

RC15: Recommendations for the use of portable heaters in the workplace



IMPORTANT NOTICE

This document has been developed through RISCAuthority and published by the Fire Protection Association (FPA). RISCAuthority membership comprises a group of UK insurers that actively support a number of expert working groups developing and promulgating best practice for the protection of people, property, business and the environment from loss due to fire and other risks. The technical expertise for this document has been provided by the Technical Directorate of the FPA, external consultants, and experts from the insurance industry who together form the various RISCAuthority Working Groups. Although produced with insurer input it does not (and is not intended to) represent a pan-insurer perspective. Individual insurance companies will have their own requirements which may be different from or not reflected in the content of this document.

FPA has made extensive efforts to check the accuracy of the information and advice contained in this document and it is believed to be accurate at the time of printing. However, FPA makes no guarantee, representation or warranty (express or implied) as to the accuracy or completeness of any information or advice contained in this document. All advice and recommendations are presented in good faith on the basis of information, knowledge and technology as at the date of publication of this document.

Without prejudice to the generality of the foregoing, FPA makes no guarantee, representation or warranty (express or implied) that this document considers all systems, equipment and procedures or state-of-the-art technologies current at the date of this document.

Use of, or reliance upon, this document, or any part of its content, is voluntary and is

at the user's own risk. Anyone considering using or implementing any recommendation or advice within this document should rely on his or her own personal judgement or, as appropriate, seek the advice of a competent professional and rely on that professional's advice. Nothing in this document replaces or excludes (nor is intended to replace or exclude), entirely or in part, mandatory and/or legal requirements howsoever arising (including without prejudice to the generality of the foregoing any such requirements for maintaining health and safety in the workplace).

Except to the extent that it is unlawful to exclude any liability, FPA accepts no liability whatsoever for any direct, indirect or consequential loss or damage arising in any way from the publication of this document or any part of it, or any use of, or reliance placed on, the content of this document or any part of it.

Contents

1	Introduction	3
2	Scope	3
3	Synopsis	4
4	Definitions	4
5	Recommendations	5
	5.1 Compliance with fire safety legislation	5
	5.2 Business continuity	6
	5.3 Fire risk management	6
	5.4 Location	7
	5.5 Electrical heaters	8
	5.6 LPG fuelled heaters	9
	5.7 Liquid fuelled heaters	11
	5.8 Other forms of portable heater	12
	5.9 Heaters for use in the open air	12
	5.10 Fire protection	13
6	Checklist	15
7	References	20

Summary of Key Points

The table below summarises the key points of the document.

<p>Compatibility with the environment</p>	<ul style="list-style-type: none"> • When a portable heater is to be sited in an industrial environment its location and use should be compatible with the hazard zones identified as part of any assessment undertaken in compliance with the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR). (5.1.2) • Portable heaters should not be used in areas where flammable gases, vapours or combustible dusts may be present, even for a short period, unless they have been designed specifically for use in that type of environment. (5.3.3)
<p>Business continuity</p>	<ul style="list-style-type: none"> • Not unlike other potential sources of fuel or ignition, a fire caused by a portable heater can have a disproportionate effect on the ability of a business to continue to function efficiently. All businesses should take steps to maintain the continuity of their operations by making an emergency plan. (5.2)
<p>Prioritise fixed over portable</p>	<ul style="list-style-type: none"> • Where permanent background heating is required it is safer, and may be more economic, to provide fixed, rather than portable appliances; the use of portable heaters should be avoided wherever possible. (5.3.1) • A fire risk assessment may determine that the risk of the heater being damaged or knocked over is too great in some workplaces and inappropriate in others. In these cases, fixed heating should be provided (5.3.5)
<p>Siting and separation</p>	<ul style="list-style-type: none"> • Portable heaters should be sited according to the manufacturer's instructions. They should be stood on a level, dry, non-combustible surface where they are not liable to be subjected to mechanical damage or be overturned. (5.4.1) • They should not be sited on escape routes or in confined spaces, cupboards, ducts or passageways. (5.4.2) • Portable heaters should be sited in areas clear of combustible goods or other readily ignitable materials. A guard should be provided or the floor area around the heater hatched prominently to maintain a clear space of at least 1m on all sides between a heater and combustible goods or combustible elements of the construction. (5.4.4)
<p>Select the right type of heater for the location</p>	<ul style="list-style-type: none"> • Portable heaters may be fuelled in a number of ways, LPG, electricity and liquid fuels for example. It is essential that where their use cannot be avoided, the type of heater is compatible with the environment. For example, LPG fuelled heaters should not be used in basements or in other low-lying locations where leaking vapour may accumulate (5.6.3); Liquid fuelled heaters, such as paraffin heaters should not be used other than in agricultural and horticultural premises (5.7.1) and electric heaters with exposed heating elements should not be provided. Convection heaters or oil filled radiators should be used in preference to appliances with radiant elements (5.5.3).
<p>Avoid unattended operation</p>	<ul style="list-style-type: none"> • The fire hazard and thus the threat to the business is increased if portable heaters are allowed to operate unattended and this should be avoided. In circumstances where it is not possible to avoid leaving portable heaters unattended, a specific risk assessment should be undertaken, and appropriate control measures introduced. This may include increasing the separation of the heater from combustible materials in the vicinity (see section 5.4) and frequent checks of the area. (5.3.6) • Portable heaters should be turned off at the end of the period of work. (5.3.7)
<p>Maintenance is essential</p>	<ul style="list-style-type: none"> • Portable heaters should be maintained regularly in accordance with the manufacturer's instructions. Maintenance, testing and cleaning undertaken by the user should be recorded together with details of periodic servicing undertaken by a competent service agent. (5.3.12) • Damaged heaters should be taken out of service immediately. (5.3.13)
<p>Minimise the risk; locate the heater externally</p>	<ul style="list-style-type: none"> • In certain circumstances (such as marquees and workshops) the heater may be sited externally, and warm air piped or ducted into the premises by means of flame retardant hosing. It should be ensured however, that exhaust fumes cannot enter the structure and are safely dispersed.

Symbols used in this guide



Good practice



Bad practice



Discussion topic



Frequently asked question

1 Introduction



- How many portable heaters are in use in our workplace and why are they being used?

Portable or transportable heaters are in common use in commercial and industrial premises, either to supplement central heating systems or for use on days when the weather is particularly inclement. Portable heaters are more likely to cause fires than fixed heating systems, usually by being placed too close to combustible materials. The continued use of such heaters should therefore be discouraged and in some cases may need to be agreed with the insurance provider.

