



BCGA GUIDANCE NOTE GN 2

**Guidance for the Storage of Gas Cylinders
in the Workplace**

Revision 3 : 2005

British Compressed Gases Association

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PREFACE

The various publications issued by the British Compressed Gases Association have the objective of establishing consistency in design, construction practices and user operational and maintenance procedures, in order to establish high standards of reliability and safety in the interests of employers, employees and the general public.

The Association endeavours to compile these documents using the best sources of information known at the date of issue. The information is used in good faith and belief in its accuracy. The publications are intended for use by technically competent persons and their application does not, therefore, remove the need for technical and managerial judgement in practical situations and with due regard to local circumstances, nor do they confer any immunity or exemption from relevant legal requirements, including by-laws.

The onus of responsibility for their application lies with the user. The Association, its officers, its members and individual members of any Working Parties can accept no legal liability or responsibility whatsoever, howsoever arising, for the consequences of the use or misuse of the publications.

For the assistance of users, references are given, either in the text or Appendices, to publications such as British, European and International Standards and Codes of Practice, and current legislation that may be applicable. The intention of BCGA is that this document should be read and used in the context of these references where the subjects have a bearing on the local application of the processes or operations carried out by the user.

BCGA's publications are reviewed, and revised if necessary, at three-yearly intervals. Readers are advised to check the list of publications on the Association's website www.bega.co.uk to ensure that the copy in their possession is the current version.

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* Numbers in brackets refer to references in Section 8. Documents referenced are the edition current at the time of publication of Guidance Note.

BCGA GUIDANCE NOTE

Guidance for the Storage of Gas Cylinders in the Workplace

1 INTRODUCTION

This Guidance Note has been prepared by producers, processors and distributors of cylinder gases.

It is aimed primarily at users of gas cylinders in the workplace. Sites operated under the direct control of the gases supplier or manufacturer of gases will be governed by guidelines drawn up on the basis of a site risk assessment.

The guidance given is based on extensive knowledge and experience of cylinder storage practices, which have been proved to be safe in practical situations for over half a century. Substantial quantities of industrial gases are produced, distributed and stored each year and, although many organisations have developed their own Codes of Practice and Engineering Standards, it is considered that this Guidance Note will be of benefit to users generally.

A risk assessment is required at all times under The Management of Health and Safety at Work Regulations (1) and may also be required under The Dangerous Substances and Explosive Atmospheres Regulations 2002 - DSEAR (2).

DSEAR is a set of regulations concerned with protection against risks from fire, explosion and similar events arising from dangerous substances used or present in the workplace. These Regulations apply to employers and the self-employed and are supported by a number of ACoPs (References 3-7). See also INDG370 - Fire & Explosion – How Safe is your Workplace? (16).

The aim of this Guidance Note is to provide information on the hazards of gas cylinder storage, and on what is good practice for controlling the risks to assist the user of gases to conduct a risk assessment.

Every storage situation must be considered on its merits and special circumstances may necessitate variations on the recommended requirements. This guidance is intended as an aid to designing new storage areas; it may also be used for reviewing the safety and suitability of existing gas cylinder storage facilities. It does not preclude the use of alternative designs, materials and methods, when they provide equivalent standards of safety.

This Guidance Note has been written in consultation with HSE and takes full account of its publication HS(G)71 “Chemical Warehousing - The Storage of Packaged Dangerous Substances” (15). Where gas cylinders are stored in conjunction with other packaged dangerous substances reference should be made to HS(G)71.

2 SCOPE

This document defines the principles of safe practice for the storage of gases in cylinders and pressurised containers for cryogenic liquids of not more than 1,000 litres. This Guidance Note is intended for users, distributors and stockists of cylinder gases.

Exclusions from this Guidance Note are:

- cylinders in use, i.e. connected to user equipment, or permanently connected for use; e.g. fire protection systems
- cylinder storage situations that are covered by specialised published guidance, from Government Agencies
- hydrogen trailer exchange installations and static cylinder storage systems permanently connected for use, e.g., hydrogen storage installations – refer BCGA Code of Practice CP33 -The bulk storage of gaseous hydrogen at users premises. (21)
- storage of radioactive gases
- very toxic or pyrophoric gases – refer to BCGA Code of Practice CP18 - The Safe Storage, Handling and Use of Special Gases in the Micro-Electronics and other Industries (18) for further information
- gas cylinders during conveyance by road, rail, air and sea.

