



TECHNICAL INFORMATION SHEET 40 - 2016

GAS CYLINDERS AT CRIME SCENES

Background

Gas cylinders come in a variety of shapes and sizes and may contain any of over 200 different compressed, liquefied and dissolved gases or gas mixtures. The design, manufacture, filling, transportation, inspection and testing of gas cylinders is subject to regulations and exacting standards, and, as such, gas cylinders are safe, robust in use and have a long service life. The vast majority of gas cylinders remain the property of the gas supply companies, and are moved to and from customers on rental schemes – so gas supply companies can provide useful information and support in respect of the cylinders, the gases and their customers.

At scenes of crime

Cylinders are designed to safely contain their contents **and in the vast majority of cases will be safe to approach and examine at crime scenes.**

However, please observe some common-sense precautions when gas cylinders are present:-

- Be alert for potential gas leaks from cylinders. If so, stay away and seek specialist advice.
- Do not approach if the cylinders are or have been exposed to fire, an explosion or if the cylinders remain hot after a fire. Seek advice from the Fire & Rescue Service or from one of the gas companies listed below.
- Consider whether the cylinders are in a confined space, such as a closed room, where a hazardous atmosphere may have built up, for example, oxygen deficient, flammable, toxic etc.

Look for signs that the area may have been deliberately sealed to reduce ventilation, such as closed vents, blocked fireplaces, taped-up areas around doors, vent fans etc. This has occurred, for example, in suicide cases involving gases.

Unless there are indicators that a highly toxic atmosphere is likely present (such as a leaking chlorine cylinder) then the action is to ventilate the room, for example, by opening windows and doors for 15 minutes, before entering and spending time in the room. Only in the case of very serious crimes, for example, terrorism or murder, will forensic officers be interested in sampling the atmosphere in a room.

- If there are indicators that a flammable or enriched oxygen atmosphere is likely, be careful not to introduce potential ignition sources such as naked flames, electrical devices (including mobile phones and cameras), vehicles or sparking equipment, until the area has been adequately ventilated.
- Do not operate or attempt to remove cylinder valves.

- If it is necessary to handle the cylinders, do so carefully and wear appropriate Personal Protective Equipment (PPE).
- Identify the contents and understand the hazards of the particular gas. The gas supplier can provide additional information, such as a Safety Data Sheet, and advice.

Identification

Gas cylinders should have a ‘supply label’, sometimes called a ‘banana label’ on their shoulder area. This provides information on the contents, such as the name of the gas and hazards



of that gas, and will also give the contact details for the gas supplier – but be mindful that these labels may have been removed by criminals.



In addition gas cylinders should also have various ‘stamp markings’ punched into their shoulder area. These may be hard to read and difficult for investigation Officers to interpret, and may have been deliberately obscured by criminals (over-painting, grinding, etc.), but gas company experts can usually interpret these markings and can provide advice. Taking a rubbing with paper and soft pencil may assist in these cases.

Gas supply companies maintain records and may be able to identify to whom and when a gas cylinder was last supplied. Most gas supply companies have cylinder-tracking technologies which might also provide useful information on the recent history of an individual cylinder.

Construction

Most cylinders are steel-bodied, but some are made from aluminium or ‘composites’ including a range of resins and fibre reinforcements. Some typical cylinder designs are:



Industrial gas cylinders



LPG cylinders

Due to their size, shape and weight, cylinders can present manual handling concerns. They may weigh up to 80 kg each, and can be awkward, slippery or cumbersome to handle. Typically, at their place of use, they will be moved on a trolley.

Availability

There are millions of gas cylinders in use across the UK, containing essential products, supporting many industries. It is not unusual to find gas cylinders in a workplace, within medical facilities or at domestic premises, for example, camping/patio gas, balloon gas or welding/brazing gas. However, gas cylinders may be found at crime scenes, where they had been brought there specifically to use within a crime. Examples include:

- oxy-acetylene sets might have been used to cut metals or to create an explosive mixture in order to ‘blow open’ cash machines (ATM’s).
- gas cylinders, such as those containing nitrous oxide (also known as ‘laughing gas’), might be found at illegal ‘raves’ and similarly there are many other gases which can potentially be misused to cause harm.

Some gas cylinders will have been obtained legitimately from gas suppliers, but then misused, whilst others may have been stolen.