Where their use is unavoidable, portable heaters have to be carefully managed to address potential problems such as the selection of inappropriate heaters, faulty appliances, the misuse of heaters, and placing items too close to, or on top of, hot surfaces. Effective management will also aim to ensure that portable heaters are not misused or forgotten, used in inappropriate locations or left turned on when staff leave the premises. Frequent movement of heaters may also cause physical damage to the appliance and introduce further hazards.

While many fires may result from the use of portable heaters, the incidence of death and injury associated with these incidents is more prevalent in the home than in the workplace where the concern relates mainly to business continuity and property protection issues. Nevertheless there does remain a risk to life associated with the use of these appliances in the workplace.

The use of portable heaters in warehouses and storage areas where a fire could develop rapidly is particularly undesirable and management procedures should be in place to prohibit portable heaters or control their use in these environments where the risk is acceptable.

Where the use of portable or transportable heaters is unavoidable, and they are necessary to provide heating during very cold weather, insurers should be consulted, especially if transportable fan assisted space heaters are to be used to heat large open buildings. Insurers may prohibit the use of certain types of portable heaters or apply policy restrictions, and should always be consulted before the use of portable heaters is sanctioned. In all circumstances the recommendations set out in this document will apply.

Wherever possible, fixed heating systems with remotely located fuel supplies should be provided; such installations are always preferred by insurers.

Where the use of portable heaters is unavoidable – such as on building sites, in temporary buildings or in cabins – care should be exercised in the choice, location and use of this method of heating. This should include avoiding siting heaters in hazardous positions and ensuring that refuelling operations do not result in the spillage and ignition of fuel.

Where stocks of portable heaters are stored for emergency supplementary heating during periods of particularly cold weather, they should be carefully managed by designated staff, and instructions prepared for their ongoing maintenance and safe use.

2 Scope

These recommendations apply to portable and transportable electrical, gas and liquid fuelled space heaters designed for use in industrial and commercial premises. While the fire protection principles are transferable to domestic and residential properties, this guidance is not addressed to this form of occupancy.

Although portable solid fuel heaters are available, these tend to be designed for camping and similar environments, have open flames and are not suitable for use in an indoor workplace. With the exception of chimineas, no further reference is made to solid fuel appliances in this document.

The guidance does not apply to permanently fixed heating systems such as low pressure water or air conditioning systems. Fixed high level radiant gas heaters are also outside the scope of this document. Further information on fixed heating appliances is set out in RISC Authority Recommendations RC27 (ref. 1).

Transportable air conditioning systems of the type used for marquees and similar large volume hospitality venues are also outside the scope of these recommendations.

These recommendations outline good practice for the management of portable heaters in the workplace where their use cannot be avoided. Consideration is given to heaters fuelled by electricity, LPG, liquid fuels (normally paraffin) and heaters designed for use in the open air. Practical advice is given to assist in the selection and management of suitable appliances with an emphasis on their maintenance and safe use.

Cabinet heater

A form of radiant LPG fuelled space heater where a cylinder of gas is located within the metal casing or cabinet which incorporates the radiant panel.

Ceramic heater

A ceramic heater produces heat by passing an electric current through a special conducting ceramic element. Because the ceramic core is larger than a conventional electric heating coil, it can operate at a lower temperature. Some forms of ceramic heaters incorporate a fan.

Chiminea

A freestanding fire clay or cast iron container used as a fireplace for heating or cooking. It has an open front and tall vertical chimney to allow smoke and hot gases to escape.

Class I and Class II electrical equipment

There are two basic types of electrical equipment construction – Class I (earthed) and Class II (double insulated). For safety reasons, Class I equipment has an earth connection. If there is a fault within the equipment, there is a possibility that the outside of the equipment could cause an electric shock if the earth connection is not there.

Halogen heater

A halogen heater has electric heating elements sealed in quartz-glass tubes and produce infrared radiation in front of a reflective backing.

Infrared heater

Most infrared heaters are fuelled by propane, but some use oil (fixed units burn natural gas). The high temperature is generated by burning fuel inside either a steel tube (a tube heater) or a ceramic surface (a luminous heater). The heat from this surface is then emitted from the heater into the surroundings in the form of radiant infrared energy.

LPG

Liquefied petroleum gas: in the case of portable heaters this will be propane or butane.

Patio heater

A form of radiant electric or LPG fuelled heater designed for use outdoors. In the case of gas powered heaters the gas cylinder is held in the base of the unit, with a 'mushroom' shaped reflector at the top to reflect radiant heat down onto people nearby.

Radiant heater

A heater providing a source of radiant heat. Infrared, ceramic and halogen heaters are examples of radiant heaters.

Tank top radiant heaters

These are a form of gas fuelled heater in which a radiant panel is mounted directly on the top of a gas cylinder.



- What types of portable heaters can we use safely where their use is unavoidable?

'Torpedo' or 'tropical' heaters

These are common names for transportable fan assisted space heaters, whereby a flame from a liquid or gaseous fuel is subject to a fan to intensify the heat and distribute it over a wide area. Intense heat may be produced by these devices, which may be fuelled by diesel fuel, fuel oil, paraffin, LPG or natural gas.

		
Cabinet heater	Chiminea	Ceramic heater
		
LPG patio heater	Electric patio heater	Tank top radiant heater
		
Infrared heater	Halogen heater	Torpedo or tropical heater

5 Recommendations

5.1 Compliance with fire safety legislation

- 5.1.1 A suitable and sufficient fire risk assessment should be undertaken for all premises to which the Regulatory Reform (Fire Safety) Order 2005 (or equivalent legislation in Scotland and Northern Ireland) applies (refs. 2-6).
- 5.1.2 When a portable heater is to be sited in an industrial environment, its location and use should be compatible with the hazard zones identified as part of any assessment undertaken in compliance with the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR (as amended) (ref. 7). DSEAR assessments, which should be undertaken by a competent person, should also be undertaken where LPG cylinders are on the premises (for example for use in LPG fuelled heaters).
- 5.1.3 Risk assessments should be subject to periodic review, including at the time when plans are being made to make changes to the contents or processes carried out in the workplace, or to introduce portable heaters. The review should consider the use of portable heaters of the style intended in conjunction with the number, alertness and mobility of the persons within the area concerned (see 5.3.5).



Figure 2: This portable heater had been covered and was the cause of a serious fire

5.1.4 The response by fire and rescue services to 999/112 calls and signals routed via fire alarm monitoring organisations varies widely throughout the UK, and differs from day to night-time. Fire safety managers should refer to the relevant fire and rescue service to make themselves aware of the levels of response in the areas in which their premises are located, and consider this information when undertaking and reviewing their fire risk assessments.

