Recommendations

RC15

for the use of portable and transportable heaters in commercial and industrial premises

Protecting people, property, business and the environment

FPA Fire Protection Association

InFiReS

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SCOPE

These recommendations apply to all types of portable and transportable space heaters used in industrial and commercial premises.

INTRODUCTION

Portable or transportable heaters are in common use, particularly in commercial premises, to supplement central heating systems or for use on days when the weather is inclement. Portable heaters are more likely to cause fires than fixed heating systems with fire often resulting from them being placed too close to combustible materials. Fire can be caused by papers, clothing or similar items being placed on top of, or against the hot surfaces of heaters.

UK *Fire Statistics* (ref. 1) show that over 800 fires in commercial buildings are caused annually by space heating appliances, but it is not clear precisely how many of these involve portable units. In addition to these, a further 1600 such incidents occurred in dwellings. Fires involving portable heaters are a common cause of death and injury.

Problems that occur include faulty appliances, the misuse of the heaters, and placing items too close to or on top of appliances.

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

Where the use of portable heaters is unavoidable, such as on building sites and in some temporary or transportable buildings, great care should be exercised in the choice, location and use of this method of heating. Where stocks of portable heaters are to be stored for emergency supplementary heating during periods of particularly cold weather, instructions should be prepared for staff to ensure their safe use.

Where portable or transportable heaters are to be used routinely to supplement fixed heating installations during very cold weather, insurers should be consulted, especially if transportable fan-assisted space heaters are to be used. 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.

DEFINITIONS

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

LPG. Liquefied petroleum gas, which in the case of portable heaters will be propane or butane.

Patio heater. A form of radiant LPG-fuelled heater designed for use outdoors. The gas cylinder is held in the base of the unit with a 'mushroom' shaped reflector at the top to reflect the heat down onto people nearby.

Tank-top heaters. These are forms of gas-fuelled heater in which a radiant panel is fixed directly to the top of the gas cylinder.

'Torpedo' 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.

RECOMMENDATIONS

1. General

1.1 Fixed heaters are preferable to the use of portable heaters, which should be avoided where possible.

1.2 Where it is necessary to use portable heaters, they should be used and maintained regularly in accordance with the manufacturers' instructions.

1.3 Adequate ventilation should be provided for the area in which the heater is to be used.

1.4 The use of portable and transportable heaters in the workplace should be sanctioned by a responsible person. The responsible 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 2-4).

1.5 The fire risk assessment should consider the use of portable heaters of the style intended in conjunction with the number, alertness and mobility of the persons within the building. Following an assessment it will normally be advisible to prohibit the use of portable heaters in buildings where there are sleeping risks, people with mobility or awareness problems or where young children may be present.

1.6 All forms of portable heater are inappropriate in crèches, many farm premises and other areas where children or livestock may be present. In these cases the hazard of the heater being damaged or knocked over is too great and thus fixed heating should be provided.

1.7 The use of portable heaters in warehouses is not recommended.

1.8 Portable heaters should not be covered in any way or used as shelves for papers.

1.9 Portable heaters should not be used for drying clothing. Where wet clothing is to be dried it should be hung on a suitable hanger or rack well away from the source of heat so that should an item fall it will not cover the heater or knock it over. In circumstances where clothing is likely to be dried on a routine basis (such as on some construction sites) a purpose designed drying room should be provided.

1.10 Heaters should not be moved while alight or switched on.

1.11 The use of personal portable heaters brought to the workplace by staff should be prohibited.

2. Electric heaters

2.1 *General*

2.1.1 Electrical appliances should preferably be of a type approved by the British Electrotechnical Approvals Board (BEAB).

2.1.2 Wherever possible, a heater incorporating a thermostat should be selected for use.

2.1.3 Convection or infra red heaters should be used in preference to appliances with radiant elements.

2.1.4 The use of time switches should be minimised; they should never be used to control a heater with a radiant element. Heaters should not be powered via a timer intended to turn the heater on or off outside of normal working hours.

2.1.5 The flexible leads of portable electric heaters should be kept as short as practicable to minimise the trip hazard.

2.1.6 Flexes should not pass beneath doors or over sharp objects that might cause fraying. Where necessary, connection leads should be protected by proprietary covers or sheathing.

2.1.7 Electric heaters should be switched off and unplugged when not in use. They should be removed from the area when no longer required.