Where reference is made to oxidants, throughout this publication, this means oxygen and nitrous oxide only.

3 ADDITIONAL RELEVANT INFORMATION

LPGA CoP No 7	Storage of full and empty LPG Cylinders and Cartridges (25).
LPGA CoP No 24 – Part 5	Storage and Use of LPG on Construction Sites (26).
BCGA CP7	The Safe Use of Oxy-Fuel Gas Equipment (Individual Portable or Mobile Cylinder Supply) (17).
BCGA CP18	The Safe Storage, Handling and Use of Special Gases in the Micro-electronics and other Industries (18).
BCGA CP27	Transportable Vacuum Insulated Containers of not more than 1000 litres volume (19).
BCGA CP28	Vacuum Insulated Tanks of not more than 1000 litres Volume which are Static Installations at User Premises (20).
Available from HSE	Health & Safety at Work Act 1974 - The Explosives Act 1875 (Exemptions) Regulations 1979 Certificate of Exemption No 2 of 1989. (10).

4 POTENTIAL HAZARDS

The contents of the gas cylinders should be identified from the cylinder labels.

As an aid to identification of cylinders at a distance, the cylinder shoulders are usually colour coded according to BS EN 1089 Part 3 introduced in 1997 or previously BS 349 (now withdrawn) (27). Shoulder colours should not be relied upon as the only means of identification. See also BCGA's Technical Information Sheet TIS6 (24).

4.1 Product Hazards

All gases are classified by the gas manufacturer according to legislation (8 and 9). The classification is shown on the label by hazard diamond markings. The following table indicates the main categories of gas:

Category	Hazard Diamond(s)	Risk phrase on label	Notes
Oxidant	Green and Yellow	Contact with combustible material may cause fire	Strongly support combustion but do not, themselves burn, e.g. oxygen.
Inert	Green	Asphyxiant in high concentrations	Do not in general react with other materials, but can cause asphyxiation by replacement of the oxygen in the atmosphere, e.g. nitrogen and carbon dioxide.
Toxic	White	Toxic by inhalation	Gases which, when inhaled, are known to produce injurious or fatal effects, e.g. carbon monoxide and hydrogen sulphide.
Very Toxic	White	Very toxic by inhalation	Gases which are toxic at lower concentrations than gases classified as toxic and which can produce injurious or fatal effects with less exposure, e.g. arsine, boron trichloride and phosphine.
Flammable	Red	Extremely flammable	Will burn if a source of ignition is present, e.g. propane, hydrogen and acetylene. In addition, acetylene may decompose explosively if the cylinder is subjected to excessive heat or severe impact.
Pyrophoric	Red	Spontaneously flammable in air	Ignite spontaneously in contact with air and, therefore, should be stored separately (18), e.g. silane and phosphine.
Corrosive	White with hand symbol	Cause severe burns and are irritating to the eyes and respiratory system	Can cause severe burns to the skin and irritation to eyes and respiratory system, e.g. hydrogen chloride, chlorine.
Cryogenic	Green	Asphyxiant in high concentration and may cause frostbite	Give rise to danger of asphyxiation in high concentrations and can cause skin burns from the liquid or cold gas, e.g. liquid nitrogen, liquid argon, and liquid helium.

- 4.1.1 All gases, with the exception of oxygen and air, are asphyxiant.
- 4.1.2 Some gases exhibit more than one of the above properties, e.g. carbon monoxide and hydrogen sulphide are both toxic and flammable. All these properties need to be taken into account when designing storage for such gases.
- 4.1.3 Some gases also have subsidiary properties such as corrosive, harmful, irritant. These do not significantly influence the storage of gas cylinders, but need to be taken into account in usage. Further details on properties are given in the supplier's Safety Data Sheet (SDS).
- 4.1.4 Cryogenic liquid is often supplied in transportable cryogenic gas containers of less than 1000 litres capacity and operating at pressures up to 20 bar above atmospheric pressure.
- 4.1.5 Acetylene cylinders which have been involved in a fire or suffered direct heat can remain hazardous for some time after the incident. Special emergency arrangements have been established to deal with such cylinders and therefore it is advisable to put appropriate signs outside of any storage areas containing acetylene cylinders, particularly where the cylinders are obscured from view, in order to alert the emergency services of their presence.

4.2 Pressure Hazards

Cylinders are pressure vessels, which may fail if over-pressurised or weakened by the application of heat. Heating causes the internal pressure to rise and could, in extreme conditions, result in the failure of the cylinder with an uncontrolled pressure release (reportable under RIDDOR (13)).

