Soldering Safety

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Introduction

Soldering is considered a 'hazardous activity' and therefore we need to ensure that risks to health and safety are adequately managed.

Soldering has been assessed as a *medium risk* activity – it is possible to sustain minor injuries that require first aid, but the effects are short-term. There is also a medium risk of damaging UTS property.

Therefore, it is important to outline the hazards and the steps we need to take to minimise the risk when soldering. This document contains a short description of what you must do, and not do, when soldering to ensure your safety.

1 Work Environment

- Ensure that the workspace is as clean and uncluttered as possible.
- Only one person at a time should be accessing the soldering/desoldering equipment.
- Ensure there is adequate lighting – the "Maggylamp" provides light and magnification.
- Prepare the workspace by collecting and positioning the appropriate tools for the job – e.g. the soldering station, solder, a pair of needle-nose pliers, a wire stripper, a desoldering bulb, desoldering wick (braid), a utility blade, and a third hand or a vice.
- Clear the path between the soldering station stand and the project to be soldered.
- Check that the cleaning wire (coarse brass wire wool) is not dirty or loaded with solder.
- Always clean up after yourself – there is a dustpan and brush provided. Place refuse in the bin with the RED lid.

2 Personal Protective Equipment

- Wear eye protection. Solder can spatter when soldering through-hole components, and molten solder can fly off a hot board if quickly removed from a hot plate. When trimming off leads or excess solder dross, be careful of the flyaway that could injure yourself as well as other people nearby.

3 Solder and Solder Paste

- Use lead-free solder and solder paste.
- Always wash your hands with soap and water after soldering.

4 Soldering Iron

- Familiarise yourself with the operation of the workstations and hand-pieces. Manuals are readily available on the internet, and hard-copy manuals are kept in the cupboard. If you are unsure about the operation of equipment, ask for help.
- Adjust the soldering iron to an appropriate temperature. Once the soldering iron is hot, clean the tip by thrusting it into the cleaning wire. This removes excess solder, burnt flux and other contaminants. Do not wipe the tip against the cleaning wire as this can flick molten solder onto you, others and your work. Tin the soldering tip by coating it with a thin coat of solder. This helps heat transfer between the tip and the components.
- Never touch the element or tip of the soldering iron. It is very hot (about 300 °C) and will burn!
- Use a third hand, a circuit board vice, pliers, tweezers, or clamps for holding components to avoid burns.
- Avoid touching plastic, wire insulation, or any flammable material in the working area with the soldering iron. This can damage equipment and release toxic smoke or gases.
- Always return the soldering iron to its stand when not in use. Never put it down on the workbench.
- Turn off the soldering iron when not in use.

5 Hot Plate

- Familiarise yourself with the operation of the hot plate.
- Always place the protective cover over the hot plate when not in immediate use.
- Always use pliers to place boards onto the hot plate, and to remove boards from the hot plate.
- When boards are removed from the hot plate, they should be placed on a heat conducting surface such as a metal plate that allows rapid cooling of the board. Don't place hot boards directly onto the benchtop or flammable materials such as paper.
- Hot board temperatures must be monitored remotely with an infrared thermometer.
- Boards may only be handled when all parts are below 50 °C.

6 Control of Fumes

- The visible fumes seen during soldering are formed mostly from the flux which can cause eye, throat and lung irritation, nose bleeds and headaches. Avoid breathing it by keeping your head to the side of, not above, your work. Repeated exposure can cause respiratory and skin sensitisation, and either cause or aggravate asthma.
- Position the bench top fume absorber close to your work so that it absorbs harmful fumes caused by solder and flux.

7 Cleaners

- Remove solder flux and by-products of soldering with a circuit board cleaner, also known as "flux remover". Wipe excess cleaner from the circuit with a lint-free cloth or paper towel. Dispose any paper towel in the bin with the RED lid.

8 Electrical Safety

- Do not use soldering irons that have obvious damage to the body, cable or plug.
- Check to ensure that all equipment has a valid AS3760 test tag.
- Keep the soldering station free of electrical cables to prevent damage from the heated tip.
- Do not solder “live” circuits.
- Know where the nearest Emergency Power Off button is located.

9 Fire Prevention

- Work on a fire-proof or fire resistant surface (such as felt).
- Wear fire resistant clothing (e.g. 100% cotton) that covers your arms and legs to prevent accidental burns.
- Know where your nearest fire extinguisher is and how to use it.

10 First Aid

- Immediately place any burns under cold water for 15 minutes. Do not apply any creams or ointments.
- Contact the first aid officer if the burn is deep or extensive, otherwise protect with an adhesive bandage.
- If a burn occurs, the incident must be reported via the UTS HIRO (Hazard and Incident Reporting Online) system:

  http://www.safetyandwellbeing.uts.edu.au/accidents/reporting.html

11 Personal Control

- Do not circumvent safety measures or take risks – do the job professionally.
- Start over when a soldering attempt fails. Old solder has impurities. Remove old solder completely with a desoldering bulb or tool. Clean up flux residuals. Try again.