5.2 Business continuity

5.2.1 Even a small fire can have a disproportionate effect on a business if it occurs in a critical area. The use of portable heaters must be carefully managed, to avoid even a small fire that would cause unnecessary disruption to the efficient functioning of the business.

5.2.2 All businesses should take steps to maintain the continuity of their operations by making a suitable emergency plan. Guidance for this is set out in *Business resilience: A guide to protecting your business and its people* (ref. 8). The emergency plan should address the implications of a fire, flood or other perceived disaster on all facets of the business model. It should indicate the lines of communication that should be followed and the contact details for specialist assistance, providers of alternative accommodation and suppliers of replacement equipment.

5.2.3 Tabletop exercises should be held periodically to test the effectiveness and suitability of the emergency plans.

5.2.4 Consideration may be given to applying commercially available computer programs, such as the ROBUST software (Resilient Business Software Toolkit) that is available free of charge (ref. 9), or similar product to develop and check the adequacy of the plan.

5.3 Fire safety management

5.3.1 Where permanent background heating is required it is safer, and potentially economical, to provide fixed rather than portable appliances – the use of portable heaters should be avoided wherever possible.

5.3.2 The use of portable and transportable heaters in the workplace should be sanctioned by a designated person. This person should ensure that the use of such equipment is considered as part of the fire risk assessment undertaken to comply with fire safety legislation (refs. 2-6).

5.3.3 Portable heaters should not be used in areas where flammable gases, vapours or combustible dusts may be present (see 5.1.2), even for a short period, unless they have been designed specifically for use in that type of environment. It should be ascertained that they will not present a source of ignition (for example that their surface temperature will not exceed the autoignition temperature of a dust layer).

5.3.4 Where it is anticipated that a portable heater may be in use in a location for a prolonged period of time (such as in temporary accommodation on construction sites), the heater should be fixed firmly to the floor or wall in a suitable location (see section 5.4) and adequate ventilation provided.

5.3.5 The fire assessment may determine that the risk of the heater being damaged or knocked over is too great in some workplaces, and inappropriate in others. In these cases fixed heating should be provided. This may be the case in:

- sleeping accommodation
- crèches where babies and toddlers will be present
- farm premises where animals are kept
- other areas where children or livestock may be present
- areas where there may be people who are elderly, frail or suffering from a disability

In other instances, such as in warehouses, the risk associated with the use of portable heaters may be too high due to the rapidity of fire spread should an incident occur.

Some forms of portable heaters will also be inappropriate for use in bathrooms, toilets or outdoors.



- Where permanent background heating is required it is safer to provide fixed, rather than portable appliances. (5.3.1)



- All portable heaters should be turned off at the end of the period of work. (5.3.4)



- All forms of portable heater are inappropriate in crèches, farm premises and other areas where children or livestock may be present. (5.3.6).



- Portable heaters should not be covered in any way or used as shelves for papers. (5.3.15)



- How often do electric heaters have to be PAT tested? (5.4.1)



- Can time switches be used to warm the workplace before staff arrive? (5.4.6)

- 5.3.6 The fire hazard and thus the threat to the business is increased if portable heaters are allowed to operate unattended, and this should be avoided. In circumstances where it is not possible to avoid leaving portable heaters unattended, a specific risk assessment should be undertaken and appropriate control measures introduced. This may include increasing the separation of the heater from combustible materials in the vicinity (see section 5.4) and frequent checks of the area.
- 5.3.7 All portable heaters should be turned off at the end of the period of work.
- 5.3.8 Designated staff working in the vicinity of portable heaters should be familiar with the operation of the equipment, including how to turn them on and off safely, and the fire hazards associated with the particular heaters when in use.
- 5.3.9 Portable heaters should not be covered in any way or used as shelves for papers. In particular, the tops of LPG fuelled cabinet heaters should be kept clear of all materials.
- 5.3.10 Portable heaters should not be used for drying clothing, as clothing placed too near may fall to cover or knock a heater over. Where wet clothing is to be dried on a routine basis (such as on some construction sites), a purpose designed drying room should be provided.
- 5.3.11 Heaters should not be handled or moved while in operation or when hot.
- 5.3.12 All forms of portable heater should be used and maintained regularly in accordance with the manufacturer's instructions. Maintenance, testing and cleaning undertaken by the user should be recorded together with details of periodic servicing undertaken by a competent service agent.
- 5.3.13 Any heater that is damaged should be taken out of service immediately, and be labelled prominently to this effect while awaiting repair.
- 5.3.14 Adequate ventilation should be provided for the area in which the heater is to be used.
- 5.3.15 All heaters should be kept clean and free from dust.
- 5.3.16 Plans should be in place for the hiring of a suitable number of appropriate portable heaters in the event of a failure of the fixed heating system. The hired heaters should be positioned as described in section 5.4 below. A procedure should be devised to ensure that the temporary heaters are turned off at the end of each work period. The heaters should be returned to the hiring company as soon as the fixed heating is returned to normal operation.
- 5.3.17 The use of personal portable heaters of any type brought to the workplace by staff from home should be prohibited.
- 5.3.18 When the continued use of portable heaters is no longer required they should be removed from the workplace.

5.4 Location

- 5.4.1 Portable heaters should be sited and used according to the manufacturer's instructions. They should be stood on a level, dry, non-combustible surface where they are not liable to be subjected to mechanical damage or be overturned. Where necessary, they should be shielded from strong draughts and splashes of water.
- 5.4.2 Portable heaters should not be sited on escape routes or in confined spaces, cupboards, ducts or passageways. Where supplementary heating is required in circulation areas or escape routes, fixed wall mounted units should be installed.
- 5.4.3 Areas where liquid or LPG fuelled heaters are used should be well ventilated to avoid depletion of oxygen levels and the accumulation of harmful fumes.
- 5.4.4 All forms of portable heaters should be sited in areas clear of combustible goods or other readily ignitable materials. A guard should be provided to maintain a clear space of at least 1m on all sides between a heater and combustible goods or combustible elements of the construction. Where a guard is not practicable, the floor 1m around the heater should be hatched prominently to indicate that it should be kept clear.
- 5.4.5 In certain circumstances (such as marquees and workshops) the heater may be sited externally and warm air piped or ducted into the premises by means of flame retardant hosing. It should be ensured however, that exhaust fumes cannot enter the structure and are safely dispersed.

