

Electronic / Mechanical Workshop Pathfoot B27

This space is used as a workshop for teaching and research. There is a wide range of general electronic and mechanical equipment.

Health and Safety information

Emergency Procedure: there is an emergency procedure notice on the wall next to the door. Please familiarise yourself with this procedure and your location within Pathfoot building.

Defibrillator: The automatic defibrillator is situated on the wall by Pathfoot reception.

Fire: There is a fire extinguisher next to the exit for use in the event of a lab fire. If the fire alarm sounds, all workshop users must leave the workshop, leaving all bags and belongings behind, and congregate at the meeting point in the car park outside the main entrance.

Out of hours and lone working: University policy (refer to safety hand book on guidance on safety in research located on the Occupational Risk & Environmental sustainability Home Page). All lab users must act responsibly and safely while working in the sports laboratories.

First Aid box: By the door.

First Aiders: A list of first aiders is at the entrance to the Pathfoot building.

Reporting accidents and incidents: Minor injuries are reported to a departmental First Aider or the Safety Officer and in case of emergencies follow the emergency control procedure to arrange for emergency service response.

Risk assessments, Standard operating procedures, Safety data sheets and Manufacturer's manuals: are held on the Health and Safety Information web pages and next to the relevant equipment. <https://sportsciencesafety.stir.ac.uk/>

Workshop Rules

Note: Wash hands before commencing work and again before leaving the workshop

- You must attend a workshop induction before you start work
- Always wear personal protective equipment as required
- Safe operating procedures (SOPs) are available in the holder by the door. Your supervisor may provide additional SOPs. Pay attention to pre use equipment checks.
- Manufacturers manuals are also available in the holder by the door
- Waste disposal: Normal (Black bag), any hazardous waste should be disposed of properly by coordinating with the building hazardous chemicals officer Fiona Strachan.

Risk assessment / Control Procedure

Faculty	Health Science and Sport		
Head of Faculty	Professor Jayne Donaldson		
Safety Officer	Doctor Nidia Rodriguez-Sanchez		
Completed by	Chris Grigson		
Date	20/05/2020		
Change log	Version 1.1	07 Sept 2022	Added change log
	Version 1.2	08/06/2023	Removed Covid 19 section Updated Lone working
Reviewed	08/06/2023	Next review due	08/2023

The activity

Activity	Use of workshop space
Equipment used	See hazards
Categories of people involved	Staff
Location of activity	Pathfoot B27
Duration of activity	Continual
Frequency of activity	Continual
Legal compliance to standards and regulations required	PUWER, HASAWA, MHSWR, COSSH

Hazard categories

Ethical approval requires hazards to be ascribed to a category. Use the following categories when describing the hazards in the table on the next page. Mark each category that applies clearly below.

<p>F1. Working in a dangerous area: e.g. high crime area, area of civil/political unrest, psychiatric unit or prison. Check with the Foreign and Commonwealth Office Travel Website and with University Insurance Officer prior to travel overseas. Discuss risk assessment/control measures with the management of any institution involved or with local police/law enforcement.</p> <p>- Take into account the possibility of psychological injury (trauma/PTSD and stress) as well as physical injury.</p> <p>- Give contact details and measures to be taken in case of emergency.</p>	<p>Yes</p> <p>No</p>
<p>F2. Working in an isolated geographical area: An isolated geographical area can include city parks, urban brownfield site as well as a remote hillside or a valley.</p> <p>- Take into account physical isolation through distance, screening effect of shrubbery/woodland or lack of mobile phone signal, etc. rather than just distance from “civilisation”.</p> <p>- Give contact details and measures in case of emergency.</p>	<p>Yes</p> <p>No</p>
<p>F3. Lone working: Lone working can include unaccompanied visits to research subjects in their own home, etc., as well as working alone in the field. Working alone in an office environment with access to a phone is not usually categorised as “lone working”.</p> <p>- Give contact details and measures in case of emergency</p>	<p>Yes</p> <p>No</p>
<p>F4. Working with equipment: Please detail the risks associated with this</p> <p>- Give the manufacturer and model</p> <p>-Take into account how the equipment and users are affected by the location</p>	<p>Yes</p> <p>No</p>
<p>F5. Environmental hazards: e.g. extremes of weather (temperature, wind speed, ice, etc.), rough terrain, animals, plants, earthquake, water quality, contaminated land, derelict/unstable buildings are examples of factors to be considered here.</p>	<p>Yes</p> <p>No</p>
<p>F6. Chemical & biological hazards: e.g. laboratory and other chemicals and mixtures (eg, oils, acids, chemical wastes (pre-existing or generated during the project), detergents, crop spraying or fumigation, diseases (of humans, animals or plants).</p> <p>- If this section is applicable, a full COSHH risk assessment will always be required.</p>	<p>Yes</p> <p>No</p>
<p>F8. Emotional risks: e.g. sensitive research. This can include many areas that can be emotional triggers – research with or regarding children, animals, conflict (war, terrorism, holocaust studies, etc.), and natural disasters are examples.</p> <p>- The predisposition of the individuals should always be taken into account as an individual’s emotional triggers depend very much upon that individual’s personal/family history.</p>	<p>Yes</p> <p>No</p>