2.1.8 Electrical leads should be as short as possible and not be subject to tension.

2.1.9 Electrical leads should be kept clear of doorways, walkways, escape routes and transit areas within rooms.

Table 1: Suggested maintenance intervals for portable electrical equipment

Type of business	User checks	Formal visual inspection	Combined inspection and test
Equipment hire	n/a	Before issue/after return	Before issue
Construction	110V - weekly	110V - monthly	110V - before first use on site then 3-monthly
	230V mains - daily/every shift	230V mains - weekly	230V mains - before first use on site then 3-monthly
Light industrial	Yes	Before initial use then 6-monthly	6-12 months
Heavy industrial or high risk of equipment damage	Daily	Weekly	6-12 months
Office information technology	No	1-2 years	None if double insulated, otherwise up to 5 years
Double-insulated equipment – not hand held	No	2-3 years	No
Double-insulated equipment (Class II) – hand held, such as some floor cleaners and kitchen equipment	Yes	6 months – 1 year	No
Earthed appliances (Class I) such as kettles, kitchen equipment and irons	Yes	6 months - 1 year	1-2 years
Equipment used by the public, such as in hotels	By members of staff	3 months	1 year
Cables and plugs, extension leads	Yes	1 year	3 years

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2.1.10 Where it is necessary for electrical leads to run across the floor (for example between desks) the flex should be protected against mechanical damage.

2.1.11 Electrric heaters should be powered directly from a socket outlet, not via an adaptor or extension lead.

2.1.12 Electric heaters should not be powered from a circuit supplying electricity to computer servers or similar business-critical apparatus.

2.2 *Inspection and testing*

2.2.1 All electric heaters should be inspected and tested periodically in accordance with the requirements of the Electricity at Work Regulations 1989 (ref. 5) and suitable records should be kept. Where necessary, the equipment should be repaired or replaced.

2.2.2 There are no absolute rules on the frequency of the testing and inspection of heaters and other portable electrical appliances. Regular inspection of equipment is an essential part of any preventative maintenance program and the periods between the inspections should be determined on a risk assessed basis or in accordance with the guidance set out by the HSE in *Maintaining Portable and Transportable Electrical Equipment*. These are set out in Table 1 (ref. 6).

2.2.3 The electrical socket outlet should be inspected visually for signs of damage or overheating periodically.

2.2.4 The fixed wiring of the circuit should be inspected and tested periodically in accordance with BS 7671 (the Institution of Electrical Engineers Wiring Regulations) (ref. 7).

3. LPG-fuelled heaters

3.1 *General*

3.1.1 Heaters selected for use should carry an EC mark.

3.1.2 Fuel piping should be as short as possible and not subject to tension.

3.1.3 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.

3.1.4 Care should be taken to use the correct gas when changing gas cylinders on portable heaters. Propane and butane cylinders must not be interchanged.

3.1.5 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.

3.1.6 Ensure that the cylinder valve is closed before disconnecting the heater.

3.1.7 A minimum number of 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 (ref.8).

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

3.1.9 In the case of LPG heaters the correct fuel should be used in accordance with the manufacturers' instructions.

3.1.10 The substitution of propane for a butane gas cylinder (or vice versa) is extremely hazardous without the appliance being modified by the manufacturer or other competent person.

3.1.11 An authorised person should carry out fuelling, lighting or extinguishing an LPG heater in accordance with the manufacturer's instructions.

3.1.12 Refuelling should not be carried out while the heater is in operation and should only be undertaken in the open air in case of release of the flammable gas.

3.1.13 Stocks of LPG should be kept to a minimum. Spare cylinders should be stored securely well away from any source of ignition, preferably in the open or in a compartment of fire-resisting construction.

3.1.14 Gas cylinders should be protected from direct sunlight and other environmental effects. RC8 (ref. 8) provides further guidance on the storage and use of LPG in cylinders.

3.2 *Inspection and testing*

3.2.1 Portable gas heaters should be serviced and maintained regularly in accordance with the manufacturer's instructions.

3.2.2 The flexible hose should be inspected visually whenever the cylinder is changed.

3.2.3 If gas is suspected to be leaking from the appliance the position of the leak should be found 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.

4. Liquid-fuelled heaters

4.1 The use of paraffin heaters in a workplace should be avoided wherever possible. This is because the hazards associated with this form of heater are compounded by the need to store the fuel and refill the tank.

4.2 If it is necessary to use a paraffin heater, a check should be made to ensure that the appliance has a British Standards Institution (BSI) kitemark.

4.3 It is essential to use the particular liquid fuel for which a heater was designed.

4.4 A minimum amount of fuel should be stored, ideally outside the premises. No more than 23 litres (5 gallons) and preferably only 9 litres (2 gallons) should be available, in closed purpose-made containers stored away from sources of heat.

4.5 Paraffin-fuelled appliances should be allowed to cool before refuelling.

4.6 Refuelling should not be carried out while the heater is in operation. Wherever possible, refuelling should be undertaken outside the premises. Any spilled fuel should be cleaned up immediately.

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

4.8 Torpedo heaters should not be used in vehicles, caravans or temporary buildings.

5. Location

5.1 Portable heaters should always be sited and used according to the manufacturer's instructions.

5.2 Heaters should stand on a level, dry surface where they are not liable to be subjected to mechanical damage or be overturned.