5.5 Electric heaters

- 5.5.1 All portable electric heaters should be inspected periodically in compliance with the requirements of the Electricity at Work Regulations 1989 (ref. 10), and suitable records should be kept. If a problem is found the item should be taken out of service immediately and labelled to indicate that it should not be used until it has been repaired or, if necessary, replaced.
- 5.5.2 Regular inspection of equipment is an essential part of any preventative maintenance programme, and should be undertaken by a competent person. The periods between inspections should be determined on a risk assessed basis or in accordance with the guidance set out by the HSE in their guide Maintaining portable and transportable electrical equipment (ref. 11). These are set out in Figure 3. HSE guide INDG236 Maintaining portable electric equipment in low-risk environments (ref. 18) provides further useful information.

Type of business		User checks	Formal visual inspection	Combined inspection and test
Equipment hire		n/a	Before issue/after return	Before issue
Construction	110V equipment	Yes, weekly	Yes, monthly	Yes, before first use on site then 3-monthly
	230V equipment	Yes, daily/every shift	Yes, weekly	Yes, before first use on site then monthly
	Equipment site offices	Yes, monthly	Yes, 6-monthly	Yes, before first use on site then yearly
Heavy industrial/high risk of equipment damage (not construction)		Yes, daily	Yes, weekly	Yes, 6-12 months
Light industrial		Yes	Yes, before initial use then 6-monthly	Yes, 6-12 months
Cables, leads and plugs connected to Class I equipment, extension leads and battery charging equipment		Yes	Yes, 6 months – 4 years depending on type of equipment it is connected to	Yes, 1-5 years depending on type of equipment it is connected to

Figure 3: Suggested initial maintenance intervals for portable electrical equipment (Reproduced from HSG 107 – ref. 11)



Figure 5: The use of extension leads to provide power to electric heaters should be avoided (5.5.7)



- The use of LPG fuelled transportable fan assisted space heaters ('torpedo heaters') should be prohibited unless agreed with the insurer. (5.5.5)

- 5.5.3 Heaters with exposed heating elements should not be provided. Convection heaters or oil filled radiators should be used in preference to appliances with radiant elements.
- 5.5.4 Wherever possible, an electric heater incorporating a thermostat should be selected for use.
- 5.5.5 Particular care should be taken to ensure that portable electric heaters are switched off and unplugged at the end of each period of work, to avoid the thermostat turning the heater on while the area is unoccupied.
- 5.5.6 Similarly, the use of time switches should be avoided where they may turn a heater on when staff are not present.
- 5.5.7 Wherever possible, portable heaters should be plugged directly into an electrical socket; the use of extension leads and block adaptors should be avoided.
- 5.5.8 Prior to each use, the heater and electrical socket outlet to be used should be visually inspected for signs of damage or overheating. If damage is found, a competent person should be consulted.
- 5.5.9 The fixed wiring of the circuit should be inspected and tested periodically in accordance with BS 7671 (ref. 12).
- 5.5.10 Electric heaters should not be powered from a circuit supplying electricity to computer servers or similar business critical equipment.
- 5.5.11 Electrical appliances such as heaters should preferably be of a type approved by the British Electrotechnical Approvals Board (BEAB).
- 5.5.12 The flexible leads of portable electric heaters should be kept as short as practicable to minimise the trip hazard and the likelihood of damage to the cable. Cables should not be subject to tension.

5.5.13 Where heaters are fixed in position the fitting should be such that the presence of trailing leads is avoided or minimised. If a trailing or loose lead is accessible, the heater should be included on the in-service testing programme to ensure that the equipment remains safe and serviceable.

		
<p>Convactor heater</p>	<p>Oil filled radiator</p>	
		
<p>Radiant heater</p>	<p>Ceramic bar heater</p>	

Figure 4: Where their use is unavoidable choose electric heaters with care



- Other than in horticultural and agricultural premises, the use of paraffin heaters in the workplace should be avoided wherever possible. (5.6.1)



Figure 6: If a loose lead on a fixed heater is accessible the heater should be included on the in-service testing programme (5.5.13)

- 5.5.14 Flexes should be kept clear of doorways and escape routes. They should be routed away from transit areas and not pass over sharp objects that might cause fraying.
- 5.5.15 Where it is necessary for an electrical cable to run across the floor (for example between desks), it should be protected against mechanical damage by a proprietary cover or sheathing.

5.6 LPG fuelled heaters

- 5.6.1 LPG fuelled heaters should be of a cabinet or tank top design, rather than a gas cylinder connected by tubing to a separate radiant panel.
- 5.6.2 Only LPG heaters designed with a cut out, intended to shut off the gas supply automatically in the event of the heater being knocked over, should be used.



Figure 7: The use of LPG heaters with exposed elements should be avoided

- 5.6.3 LPG fuelled heaters should not be used in basements or in other low lying locations where leaking vapour may accumulate.
- 5.6.4 Due to the potential hazard that they present, only an authorised, competent person should carry out fuelling, lighting and extinguishing an LPG heater in accordance with the manufacturer's instructions.
- 5.6.5 Heaters selected for use should carry a British Standards Institution (BSI) kitemark.
- 5.6.6 Portable gas heaters should be serviced and maintained regularly in accordance with the manufacturer's instructions. In addition, they should be visually examined by a competent person periodically, including at each time that the gas cylinder is changed.
- 5.6.7 The use of LPG fuelled transportable fan assisted space heaters ('torpedo', 'salamander' or 'tropical' heaters) should be prohibited unless agreed with the insurer. This is because of the greater separation distances needed between this form of heater and combustible materials.
- 5.6.8 LPG fuelled heaters should be allowed to cool before the cylinder is changed.
- 5.6.9 Care should be taken to use the correct gas when changing gas cylinders on portable heaters; propane and butane cylinders must not be interchanged (the substitution of a propane for a butane gas cylinder or vice versa is extremely hazardous without the appliance being modified by the manufacturer or other competent person).
- 5.6.10 The fuel used should be in accordance with the manufacturer's instructions.
- 5.6.11 Gas cylinders should be changed in the open air. If this is not possible, all sources of ignition should be removed from the vicinity and the windows and doors opened to provide additional ventilation during the operation.