The Hazards

*Details under relevant heading in appendix

All hazards other than category F.6 (Chemical and biological hazards) should go here

Faculty / Service Area:		Health Science and Sport		Location:		Pathfoot B27			
Description of work task / equipment /area being assessed:									
Use of workshop									
What are the hazards?	Hazard category	Who might be harmed and how?	What are you already doing to control the risks?	*Risk rating	What additional controls (if any) are required to reduce the risks?	*Risk rating	Action by who?	Action by when?	Date of completion
Use of hand tools for general fabrication	F4	Operator, others a. Poorly maintained and incorrect tools, and poor technique lead to: Crushing, cuts, bruises, burns and abrasion injuries b. Repetitive movement and poor technique leads to Musculoskeletal problems	a. i) Experience, instruction and ongoing training ii) Tool inspection and maintenance iii) PPE Gloves, Eye protection, safety shoes, PFP3 Mask and overall when required iv) Keep tools and workpiece away from others while working b. i) Plan work to avoid long periods of repetitive work, take breaks		Monthly inspection Pre use checks		Competent person	Continual	

		c. Overheating of tools leads to burns and ignition hazard	ii) Adopt good posture, ensure workpiece securely mounted at appropriate height c. i) Avoid overheating of tools bits and power tools ii) Keep activities that might generate sparks away from flammable material iii) Clear flammable / hazardous material and swarf from work area						
Soldering	F4	Operator, others in immediate vicinity a. See RA27	a. RA27		Monthly inspection Pre use checks		Competent person	Continual	
Use of machinery	F4	Operator, others in immediate vicinity a. See RA23 3d Printer RA24 Mill RA25 Formit RA26 Pillar drill	a. RA23,24,25,26 Sops		Monthly inspection Pre use checks		Competent person	Continual	
Hazardous waste	F4	Operator, all a. Chemical burns b.	a.						

<p>Lone working</p>	<p>F3</p>	<p>Operator</p> <ul style="list-style-type: none"> a. Increased exposure to hazards due to lack of assistance from co-workers b. Stress and fatigue lead to poor health and function c. Increased risk of harm associated with isolation in case of an incident 	<p>See University policy</p> <p>Operator not to work alone or out of hours unless necessary</p> <ul style="list-style-type: none"> a. Operator instructed to take extra care and be aware that they are at a greater risk. Also not to perform hazardous activities. b. Lone workers in regular contact with their supervisors or line managers who monitor stress and wellbeing. c. Lone workers instructed to inform other available and competent staff of their schedule, location and contact information. For longer periods of work or more hazardous activities, periodic check – ins are required. Emergency procedures, first aid kit and telephone available in each room 	<p>3</p>				
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			Instruction given in SOPs and induction						
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COSHH Section

