DEPARTMENT OF ELECTRONIC AND ELECTRICAL ENGINEERING

EQUIPMENT SOP

Ensure you have a copy of the latest Manufacturers Data Sheets for the device/s,

Completed SOP should be kept locally in Red Safety Folder and made available to all persons working in the area.

SOP Title	**Version**
Soldering using a hand Soldering iron	1
Creation Date	**Produced by**
07/04/2026	Mr Andrew Moss
Review Date	**Approved By**
07/04/2027	Mr Gerald McBrearty

Purpose
The purpose of this document is to outline the safe procedures using hand soldering equipment in the process of manufacturing electronic circuits, joining cables/connectors.

Scope
The procedure provides general instructions on how to solder components in a laboratory environment in a safe manner, using tools such as a soldering iron, desoldering pump, flux, solder, light duty hand tools and fume extraction. It does not cover the use of more specialised soldering tools or equipment such as reflow ovens, Infra-red station and microscopes.

Health and Safety precautions
Students are to be given clear and specific instructions in the proper safe handling and use of soldering equipment. Constant vigilance is required on the part of staff where soldering takes place. Soldering irons operate using mains electrical power (240V), electric shock can occur if equipment is damaged or poorly maintained. Soldering equipment operates at a high temperature (up to 400°C), burns can result on contact to the skin if used incorrectly. Potential consequences of soldering include: Thermal burns to the skin. Cuts to fingers. Inhalation of toxic fumes. Absorption chemical residue if hands not washed after use.

Materials
Metcal soldering station (MX-5200 – Duel hand iron) Solder wire (R-TECH 856874 Lead-Free contains rosin) Solder flux (MF 300 rosin free) Bofa fume extraction (V250 – duel extract) PPE (gloves, glasses) Desolder wick Desolder pump Cleaning solvent (IPA) Hand tools (scalpel, side\wire cutter, fine tweezers, wire stripper, pliers)

Standard Operating Procedure
Before use ensure the area is clean, tidy and clear of any combustible items. Visual checks must be made of the equipment for damage and has an approved/passed PAT label. (Report if damage found). Prepare the workspace for soldering job. (prep components, select correct soldering tip, wet sponge and ready hand tools). Turn on fume extraction and site the extraction nozzle. Make sure soldering iron is secure in the cradle. Turn on the soldering iron and allow to heat. Perform soldering/desolder task. Site work piece and components, cables, etc. Clean the iron tip using the wire wool and wet sponge. Apply flux to circuit/components/cables if required. Apply heat using the soldering iron to the joint. Feed in the solder wire to form a molten joint or suck/pump/wick away molten solder to desolder. Remove solder/soldering iron from the joint and allow to cool. Returning the soldering iron to the cradle/when not in use. Once complete turn of the soldering iron and allow to cool (do not leave unattended until cool). Tidy the work area, return hand tools, dispose of waste and wipe surface with paper towel/solvent cleaner. Any rosin flux residue left on the work piece is a minimum and level considered safe by manufacturer. IPA cleaner can be used to remove remnants. Wash hands using soap and water.

Othe procedures that need consideration
Some hand tools used in soldering are sharp such as wire cutters and scalpel blade which can cause cuts to the skin. PPE is advised but not mandatory, Safety glasses and nitril gloves. Do not perform gestures or move outside of the working area while holding a soldering iron. All solder and components are lead free. Liquid flux is rosin free Solder wire contains Rosin but is a no clean variant meaning rosin maybe present after use but at a safe minimal level. Work should cease if user has breathing problems due to soldering vapours and seek medical attention.

Responsibilities

Technicians

Visually inspecting area and equipment.
PAT Testing and maintaining equipment.
Keeping area tidy.
Replacing faulty parts.
Acting upon reported issues.
Booking external company for annual LEV inspections.
Maintain consumables such as solder, flux, PPE, cleaning products, etc

Students\other staff

Cleaning up the area after use.
Putting away used tools.
Reporting faulty equipment or issues.
Reporting and injuries such as burns/cuts.

Documents and References

Documents

- Soldering iron (MX-5200) see equipment datasheet
- Bofa LEV (V250) see equipment datasheet.
- LEV and PAT test information. See safety folder.
- Solder wire (R-TECH 856874). See Safety folder – COSHH & Datasheet
- Flux (MF 300). See Safety folder – COSHH & Datasheet

References\Links

HSE solder/ing
https://www.hse.gov.uk/pubns/indg248.htm
https://www.hse.gov.uk/asthma/solderers.htm
HSE Electrical safety
https://www.hse.gov.uk/electricity/index.htm
UCL EEE performing soldering
https://intranet.ee.ucl.ac.uk/facilities/teaching-lab/cop_performing_soldering.docx