Figure 8: Gas cylinders should be stored securely and safely, not in an accessible area of the premises as in this case (5.6.13)



Figure 9: Paraffin heaters should not be used within a building (5.7.1)

- 5.6.12 Ensure that the cylinder valve is closed before the heater is moved or the cylinder is disconnected.
- 5.6.13 Flexible hoses within cabinet heaters should be kept as short as practicable, and the hose and connection points should be inspected visually whenever the cylinder is changed.
- 5.6.14 Stocks of LPG and nominally empty cylinders should be kept to a minimum. Spare gas cylinders should be stored securely and safely, well away from the building if possible. Spare cylinders should be stored upright and not in a basement area, near drains or in the immediate vicinity of electric meters or other sources of ignition. Gas cylinders should be protected from direct sunlight and environmental effects. Further information regarding the storage of gas cylinders is set out in RISC Authority Recommendations RC8 (ref. 13).
- 5.6.15 If gas is suspected to be leaking from a heater, the cylinder valve should be closed, all ignition sources in the vicinity should be eliminated and the appliance removed from the building. The position of the leak should be found by use of an ultrasonic gas leak detector or by brushing soapy water onto the connections. A naked flame should never be used for this purpose. If the leak is not sealed by tightening the fittings, the gas cylinder should be removed and the heater labelled as being unfit for use until it has been repaired by a competent person.

5.7 Liquid fuelled heaters

- 5.7.1 Liquid fuelled heaters such as paraffin heaters are now rarely encountered, and should not be used other than in agricultural and horticultural premises. Liquid fuelled portable heaters, such as those employing paraffin or waste oil, should not be used elsewhere because the hazards associated with this form of heater are compounded by the need to store the fuel and refill the tank.
- 5.7.2 A specific fire risk assessment should be undertaken in any workplace prior to the introduction of a liquid fuelled heater.
- 5.7.3 Prior to use, a check should be made to ensure that the appliance has a British Standards Institution (BSI) kitemark.
- 5.7.4 Portable heaters of this type must only be used in conjunction with the correct fuel.
- 5.7.5 Liquid fuelled heaters should be cleaned and maintained annually. They should be used in accordance with the manufacturer's instructions and be visually examined by a competent person each time they are refilled. When a fault such as a luminous flame develops, the heater should be taken out of service until it has been repaired by a competent person. Repairs should only be undertaken by a competent person using parts supplied by the manufacturer of the heater.
- 5.7.6 Only liquid fuelled heaters designed with a cut out, intended to shut off the fuel supply automatically in the event of the heater being knocked over, should be used.
- 5.7.7 The minimum amount of fuel should be stored in accordance with the guidance set out in RISC Authority Recommendations RC56 (ref. 14). The storage location should be clearly identified by an appropriate pictogram and prominent signs stating 'Flammable liquid'.
- 5.7.8 Flammable liquid stores should be at or above ground level unless sufficient mechanical ventilation is provided. Where storage is in the open air, sites selected for this purpose should not be in hollows or close to drains and other areas below surrounding ground level, where released flammable vapours that are heavier than air may accumulate. Further information is set out in RISC Authority Recommendations RC56 (ref. 14) and Health and Safety Executive publication HSG 51 (ref. 15).
- 5.7.9 Liquid fuelled heaters should only be refuelled by an authorised, competent person. The heaters should be allowed to cool before refuelling; under no circumstances should they be refuelled while still in operation.
- 5.7.10 Wherever possible, refuelling should be undertaken outside the premises. Any spilled fuel should be cleaned up immediately.

5.7.11 The use of paraffin fuelled transportable fan assisted space heaters ('torpedo', 'salamander' or 'tropical' heaters') should be prohibited without the agreement of the insurer.



Figure 10: Liquid fuelled heaters should only be used in carefully assessed workplaces



- Portable heaters, other than those specifically designed for the purpose, should not be used in bathrooms or outdoors. (5.3.5)

5.8 Other forms of portable heaters

- 5.8.1 Small personal hand warmers which incorporate a glowing element are potentially hazardous, and should be subject to assessment for use in the workplace as for other forms of portable heater. Other forms of personal warmers which are based on a gel, corn or similar material present less of a hazard but should only be used and recharged with the agreement of a management representative.
- 5.8.2 Heated clothing, similar to that worn by motor cyclists, should be used according to the manufacturer's instructions and be subject to a risk assessment as for the use of other forms of heating. Heated clothing should not be adapted or modified for use in the workplace without specialist advice.
- 5.8.3 Electrically heated mats are not appropriate for use in the workplace due to the likelihood of the mats or their associated cables being damaged or becoming wet.
- 5.8.4 Chimineas are solid fuelled heaters designed for use outdoors. As they use solid fuel they are difficult to manage, and require operating procedures for lighting the heater and disposing of the hot ashes. In use the devices can also become very hot. For these reasons it is safer and more practical to use patio heaters (see section 5.9) to provide heating for an outdoor workplace or designated smoking area.

5.9 Heaters for use in the open air

- 5.9.1 External patio or 'mushroom' heaters designed for use outdoors are typically fuelled by electricity or by a gas cylinder in the base of the unit. In the latter case the cylinder, being heavy, also contributes to the stability of the heater. The gas is burnt on metal gauze beneath a mushroom shaped cap, which reflects a large proportion of the radiant heat produced downwards to provide warmth for people in the vicinity. Care should be taken to locate these heaters away from trees and bushes, as the top can become very hot in use.
- 5.9.2 Patio heaters should not be sited directly beneath or in close proximity to awnings, canopies or combustible decorations, and should not be used indoors.
- 5.9.3 Patio heaters should be sited on level ground so as to be stable and stand approximately upright. Where a large number of people may be in the vicinity, it may be necessary to fix the heater in position to prevent it being knocked over.

FAQ

- How far away from combustible materials should portable heaters be located? (5.4.4)



Figure 11: Radiant heater beneath a parasol (see 5.9.15)

FAQ

- How far away from a building should a patio heater be sited? (5.9.9)