Anything in category F.6 (Chemical and biological hazards) should go here

*Details under relevant heading in appendix

Manufacturers COSHH data sheets are required for all chemical hazards

The Substance What are the hazards and *classification? *Route of exposure	*WEL mg/m3	Who might be harmed and how?	What are you already doing to control the risks?	*Risk rating	What additional controls (if any) are required to reduce the risks?	*Risk rating	Action by who?	Action by when?	Date of completion	Health monitoring
General precautions WD40 Ethanol Propanol Acetone Solder Contact cleaner Contact adhesive Super glue Hot melt glue Gorilla Glue Cutting fluid		Investigators, Students Skin irritation, Eye irritation	Provide Eye goggles, washing up gloves Manufacturer safety data sheet Instruction on PPE during induction and in SOP Instruction – In case of contact with eyes rinse immediately with plenty of water for least 5 minutes.	2						No

The Substance What are the hazards and *classification? *Route of exposure	*WEL mg/m3	Who might be harmed and how?	What are you already doing to control the risks?	*Risk rating	What additional controls (if any) are required to reduce the risks?	*Risk rating	Action by who?	Action by when?	Date of completion	Health monitoring
Acetic acid			In case of contact with skin, wash affected area thoroughly with water.							
WD40	TWA: 800									
Ethanol	TWA: 1920									
Propanol	TWA: 400									
Acetone	TWA: 500									
Solder leaded	See	Soldering	RA							
Solder lead free	See	Soldering	RA							
Contact cleaner	9.4 %									

The Substance What are the hazards and *classification? *Route of exposure	*WEL mg/m3	Who might be harmed and how?	What are you already doing to control the risks?	*Risk rating	What additional controls (if any) are required to reduce the risks?	*Risk rating	Action by who?	Action by when?	Date of completion	Health monitoring
	0.748 g/cm3									
Contact adhesive	Acetone TWA: 750ppm STEL: 1500ppm Methyl Ethyl Ketone TWA: 200ppm STEL: 300ppm									
Super glue										
Hot melt glue										
Gorilla glue										
Cutting fluid										

Append supplier safety data sheets for all substances here:



LeadFreeSolderSDS.pdf



LeadedSolderSDS.pdf



servisol.pdf



wd40.pdf



ct90CuttingFluid.pdf



gorillaGlue.pdf



hotMeltGlue.pdf



propanol.pdf



acetone.pdf



Bostik.pdf



cyanoAcrylateSuper
Glue.pdf



ethanol.pdf

Appendix

Risk ratings

Risk ratings are a way of evaluating risk. A risk is defined as the likelihood that a hazard will cause harm combined with the severity of the harm. We can apply a value to a risk by using the following formula and matrix.

$$\text{Risk} = \text{Likelihood} \times \text{Severity}$$

Likelihood	Severity				
	Trivial	Minor Injury	Over 3 Day Injury	Major Injury	Incapacity or Death
Highly Unlikely	1	2	3	4	5
Unlikely	2	4	6	8	10
Possible	3	6	9	12	15
Probable	4	8	12	16	20
Certain	5	10	15	20	25

Risks can then be prioritised by their rating

- 1 Urgent Action - (Risk 15 - 25)
- 2 High Priority - (Risk 10 - 12)
- 3 Medium Priority - (Risk 5 - 9)
- 4 Low Priority - (Risk 2 - 4)
- 5 Very Low Priority - No Action Required (Risk 1)

This gives the leads to the residual risk: Low (Risk 1-4), Medium (Risk 5-9), or High (Risk 10 to 25). If the risks are acceptable (Low Risk) then you may feel able to proceed without further action. If the risk is Medium or High then you must do something to bring the risk to a "tolerable" level.

Controls measures

Control measures are actions that reduce the risk to a tolerable level. Controls should be chosen to reduce the severity and or likelihood of a risk. Controls should be applied in an order of preference or Hierarchy of Controls:

1. Elimination – Remove the hazard
2. Substitution – Exchange the risk for something less likely or severe
3. Physical Controls – separation or isolation, prevent contact with the hazard
4. Administrative controls - safe operating procedures to ensure safe interaction with hazard
5. Information, instruction, training & supervision – warn people of the hazard and tell or show them how, or help them to deal with it.
6. Personal Protective Equipment – dress people to reduce severity of harm

COSSH section

The Control of Substances Hazardous to Health Regulations 2002 require additional specific risk assessment for hazardous substances. Fill in the COSHH section for any of the substances identified under hazard category F.6 . Control is adequate when the risk of harm is 'as low as is reasonably practicable'. This means you need to demonstrate that:

1. All control measures are in good working order.
2. Exposure is below the Workplace Exposure Limit, where one exists.
3. Exposure to substances that cause cancer, asthma or genetic damage is reduced to as low a level as possible.

