



Risk assessments for storing gas cylinders in halls and central catering areas

1 INTRODUCTION

Carbon dioxide gas (CO₂) is used in bars and catering areas to pressurise consumable liquids, such as beer, etc. The associated CO₂ cylinders are commonly stored in underground cellars or similar enclosed/confined spaces. Carbon dioxide is an odourless gas that is 1.5 times heavier than air. If a leak should occur then carbon dioxide can build up in these enclosed subterranean spaces in hazardous concentrations and cause asphyxiation unless adequate ventilation is provided.

2 GENERAL ASPECTS

Although many bar storage areas would not be classed as enclosed spaces, the following general safety precautions should nevertheless be adhered to:

- all cylinder handlers should undergo training (BOC run courses);
- each operator should be provided with the written advice from the supplier, ie BOC, CCSB, etc, on safety data and storage and handling information; and
- each hall/catering area must hold the suppliers (usually BOC) safety data sheets.

It is important to remember that:

- the Estates and Buildings Department are responsible for routine maintenance but not the gas systems themselves;
- the supplier must carry out preliminary safety checks prior to installation, appropriateness of piping, etc - they should be requested as part of the contract;
- all halls should use the same supplier; and
- only food grade cylinders and gas should be used for dispensing beer and soft drinks.

3 STORAGE

CO₂ cylinders are black and should have a label attached – the label should be checked upon receipt to ensure that the contents are correct. Where possible cylinders should be stored outside in metal cages, or in a secure location that is free from fire risk and ignition sources. Cylinders stored in the open should be protected from rusting and extremes of temperature and weather. Ideally cylinders should be stored in the vertical position and properly secured using restraining chains. If stored in the horizontal position, cylinders should be chocked and placed so that the valve cannot be damaged. When cylinders have been horizontally stored they must be stored upright for 1 hour before use. A cylinder warning notice should be displayed on storage area, and access only permitted to authorised persons (signs are available from the Safety Office).

4 HANDLING AND USE

Any damaged cylinders must be reported to the supplier and not used. Cylinders should not be transported unnecessarily. Manual handling aspects are important - use trolleys to move cylinders, wear appropriate personal protective equipment, such as, gloves and safety shoes/boots, and ensure that the personnel involved have been trained in manual handling techniques. Cylinder pressure regulators should be checked annually.

When CO₂ cylinders are brought inside buildings the room must be adequately naturally or artificially ventilated, and cylinders should be:

- checked for leakage after delivery, before storage, and before use using the appropriate leak test solution (obtain advice from the supplier - bubbling will evidence any leaks);
- checked for leakage, say weekly, when connected to the system;
- kept away from ignition sources; and
- stored at temperatures below 45°C with valve guards in place and the cylinder valve closed when not in use.

In exceptional circumstances cylinders may need to be stored in unventilated rooms. Such rooms would be classed as confined spaces and specific risk assessments would be required. This arrangement should be avoided if possible. Carbon dioxide monitoring (using a carbon dioxide detector and alarm system) would be required in poorly ventilated areas - advice should be sought from the CO₂ supplier. Regular checks would need to be made to ensure the system is working. Risk assessments should include, safe working procedures, action to be taken in an emergency, first aid, etc.

4 EMERGENCY ACTION

In the event of a leak, the area should be evacuated and well ventilated. If the cylinder has a bursting disc which may give a sudden release of gas, then the area must be cleared and ventilated. Remember:

- do not enter a confined space unless the oxygen and carbon dioxide levels are satisfactory; and
- then - and only then - check that the cylinder valve is closed.

In the event of fire:

- vacate area, call fire brigade and follow hall/area procedures;
- inform emergency services of the presence of cylinders and the possibility of bursting discs; and

In either instance notify the supplier to collect the cylinders for examination and testing.

5 FIRST AID

5.1 Inhalation-asphyxiation

Staff should be aware of the effects of inhalation. The normal level of carbon dioxide in air is 0.03%, and increased levels of carbon dioxide (2%) will cause increased breathing rates, headaches, lack of concentration. Concentrations of 8-15% cause headaches, nausea and vomiting, and concentrations of 12-15% will cause unconsciousness and rapid death. If a medical emergency arises, the casualty should be removed to an uncontaminated area. The casualty should be kept warm and rested, and an ambulance summoned. Artificial respiration should be applied if breathing has stopped. Breathing apparatus will be required in the affected area.

5.2 Skin contact - cold burns

Treat as thermal burn, ie irrigate affected area with tepid water and seek medical advice.

7 REFERENCES

1. BOC Sureflow Gases Cylinders Data and Safety Sheets
2. Safe work in confined spaces ACOP, L101, ISBN 0-7176-1405-0