- 5.9.4 Portable heaters used in the open air should not be left unattended for a prolonged period of time (see 5.3.8).
- 5.9.5 Heaters should not be positioned or used where they could be in danger of being struck by passing or manoeuvring vehicles.
- 5.9.6 Patio heaters should not be sited directly in front of fire exit routes or other doorways from buildings.
- 5.9.7 Patio heaters should be kept in good condition and be used and maintained as recommended by the manufacturer. Patio heaters should be inspected visually by a competent person prior to each period of use. On external heaters, the cover to the gas cylinder compartment should be kept in position, to restrict access by staff or members of the public to the gas cylinder and control valve.
- 5.9.8 Only LPG patio heaters designed with a cut out, intended to shut off the gas supply automatically in the event of the heater being knocked over, should be used.
- 5.9.9 All patio heaters should be positioned as far as practical from buildings and structures, with the distance from the building or structure being at least the height of the heater.
- 5.9.10 Care must be taken at Christmas and times of other festivals to ensure that a space of at least twice the height of a heater remains free between the heater itself and any combustible decorations, especially Christmas trees.
- 5.9.11 Care must be taken during windy weather conditions for two reasons. The stability of the heater should be monitored, and if there is any danger of the heater being blown over it should be immediately turned off. During windy conditions the flames of heaters should also be monitored periodically, and if abnormal burning occurs (flame colour, height or shape), the appliances should again be turned off immediately.
- 5.9.12 When no longer required, the heater should be allowed to cool fully before being returned to its storage area.
- 5.9.13 Power points for electric patio heaters should be provided in suitable locations by a competent electrician. Supplies should be protected by appropriate residual current devices (RCDs). For information: The 18th edition of the IET wiring regulations – BS 7671: 2018 will be published 1st July 2018 with a six month transition period. The 18th edition introduces arc fault detection devices (AFDDs), their purpose being to mitigate the risk of fire in final circuits of a fixed installation due to the effect of arc fault currents not picked up by RCDs.
- 5.9.14 Cables providing power for patio heaters should be as short as practicable, and to avoid becoming damaged should not run around sharp corners or across doorways. They should be protected where they run across the ground. Patio heaters should not be powered via extension leads or adaptors.
- 5.9.15 Particular care should be taken where heaters are an integral fitting beneath large parasols. When no longer required, the heaters should be turned off and allowed to cool before the parasol is closed. Similarly, a parasol fitted with heaters should be opened before the heaters are turned on. This should be emphasised in staff training sessions. Where available, proprietary safety switches should be fitted to ensure that the power is off when the parasol is closed.

5.10 Fire protection

- 5.10.1 The fire service should be called to all fires involving heaters and gas cylinders. Information collated for use by fire and rescue services in the event of an emergency should be kept up to date, and include the location of heaters and cylinders.
- 5.10.2 An appropriate number of fire extinguishers, of a type suitable for extinguishing fires in nearby materials, should be provided in all areas in which portable heaters are in use. All such extinguishers should be approved and certificated by an independent, third-party accredited certification body. The extinguishers should be provided in easily accessible positions as set out in BS 5306-8 Fire extinguishing installations and equipment on premises. Selection and installation of portable fire extinguishers. Code of practice (ref. 16).

- 5.10.3 In the case of electrical heaters, at least one carbon dioxide extinguisher should be immediately to hand.
- 5.10.4 No attempt should be made to extinguish an outbreak of fire involving burning LPG until the gas supply has been shut off. Untrained personnel should not attempt to tackle a fire involving fuel gases; the area should be evacuated and the fire service should be called immediately.
- 5.10.5 In the case of a liquid fuelled heater, a foam or spray foam extinguisher should be available to fight a fire involving leaking or spilled fuel.
- 5.10.6 Fire extinguishers should be serviced and maintained in accordance with BS 5306-3: Fire extinguishing installations and equipment on premises. Commissioning and maintenance of portable fire extinguishers. Code of Practice (ref. 17).

6 Checklist

		Yes	No	N/A	Action required	Due date	Sign on completion
6.1	Compliance with fire safety legislation (section 5.1)						
6.1.1	Has a suitable and sufficient fire risk assessment been undertaken for all premises to which the Regulatory Reform (Fire Safety) Order 2005 (or equivalent legislation in Scotland and Northern Ireland) applies? (5.1.1)						
6.1.2	When a portable heater is to be sited in an industrial environment are checks made to ensure that its location and use are compatible with the hazard zones identified as part of any DSEAR assessment? (5.1.2)						
6.1.3	Are risk assessments subject to periodic review, including at the time when plans are being made to introduce portable heaters? (5.1.3)						
6.1.4	Has the fire safety manager consulted with the fire and rescue service to become aware of the levels of response in the area where the premises are located? (5.1.4)						
6.2	Business continuity (section 5. 2)						
6.2.1	Is the use of portable heaters carefully managed to avoid even a small fire that would cause unnecessary disruption to the efficient functioning of the business? (5.2.1)						
6.2.2	Have steps been taken to maintain the continuity of the operations by making a suitable emergency plan? (5.2.2)						
6.2.3	Are tabletop exercises held periodically to test the effectiveness and suitability of the emergency plans? (5.2.3)						
6.2.4	Has consideration been given to applying commercially available computer programs, such as the ROBUST software, to develop and check the adequacy of the plan? (5.2.4)						
6.3	Fire safety management (section 5. 3)						
6.3.1	Is the use of portable heaters avoided wherever possible? (5.3.1)						
6.3.2	Is the use of portable and transportable heaters in the workplace sanctioned by a designated person? (5.3.2)						
6.3.3	Is the use of portable heaters prohibited in areas where flammable gases, vapours or combustible dusts may be present unless they have been designed specifically for use in that type of environment? (5.3.3)						
6.3.4	Where it is anticipated that a heater may be in use in a location for a prolonged period of time is the heater fixed firmly to the floor or wall in a suitable location with adequate ventilation provided? (5.3.4)						
6.3.5	If the fire assessment has determined that the risk of the heater being damaged or knocked over is unacceptable is fixed heating provided? (5.3.5)						
6.3.6	Is there a prohibition on portable heaters being allowed to operate unattended? (5.3.6)						
6.3.7	In circumstances where it is not possible to avoid leaving portable heaters unattended, is a specific risk assessment should be undertaken and appropriate control measures introduced? (5.3.6)						
6.3.8	Are all portable heaters turned off at the end of the period of work? (5.3.7)						

