



# The safe use of gas cylinders





## INTRODUCTION

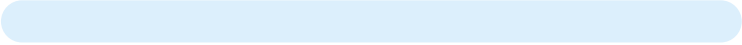
When accidents involving gas cylinders occur they can cause serious injury or even death. Fortunately they rarely happen. This leaflet provides simple practical advice on eliminating or reducing the risks associated with gas cylinders.

It is aimed at anyone who uses, owns, fills or repairs gas cylinders at work (the legal term for a gas cylinder is transportable pressure receptacle). The advice will be useful for those who own or manage small businesses. Additional guidance is listed at the end of this leaflet.

Gas cylinders used in adverse or extreme conditions, such as under water, may require special precautions. While the advice in this leaflet is valid for all uses of gas cylinders, these extra precautions are not covered.

Gas cylinders are a convenient way to transport and store gases under pressure. These gases are used for many different purposes including:

- chemical processes;
- soldering, welding and flame cutting;
- breathing (eg diving, emergency rescue);
- medical and laboratory uses;
- fuel for vehicles (eg fork-lift trucks);
- fire extinguishers;
- heating and cooking.



The main causes of accidents are:

- inadequate training and supervision;
- poor installation;
- poor maintenance;
- faulty equipment and/or design (eg badly fitted valves and regulators);
- poor handling;
- poor storage;
- inadequately ventilated working conditions.

The main hazards are:

- impact from the blast of a gas cylinder explosion or rapid release of compressed gas;
- impact from parts of gas cylinders that fail or any flying debris;
- contact with the released gas or fluid (such as chlorine);
- fire resulting from the escape of flammable gases or fluids (such as liquefied petroleum gas);
- impact from falling cylinders.

## HOW TO REDUCE THE RISKS

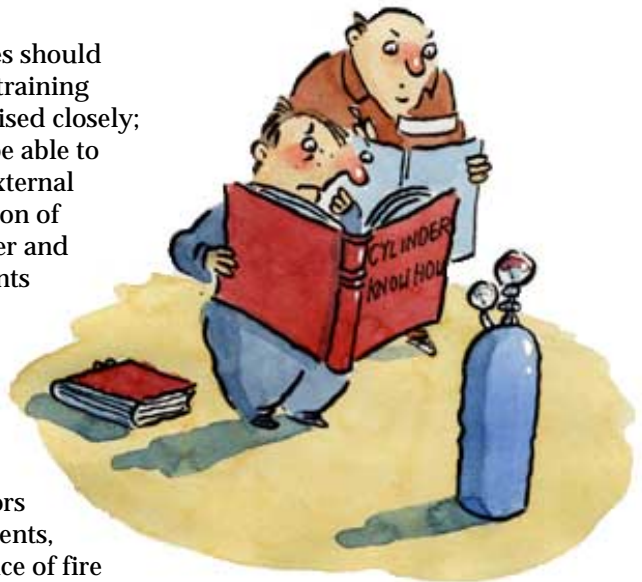
All gas cylinders must be designed and manufactured to an approved specification to withstand everyday use and to prevent danger. To reduce the risks of failure you need to know, and act on, the following precautions.

### Training

Anyone who refurbishes, fills or uses a gas cylinder should be suitably trained and have the necessary skills to carry out their job safely. They should understand the risks associated with the gas cylinder and its contents.

In particular:

- new employees should receive initial training and be supervised closely;
- users should be able to carry out an external visual inspection of the gas cylinder and any attachments (eg valves and regulators), to determine whether they are damaged - visual indicators may include dents, bulges, evidence of fire damage (scorch marks), etc.



## Initial integrity

The law requires that gas cylinders should be:

- manufactured to a design standard or design specification of a type approved by the Health and Safety Executive (HSE); or
- manufactured in accordance with an established European Directive, relating to gas cylinders (often called 'EEC-type cylinders');
- examined by an approved inspection body to verify the cylinders are manufactured correctly.

Owners and fillers should satisfy themselves that these requirements have been carried out by examining either:

- the written certificate which accompanies the gas cylinder; or
- the stamp or mark of the inspection body on the gas cylinder itself.



## Continuing integrity

If you own gas cylinders, **you** should ensure that they are examined at appropriate intervals to make sure that they are safe for continued use. The law requires that gas cylinders are:

- examined and tested at appropriate intervals, by a competent person, in accordance with recognised national standards or the relevant design specification;
- marked, with a stamp or label, to show that they have been examined and tested by a competent person (see note in box below);
- marked, with a stamp or label to show when the next examination is due;
- checked by an appointed verification body before being resupplied - if modified or repaired.



**The law prohibits modifications or major repairs to the body of seamless gas cylinders or cylinders that have contained acetylene.**

For cylinders, where there is minor damage only, refurbishment (limited to 'cosmetic' work only, which does not affect the integrity of the cylinder) can be undertaken by a person competent to do so.

**Note:** A competent person is an individual person or body who has the necessary skills, experience and expertise to carry out a thorough examination and test of a gas cylinder to determine whether it is safe for continued use.

## **Filling**

Anyone carrying out the filling of gas cylinders should wear suitable personal protective equipment as appropriate. This may include safety shoes, gloves, ear and eye protection.

Before filling a gas cylinder check:

- that the gas cylinder has been properly examined by a competent person and is still within its due test date;
- it is suitable for the gas/fluid with which it is to be filled;
- the gas cylinder's safe operating limits;
- that the valves and regulators (where fitted) are:
  - correctly fitted and not leaking;
  - in good working condition;
  - suitable for their intended purpose;
  - valves and fittings are not contaminated, eg with incompatible lubricants.