Safety

There are two main hazards from the contents.

1. Cylinders can contain gases at very high pressures, up to 300 bar (car tyres are typically 2-3 bar). Sudden releases of such pressures, for example, if the valve is broken off, could cause the cylinder to become a projectile, or could have an effect similar to an explosion.
2. Gas contents may be hazardous – for example, flammable, toxic, corrosive or irritant. All gases, with the exception of oxygen and compressed air, have the potential to asphyxiate through oxygen depletion. Gas cylinders can release a lot of gas! If released in a confined space, the oxygen content in the air can be brought below or above safe levels.

Gas cylinders should not be approached, nor attempts made to move them, if any of the following are apparent:-

- They are in an enclosed area which may represent a confined space, especially if there is evidence of the room having been sealed to prevent ventilation. Do not enter until the atmosphere has been assessed as being safe to enter.
- They have been in a fire or otherwise suffered substantive heat, perhaps within an explosion? Are there signs of blistering of paint, or charring of paint or labels?
- They show signs of severe mechanical damage? Are they severely dented, creased or gouged? Has the valve assembly been bent or damaged? Has it been modified by the user?
- They are leaking? - is there any audible hissing sound from them or perceptible odour or vapour around them? For example, a ‘natural gas’ smell, indicating propane or butane fuel gas, or a ‘garlic’ smell, indicating dissolved acetylene. But many gases have no colour, taste, toxicity or odour, yet can still create a hazardous atmosphere by oxygen depletion.

In many cases, leaking cylinders are just the result of their valves being left open and the gas flowing – in which case the Fire & Rescue Services action may be as simple as turning off the valve. Note that this action may disturb possible evidence.



Gas cylinders contain a finite quantity of gas. In some cases it may be acceptable to leave the gas cylinder alone and to let it release all its contents. This will have to be assessed for each individual case and will depend on local circumstances and the possible hazard that the leaking gas could create.

In all these cases call the Fire & Rescue Service or a gas industry expert for advice. Try to collect, from range, clues which could assist in identifying the contents of the cylinder(s). Is there a product label readable around the shoulder? Roughly what dimensions and what colour(s) is the cylinder? Take photographs where safe to do so.

Transporting gas cylinders

For occasional carriage of a gas cylinder, there is no need for special vehicle insurance, but users should consider the suitability of the vehicle (ventilation, means of securing cylinders etc.). For regular use for the carriage of gas cylinders, it would be prudent to advise insurers. For guidance on transporting gas cylinders refer to BCGA Guidance Note 27 and Leaflet 1.

Police should NOT be calling in recycling companies to move cylinders. Some do not have the competence to assess gas cylinders, nor any authority to move them. Gas cylinders, in general, remain property of the gas company and no-one should be moving or disposing of them without their express authority. Gas companies might ask specific, approved recycling companies with whom they have agreements to become involved.

For more information

Gas supply companies can assist with specialist advice if you are unsure of how to approach cylinders. If the cylinder has legible labels, an emergency contact number may be visible for the gas supply company. Advice can be provided via these numbers on safety, recovery options, etc.

A-Gas (UK) Ltd	01275 376 600
Air Liquide UK	0800 637 737
Air Products PLC	0800 389 0202
Blended Products Limited	01652 680 555
BOC Gases	0800 111 333
Calor	01179 413 721
LPG Cylinder Recovery Line	0800 083 9652
British Compressed Gases Association (BCGA)	www.bcgaco.uk
The UK LPG trade association (UKLPG)	www.uklpg.org

There is a lot of useful information on the BCGA website, including many publications which will provide guidance and advice on best practice, for example, to identify, handle, transport or dispose of gas cylinders.

- BCGA CP 44, *The storage of gas cylinders.*
- BCGA GN 3, *Safe cylinder handling and the application of the manual handling regulations to gas cylinders.*
- BCGA GN 27, *Guidance for the carriage of gas cylinders on vehicles.*
- BCGA TIS 6, *Cylinder identification. Colour coding and labelling requirements.*
- BCGA Leaflet 1, *The carriage of small quantities of gas cylinders on vehicles.*
- BCGA Leaflet 2, *The safe handling of gas cylinders at waste facilities.*
- BCGA Leaflet 6, *Cylinders in fire.*

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