

Appendix 2. Detailed guidance for specific work equipment.

2A. Personal Protective Equipment (PPE)

The use of PPE should only be considered a last line of safety when other physical guards and controls cannot be implemented.

Suitability

When choosing an item of PPE consideration should be given to:

- The task and risks for which protection is needed;
- The physical effort required for the task and how long the task lasts;
- Requirements for visibility and communication;
- The environment the task takes place in; and
- The person – consider their health and any ergonomic effects;

Those carrying out the task should be consulted and involved in the selection of PPE.

If more than one item of PPE needs to be worn, the equipment must be compatible (not interfere with other PPE) and continue to be effective against the risks in question.

Maintenance

PPE should be maintained in working order and in good repair. It should be:

- Examined to check for faults and damage;
- Tested if necessary to ensure it is operating as intended;
- Cleaned – and disinfected if appropriate; and
- Repaired or replaced if damaged.

Storage

PPE should be stored to prevent: damage, contamination by dirt and other substances, and loss.

Type Specific PPE Requirements			
Category	Types available	Hazards	Specific Requirements
Head Protection	Industrial safety helmets; bump caps	Low level fixed objects (pipework, scaffold etc); transport activities; construction related work (falling objects).	Replace: <ul style="list-style-type: none"> • After a significant impact; • If deeply scratched or worn; • If the harness is damaged; • If more than five years old. Store out of direct sunlight
Eye and Face	Safety spectacles;	Liquid or chemical splash; ejection of	Ensure the eye/face protection fits the user well
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Protection	goggles; face shields	material when working with tools; Dust, gas or liquid mist from machinery or during cleaning; radiant heat during welding; Laser radiation	<p>and does not fall off easily.</p> <p>Store in a protective case.</p> <p>Laser eyewear should ideally be enclosed to avoid beam penetration (this may not be possible for all types).</p> <p>Consider misting and fogging of eyewear when selecting.</p>
Hand and Arm Protection	Gloves – hand only; gloves with a cuff; gauntlets; sleeving/arm protection.	Handling sharp and pointed objects; cold weather; chemical handling; handling hot objects; cryogenics; work involving radioactive materials	<p>Ensure the wearer is not allergic to, or sensitised by the glove material.</p> <p>Ensure glove users are instructed as to how to handle and remove gloves carefully to avoid contamination of the hands and the inside of the glove.</p> <p>For chemical handling do not use for longer than the recommended breakthrough time.</p>
Protective Clothing	Separates; aprons; overalls, coveralls and body suits.	Working with chemicals; cuts and hazards working with machinery/knives etc.; electrical hazards; electrostatic hazards; cold work; hot work; work in wet areas	<p>Store used/contaminated clothing separately from clean clothing.</p> <p>Clean clothing according to the manufacturer's instructions.</p> <p>Do not wear loose protective clothing near moving machinery.</p>
Foot Protection	Safety boots or shoes (protective toe caps); wellington boots; clogs; other task specific footwear	Falling objects; Sharp Objects piercing the shoe; Slips/Trips/Falls; Hot or Cold conditions; Electrical hazards; Explosive atmospheres; Chemical work; wet work	<p>Comfort is a significant issue. Footwear should be flexible, wet resistant and absorb perspiration. Cushioned soles will make standing more comfortable.</p>
Personal Fall Protections	Work-restraint system; work-positioning system; rope-access system;	Fall from height.	<p>The following should be considered when selecting equipment:</p> <ul style="list-style-type: none"> • Maximum decent height and load;

	rescue system; fall-arrest systems		<ul style="list-style-type: none"> • Safe and secure anchor points; • Type and number of ropes and lanyards; • Specification of ascender/descender devices; • Fall recovery system. <p>Fall protection equipment should be inspected before each use by the user.</p> <p>It should also undergo a statutory inspection every six months.</p> <p>Fall protection equipment that has been used may need to be disposed of – check with the manufacturer.</p>
Hearing Protection	Ear plugs; ear muffs	Noise hazards – noise level and frequency (ies)	<p>Ear Plugs should only be used for short term protection (less than one hour).</p> <p>Ear Muffs can be helmet or head band mounted; and can have communication equipment built in.</p>
Respiratory Protective Equipment (RPE)	Respirators (filter workplace air); breathing apparatus (independent air supply); Nuisance dust masks	Noxious atmospheres; dusty environments; work involving radioactive open sources/materials	<p>First Time users of RPE should inform SHE Group of their work using such protective equipment. Those working with radioactive materials should ensure they have spoken to the RPA about the work.</p> <p>Users should make sure they have the correct RPE and associated filters for the required use.</p> <p>Users of RPE should undergo fit testing to ensure they get the correct size face piece before first use. This should be requested from the supplier.</p> <p>Nuisance dusts masks can only be considered suitable</p>

