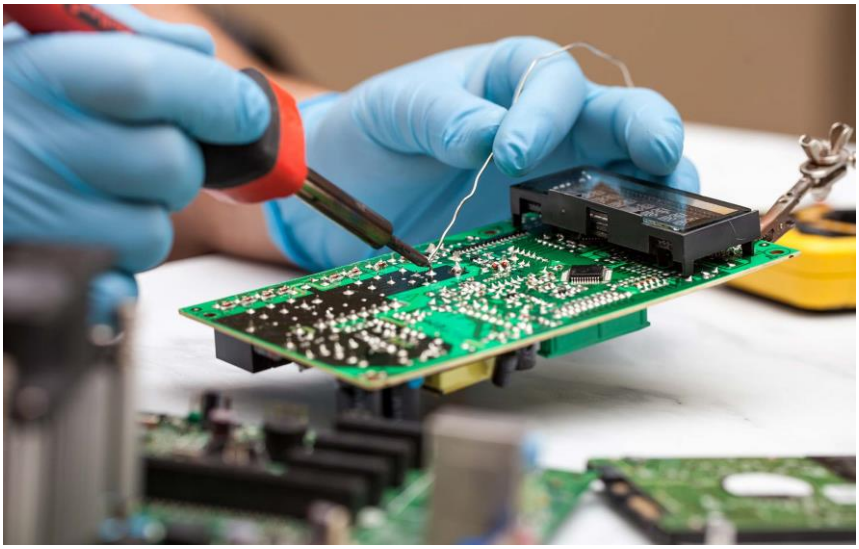
UNIVERSITY OF SUSSEX

Health and Safety

Soldering Safety Guidance



DOCUMENT HISTORY

Version	Section(s)	Date	Change details
1.0	All	Sept 24	Guidance document created.

Contents

1 PURPOSE

To provide information to those responsible for, and those that carry out, soldering activities at the university to ensure that this is done as safely as possible to protect the health and safety of those involved.

2 INTRODUCTION

Soldering activities take place throughout the university in a number of schools and professional service divisions. This document therefore provides guidance on how to ensure these activities are carried out safely. Although this guidance provides a number of points to consider when risk assessing and arranging soldering activities, schools and divisions should take this guidance and apply it in a pragmatic way in practice.

3 RESPONSIBILITIES

3.1 Principal Investigators and Line Managers

- Ensure that a risk assessment of soldering activities is undertaken and that control measures from this are implemented.
- Ensure that those required to carry out soldering activities are provided with information, instruction, training and supervision in the arrangements put in place to protect them.
- Ensure that arrangements are communicated to all those involved in soldering activities and that changes in these arrangements are notified to all those concerned.
- Ensure that all those involved in soldering activities are aware of when and how to report any accidents or near misses relating to their soldering activities.
- Ensure that procedures are in place for dealing with foreseeable emergencies that may arise from soldering activities.
- Monitor those involved in soldering activities to ensure that control measures are followed and are effective.
- Refer those involved in regular soldering activities to Occupational Health for health surveillance and take action if required upon the results.

3.2 All staff

- Ensure that they follow risk assessments and procedures put in place to keep them safe whilst soldering.
- Ensure that they follow instruction and training provided to them.
- Ensure that students under their supervision follow the control measures put in place to protect them.
- Tell their supervisor if controls are not working effectively and require review.
- Report accidents and near misses related to soldering activities.
- Attend health surveillance appointments as requested.

4 THINGS TO CONSIDER WHEN PLANNING FOR SOLDERING ACTIVITIES

4.1 Risk assessment

A general risk assessment should be carried out covering the project, room or wider activity that soldering will be part of. From this a COSHH risk assessment covering the soldering activity should be carried out.

4.2 Soldering Iron

- Never touch the element of the soldering iron, it can reach up to 400°C.
- Hold wiring and other items that are to be heated with tweezers or clamps to hold them in place, not your hands. This will reduce the risk of burns to your skin.
- Where possible, wear heat protective gloves, however keep in mind that these may affect your dexterity making it more difficult to hold the soldering iron.
- Use a sponge to clean as you go, ensuring it is kept wet throughout the activity.
- Always use a soldering iron stand and ensure you return it to its stand when it is not in use. Never leave a soldering iron directly on a workbench.
- When you have finished your work, always switch off and unplug the soldering iron.

4.3 Solder, flux and cleaners

4.3.1 General

- Check the Safety Data Sheet (SDS) from the suppliers of any substances used whilst soldering e.g. solder, flux cleaning substances etc.
- Always use suitable eye protection as directed by the substance's SDS as solder can 'spit' when it is heated.
- Some solders contain rosin and lead, which are hazardous to health. You should use rosin-free and lead-free solder wherever possible.
- Cleaning solvents should be stored in sealed bottles when not in use to reduce the chance of them evaporating into the air. Ideally they should be stored in clearly labelled dispensing bottles.
- Whatever types of substances you use when soldering, always wash your hands with soap and water when you have finished. Even if gloves are worn, these should not be treated as an alternative to handwashing.