5.3 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, wall- mounted units should be installed.

5.4 Portable heaters should not be used in areas where flammable gases, vapours or combustible dusts may be present unless they have been designed specifically to be fit for use in that type of environment. Where suitable portable heaters are available, their use should be subject to a fire risk assessment in accordance with the current legislation.

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

5.6 Areas where liquid- or LPG-fuelled heaters are used should be well ventilated to prevent the accumulation of harmful fumes.

5.7 LPG-fuelled heaters should not be used in basements or in other low lying locations where leaking vapour may accumulate.

5.8 Heaters should be sited in areas clear of combustible goods or other readily ignitable materials. Where there is any possibility of combustible materials coming into contact with the appliance, a guard should be provided to maintain a clear space of at least 1m around it. Alternatively, the floor 1m around the unit should be hatched prominently to indicate that it should be kept clear.

5.9 Heaters, other than electric appliances with unexposed elements and an outer casing temperature that does not exceed 120°C, should be sited on a non-combustible floor or surface.

6. Use

6.1 Portable heaters should not be left unattended for prolonged periods of time. Where permanent background heating is required it will be safer, and may be more economic, to provide fixed appliances.

6.2 Heaters should not be handled or moved whilst in operation or when hot.

6.3 Care should be taken to ensure that all heaters are turned off and unplugged at the end of the period of work.

6.4 All heaters should be kept clean and free of dust.

6.5 If a heater is damaged, it should be taken out of service immediately and be labelled prominently to this effect while awaiting repair.

7. Heaters for use in the open air

External patio or 'mushroom' heaters have come into common use in the UK in recent years. Designed for use outdoors, they are typically fuelled by a gas cylinder in the base of the unit. This cylinder, being heavy, also contributes to the stability of the heater. The gas is burnt on metal gauze beneath a mushroom-shaped cap that reflects a large proportion of the radiant heat produced downwards to provide warmth for people in the vicinity. The heat output tends to be between 10MJ and 40MJ (approximately 10,000-40,000 BTU), with the fuel normally being supplied from a 9kg propane cylinder.

Like all consumer products, the heaters require maintenance and management.

7.1 *General precautions*

7.1.1 Portable heaters used in the open air should not be left unattended for a prolonged period of time.

7.1.2 Heaters should be used in accordance with the manufacturers' instructions.

7.1.3 Equipment should be serviced and maintained in accordance with the manufacturers' instructions. Routine maintenance undertaken by the user should be recorded, as should any periodic servicing that is required to be undertaken by a competent service agent.

7.1.4 All items should be in good condition; on external heaters, the cover to the gas cylinder compartment should be in position to restrict access by unauthorised members of staff or members of the public to the gas cylinder and control valve.

7.1.5 Only 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.

7.1.6 Care must be taken during windy weather conditions. At these times the flames of heaters should be monitored periodically and if abnormal burning occurs the appliances should be turned off immediately.

7.1.7 Out of working hours all gas-fuelled equipment should be stored safely. The equipment may be taken into the premises, but only provided that all its surfaces are cool and the valve on the propane cylinder has been closed.

7.2 *Siting and location*

7.2.1 Heaters should not be positioned or used where they could be in danger of being struck by passing or manoeuvring vehicles.

7.2.2 Gas-fuelled appliances should not be sited directly in front of doorways or other fire exit routes from buildings.

7.2.3 Heaters should not be sited directly beneath awnings, canopies or combustible decorations.

7.2.4 Heaters should be sited on level ground so as to stand approximately upright.

7.2.5 All heaters should be positioned as far as practical from the buildings, with a safe distance between the closest part of the heater and any element of the structure.

7.2.6 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 (measured both horizontally and vertically) remains free between a heater itself and any combustible decorations, especially Christmas trees.

8. Firefighting

8.1 A suitable number of fire extinguishers should be available to fight a fire, appropriate for the type of heater in use.

8.2 In the case of electrical heaters, at least one carbon dioxide or dry powder extinguisher should be immediately to hand.

8.3 In the United Kingdom, the national accreditation body is the United Kingdom Accreditation Service (UKAS). Portable extinguishers should be approved and certified by an independent, UKAS-accredited, third-party certification body, such as the Loss Prevention Certification Board (LPCB) or British Approvals for Fire Equipment (BAFE) and should be installed in accordance with BS 5306: Part 8 (ref. 9) and inspected and maintained in accordance with BS 5306: Part 3 (ref. 10).

8.4 An outbreak of fire involving release of gas from a cylinder should only be controlled and not extinguished until the gas supply can be shut off at the valve.

8.5 The fire brigade should be called to all fires involving heaters and gas cylinders.

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