Most gas cylinders are not fitted with pressure relief devices.

However some cylinders do incorporate such devices including:

- propane, butane and other LPG cylinders, which are protected by pressure relief valves
- some older acetylene cylinders, which are protected by fusible plugs
- carbon dioxide cylinders, which are protected by bursting discs
- transportable vacuum-insulated cryogenic gas containers: these storage vessels are fitted with pressure relief devices, which, during normal operation, are designed to lift and vent any excess pressure.

Fusible plugs operate when direct excessive heat is applied to the device. Pressure relief valves or bursting discs can operate when heat raises the pressure in the cylinders. It should be noted, that whilst these devices should protect the cylinders against rupture, their operation might give rise to a localised hazardous atmosphere. Reference SI 1997:1713 - Confined Spaces Regulations 1997 (14).

5 GENERAL PRINCIPLES OF CYLINDER STORAGE

5.1 Storage Area Layout and Separation Distances

5.1.1 TABLE 1 – Minimum recommended separation distances

TYPICAL TYPE OF EXPOSURE (Note 1)		MINIMUM SEPARATION DISTANCE (Metres) (Note 2)				
Between gas cylinders of different types						
	Inerts including CO₂	Oxidants	Flammable(s) Compressed or dissolved gases only – e.g. H₂ and Acetylene	LPG and other liquefied flammables (Note 3)	Toxics (Note 4)	
Inert and CO₂	0	0	0	3	0	
Oxidants	0	0	0	3	0	
Flammable(s) Compressed or dissolved gases only – e.g. H₂ and Acetylene	0	0	0	3	1	
LPG and other liquefied flammables (Note 3)	3	3	3	0	3	
Toxics (Note 4)	0	0	1	3	0	
Pyrophoric gases in separate storage area (Note 5)	2	2	2	3	2	
Between gas cylinders and other gas storage						
Bulk storage of flammable gases and liquids (Note 6)	1	3	3	3	3	
Bulk storage of cryogenic liquids – (Notes 6 and 7)	Oxidants <1000 l cap.		5	5	1	
	>1000l up to 200 Tonnes	1	1	8 (> 70m ³ flammable gas – 7 large cylinders)		7.5 (above 50kg total capacity LPG)
	Inerts <1000 l	1	1	1	3	1
	Inerts >1000 l	1	1	3	3	1
Transportable cryogenic containers	Oxidants	1	1	5	5	1
	Others	1	1	1	3	1
Between gas cylinders and other features						
Site boundaries	1	1	3	1 <400 kg	3	
				3 >400 kg (Note 8)		
Building openings. Ref. Section 5.2.1	1	1	1	3	3	
Smoking, naked flames, sources of ignition and heat sources	1	1	3	1 <400 kg	3	
				3 >400 kg		
Unprotected electrical equipment	0	0	3 (Note 9)	1 <400 kg	0	
				3 >400 kg		
Air compressors and ventilator intakes (Note 10)	3	3	3 (Note 11)	3	3	
Combustible materials e.g. paper, wood etc.	0	3	3	3	3	

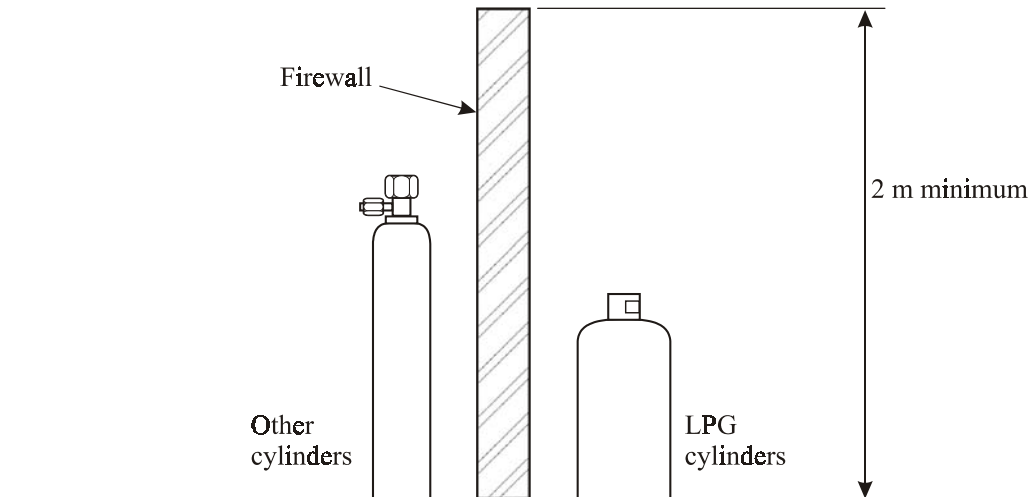
Table 1 shows the recommended separation distances for cylinders containing different types of gases. A typical layout, which indicates good practice, is shown in Appendix 1.