4.3.2 Lead exposure

Lead can cause chronic health effects and therefore lead based solder and flux should be avoided unless justified through a COSHH risk assessment. Exposure will primarily be through accidental ingestion from the skin, for example, by not washing your hands after soldering and eating straight afterwards.

If you have a justified reason for using lead based solder and/or flux, please contact healthsafety@sussex.ac.uk to discuss further as there may be other points you need to consider under the Control of Lead at Work Regulations 2002.

4.3.3 Rosin exposure

Rosin, also known as colophony or ersin, is a resin contained in solder flux. Flux generates the visible white fumes seen during soldering. Exposure to rosin can cause eye, throat and lung irritation, nose bleeds and headaches. Repeated exposure can cause respiratory and skin sensitisation, causing or aggravating asthma.

4.4 Controlling soldering fumes

- Use of rosin or lead based solder and/or flux should be avoided wherever possible unless there is no effective alternative. The justification for their use must be documented within the COSHH risk assessment for the activity.
- If use of rosin or lead based solder and/or flux is justified then fume extraction through use of Local Exhaust Ventilation (LEV) should be in place through either the preferred method of an enclosed hood, or if this is not feasible, tip extraction. In both cases these should vent to outside. If tip extraction is to be used with a filter box, the box should have both an activated carbon filter and a HEPA filter.
- Where rosin-free and lead-free solder and/or flux is to be used, a benchtop extract filter is sufficient as long as the room it is to be used in is well ventilated, for example, by opening windows

whilst soldering or through use of general mechanical ventilation.

- Positioning of benchtop extract filters is key to ensuring they draw fume into them sufficiently. If in doubt, contact healthsafety@sussex.ac.uk. A smoke test using a smoke pen can be carried out to ensure the filter position is suitable for drawing in the solder fume.
- Mechanical LEV extraction must be subject to test and inspection by a competent engineer at least every 14 months and certificates should be kept for 5 years.
- Tip extractor filter boxes should also be subject to test and inspection at least every 14 months with certificates being kept for 5 years. Filters should also be changed regularly as directed by the manufacturer, though this may also be advised through the regular test and inspection program.
- Benchtop extractors should have their filters changed at regular intervals as directed by the manufacturer and should be subject to regular portable appliance testing (PAT) and visual inspection.
- Whichever extraction system is used, if it is found not to be working or not working effectively, it should be taken out of use until it can be repaired or replaced.

4.5 Health Surveillance

- Anyone who is required to solder on a frequent basis (i.e. more than once a week), should be referred to Occupational Health for regular health surveillance.
- Anyone that has a justified use for rosin or lead containing solder and/or flux must be referred to Occupational Health for regular health surveillance.

4.6 Training and supervision

- Those responsible for staff and students who carry out soldering activities should inform them of the risks from soldering.
- Those responsible should ensure that controls and in place, working effectively and check that they are being followed.
- Those responsible should ensure that suitable training is provided to those involved in soldering activities.

4.7 Electrical safety

- Do not use soldering irons that have obvious signs of damage to the body, cable or plug.
- All soldering irons should have been portable appliance tested (PAT) in line with the school or division's testing frequency. If not, the soldering iron should not be used until it has passed.
- Keep soldering stations free of electrical cables that could become damaged by the heated solder tip.
- If there is the possibility of a short circuit, use a grounded outlet and grounding prong.

4.8 Fire prevention

- Work on a fire-proof or fire-resistant surface.
- Wear fire resistant clothing that covers your arms and legs to prevent accidental burns.
- Be aware of local fire evacuation arrangements and emergency procedures covering foreseeable emergencies involving soldering.
- To avoid unnecessary disruption to work, check for overhead smoke detection in the immediate vicinity of the work area. Relocate or re-position your work if necessary.
- If you plan to use a handheld butane torch or similar for soldering, please contact healthsafety@sussex.ac.uk before going ahead as this will introduce hot works and will therefore require further consideration.

4.9 First Aid

- As with any dry burn (not chemical burn), run the body part under a cold water tap for 10-15minutes.
- Request assistance from a local first aider or the Medical Response Team (MRT) if a more significant burn is sustained.

4.10 Waste

- Waste solder should be collected in a lidded container and the lid replaced when not in use.
- The container should be labelled appropriately and disposed of as hazardous waste.
- Used solder sponges and contaminated rags should be placed in a sealable bag for disposal as hazardous waste.

5 REFERENCES

Sources of information include:

- The Control of Substances Hazardous to Health Regulations 2002. Approved Code of Practice and guidance, L5 (Sixth edition) https://www.hse.gov.uk/pubns/priced/l5.pdf
- Working with substances hazardous to health: A brief guide to COSHH https://www.hse.gov.uk/pubns/indg136.htm

6 QUICK REFERENCE GUIDE