		Yes	No	N/A	Action required	Due date	Sign on completion
6.3.9	Are designated staff working in the vicinity of portable heaters familiar with the operation of the equipment and the fire hazards associated with their use? (5.3.8)						
6.3.10	Is care taken to avoid covering heaters or using them as shelves for papers? (5.3.9)						
6.3.11	Are staff aware that portable heaters should not be used for drying clothing as clothing placed too near may fall to cover or knock a heater over? (5.3.10)						
6.3.12	Is care taken not to handle or move heaters while in operation or when hot? (5.3.11)						
6.3.13	Are all portable heaters used and maintained regularly in accordance with the manufacturer's instructions? (5.3.12)						
6.3.14	Is any heater that is damaged taken out of service immediately and labelled prominently to this effect while awaiting repair? (5.3.13)						
6.3.15	Is adequate ventilation provided for all areas in which heaters are to be used? (5.3.14)						
6.3.16	Are all heaters kept clean and free from dust? (5.3.15)						
6.3.17	Are plans in place for the hiring of a suitable number of appropriate portable heaters in the event of a failure of the fixed heating system? (5.3.16)						
6.3.18	Is the use of personal portable heaters of any type brought to the workplace by staff from home prohibited? (5.3.17)						
6.3.19	When the continued use of portable heaters is no longer required are they removed from the workplace? (5.3.18)						
6.4	Location (Section 5.4)						
6.4.1	Are portable heaters sited and used according to the manufacturer's instructions? (5.4.1)						
6.4.2	Is the siting of portable heaters on escape routes, in confined spaces, cupboards, ducts or passageways avoided? (5.4.2)						
6.4.3	Are areas where liquid or LPG fuelled heaters to be used well ventilated to avoid depletion of oxygen levels and the accumulation of harmful fumes? (5.4.3)						
6.4.4	Are portable heaters sited in areas clear of combustible goods or other readily ignitable materials with a guard provided to maintain a clear space of at least 1m on all sides between a heater and combustible goods or combustible elements of the construction? (5.4.4)						
6.4.5	Where practicable are heaters sited externally and warm air piped or ducted into the premises by means of flame retardant hosing? (5.4.5)						
6.4.6	Where heaters are sited externally has it been ensured that exhaust fumes cannot enter the structure and are safely dispersed? (5.4.5)						
6.5	Electrical heaters (Section 5.5)						
6.5.1	Are portable electric heaters inspected periodically in compliance with the requirements of the Electricity at Work Regulations 1989 with suitable records being kept? (5.5.1)						
6.5.2	Are the regular inspections undertaken by a competent person with periods between inspections being determined on a risk assessed basis? (5.5.2)						
6.5.3	Is the use of heaters with exposed heating elements prohibited? (5.5.3)						
6.5.4	Wherever possible is an electric heater incorporating a thermostat selected for use? (5.5.4)						
6.5.5	Is particular care taken to ensure that portable electric heaters are switched off and unplugged at the end of each period of work? (5.5.5)						

		Yes	No	N/A	Action required	Due date	Sign on completion
6.5.6	Is the use of time switches avoided where they may turn a heater on when staff are not present? (5.5.6)						
6.5.7	Wherever possible, are portable heaters plugged directly into an electrical socket without the use of an extension lead? (5.5.7)						
6.5.8	Prior to each use is the heater and electrical socket outlet to be used visually inspected for signs of damage or overheating? (5.5.8)						
6.5.9	Is the fixed wiring of the circuit inspected and tested periodically in accordance with BS 7671? (5.5.9)						
6.5.10	Is care taken not to power electric heaters from a circuit supplying electricity to computer servers or similar business critical equipment? (5.5.10)						
6.5.11	Are electrical appliances such as heaters of a type approved by the British Electrotechnical Approvals Board? (5.5.11)						
6.5.12	Are flexible leads of portable electric heaters kept as short as practicable to minimise the trip hazard and the likelihood of damage to the cable? (5.5.12)						
6.5.13	Where heaters are fixed in position are the fittings such that the presence of trailing leads is avoided or minimised? (5.5.13)						
6.5.14	Are flexes kept clear of doorways and escape routes? (5.5.14)						
5.4.15	Where it is necessary for an electrical cable to run across the floor is it protected against mechanical damage by a proprietary cover or sheathing? (5.5.15)						
6.6	LPG Fuelled heaters (Section 5.6)						
6.6.1	Are LPG fuelled heaters of a cabinet or tank top design rather than a gas cylinder connected by tubing to a separate radiant panel? (5.6.1)						
6.6.2	Do all LPG heaters incorporate a cut out designed to shut off the gas supply automatically in the event of the heater being knocked over? (5.6.2)						
6.6.3	Is the use of LPG fuelled heaters avoided in basements or in other low lying locations where leaking vapour may accumulate? (5.6.3)						
6.6.4	Due to the potential hazard that LPG heaters present, are only authorised, competent persons permitted to carry out fuelling, lighting and extinguishing of an LPG heater? (5.6.4)						
6.6.5	Do heaters selected for use carry a British Standards Institution kitemark? (5.6.5)						
6.6.6	Are portable gas heaters serviced and maintained regularly in accordance with the manufacturer's instructions? (5.6.6)						
6.6.7	Are LPG fuelled heaters visually examined by a competent person periodically including at each time that the gas cylinder is changed? (5.6.6)						
6.6.8	Is the use of LPG fuelled transportable fan assisted space heaters ('torpedo', 'salamander' or 'tropical' heaters) prohibited unless agreed with the insurer? (5.6.7)						
6.6.9	Are LPG fuelled heaters allowed to cool before the cylinder is changed? (5.6.8)						
6.6.10	Is care taken to use the correct gas when changing gas cylinders on portable heaters? (5.6.9)						
6.6.11	Is the fuel used in accordance with the manufacturer's instructions? (5.6.10)						
6.6.12	Are gas cylinders changed in the open air? (5.6.11)						

		Yes	No	N/A	Action required	Due date	Sign on completion
6.6.13	Is a check made that the cylinder valve is closed before the heater is moved or the cylinder is disconnected? (5.6.12)						
6.6.14	Are flexible hoses within cabinet heaters kept as short as practicable and are the hose and connection points inspected visually whenever the cylinder is changed? (5.6.13)						
6.6.15	Are stocks of LPG and nominally empty cylinders kept to a minimum? (5.6.14)						
6.6.16	If gas is suspected to be leaking from a heater is the cylinder valve closed, all ignition sources in the vicinity eliminated and the appliance removed from the building? (5.6.15)						
6.7	Liquid fuelled heaters (Section 5.7)						
6.7.1	Are liquid fuelled heaters only used where absolutely necessary? (5.7.1)						
6.7.2	Is a specific fire risk assessment undertaken in any workplace prior to the introduction of a liquid fuelled heater? (5.7.2)						
6.7.3	Prior to use is a check made to ensure that the appliance has a British Standards Institution (BSI) kitemark? (5.7.3)						
6.7.4	Are portable heaters of this type only used in conjunction with the correct fuel? (5.7.4)						
6.7.5	Are liquid fuelled heaters cleaned and maintained annually and used in accordance with the manufacturer's instructions? (5.7.5)						
6.7.6	Do liquid fuelled heaters incorporate a cut out intended to shut off the fuel supply automatically in the event of the heater being knocked over? (5.7.6)						
6.7.7	Is the minimum amount of fuel stored in accordance with the guidance set out in RC56 and with the storage location clearly identified by appropriate signs? (5.7.7)						
6.7.8	Are flammable liquid stores at or above ground level unless sufficient mechanical ventilation is provided? (5.7.8)						
6.7.9	Are liquid fuelled heaters only refuelled by an authorised, competent person after having been allowed to cool? (5.7.9)						
6.7.10	Is refuelling undertaken outside the premises? (5.7.10)						
6.7.11	Is any spilled fuel cleaned up immediately? (5.7.10)						
6.7.12	Is the use of paraffin fuelled transportable fan assisted space heaters ('torpedo', 'salamander' or 'tropical' heaters) prohibited without the agreement of the insurer? (5.7.11)						
6.8	Other forms of heater (Section 5.8)						
6.8.1	Are small personal hand warmers which incorporate a glowing element subject to assessment for use in the workplace as for other forms of portable heater? (5.8.1)						
6.8.2	Is heated clothing used according to the manufacturer's instructions and be subject to a risk assessment as for the use of other forms of heating? (5.8.2)						
6.8.3	Are electrically heated mats prohibited in the workplace? (5.8.3)						
6.8.4	Are patio heaters provided in preference to chimineas to provide heating for outdoor workplaces or designated smoking areas? (5.8.4)						
6.9	Heaters for use in the open air (Section 5.9)						
6.9.1	Is care taken to locate patio heaters away from trees and bushes? (5.9.1)						
6.9.2	Are patio heaters sited away from awnings, canopies or combustible decorations and never used indoors? (5.9.2)						

