



ISLE OF WIGHT FIRE AND RESCUE SERVICE

Fire Safety Fire and CO Risk on Boats

In 2012, the most common causes of fires on boats were electrical fires, engine space fires and solid fuel stove fires.

Many people do not appreciate the risks associated with boats and their domestic equipment and installations. Even a moderate sized boat can carry hundreds of litres of diesel, dozens of kilograms and Liquefied Petroleum Gas (LPG) and 20-50 litres of petrol. These fuels are combined with readily combustible materials such as wood and glass-reinforced-plastic and they are all placed in close proximity of sources of heat and ignition such as engines, 12, 24 and 240 volt electrics and solid fuel stoves.

Petrol

The Boat Safety Scheme urges owners to keep their boats well maintained and to keep alert to possible leaks, poor running engines and the strong smell of petrol.

The advice to boaters is:

"Don't carry spare petrol on board unless it is completely unavoidable. If you must, please take every measure you can to reduce the chance of an accident."

- Spare petrol containers should not be carried on-board unless it is judged to be essential to assure the safe completion of a voyage or excursion or to keep a necessary generator running.
- Limit the capacity! Don't forget that UK law allows you only to carry restricted amounts of spare petrol aboard.
- Use proper cans, specifically designed for petrol. Any other container not designed for petrol could allow fuel and vapours to escape.
- Protect petrol containers from direct sunlight wherever you can, but never keep them in the engine or cabin space.
- Store petrol cans and engines with integral tanks such as outboard motors and generators away from sources of ignition in drained lockers, or on open deck areas where any escaping petrol fuel and vapours will flow overboard.
- Decanting petrol from containers should be avoided if possible, and re-filling containers or equipment should take place in the open air on the bank and away from sources of ignition.
- Never use a bucket or other open receptacle to hold or transfer petrol or to mix petrol and two-stroke oil, add the oil to the engines tank before filling with petrol.

- Containers should not be overfilled, because petrol expands and vapour pressure can build-up in hot weather.
- Containers should be securely stowed to prevent them falling over and leaking.
- Take care to protect petrol containers, any that is dropped or treated roughly could start leaking.

Solid Fuel Stoves

Solid fuel stoves continue to be a significant cause of fire on inland waterway boats. These heaters are very popular on narrowboats, coastal barges and on some classic and vintage yachts or ex-fishing boats.

There are four risks that must be avoided or managed, if boaters and crews are to keep safe with solid fuel stoves:

- 'Over-firing' of the stove leading to a boat fire.
- Carbon Monoxide (CO) poisoning due to the escape of stove flue gases into the cabin.
- Items and materials being too close and getting too hot for too long.
- Poor maintenance and misuse of the stove.

Liquified Petroleum Gas (LPG)

Fixed gas systems must be installed to accepted boat installation standards and in accordance with the appliance maker's instructions. Gas appliances and flues should be routinely serviced and maintained.

- Make sure gas canisters, bottles or cylinders are stored upright and where any leaking gas will flow overboard and not into the interior of the craft. Preferably this will be in a suitable, vapour-tight, self-draining locker.
- Check flexible hoses for damage or deterioration. If you're in any doubt about their good condition, get them professionally checked and renewed.
- Check your LPG system for leakage by routine observation or a bubble tester installed in the cylinder locker, or by testing all joints with leak detection fluid.

Portable 'camping style' Equipment

Owners of boats without proper galley facilities are recommended to consider using a flask for hot drinks when aboard as portable camping equipment is not suitable.

Unless any portable gas equipment is specifically designed for boat use, then its usage should be restricted to times ashore. And whatever else happens, fuel canisters should always be changed away from the boat and away from ignition sources.

Carbon Monoxide (CO)

When carbon-based, appliance and engine fuels, such as gas, LPG, coal, wood, paraffin, oil, petrol and diesel don't burn completely, CO is produced, CO build-up in the cabin can occur due to one, or a mix, of these factors:

- With faulty, badly maintained or misused appliances.

- Exhaust fumes from a boat's engine or generator.
- Escaped flue gases from solid fuel stoves.
- Blocked ventilation or short supply of air - fuels need the right amount of oxygen to burn safely.

Carbon monoxide tips for boaters:

- Install a CO alarm.
- Test the alarm routinely.
- Never remove the batteries.
- Install fuel burning appliances properly.
- Maintain appliances and engines routinely.
- Use the equipment correctly.
- Don't allow engine fumes into the cabin space.
- Never bring a lit or cooling barbecue into a cabin or covered area (the only safe charcoal is *stone-cold* charcoal).
- Deal with problems immediately.
- Don't allow bodged repairs and maintenance.
- Know the signs of CO poisoning and how to react.

Detection Equipment

Smoke alarms save lives

In the absence of any British or international standards incorporating a suitable code for marine installation, the Fire Protection Association's (FPA) advice is that the alarm of choice is; an optical alarm with a long-life battery, a hush button and one that meets either BS 5446:2000 Part 1, or BS EN 14604:2005, preferably also carrying a BSI or LPCB certification mark.

This advice recognises the confined nature of the space inside a boat and the potential for high levels of humidity and vibration, wider temperature ranges and an aggressive chemical atmosphere. These conditions may affect battery lifespan hence the recommendation for the lithium sealed alarms. Even though some boats have 230/240 V a.c. systems, mains powered alarms are not recommended due to the erratic and unreliable nature of the power supply.

Generally alarms should be mounted on the deckhead (ceiling), 30cm from the cabin sides and within five metres of each protected area of the vessel. On some boats this will mean installing more than one alarm, and it is recommended to choose units that can be linked together.

Carbon monoxide alarms save lives

For boats with fuel burning appliances aboard, an engine or generator, the recommendation is to fit a suitable audible carbon monoxide alarm for an added re-assurance. 'Black-spot' colour-changing indicator cards are not good enough. Boaters will not have an instant warning of dangerous CO levels and there's not alarm to wake up anyone asleep. The BSS advice is to fit alarms approved as meeting BSEN 50291; these are best suited for boats. Alarms with life-long batteries are available.

For the best protection, follow the alarm manufacturer's installation instructions as far as the space and nature of the boat allow. But if the placement directions are difficult to meet on any boat, these are the 'best practice' points. Try to place the alarm:

- In living quarters between 1m and 3m (on plan view) from the appliance.
- In living quarters fix alarms high up on a wall, but at least 150mm from the ceiling and where the indicator lights can be seen.
- In sleeping quarters have the alarm in the "breathing zone", i.e. near the bed head.
- Before fixing, test that the alarm can be heard from any position in the boat (or buy an additional alarm).