BRITISH COMPRESSED GASES ASSOCIATION
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BCGA Leaflet 7

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THE DANGERS OF MISUSING GASES

The British Compressed Gases Association (BCGA) and its members have campaigned for some years to raise awareness about the danger of misusing industrial, food or medical gases.

Gases are used widely in a number of industry sectors and, handled correctly, provide an invaluable resource. Gas suppliers within the BCGA take great care to advise customers on the safe and appropriate use of their products in order to ensure users are aware of the potential hazards.

While the inhalation of helium, nitrous oxide (so-called laughing gas) and other gases is often depicted in the media as harmless fun, the misuse of such substances can badly affect health and there have been many fatalities as a result.

Gases can have other hazardous properties, such as extreme cold, and are stored under pressure in their containers. Their uncontrolled or inappropriate release or use can quickly lead to an unsafe situation.

The BCGA is keen to get that message across – particularly to those who believe gas abuse can be fun or entertaining.

INHALATION

The inhalation of any gas, other than air and oxygen, can cause death by asphyxiation and every breath can cause unconsciousness - or worse. Quite simply, industrial, food and medical gases should never be inhaled unless under medical supervision or when being used by trained professionals or competent sportspersons, for example diving activities.

Helium (He) (and its variant Balloon Gas)

Helium is a very light and inert non-toxic gas, which gives those who inhale it a temporary high pitched or squeaky voice effect.

Many believe helium to be harmless, yet helium displaces oxygen and carbon dioxide from within the lungs and inhalation can be fatal.

The BCGA advocates the use of warning labels with every helium-filled balloon and with every canister of the gas supplied to members of the public.

Sulphur Hexafluoride (SF_6)

This is another inert, non-toxic gas, used mainly as a dielectric medium in the electrical industry. Sulphur hexafluoride produces the effect of a deep voice after inhalation.

Sulphur hexafluoride is much heavier than air and is therefore even more dangerous than helium as it is far more difficult to expel from the lungs.

Nitrous Oxide (N_2O), (also known as Laughing Gas)

Legitimately used in surgery and dentistry for its anaesthetic and analgesic effects, in racing engines as a performance boost and for whipped cream dispensers, the inhalation of nitrous oxide as a 'recreational drug' is no laughing matter.

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Like many forms of substance abuse, nitrous oxide inhalation is addictive, can lead to crime to feed the habit and also creates a serious risk to health.

Nitrous oxide inhalation can give rise to a 'drunken' or euphoric effect, but even at the first exposure, the awareness and judgement of someone who breathes the gas will be impaired.

Nitrous oxide can cause a hypoxic state, which can lead to heart arrest and also cause immediate death through asphyxiation. Repeated and long-term abuse of nitrous oxide can lead to irreversible damage to the nervous system, liver and kidneys.

LEGISLATION

The BCGA welcomed the introduction of new legislation surrounding the use of harmful gases in 2016 after several years of campaigning. The Psychoactive Substances Act outlaws the manufacture, importation, sale or supply, or offer to supply, of a wide range of substances, including nitrous oxide, for non-medically-supervised human consumption.

The law makes clear that pleading ignorance about the buyer's intentions is no excuse, with those found guilty facing up to seven years in prison.

The supply of medical grade nitrous oxide to anyone other than a qualified medical practitioner is illegal under the Medicines Act.

Legitimate users in the industrial, food and medical sectors will be extra vigilant in monitoring stocks and will be wary of staff and others taking it for their own use or monetary gain.

FOGGING DRINKS AND THE RAPID COOLING OF DRINKS

Gas (in liquefied or solid form) is now being used to create a 'trendy' fogging effect in drinks such as cocktails and to create a rapid cooling effect.

Such practices can deliver severe burns to the hands, throat or stomach and should only be used by competent users exercising extreme caution.

Solid Carbon Dioxide (CO_2), Dry Ice

Dry ice may be used safely to create a fogging or cooling effect only when securely encased in a specialist compartmentalised 'glass' or in a caged cocktail stick, which prevents ingestion.

Cryogenic Liquids

Cryogenic liquids, such as liquid nitrogen or oxygen, should NEVER be used within a drink, especially at the point of consumption, as the liquid, which is at an extremely low temperature, could be swallowed – causing severe internal burns, which may require surgical intervention.

MISUSING SOLID CARBON DIOXIDE (CO_2), DRY ICE

The use of dry ice as a means of entertainment should, in the view of BCGA members, be outlawed. Dry ice can cause cold burns if it comes into direct contact with the skin – as shown by a stunt on a radio show which went badly wrong.

Contestants were challenged to see how long they could bear to sit on a block of dry ice (as the organisers didn't realise the temperature difference between dry ice (-78 °C) and water ice (0 °C).

The stunt left contestants with third degree burns and needing skin grafts.

USING GAS PRESSURE TO RUPTURE CONTAINERS

Cryogenic liquid or dry ice has been used to blow up containers for entertainment value, but this is

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particularly dangerous as the time to failure is unpredictable and these 'explosions' can and do lead to serious injury. Experimenters who may consider themselves as 'experts' are often the worst offenders.

Gases should only ever be stored in the containers in which they were supplied.

FOGGING EFFECTS

The release of liquid nitrogen or liquid carbon dioxide in order to produce a large fogging effect – such as on dancefloors in nightclubs – can be extremely hazardous.

Unless carried out correctly, such practices can create a significant risk of asphyxiation, which may well contravene Confined Space Regulations. There is also a risk of cryogenic burns.

The use of liquid nitrogen to create fogging effects over swimming pools creates a high risk of asphyxiation to those in, or close to the pool.

USING GAS PRESSURE TO PROPEL OBJECTS

The contained pressure in gas cylinders is sometimes misused as a propellant for the purposes of entertainment.

Presenters on TV programmes have been seen to smash the valves off cylinders with a lump hammer or strap them to improvised vehicles to create propulsion.

People generally have little understanding of the hazards of releasing contained gas pressure in this way. The pressure in a car tyre can be sufficient to cause death – gas cylinders typically contain 100 times the pressure energy of a tyre.

FOOD FOLLY

The use of cryogenic liquids in food and drink has become increasingly fashionable in recent years.

People who have attempted to 'cook' with liquid nitrogen while inadequately trained and poorly equipped have caused serious injuries to themselves and others.

Cryo-cookery can:

- cause burns because of the extreme cold;
- lead to explosions arising from volume changes if the substance is stored inappropriately, such as in a Thermos flask; and
- result in asphyxiation caused by the displacement of oxygen creating a dangerous atmosphere.

Only trained, competent personnel, should have access to and use of cryogenic liquids. When doing so they should only use appropriate equipment and should wear appropriate personal protective equipment.

IN SUMMARY

Gases are used widely and provide an invaluable resource. BCGA members can provide advice on safety and specific applications on request. People need to understand the properties and hazards of gases they are using and should ensure they are properly trained and use appropriate equipment, including personal protective equipment.

The misuse of gas can cause all kinds of issues and dangers. Media coverage portraying such activity as harmless is irresponsible and they should consider the effects upon the general public, both through direct exposure to any hazard and in terms of what they may be encouraging or even inciting others to try at home. Consideration of relevant laws and reference to their own insurers (Professional Indemnity, Product Liability, OFCOM code of practice) might cause people to think again before engaging in what they thought was 'just harmless fun'.

For more information - Please refer to our website: www.bcga.co.uk

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