		Yes	No	N/A	Action required	Due date	Sign on completion
6.9.3	Are patio heaters sited on level ground so as to be stable and stand approximately upright? (5.9.3)						
6.9.4	Are portable heaters used in the open air not left unattended for prolonged period of time? (5.9.4)						
6.9.5	Are external heaters positioned away from areas where they could be in danger of being struck by passing or manoeuvring vehicles? (5.9.5)						
6.9.6	Are patio heaters sited away from fire exit routes or other doorways from buildings? (5.9.6)						
6.9.7	Are patio heaters kept in good condition and used and maintained as recommended by the manufacturer? (5.9.7)						
6.9.8	Do LPG patio heaters incorporate a cut out intended to shut off the gas supply automatically in the event of the heater being knocked over? (5.9.8)						
6.9.9	Are patio heaters positioned as far as practical from buildings and structures? (5.9.9)						
6.9.10	Is care taken at Christmas and times of other festivals to ensure that a space of at least twice the height of a heater remains free between the heater and any combustible decorations, especially Christmas trees? (5.9.10)						
6.9.11	Is care taken with external heaters during windy weather conditions? (5.9.11)						
6.9.12	When no longer required, is the heater allowed to cool fully before being returned to its storage area? (5.9.12)						
6.9.13	Are power points for electric patio heaters provided in suitable locations by a competent electrician? (5.9.13)						
6.9.14	Are cables providing power for patio heaters as short as practicable and routed so as to avoid sharp corners and crossing doorways? (5.9.14)						
6.9.15	Are patio heaters powered directly from a powered socket and not via extension leads or adaptors? (5.9.14)						
6.9.16	Is particular care taken where heaters are an integral fitting beneath large parasols? (5.9.15)						
6.10	Fire protection (Section 5.10)						
6.10.1	Is the fire brigade called to all fires involving heaters and gas cylinders? (5.10.1)						
6.10.2	Is information provided for use by fire and rescue services in the event of an emergency up to date and does it show the location of heaters and cylinders? (5.10.1)						
6.10.3	Are an appropriate number of fire extinguishers, of a type suitable for extinguishing fires in nearby materials provided in all areas in which portable heaters are in use? (5.10.2)						
6.10.4	Where electrical heaters are in use is at least one carbon dioxide extinguisher immediately to hand? (5.10.3)						
6.10.5	Are staff aware that no attempt should be made to extinguish an outbreak of fire involving burning LPG until the gas supply has been shut off? (5.10.4)						
6.10.6	Where a liquid fuelled heater is in use is a foam or spray foam extinguisher available to fight a fire involving leaking or spilled fuel? (5.10.5)						
6.10.7	Are fire extinguishers serviced and maintained in accordance with BS 5306-3? (5.10.6)						

1. RC27: **Recommendations for hazard classification of heating appliances**, 2014, Fire Protection Association.
2. Regulatory Reform (Fire Safety) Order 2005, SI 2005 No 1541, The Stationery Office.
3. The Fire (Scotland) Act 2005, asp 5, The Stationery Office.
4. Fire Safety (Scotland) Regulations 2006, Scottish SI 2006 No 456, The Stationery Office.
5. Fire and Rescue Services (Northern Ireland) Order 2006, SI 2006 No 1254 (NI9), The Stationery Office.
6. Fire Safety Regulations (Northern Ireland) 2010, SI 2010 No 325 (NI), The Stationery Office.
7. Dangerous Substances and Explosive Atmospheres Regulations (DSEAR), 2002, SI 2002 No 2776 (as amended in 2015), The Stationery Office.
8. **Business resilience: A guide to protecting your business and its people**, 2005, Fire Protection Association.
9. The ROBUST software (Resilient Business Software Toolkit) may be found at <https://robust.riscauthority.co.uk>
10. Electricity at Work Regulations 1989, SI 1989 No. 635, The Stationery Office.
11. HSG107: **Maintaining portable and transportable electrical equipment**, Third edition 2013, HSE.
12. BS 7671: 2008 + A3: 2015: **Requirements for electrical installations. IET Wiring Regulations**, British Standards Institution.
13. RC8: **Recommendations for the storage, use and handling of industrial gases in cylinders**, 2016, Fire protection Association.
14. RC56: **Recommendations for fire safety in the storage, handling and use of highly flammable and flammable liquids: storage in containers other than external fixed tanks**, 2014, Fire protection Association.
15. HSG 51: **Storage of flammable liquids in containers**, 2015, Health and Safety Executive.
16. BS 5306-8: 2012: **Fire extinguishing installations and equipment on premises. Selection and positioning of portable fire extinguishers. Code of practice**, British Standards Institution.
17. BS 5306-3: 2009: **Fire extinguishing installations and equipment on premises. Commissioning and maintenance of portable fire extinguishers. Code of practice**, British Standards Institution.
18. INDG236: **Maintaining portable electric equipment in low-risk environments**, Health and Safety Executive.



Fire Protection Association

London Road
Moreton in Marsh
Gloucestershire GL56 0RH
Tel: +44 (0)1608 812500
Email: info@riscauthority.co.uk
Website: www.riscauthority.co.uk

RC15 Version 3 First published 1995

2018 © The Fire Protection Association
on behalf of RISCAuthority