			<p>for use as PPE if marked as “FFP1, FFP2, or FFP3”. These indicate that the mask contains a filtering face piece.</p> <p>Users of RPE require basic training from the supplier or an experienced user to enable them to use the RPE effectively.</p>
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2B. Ladders, stepladders and kick stools

Ladders and stepladders

When to use:

Ladders or stepladders should only be used if:

- The task does not require working in the same high point for more than 30 minutes;
- The maximum height of any work area is 5m (this means the operatives head may be slightly higher than 5m during the work);
- A handhold is available on the ladder; and
- Three points of contact can be maintained at the working position while undertaking the task.



Figure 1a Incorrect
- overreaching and not
maintaining three points
of contact



Figure 1b Correct - user
maintaining three points
of contact

Selection and use:

The following requirements apply to all ladder use:

- Consideration should be given to the type of work involved – metal ladders should not be used for electrical works;
- Domestic Ladders should NOT be used – all new ladders must meet current BS EN131 or existing ladders the previous UK Class 1 or EN131 standards. All ladders and stepladders must be marked with their appropriate standard;
- Access ladders for scaffold must be secured at the top and another point;
- Unsecured ladders must be footed by a person or ladder mate; and
- Distractions should, if at all possible, be avoided by those working on or footing a ladder (for example mobile phones should not be answered etc.).

Maintenance:

- The treads and feet of ladders should be kept clean to prevent slips during use;
- Broken feet can be repaired/replaced (if parts are available); and
- If a ladder has a damaged rail or treads it should be removed from service and disposed of.

Storage:

- Ladders should be removed from the work area following the task, and stored in a clean and dry location in a way to minimise the risk of possible damage from other objects and area users.

Registration and inspection:

- Ladders should be registered with the appropriate departmental ladder inspector. SHE Group can advise who this is.
- The appropriate person should record:
 - Unique departmental identification number;
 - Type of ladder;
 - Size; and
 - Storage location.
- The unique identification number provided should be indelibly marked on the ladder;
- In addition to regular inspection by the user, all ladders should be checked at regular intervals (at least annually) by a competent Ladder Inspector, appointed by SHE Group.
- All registered ladders should have a 'scaf-tag' attached to them for inspection purposes. This is to enable all users to clearly see if a ladder is in date or not prior to use.

Kick stools

Selection and use:

The following requirements apply to use of kick stools:

- Kick stools should only be used for low risk tasks of very short duration where a stepladder would not be practical e.g. to reach a book on a high shelf;
- Inspect the kick stool for damage prior to every use;
- Do not overreach or stretch whilst using the kick stool – this could result in a loss of balance. If you can't reach the object comfortably, alternative access equipment, such as a stepladder, should be used;
- The kick stool needs to be used in such a way that it is prevented from slipping on the surface;
- The surface must be level and clear of contamination (e.g. oils, greases) to allow the kick stool to keep good contact with the floor;
- Any items that are carried / handled should be relatively small and lightweight; and
- Keep both feet on the kick stool at all times.

Maintenance:

- Check kick stools regularly to ensure they are in good condition:
 - Check all the wheels are present and rotate freely;
 - Check the rubber ring on the base is fixed in position;
 - Check the rubber surfaces on the bottom and top step are free from contamination;
 - Check for cracks or other signs of damage; and
 - Check the kick stool engages when you stand on it.
- If damage is found, the kick stool should be removed from service and disposed of.

Registration and inspection:

- Kick stools should be registered with the appropriate departmental ladder inspector. SHE Group can advise who this is.
- The appropriate person should record:
 - Unique departmental identification number; and
 - Storage location.
- The unique identification number provided should be indelibly marked on the kick stool.
- In addition to regular inspection by the user, all kick stools should be checked at regular intervals (at least annually) by a competent Ladder Inspector appointed by SHE Group.

