (Signature)

Review Date	Reviewed by (Signature)

## Change log

Change	Date	Updated by	Description
1	11/09/2017	W. Skelton-Hough	Document issued
2	14/09/2017	W. Skelton-Hough	Additional hazards and control measures added to the risk assessment.
3	15/09/2017	W. Skelton-Hough	Section 3 of risk assessment added back into document
4	26/03/2020	W. Skelton-Hough	Compressed air – pressure to withstand increased to 10 bar in line with department safety book.