- Note 1: When siting cylinders near another hazard, check that there is no specific legislation concerning that hazard which requires measures beyond those stated above.
- Note 2: In some cases physical partitions or barriers may be used to reduce the required separation distances. A suitably constructed firewall may eliminate the need for separation distances. See section 5.1.2 – Fire Walls.
- Note 3: This guidance refers to quantities of LPG between 50 - 1000 kg. Below 50 kg no specific separation is defined. For quantities above 1000 kg refer to LPGA's Code of Practice CoP 7 (25). For further information on storage of LPG cylinders in other circumstances, e.g. domestic and retail, refer to LPGA CoP 7.
- Note 4: Where flammable toxics are concerned the greater distance (from the Flammables column) shall apply. Where pure toxic/corrosive cylinders are stored as an adjacent group, no separation is required within the same product type, as there would be no immediate domino effect resulting from a leak or spill.
- Note 5: Reference shall be made to BCGA Code of Practice CP18 (18) for the requirements for the storage of pyrophoric gases.
- Note 6: Bulk storage is defined as static vessels of a capacity greater than 1000 litres into which product is delivered.
- Note 7: The distances from bulk storage are to be taken from the nearest point of the tank including the filling line or vaporiser.
- Note 8: A separation distance of 8m should be applied where the site boundary forms the boundary with vulnerable populations. See section 5.1.2 for definition of vulnerable populations.
- Note 9: A documented risk assessment will identify if there is a need for protected electrical equipment or may justify the reduction or removal of a separation distance for, un-protected electrical equipment. See section 5.5.
- Note 10: Storage area shall not be directly below an air intake.
- Note 11: Generally the separation distance is 3 metres but special consideration should be given to the density of gas, e.g. if the gas is lighter than air, consider windows, air intakes and openings above the storage area.

5.1.2 Fire Walls

In some cases physical partitions or barriers may be used to reduce the required separation distances. Such partitions / barriers should be of at least 30 minutes' fire-resisting construction (28), imperforate and constructed of

materials such as solid masonry or concrete. They should be not less than 2 metres high, See also L136 DSEAR Code of Practice – Control & Mitigation Measures (5).



Where the wall separates vulnerable populations from the cylinders (not inerts), the fire resistance provided should be a minimum of 60 minutes. Vulnerable populations include those in schools, hospitals, old people's homes and other residential accommodation.

5.2 Siting the Storage Area

Storage areas should be well defined and located in the open air where there is good natural ventilation. Storage within a building is not recommended and should not be considered for new locations for cylinder stores.

Storage areas should be segregated and located with due regard to the potential hazards of the particular gases. See Table 1.

Storage locations for cryogenic, liquefied and heavier-than-air compressed gases, e.g. argon, carbon dioxide, LPG, liquid nitrogen, should be sited with due regard to the dangers of seepage into drains, basements, cable ducts, etc. The separation distances given in Table 1 may need to be increased.

Consideration should be given to the proximity of the site boundary, other process equipment or buildings containing process plant where there is a potential fire or explosion hazard. Precautions such as increased separation distances or properly designed fire or radiation barriers may be necessary in such cases. Refer to Section 4 and see Section 5.1.1 for separation distances.

Store cylinders away from sources of heat. The cylinder storage must be designated a **NO SMOKING AREA**.

5.3 Ventilation

Good ventilation is required to ensure that any small leakage of gas is adequately dispersed. An ideal outdoor storage structure should be well ventilated, with no roof and up to two solid walls. High walls (>2m high) or thin corridor style storage is not conducive to good ventilation, and in general, no more than 50% of the perimeter wall should be obstructed. However, a typical storage structure for non-flammable cylinders or for small quantities of flammable cylinders may consist of three adjacent walls, provided that at least 25% of the perimeter is constructed to ensure that ventilation is not impaired, eg. meshed fencing. If overhead weather protection is required, then roofing designed to prevent potential gas pockets is suitable, eg. gaps between the wall and sloping roof, natural ventilation in the roof apex etc. Properties of gases should be considered; refer to safety data sheet.