2C. Local Exhaust ventilation (LEV)

See also STFC [SHE Code 20: Gases and Dust](#)

Scope

LEV refers to any powered extraction system that is designed to either remove airborne contaminants from the working area directly, or dilute contaminants by bringing large quantities of air into the breathing zone of the worker.

LEV includes (but is not limited to):

- Fume Cupboards
- On tool extraction
- Nederman arms
- Welding fume extraction hoods
- Shot blasting booths
- Paint booths

Selection and Use

Fume Cupboards:

- New fume cupboards should be designed, manufactured, installed and commissioned to the requirements of EN 14175 - 2003.
- Consideration should be given to:
 - the required use when specifying the lining of the fume cupboard.
 - the use of scrubbing systems if highly corrosive chemicals will be used routinely.
 - whether any components needed to be ATEX rated – if the fume cupboard is to be used with flammable gases.
 - LEV systems employed in handling open radioactive sources (See also [STFC SHE Code 28: Radioactive Open Sources](#)) must only be installed following consultation with the site Radiation Protection Advisor (RPA); and
 - fitting sash stops, sash alarm, some form of flow indicator (fan speed indicator or manometer) and flow failure alarms.

Other LEV:

- New LEV systems should be specific to the work need.
- Consideration should be given to:
 - On-tool extraction vs. capture hood;
 - The size and shape of any capture hood to be used;
 - The location of moveable LEV if it is to be used in more than one area;
 - The need for filtration and ATEX rated electrical equipment if large amounts of dust or flammable gases etc. are to be extracted; and
 - The size of fan to produce the required flow rate.

Cleaning, Checks and Maintenance

- All LEV should be cleaned regularly to prevent build-up of contaminants.
- Filters should be changed/cleaned on a regular basis. Used/contaminated filters should be disposed of as Hazardous Waste.
- Regular checks should be made of:
 - Moving parts that may wear (bearings);
 - Parts that can suffer damage (hoods, ductwork and seals); and
 - Parts that deteriorate with use.

- Given the need for regular and occasionally extensive maintenance, consideration should be given to putting a maintenance contract in place with a specialist

All LEV must undergo a regular statutory inspection – 6 or 12 monthly. This inspection is organised by SHE Group at RAL and Estates at DL and ROE. All LEV MUST be registered with SHE/DL Estates. To register LEV on your site please provide:

- An original certificate of conformity; and
- An original installation and test report.

2D. Hand Tools

Scope

Hand tools, as indicated in definition 3.6 include: Screwdrivers, Hammers, Punches, Chisels, Hacksaws, Files, Axes, Knives, Crowbars, Shovels, Spanners, Mains and Battery Powered Electric Drills, Saws, Sanders, Grinders and any other item used by hand as a tool.

They normally present a low risk of injury if their use is restricted to activities they are designed for.

Selection, Use, Checks, Maintenance and Inspection

Hand tools should:

- Only be used for tasks for which they are designed (e.g. screwdrivers should not be used as punches);
- Not used if damaged or work beyond effective service;
- PAT tested annually if mains powered;
- Checked before use by the user; and
- Be replaced or repaired if damaged.

Hand tools are unlikely to need formalised maintenance, though some may require regular lubrication, and tools such as drills, grinders, sanders and saws may require replacement of the cutting/sanding/grinding piece.

There is no requirement for any formal form of inspection – pre use checks by the user should be sufficient.

2E. Scaffolding and Scaffold Towers

Scaffold and scaffold towers provide a working platform for those working at height.

Scaffold

Within STFC Scaffold will be designed, specified, erected and taken down only by specialist contractors to meet STFC design access requirements for that particular job (location, size, shape, load capability etc.).

Scaffold should be:

- Used when long term access is required to large high areas (i.e. most construction work at height); and
- Erected and dismantled by competent scaffolders working to industry standards.

STFC staff who are involved in the procurement of scaffolding services should ensure that the scaffolding:

- Is designed and built to meet STFC's access requirements;
- Is inspected on erection and prior to use by a competent person, see Appendix 4; and
- Subject to a weekly inspection programme to ensure that it is safe for STFC staff and contractors to use. These arrangements should include:
 - Signage to indicate state of scaffold (safe to use/under construction/being dismantled etc.);
 - Appropriate signage to indicate when the scaffold was inspected; and
 - Signage detailing next inspection date (no more than 7 days from previous).