“A brief guide to COSHH”: <https://www.hse.gov.uk/pubns/indg136.htm>

Workplace exposure limits (WEL)

There is a maximum exposure to hazardous substances defined by law. These workplace exposure limits are given in the following document.

“EH40/2005 Workplace exposure limits”: <https://www.hse.gov.uk/pubns/priced/eh40.pdf>

COSHH Hazard classifications

This information should be given on the exterior of the container and on the COSHH data sheet supplied with the hazardous substance.

- Very Toxic
- Toxic
- Corrosive
- Harmful
- Irritant
- Sensitiser
- Dust
- Teratogenic
- Carcinogen or suspected carcinogen
- Microorganism
- Possible long term effects

COSHH Routes of exposure

Routes of exposure are the different ways hazardous substances interact with the body. There may be more than one route.

- Contact damage to skin or eyes
- Injection
- Absorption through skin
- Ingestion
- Inhalation

COSHH Supplier Safety data sheets

Attach the supplier safety data sheet to the risk assessment for each substance covered.

Safe operating procedures

The faculty provides safe operating procedures for many activities these can be found on the health and safety web pages and in the folders located near any equipment they apply to. The activity you are planning may require an additional procedure to be written as a control. Contact the safety officer for help with this as they may be able to identify similar activities the procedure should apply to. They will also be able to advise on a suitable format and wording.

Pre operation equipment checks

Pre operation checks are detailed in operating procedures found on the health and safety web pages and in the folders located near any equipment they apply to. Fill in the form provided each time you use the machine. Report any issues you encounter in your check and leave a note on the machine. Do not be tempted to skip pre operation checks. Faulty machinery can cause injury.

Resources, instruction, information, supervision and training

In addition to the resources mentioned elsewhere. Manufacturer user manuals are available from the health and safety webpages <https://sportsiencesafety.stir.ac.uk> and in the folders by the equipment. Training and supervision are arranged as part of the laboratory induction. Remember, you must not work in any laboratory without obtaining authorisation for the activities you wish to undertake as part of an induction. Inductions should be repeated on a regular basis as indicated on your induction record. If further instruction, training or supervision is required, please contact the person in charge of the laboratory.

Records, reporting faults

Every time you use a piece of equipment you should fill in the use form in the folder located nearby and note any faults you experience. This is important as adequate maintenance requires monitoring and maintenance periods are determined by the amount of use.

Where does this all come from?

As part of your University induction and regular training you should have taken a set of compulsory courses

<https://www.stir.ac.uk/about/professional-services/estates-and-campus-services/safety-environment-and-continuity/safety/induction-courses/>

The University has further information available on their health and safety pages

<https://www.stir.ac.uk/about/professional-services/estates-and-campus-services/safety-environment-and-continuity/safety/>

The Sport Science health and safety pages are here

<https://sportsiencesafety.stir.ac.uk>

Employers, employees and people who own buildings have a legal duty to their own safety and the safety of any others who may be affected by their activities. This mainly comes from the Health and Safety at Work act 1974 (HASAWA) and the Management of Health and Safety at Work Regulations 1999 (MHSWR). Substances used in the workplace must be used in accordance with The Control of Substances Hazardous to Health Regulations 2004 (COSHH). Work equipment must be suitable, safe and well maintained in accordance with The Provision of Work Equipment Regulations (PUWER). Further regulations apply to machinery. Machinery is a special category of work equipment which usually incorporates a motor. The legal requirements are summarised in guidance provided by the Health and Safety Executive. The guidance is much easier to read and can be found on the HSE web site.