5.4 Access

The storage area should be located so that it is readily accessible for cylinder movements with manual handling distances kept to a minimum and clear access maintained at all times for deliveries and the emergency services.

For safe access to cylinders and to facilitate housekeeping and stock control, aisles should be provided. Typically, they should be 0.6 metres wide.

The layout of the area should be such as to prevent damage to cylinders, bearing in mind that trolleys, fork lift trucks or other vehicles may be used.

Where installed, emergency exits should open outwards and be operated by a panic bar or other suitable device. These exits should be properly identified, unobstructed and be able to be opened at all times.

5.5 Lighting and other Electrical Equipment

The area should have adequate lighting to assist in the identification of the cylinder contents. Where flammable gases are involved a risk assessment is required to determine whether protected electrical equipment is required. For the standard regarding electrical equipment see BS EN 60079 Part 14 - Electrical Apparatus for Explosive Gas Atmospheres. Part 14 Electrical installations in hazardous areas (other than mines), (31).

5.6 Fire Safety

Adequate fire fighting facilities as identified in the risk assessment of the storage facility should be provided. Refer BS 5306 Part 3 - Fire Extinguishing Installations and Equipment on Premises. Code of Practice for inspection and maintenance of Portable Fire Extinguishers (29). Materials of construction should be non-combustible.

For emergency procedures in the event of a fire – see Section 7.

5.7 Signage

Warning notices should be displayed – see:

- SI 1990:304 - The Dangerous Substances (Notification and Marking of Sites) Regulations (12) (where more than 25 tonnes of dangerous substances are stored).
- SI 1996: 341 - The Health and Safety (Safety Signs and Signals) Regulations. (11)
- BS 5499 Part 5: 2002 Graphical symbols and signs. Safety signs including fire safety signs. Signs with specific safety meanings. (30).

As a minimum the following signs should be displayed:



Smoking and naked flames forbidden



Consideration should be given to using the appropriate Hazchem “diamond” signs for the gases stored, particularly when they are not in clear view (see Section 4.1.5) and, if there is a risk of the development of an explosive atmosphere (DSEAR) (2, 4 & 7), then it may be necessary to display the EX-sign:



5.8 Security

Access to the storage area should be restricted to authorised personnel only.

Consideration should be given to site security, to prevent the unauthorised access to or tampering with cylinders. See Appendix 1. If the site conditions so require it, the storage area should be enclosed by an industrial-type fence or equivalent, not less

than 1.8 metres high with suitable emergency exits. A firewall (see Section 5.1.2) may be considered as part of the enclosure.

Security for small quantities of cylinders may be achieved by the use of a suitably ventilated, lockable cabinet or wire mesh enclosure.

5.9 Drainage

The base of the storage area should be even and be provided with adequate drainage so that stored cylinders do not stand in trapped water and risk being subjected to corrosion.

5.10 Indoor Storage

Internal storage is not recommended.

Where indoor storage of **small numbers** of cylinders cannot be avoided, a risk assessment shall be carried out to cover quantity of cylinders and proposed location.

Consideration shall be given to:

- fire, impacting on cylinder store
- density of gas
- risk of explosion from flammable gas release
- leakage from valves or safety relief devices
- ventilation requirements
- access to and egress from cylinder store
- movement and handling of cylinders to store
- detection equipment
- exposure of personnel to gas / gases

BCGA GN9 - The application of the Confined Spaces Regulations to the Drinks Dispense Industry (22) and BCGA GN11 – The management of risks associated with reduced oxygen atmospheres (23) give guidance on risk assessment.

Some general principles that apply are:

- a) the number of containers shall be kept to a minimum
- b) where practicable the store shall be constructed of non-combustible materials, by making the walls, floor and ceiling from materials complying with BS 476 Parts 20 to 23 Test Methods and Criteria for the Fire Resistance of Elements of Building Construction (28). If the wall of a cylinder store forms part of a building, it should be of at least 30 minutes fire-resisting construction, preferably made of brick or concrete.
- c) the store shall be adequately ventilated as determined by the risk assessment

- d) any forced ventilation system shall be linked to a suitable visual / audible alarm system to warn of failure
- e) consideration should be given to atmospheric monitoring within the store depending upon the perceived risk.