Scaffold Towers

Within STFC Scaffold Towers will be used by teams to provide a temporary platform for work at height.

Scaffold Towers should:

- Conform to BS 1139, and be certified or marked as such;
- Be procured or hired from competent suppliers;
- Stored as a complete set in dry and clean conditions;
- Thoroughly checked before and after each use;
- Any damaged parts replaced or repaired; and
- Erected, dismantled and used by individuals who have had appropriate training, see Appendix 4.

2F. Abrasive Wheels

Scope

An abrasive wheel is defined as a wheel consisting of abrasive particles bonded together with various substances. They are used for cutting and finishing materials, and can be mounted on fixed machinery, or – for smaller wheels – on portable/hand held grinding machines.

Failure of an abrasive wheel disc can result in damage to the equipment and injury to people in the vicinity. The hazards of ejected material, and evolved dust and heat also exist when using abrasive wheels.

Selection and Use

- Selecting the correct wheel for the task is essential for safety. An abrasive wheel may be dangerous if used for an application for which it is not intended.
- Consideration should be given to;
 - The type and hardness of material being worked;
 - The speed of machine or spindle on which the wheel is to be mounted;
 - The type of grinding machine;
 - The accuracy and finish required; and
 - The area of contact.
- The following steps should be followed to minimise the risk of failure:
 - Abrasive wheel discs should only be mounted and set by trained competent people, see Appendix 4;
 - Abrasive wheels should always be run within the specified maximum rotational speed;
 - If they are large enough, this speed should be marked on the disc;
 - Smaller discs should have a notice fixed near the machine, giving the individual or class maximum permissible rotational speed;
 - The power driven spindle should be governed so that its rotational speed does not exceed this; and
 - Guarding should be provided to contain fragments of the disc if it “bursts”. These guards will also restrict access to the dangerous parts of the wheel, only allowing access to the area used to work materials.

Cleaning, Maintenance and inspection

- Abrasive wheels and grinding machines should be cleaned after each days use with appropriate materials/solvents – as described in the instructions provided with the wheel.
- Worn or damaged wheels should be replaced.
- Guards should be checked regularly and repaired or replaced if damaged.
- Abrasive wheels and grinding machines should be inspected by the user before each use, to ensure that:
 - The wheel is safely attached and true;
 - The emergency stops function as required; and
 - Guards are correctly fitted and not damaged.

2G. Machinery

Scope

Machinery refers to an assembly of parts, one or more of which are fitted with a drive system, and which are joined together for a specific application.

Consequently, whilst a pillar drill, or a neutron beam line are considered as pieces of **work equipment**, and all the general parts of this code apply, only those parts of the pillar drill, or neutron beam line, which are powered and can be remotely moved (without direct human effort) are considered to be **machinery**.

Machinery used within STFC includes (but is not limited to): workshop machines (pillar Drills, lathes, milling machines, guillotines etc.); robots; moveable beam line components; and neutron beam line shutters etc.

Safe Machines

Machines are made safe by employing a number of parallel strategies. These strategies are enshrined in the relevant legislation given in Appendix 1A, but an overview of the essential requirements is given below.

1: Prevent access to dangerous parts of machinery

Machinery should be constructed to prevent contact of any part of the body or clothing with any dangerous (moving, sharp, hot or electrically live) part of the machine. This is done by:

- The provision of fixed closing guards; or, if not practicable;
- The provision of other guards or protection devices such as interlocked guards and pressure mats; and
- With workshop machinery it will be necessary to provide appliances such as jigs, holders and push sticks etc.

2: Provide suitable controls including emergency stops

Controls should be designed and fitted such that:

- It is possible to easily identify what each control does, and which equipment it effects.
- Controls and their markings are clearly visible;
- Controls for normal operations should not be placed where anybody using them might be exposed to risk;
- It should only be possible to start, or re-start equipment by using the appropriate controls. (e.g. it should not be possible to restart equipment by simply re-setting a protection device);
- Any change in the operating conditions of equipment should only be possible by the use of a control unless the change does not increase Health and Safety risks;
- Start controls should not be combined with “emergency stop” controls;
- “Hold to run” controls should be designed so that the stop function has priority over the start control following the release of the control; and
- Accidental operation is prevented (e.g. buttons and levers should be shrouded or lockable).

