# **Standard Operating Procedure (SOP) Title: Use of Melting Apparatus**

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| Assessor: | Joshua Linfoot | | | Location of work: | MSRH 502 |
| Principal Investigator: | | | Prof Alan Spivey | | |
| Date of approval: | | 13/09/2021 | | Date for review: | 13/09/2022 |

## **Justifying the hazards:**

Onset melting temperature is determined for solid samples by placing into closed-end glass or quartz capillary tubes and inserting into an automatically heated melting point apparatus.

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| Identify hazards with specific risk assessments and a College or a departmental approval process | | | |
| [Ionising radiation sources](https://www.imperial.ac.uk/safety/safety-by-topic/laboratory-safety/) |  | [Biological sources](https://www.imperial.ac.uk/safety/safety-by-topic/laboratory-safety/) (microorganisms, human/animal tissues, plants) |  |
| [[Class 3R, 3B or 4 Lasers](https://imperiallondon.sharepoint.com/sites/fons/faculty/safety/lasers/SitePages/laserhome.aspx)](https://share.imperial.ac.uk/fons/operations/safety/lasers/SitePages/laserhome.aspx) |  | [Offsite work](http://www.imperial.ac.uk/safety/safety-by-topic/off-site-working/) |  |
| Confirm if [Lone working](https://www.imperial.ac.uk/safety/safety-by-topic/lone-working/) is permitted with this SOP?  If it is permitted, describe the control measures for lone workers: | | | |

## **Preparing for the SOP:**

* **DON’T** leave apparatus and area dirty.
* **DON’T** place items on the heat cover.
* **DON’T** use faulty or damaged equipment until it is repaired.
* **DON’T** touch control panel and cords with wet hands.
* **DO** use the meltimeter in a fume cupboard when work with toxic reagents.
* **DO** take special care when handling capillary tubes and packing wire to avoid puncture type injuries.

## **Procedure:**

# **Before use:**

1. Place a small amount (ca. 2-4 mg) of sample into a small closed-end capillary tube, and gently tap it on the bench top until the sample is packed at the bottom of the tube (or use special packing wire – please ensure its clean before and after use). Ensure a moderate packing of the material, not too dense and not loose.
2. Place the sample(s) closed end downwards in the holes of the ceramic insulator located on top of the heating block.

# **During use:**

1. Use the control panel to input the desired heating range and rate.
2. Monitor the state of your sample, the melting apparatus will make an automatic determination of the onset point and clear point for each capillary present. Manual determinations may also be recorded during the melt.

# **After the measurement**

1. Remove your sample tube(s) from the sample holder and turn off the power switch.
2. Dispose of sample tubes as hazardous sharps waste.
3. Make sure you **leave the apparatus and the area clean**.

## **Disposal:**

If any chemical waste is produced, ensure it is disposed of via the appropriate chemical waste stream. If the equipment is to be disposed of, ensure it is decontaminated, and then dispose of via the ‘Waste Electrical and Electronic Equipment route ([WEEE](http://www.imperial.ac.uk/estates-facilities/buildings/services/waste-disposal/waste-disposal-forms/weee-forms/))’.

## **Personal Protective Equipment (PPE):**

Lab coat, appropriate gloves, safety glasses

## **Risk Analysis of SOP and emergency procedures:**

(In addition to [Safe Lab Practice](https://imperiallondon.sharepoint.com/sites/fons/faculty/safety/SitePages/Basic%20Laboratory%20Rules%20for%20All%20Laboratories%20in%20FoNS.aspx))

### **Always remember to include fire associated risks and control measures where appropriate**

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| Hazard | Raw risks | Current control measures | Residual risk  (Low/Med/High) |
| Hot surfaces, hot samples | Burns, fire | Use slip-resistant insulated thermal gloves for handling hot samples.  Remove all flammable substances from the area when using hot equipment. | Med |
| Electrical equipment and cables | Electrocution and electrical fire | Commercial equipment, no modifications to be made.  Regular portable appliance testing (PAT).  Visual inspection of equipment and cables prior to each use.  Immediate clean of any spills.  Ensure plugs, sockets, cables and equipment positioned so as not to be at risk of ingress from liquids.  Ensure a CO2 extinguisher is available.  Ensure easy access to the power supply. | Low |
| Heavy item | Crushing injury | Equipment securely located on suitable work surface.  No lifting or moving of equipment. | Low |
| Glassware and glass parts | Cuts and splinters from broken glass | Visually inspect glassware for cracks and other defects before and after use. If glassware is damaged, arrange for repair or dispose. | Low |
| Hazardous materials | Exposure via inhalation of hazardous reagents | No use of volatile reagents outside of LEV.  Ensure the equipment is cleaned before and after each use.  (Include hazards and controls of associated reagents in this or separate risk assessment) | Low |

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| **Additional control measures to minimise residual risks** | **Implementation date** |
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| **Who may be harmed** | |
| Staff / students | Cleaners / Engineers |
| Supporting staff | Others (specify): |

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| **Emergency procedures** – describe the response(s) required by the user and lab members |
| In the event of an incident involving the **equipment itself,** turn off the power supply, unplug and place a sign on the equipment stating it is not to be used. Arrange for repair.  **Electrical shock** - switch off power. Do not touch the affected individual until the power is definitely off. Seek immediate medical attention by calling 4444 (+44 20 7589 1000) and contacting a nearby First Aid officer. Use a non-conductive lever to remove them from electrical source (e.g. a dry wooden broom handle).    **Electrical fire** – If ignition occurs but extinction is managed in a controlled manner, ensure a SALUS report is completed at the earliest opportunity. If the fire is not controllable, you must activate a fire alarm call point and evacuate. Inform Fire Safety Officers or Security of where the fire is and what it involves when they arrive at the building.  **Burns** - run site of injury under tepid water for 15 minutes if able (burn dressing available in first aid kits if location of the injury is awkward to rinse, e.g. leg) and contact a first aider. In the case of a serious burn, seek medical attention immediately.  Clear up **broken glass** using dustpan and brush, tweezers or other suitable equipment to prevent exposure to the glass then place into the appropriate waste bin (clean or contaminated glassware).  If anyone is injured while using the equipment contact a first aider.  If any **cuts or exposures** to hazardous substances, ensure affected area is held under running water for at least 15 mins and the wound is encouraged to bleed, ask for first aid assistance. If water is not available use alcohol free wipe from the First Aid Kit and dress the wound. Seek further medical attention if required.  If **crushing injury** - contact first aider immediately – use ice/cool pack (if on hand only) to reduce immediate swelling – seek medical attention if required.  (Include emergency procedures associated with the use of hazardous substances if relevant) |

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| Recommended trainings and records: |
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| List of individuals competent to demonstrate safe work practice and train others (level 1 trainers): | Names of those that have been trained and can work unsupervised (level 2) and date training completed: |
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