5.11 Stores for Cylinders

- 5.11.1 Containers should be stored upright, when designed for this, and suitable measures be implemented to prevent them toppling over. Alternatively, they may be stored in specially designed pallets. Special arrangements may be required to secure small or round-bottomed cylinders.
- 5.11.2 For good stock management, full and empty cylinders should be stored separately and the areas properly identified according to the gas being stored.
- 5.11.3 Generally gases with the same hazard category should be grouped together.
- 5.11.4 Layouts which meet with the separation distances as given in Table 1 should be used.
- 5.11.5 By storing toxics separately from other gases there will be less activity in the area, reducing risk of an accident and exposure of personnel, should an incident occur. It is also important to have good access to toxic gas cylinders for routine checking and control.
- 5.11.6 Stock rotation should be controlled on a First in First Out (FIFO) basis.

All cylinders are required by law to have regular inspection and test procedures carried out to ensure total safety of the cylinder. Cylinders are generally inspected every 5 or 10 years dependent upon service. Stamps on the shoulder identify the test date and the approved test authority. These cylinders can be used, but not refilled, if the due date for inspection and re-test has passed.

Some corrosive products will be subject to a “return by” date. These products will be highlighted with a separate label specifying the return date. Contact the supplier if this date is due or has passed.

- 5.11.7 Cylinder storage areas should be inspected regularly to check that the cylinders are not being subjected to adverse conditions.
- 5.11.8 The local management should prepare a procedure for dealing with leaking cylinders based on the extent of the leak and the risks associated with the leaking product.

6 TRAINING

All people engaged in the storage and handling of gases in cylinders must receive suitable training. It should include, but not be necessarily confined to the following subjects:

6.1 Identification of the cylinder contents

- Cylinder labels, tags, stencilling
- Colour coding

6.2 Properties of gases

- Meaning of flammable, toxic and non-flammable non-toxic classification
- Potential hazards as given in Section 4
- Contents of supplier safety data sheet (SDS)
- Fire triangle

6.3 Construction of cylinders

- Materials of construction
- Difference between welded and seamless cylinders
- Valve operation and valve types
- Cylinder information on data plate or stamped into cylinder shoulder
- Use of guards, caps on valves where fitted
- Checks on cylinder condition

6.4 Handling of cylinders

- Cylinder weights full and empty
- Safe handling techniques for individual cylinders
- Safe movement of cylinders in or out of pallets
- Safe movement of palletised cylinders
- Use of trolleys or other handling devices
- Use of mechanical handling devices e.g. FLT
- Operation and maintenance of securing devices for cylinders
- Personal protective equipment required

6.5 Stock management

- Examination of cylinder storage conditions
- Separation of full and empty cylinders
- Stock rotation of cylinders
- Reporting of cylinder defects to line management/supplier

6.6 Storage compound

- Need for removal of debris and good housekeeping
- Need for security
- Identification by the appropriate signage

6.7 Emergency situations

- Action to be taken in cases of
 - Leaking cylinder valve
 - Cylinders on fire
 - Fire impact on cylinders in storage
- Emergency contact details for supplier
- Location of emergency equipment

Training should be carried out regularly under a formalised system and records kept

Training should be reviewed and / or up-dated following:

- A related accident or incident
- When gases are purchased which have not previously been used on site
- Information or guidance previously given changes
- New people are brought in

7 EMERGENCY PROCEDURES

Cylinders handled and stored in a safe manner, as described in this document, should not give rise to an emergency situation. It is recognised, however, that they may occasionally become involved in an incident. This section is included to provide guidance on what action should be considered on such occasions.

Risk assessments should identify potential emergency situations. Control measures and emergency plans should be established accordingly.

The following items should be considered in the preparation of documented emergency procedures.

7.1 Incident Controller

The need for and appointment of a trained person with adequate local site knowledge to take charge of the emergency and assist the emergency services as necessary

7.2 Action in the event of a serious leakage

- identify the source of the leak,
- identify the gas concerned,
- undertake actions as based on the properties of the gas concerned
- consult gas supplier for advice.

Only people who have knowledge of gas properties and hazards and who have been trained to deal with gas emergencies should handle leaking cylinders.

Note: Never attempt to dismantle or repair cylinder valves.

BCGA TIS 11 (32) gives advice on leaking cylinders.

7.3 Action in the event of a fire

- Sound the alarm
- Evacuate the danger area
- Call the fire brigade
- Fight fire if safe to do so (except acetylene see note below)

Note **Never approach or move an acetylene cylinder** if it has been involved in a fire or has become heated

Further advice on fire fighting equipment and fire precautions may be obtained from either the enforcing or fire authorities.