Stop Controls

Operation of a stop control should bring equipment to a safe condition in a safe manner. The stop control does not have to be instantaneous in its action and can bring the equipment to rest in sequence or at the end of an operating cycle if this is required to ensure safety.

Stop controls should switch off all sources of energy from the equipment after it has stopped, if this is necessary to prevent or minimise risks to health and safety. Where internally stored energy could lead to risk, it should be cut off or dissipated by the operation of the stop control.

The stop control should take priority over an operating or start control. Where possible, it should only require a short manual action to activate it, even though the stop sequence once initiated may take some time to complete.

Emergency Stop Controls

Emergency control(s) should be provided where the other safeguards in place are not adequate to prevent risk when an irregular event occurs. However, emergency stops should not be considered as a substitute for safeguarding. Emergency stops should be easily reached and activated but should not be used as functional stops during normal operation.

3: Implement Lock Off and Isolation Procedures

Such procedures should be used to make equipment safe:

- During maintenance;
- When unsafe conditions develop; or
- When a temporary situation (such as a change in environmental conditions) would make it unsafe to use the equipment.

Isolation entails breaking the energy supply in a way that ensures inadvertent reconnection is not possible. For some equipment this could be as simple as removing the plug from the electrical supply, whilst for others an isolating switch or valve may need to be locked in the closed position to avoid reconnection.

Control of Maintenance work

If work on isolated equipment is being done by more than one person:

- Consider providing a locking device with multiple locks and keys. Each person will have their own lock and key, and all locks will have to be removed before the isolating device can be removed.
- Keys should not be passed to anyone other than the nominated people working on the isolated equipment, and they should not interchange keys.
- When equipment contains stored energy, this should be dissipated in addition to effective isolation of the machine before any maintenance or repair work begins.

4: Provide Markings and Warnings

Markings

Markings should be fixed to the machinery as appropriate to indicate the presence of hazards and provide useful information to the user. For example:

- Start and stop controls;

- Safe working loads for lifting equipment & lifting accessories;
- Gas cylinder colour to identify contents;
- Pipe work should be colour coded to indicate contents; and
- Markings are also required to denote the presence of radioactivity or lasers.

Markings may use words, letters, numbers or symbols and as far as possible should conform to published standards.

Warnings and Warning Devices

Warnings or warning devices are appropriate where risks to health and safety remain after other hardware measures have been taken. A warning is normally in the form of a notice or warning device with the intention of reinforcing information, instruction and training, e.g. "Hard hats must be worn".

Warning devices make the extra step and actively warn users of danger. They can be audible or visible, and indicate either imminent danger or the continued presence of a potential hazard.

Warnings must be designed so that they are:

- easily perceived, understood and can be acted on; and
- unambiguous;

Consideration should be given to factors which affect people's perception of warnings and warning devices, especially those indicating imminent danger. Choice of colour or constant or flashing signal can have a different impact in different situations.

Maintain and Inspect

Maintenance and Inspection of Machinery should be carried out in line with the guidance in Appendix 1.

2H. Fork Lift Truck (FLT), Mobile Elevated Work Platforms (MEWP), battery operated buggies, bicycles and motor vehicles.

See STFC [SHE Code 2: Safe movement of vehicles on STFC sites](#)

Scope

FLTs and MEWPs operate within storage areas, construction areas and on site roads on STFC sites. They are used for manoeuvring equipment/providing temporary access to elevated work areas.

Battery operated buggies (“golf buggies” etc.) and bicycles are used for deliveries and occasional travel between areas of site. The basic requirements for the safe use of these two types of vehicle on the roads of STFC sites are given in STFC [SHE Code 2: Safe movement of vehicles on STFC sites, Appendix 1](#). Battery operated buggies and bicycles **are** items of work equipment.