After filling a gas cylinder check:

- the gas cylinder is within its safe operating limits;
- the gas cylinder is not overfilled or overpressurised:
  - in the event of inadvertent overfilling, any excess gas has to be removed in a safe manner;
- that the gas cylinder connections are not leaking, eg by using special equipment, such as 'sniffers' or manometers. If appropriate, the simple method of using a soapy water solution can be used.

## **Handling and use**

- Use gas cylinders in a vertical position, unless specifically designed to be used otherwise.



- Always **double check** that the cylinder/gas is the right one for the intended use.
- Securely restrain cylinders to prevent them falling over.
- Close the cylinder valve and replace dust caps, where provided, when a gas cylinder is not in use.
- Before connecting a gas cylinder to equipment or pipework make sure that the regulator and pipework are suitable for the type of gas and pressure being used.
- Wear suitable safety shoes when handling gas cylinders.
- **Do not** use gas cylinders for any other purpose than the transport and storage of gas.
- **Do not** drop gas cylinders.



### Lifting

- Use suitable cradles, slings, clamps or other effective means when lifting cylinders with a hoist or crane.
- **Do not** use valves, shrouds and caps for lifting cylinders unless they have been designed and manufactured for this purpose.
- Gas cylinders **should not** be raised or lowered on the forks of lift trucks unless adequate precautions are taken to prevent them from falling.

## Transport

- Fit suitable protective valve caps and covers to cylinders, when necessary, before transporting. (Note: caps and covers prevent moisture and dirt from gathering in the valve of the cylinder. They also help in preventing gas from leaking.)
- Securely stow gas cylinders to prevent them from moving or falling. This is normally in the vertical position, unless instructions for transport state otherwise.
- Disconnect regulators and hoses from cylinders whenever practicable.
- **Do not** let gas cylinders project beyond the sides or end of a vehicle.
- Ensure gas cylinders are clearly marked to show their contents and the hazards associated with their contents.
- It may be necessary to take special measures with certain types and quantities of compressed gases and fluids in order to ensure their safe carriage. If you have any doubts seek further guidance (see *Further advice*).





## **Storage**

- Store gas cylinders in a safe place in the open air. If this is not reasonably practicable, then store them in an adequately ventilated building or part of a building specifically reserved for this purpose.
- Gas cylinders containing flammable gas should not be stored in part of a building used for other purposes.
- Protect gas cylinders from external heat sources which may adversely affect their mechanical integrity.
- Gas cylinders should be stored away from sources of ignition and other flammable materials.
- Avoid storing gas cylinders so that they stand or lie in water.
- Store gas cylinders securely when they are not in use. They should be properly restrained, unless designed to be free-standing.
- Gas cylinders must be clearly marked to show, what they contain and the hazards associated with their contents.

## FURTHER ADVICE

Contact the following:

Your local HSE office - the number can be obtained from directory enquiries or the phone book under 'Health and Safety Executive'.

For premises covered by the local authority, eg offices and shops, contact the Local Authority Unit enquiry point.  
Tel: 0207 717 6442; Fax: 0207 717 6418.

The United Kingdom Accreditation Service (UKAS) can advise on competent people. UKAS can be contacted at 21-47 High Street, Feltham, Middlesex TW13 4UN.  
Tel: 0208 917 8435; Fax: 0208 917 8499.

### **Related regulations, guidance and further information**

This leaflet tells you about the main dangers of gas cylinders and of some of your legal responsibilities. For more detail you should refer to:

The Carriage of Dangerous Goods (Classification, Packaging and Labelling) and Use of Transportable Pressure Receptacles Regulations 1996: SI 1996/2092

The Highly Flammable Liquids and Liquefied Petroleum Gases Regulations 1972: SI 1972/917

The Pressure Vessels (Verification) Regulations 1988:  
SI 1988/896

*Manual handling*: Manual Handling Operations Regulations 1992  
Guidance on Regulations L23 HSE Books 1998  
ISBN 0 7176 2415 3

*Safe use of lifting equipment.* Lifting Operations and Lifting Equipment Regulations 1998. Approved Code of Practice and Guidance L113 HSE Books 1998 ISBN 0 7176 1628 2

*Chemical warehousing: the storage of packaged dangerous substances* HSG71 HSE Books 1998 ISBN 0 7176 1484 0

*Guidance for road vehicle operators and others involved in the carriage of dangerous goods by road* HSG161 HSE Books 1996 ISBN 0 7176 1253 8

*The safe use of compressed gases in welding, flame cutting and allied processes* HSG139 HSE Books 1997 ISBN 0 7176 0680 5

British Compressed Gases Association Guidance Note GN2 (on storage of cylinders) and Code of Practice CP11 (on testing of cylinders). BCGA address given below.

*The storage of full and empty LPG cylinders and cartridges.* LP Gas Association Code of Practice No. 7 Available from the LP Gas Association, address given on page 12.

While every effort has been made to ensure the accuracy of the references listed in this publication, their future availability cannot be guaranteed.

Regulations are available from:  
The Stationery Office (formerly HMSO), PO Box 272,  
London SW8 5DT. Tel: 0870 600 5522; Fax: 0870 600 5533

Further guidance may be obtained from:  
The British Compressed Gases Association, 14 Tollgate,  
Eastleigh, Hampshire SO5 33TG. Tel: 01703 641488



The LP Gas Association, Pavilion 16, Headlands Business Park, Salisbury Road, Ringwood, Hampshire BH24 3PB.

HSE priced and free publications are available by mail order from:

HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA.  
Tel: 01787 881165; Fax: 01787 313885. HSE priced publications are also available from good booksellers.

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HSE home page on the World Wide Web:  
**<http://www.open.gov.uk/hse/hsehome.htm>**



This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

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