7.4 Information required by the Emergency Services

Inform the fire brigade immediately of the location and type of any gas cylinders involved in the fire and any others located on the site.

7.5 Gas Supplier

Contact the gas supplier for further information regarding the gases involved. The gas supplier should **ALWAYS** be notified of any cylinder involved in a fire.

8 REFERENCES *

	<u>Document Number</u>	<u>Title</u>
1	SI 1999:3242	The Management of Health and Safety at Work Regulations
2	SI 2002:2776	Dangerous Substances and Explosives Atmospheres Regulations 2002 - (DSEAR)
3	HSE ACoP - L134	Design of plant, equipment and workplaces
4	HSE ACoP – L135	Storage of Dangerous Substances
5	HSE ACoP – L136	DSEAR Code of Practice – Control & Mitigation Measures
6	HSE ACoP – L137	Safe maintenance, repair and cleaning procedures
7	HSE ACoP – L138	Dangerous Substances and Explosives Atmospheres Regulations 2002 - Approved Code of Practice and Guidance
8	SI 2004:568	The Carriage of Dangerous Goods and use of Transportable Pressure Equipment Regulations 2004
9	SI 2002: 1689	The Chemicals (Hazard Information and Packaging for Supply) Regulations 2002
10	Available from HSE	The Health and Safety at Work Act 1974 The Explosives Act 1875 (Exemptions) Regulations 1979 Certificate of Exemption No 2 of 1989
11	SI 1996: 341	The Health and Safety (Safety Signs and Signals) Regulations 1996
12	SI 1990:304	The Dangerous Substances (Notification and Marking of Sites) Regulations 1990
13	SI 1995:3163	Reportable Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR)
14	SI 1997:1713	Confined Spaces Regulations 1997
15	HS(G)71	Chemical Warehousing - The Storage of Packaged Dangerous Substances

	<u>Document Number</u>	<u>Title</u>
16	INDG370	Fire & Explosion – How Safe is your Workplace?
17	BCGA CP7	The Safe Use of Oxy-Fuel Gas Equipment (Individual Portable or Mobile Cylinder Supply)
18	BCGA Code of Practice CP18	The Safe Storage, Handling and Use of Special Gases in the Micro-Electronics and other Industries
19	BCGA Code of Practice CP27	Transportable Vacuum Insulated Containers of not more than 1000 litres volume
20	BCGA Code of Practice CP28	Vacuum Insulated Tanks of not More Than 1,000 Litres Volume Which are Static Installations at User Premises
21	BCGA Code of Practice CP33	The bulk storage of gaseous hydrogen at users premises
22	BCGA Guidance Note GN9	The application of the Confined Spaces Regulations to the Drinks Dispense Industry
23	BCGA Guidance Note GN11	Use of Gases in the Workplace – The management of risks associated with reduced oxygen atmospheres
24	BCGA Technical Information Sheet TIS6	Cylinder Identification Colour Coding and Labelling Requirements
25	LPGA Code of Practice CoP 7	Storage of Full and Empty LPG Cylinders and cartridges
26	LPGA Code of Practice CoP 24 – Part 5	The Storage and Use of LPG on Construction Sites
27	BS EN 1089 Part 3 and BS 349 (now withdrawn)	Identification of Contents of Industrial Gas Containers Transportable Gas Cylinders. Gas Cylinders Identification (excluding LPG). Colour coding
28	BS 476 Parts 20 to 23	Test Methods and Criteria for the Fire Resistance of Elements of Building Construction
29	BS 5306 Part 3	Fire Extinguishing Installations and Equipment on Premises. Code of Practice for inspection and maintenance of Portable Fire Extinguishers

	<u>Document Number</u>	<u>Title</u>
30	BS 5499 Part 5	Graphical symbols and signs. Safety signs including fire safety signs. Signs with specific safety meanings
31	BS EN 60079 Part 14	Electrical Apparatus for Explosive Gas Atmospheres. Part 14 Electrical installations in hazardous areas (other than mines)
32	BCGA TIS 11	Gas Cylinder Safety - Information for Customers for Leaking Cylinders

Further information can be obtained from:

Health and Safety Executive

www.hse.gov.uk

HSE Books

www.hsebooks.co.uk

HMSO

www.hmso.gov.uk

EIGA

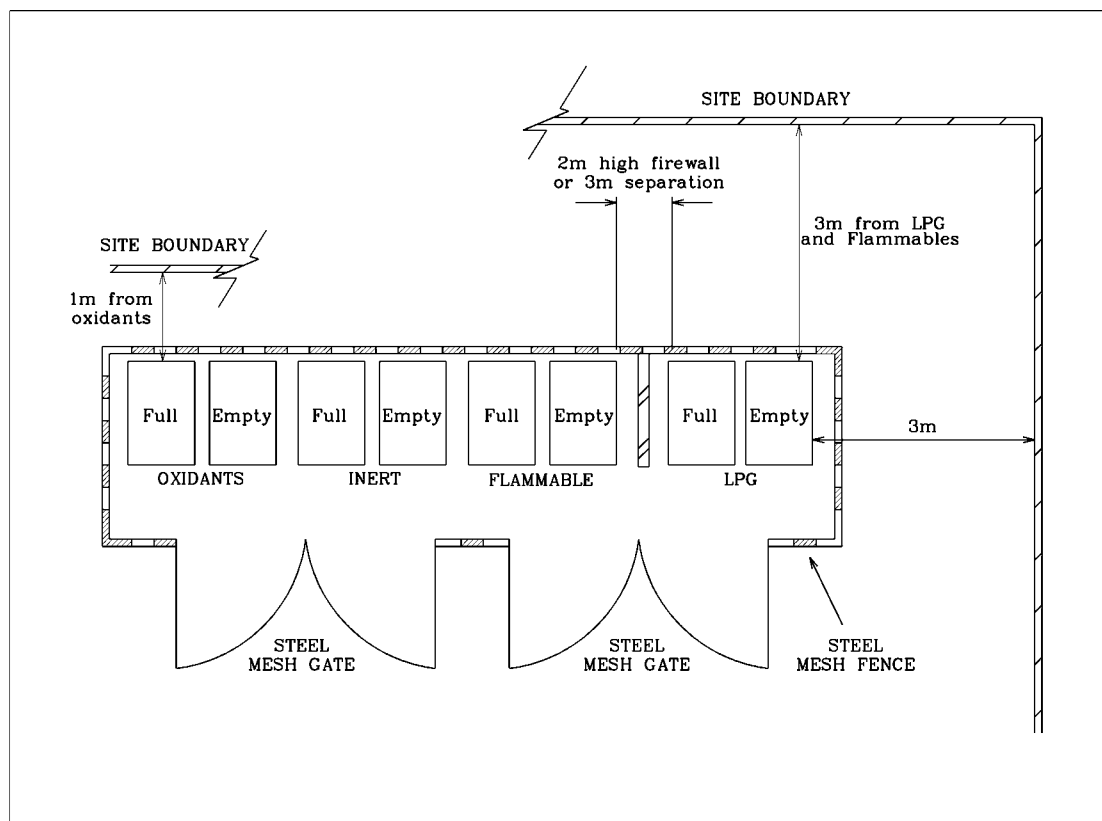
www.eiga.be

APPENDIX 1 – TYPICAL STORAGE COMPOUND

Before arranging the construction of the cylinder storage area it is strongly advised that all sections of this Guidance Note are read and understood.

This section provides an example of a cylinder storage area designed in accordance with the guidance given.

It is not intended as a definitive guide and if further advice is required contact should be made with the gas supplier.



HISTORY AND OBJECTIVES OF BCGA

The British Compressed Gases Association was established in August 1971 as the successor to the British Acetylene Association, formed in 1901. Its Members consist of producers, suppliers of gases equipment and container manufacturers and users operating in the compressed gas field.

The main objective of the Association is the advancement of technology and safe practice in the manufacture, handling and use of all gases and the design and manufacture of all containers, apparatus, appliances, plant, etc. BCGA also provides advice and makes representations, insofar as these relate to particular problems of the compressed gases industry, on behalf of its Members to all regulatory bodies, including the UK Government, concerning legislation both existing and proposed.

Policy is determined by a Council elected from Member Companies, with detailed technical studies being undertaken by a Technical Committee and its specialist Sub-Committees appointed for this purpose.

Further details of the Association may be obtained from:

BRITISH COMPRESSED GASES ASSOCIATION
6 St. Mary's Street, Wallingford, OX10 0EL
Tel: 0044 (0)1491 825533 Fax: 0044 (0)1491 826689
Website: www.bcgga.co.uk
E-mail: enquiries@bcgga.co.uk

