Activity being assessed:	Construction of PCBs including hand soldering of components with soldering iron and use of hand tools.			Reference no:	EEE-GRA-001
Location:	EEE locations - George Porter F13, Nanoscience, Portobello C34 lab and Mechanical Workshop	Assessment date:	September 2018	Review period:	Annual – next review September 2019

Significant Hazards What could cause harm?	**What harm might occur, and to whom?** Remember to consider all affected groups	**Existing control measures**	**Additional control measures** What can we do / use / put in place to further reduce the risks to an acceptable level?	**Residual Risk**		
				L	**S**	**RR**
Contact with hot soldering iron/work piece	Burns to hands/fingers/other body parts Those affected: technical staff; research staff; postgraduates; undergraduates; visitors	Use tweezers/pliers or a vice to hold work piece where possible. Always assume that the soldering iron is hot and place back in its holder when not being used. Switch the iron off when it is not in use and replace in holder. First aid box available locally for treatment of minor burns. First aiders contact details listed.		**1**	**2**	**2 Low**
Combustible items coming in to contact with hot soldering iron.	Fire, burns, inhalation of smoke/fumes. Those affected: technical staff; research staff; postgraduates; undergraduates; visitors; all building users	Keep work area tidy at all times. Ensure that combustible/flammable items (e.g. paper, clothing, flammable substances) are stored well away from the hot soldering iron/work area. Check the work area is in a safe state when work has been completed. Switch soldering iron off after use.		**1**	**2**	**2 Low**

L = likelihood, S = severity, RR = risk rating

Potential for solder or flux to spit	Burns to the skin or solder/flux spit to eyes. Those affected: technical staff; research staff; postgraduates; undergraduates; visitors	Wear protective glasses (EN166) when soldering. Avoid working close to face.	Cover exposed skin with clothing or lab coat if available.	**1**	**2**	**2 Low**
Use of hand tools e.g. cutters, pliers, blades, screwdrivers etc.	Cuts, nips and pinches to hands and fingers. Injury to eyes from cutting component legs incorrectly. Those affected: technical staff; research staff; postgraduates; undergraduates; visitors	Wear protective glasses (EN166) When trimming component legs, point towards the floor or into a waste container/bin. Visually inspect hand tools prior to use. If tools are damaged, do not use and contact technical staff for replacement.	Ensure that tools are stored safely and appropriately when not in use. If user is unsure of how to use tools safely, contact supervisor or technical staff for training. Seek advice from technical staff if necessary. Lab coat may be worn if required to protect skin and clothing.	**1**	**2**	**2 Low**
Solder fumes	Eye and nose irritation, damage to the air passages and/or respiratory irritation Existing health problems, i.e. asthma, COPD may become worse during soldering. Those affected:	Use fume extraction and ensure adequate ventilation when soldering. If soldering activites are likely to take longer than 15 continuous minutes, speak to supervisor/technical staff to discuss further controls.	For soldering activities, refer to CoSHH form. Inform supervisor of any health conditions	**1**	**2**	**2 Low**

	technical staff; research staff; postgraduates; undergraduates; visitors	Check that the bench top fume extractor unit is operating correctly before soldering. Check that the filter is not clogged. Filter colour should be black. If grey in colour, contact local technical staff to fit replacement filter. Lead free solder supplied and available from the EEE Stores. Tin/lead solder must not be used.	Technical staff check on a daily basis and replace filters when required. If an extraction unit is not available, contact technical staff who will provide.			
Electrical	Risk of electric shock for damaged or poorly maintained equipment. Those affected: technical staff; research staff; postgraduates; undergraduates; visitors	Ensure that the soldering iron has been PAT tested and is in date (check label). Visually inspect the soldering iron and cable before use and report defects to technical staff immediately. Label "Faulty: Do not use" and remove from service. Replace iron in its holder when not in use to prevent damage to cables etc.	If PAT is not in date, contact technical staff immediately. Do not use.	**1**	**5**	**5 Low**
Physical	Upper limb discomfort, tiredness, loss of concentration may occur when soldering for long periods of time e.g. more than 15 minutes. Those affected: technical staff; research staff; postgraduates; undergraduates; visitors	Adjustable height seating provided. Ensure that a break or change of activity is made for at least 5 minutes every hour. Organise the work bench/area in a way that provides easy access to all items needed for the construction of the equipment.	Make sure your clothes and laboratory coat (if worn) are not restricting movement.	**1**	**2**	**2 Low**

Fire	Faulty equipment, poorly constructed electrical circuits or component failure may lead to short circuit, causing a spark; skin burns. Leaving hot soldering iron/workpiece in contact with combustible items may lead to fire Those affected: technical staff; research staff; postgraduates; undergraduates; visitors	Always use a damp sponge for wiping the soldering irons tips (not paper towels). A competent person e.g. supervisor/technical staff should check circuits. Visually inspect all "in-house" constructed circuits for short circuits, incorrectly orientated components e.g. capacitors, batteries etc., before connecting to a power supply. Local lab induction should be undertaken with technical staff before access to the labs is permitted. Induction will cover emergency evacuation procedures.. Local lab inductions undertaken in their research group.	Contact technical staff if sponge is worn or missing Automatic fire detection fitted in all university buildings. Maintained and tested on a weekly basis by Estates & Facilities Management (EFM). Annual fire drills undertaken in October each year. All staff, PG and MSc students to have completed fire training within the last year. All new staff and students must attend a health & safety induction with the Departmental Safety Officer and should be aware of emergency procedures for evacuation and know how to raise the alarm. Fire extinguishers are provided in all buildings.	**1**	**5**	**5 Low**

L = likelihood, S = severity, RR = risk rating

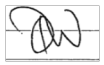
			Do not use unless trained or feel confident that the fire can be tackled. Use CO2 or foam. Do not use water where electricity is present.			

Likelihood	Guide Description
5	Very likely/imminent – certain to happen
4	Probable – a strong possibility of it happening
3	Possible – it may have happened before
2	Unlikely - could happen but unusual
1	Rare – highly unlikely to occur

Severity	Guide Description
5	Catastrophic - fatality, catastrophic damage
4	Major – significant injury or property damage, hospitalisation
3	Moderate - injury requiring further treatment, lost time
2	Minor - first aid injury, no lost time
1	Very minor – insignificant injury

Likelihood (L)	Severity (S)				
	1	**2**	**3**	**4**	**5**
5	5	10	15	20	25
4	4	8	12	16	20
3	3	6	9	12	15
2	2	4	6	8	10
1	1	2	3	4	5

Risk Rating (RR)	Action
High Risk	Stop the task/activity until controls can be put into place to reduce the risk to an acceptable level
Medium Risk	Determine if further safety precautions are required to reduce risk to as low as is reasonably practicable
Low Risk	No further action, keep under review

Signature of Risk Assessor		Name / job title:	Dianne Webster (DSO)
Details of any persons consulted	Luke Marsden (DAM); Ian Wraith (TTL); Luke Seed; Jon Rigelsford; Ian Ross; Eddie Ball		
Signed off by:	Luke Marsden 23/10/18		

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