Selection, Maintenance, Use and Inspection of FLTs and MEWPs

Fork Lift Trucks and Mobile Elevated Work Platforms must:

- Be suitable for the environments in which they are operating. Consideration should be given to:
 - Where the FLT/MEWP will be used. Gas/diesel powered FPTs should only be employed in open ventilated work environments. Where electric FLTs are required consideration should be given to where they will be re-charged. Re-charging should only be undertaken in open ventilated environments to guard against the generation of explosive atmospheres;
 - What loads/personnel will be carried; and
 - How often and for how long the FLT/MEWP will be used;
- Only be operated by qualified staff. Training must be relevant for the type of FLT/MEWP operated, see Appendix 4. All FLT/MEWP drivers must have an STFC “Permit to Drive” for insurance purposes;
- Be subject to an inspection and maintenance regime – carried out by the operator - in line with the guidance given in the table at the end of this section; and Undergo a regular statutory inspection – as required under the Lifting operations and Lifting Equipment Regulations 1998 (See also STFC [SHE Code 26: Safe use of lifting equipment and lifting accessories](#))

Additionally staff operating FLTs and MEWPs:

- Must have an adequate level of fitness. If necessary following illness or injury, occupational health medical opinion should be sought regarding fitness to operate.

Operators should be medically screened for fitness before employment, see [SHE code 24 “Occupational health surveillance and health screening medicals” Appendix 1](#)

To help ensure the safety of others:

- Pedestrians should be excluded from areas where FLTs/MEWPs operate, so far as is practicable; and
- Keys must always be removed from FLTs/MEWPs when they are not in use to prevent inadvertent usage.

- MEWPs should not be used as a crane to lift equipment/materials through the use of slings or other lifting accessories. MEWPs can be employed to lift people, materials and tools located on the working platform/carrier provided the Safe Working Load (SWL) is not exceeded.

Frequency of Check	Items to be Checked/Maintained
Every shift or start of days use	Tyre pressures: Pneumatic tyres should be inflated to the proper pressure. Tyres should also be checked for damage, for embedded material and cuts and bubbles.
Every shift or start of days use	Parking brake, service brakes, and steering gear to ensure they are working efficiently.
Every shift or start of days use	Fuel, water and oil in internal combustion engine powered vehicles for leaks and correct levels.
Every shift or start of days use	Batteries of battery-operated lift trucks to check that they are adequately charged and leak free, that the charger is switched off, the charge lead disconnected and properly stored, and the battery retention device is in place.
Every shift or start of days use	Systems for lifting, tilting and manipulation, including attachments. These should be working properly. Hydraulic systems should be free from leaks and hydraulic fluid levels should be correct when the fork arms are in the parked position.
Every shift or start of days use	Audible warning signal.
Every shift or start of days use	Lights.
Every shift or start of days use	Mirrors, if fitted.
Weekly	An operational check of the steering gear, lifting gear, condition of the battery and other working parts.
Weekly	The condition of the mast, fork arms, attachments, tyres and any chains or ropes used in the lifting mechanisms, and , if fitted, the operator restraint.
Weekly	Security of the overhead guard and load back-rest extension.

Selection, Maintenance, Use and Inspection of battery operated buggies and bicycles

All battery operated buggy drivers must have an STFC “Permit to Drive” for insurance purposes.

Battery operated buggies and bicycles should undergo regular pre-use checks by their users.

Checks should ensure that:

- Tyres are correctly inflated and in good condition; and
- Brake, reversing and indicator lights are working for battery operated buggies and front and rear lights are working on bicycles.

Any maintenance carried out on battery operated buggies and bicycles - with the exception of pumping up the tyres or replacing light batteries – should be recorded, and those records maintained for the life of the vehicle. This includes records of when the vehicle is charged for battery operated vehicles.

Selection, Maintenance, Use and Inspection of motor vehicles

All drivers of motorised vehicles, including but not limited to: cars; vans; delivery vehicles; cranes; passenger vehicles; must have an STFC "Permit to Drive" for insurance purposes, and by implication a valid driver's license.

As any car, motor vehicles should undergo regular pre-use checks by their drivers, including but not limited to ensuring that:

- Tyres are correctly inflated and in good condition;
- Rear and wing mirrors in place and adjustable; and
- Front, brake, reversing and indicator lights are working.

Any maintenance and MOT test carried out on motor vehicles – should be recorded, and those records maintained for the life of the vehicle.