

BRITISH COMPRESSED GASES ASSOCIATION

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SAFETY ALERT



SAFETY ALERT 1 - 2014

THE HAZARDS OF USING INCORRECT REGULATORS ON ACETYLENE GAS CYLINDERS

Background

Acetylene and propane are flammable gases, and both are widely used for welding, cutting and other allied purposes. However, these gases have quite different properties, which are taken into account in the design and manufacture of the gas regulators. Due to the different properties, each gas requires a specific design of gas regulator that has been manufactured from materials compatible with and type-tested for use with that gas.

Concerns

The use of an incorrect regulator for acetylene can cause an explosion, this may be due to incorrect pressure or incompatible materials. There have been occasions where propane regulators have been incorrectly fitted to acetylene cylinders.

Safety

Using an incorrect regulator is a very dangerous practice for a number of reasons:

The outlet pressure will be different i.e. acetylene regulators are designed so that the stabilized outlet pressure does not exceed 1.5 bar for all inlet pressures. This complies with regulations regarding the use of acetylene and ensures the gas remains within a safe working range.

Acetylene will react with copper, particularly in damp conditions to form copper acetylide. This is an impact explosive. For this reason, acetylene should not be allowed to remain in contact with pure copper or brass which contains more than 70 % copper. Such materials may be present in a propane regulator.

Under certain conditions acetylene can decompose. Acetylene regulators are designed to be able to withstand an acetylene decomposition and are very strong compared to many propane regulations.

Choosing the correct regulator

The following requirements should be adhered to when selecting and fitting regulators to allow the gases to be used safely:

The regulator is to be built to a recognised standard, such as BS EN ISO 2503 or BS EN ISO 7291, for propane regulators refer also to BS EN 16129 and UKLPG, UIS 28.

The regulator is to be clearly marked, as appropriate, for use with acetylene or propane.

The regulator is to be used within its life period. Note that a date is stamped on the regulator body to identify its life, generally regulators have a five year life. BCGA TIS 18 provides further information on the date marking of regulators.

The regulator is to be mounted in its correct orientation, i.e. top outlet or side outlet.

BCGA Code of Practice 7 provides further information on the selection and use of regulators.

Figure 1

An acetylene cylinder fitted with a clearly identified acetylene regulator, in the correct orientation.



Figure 2

An acetylene cylinder fitted incorrectly with a propane regulator.



Future legislation

New regulations are being drafted for acetylene 'The Acetylene Safety (England and Wales and Scotland) Regulations 2014' and these will make it a legal requirement to fit a regulator specifically designed and constructed for use with compressed acetylene to an acetylene cylinder. The new regulations are expected to come into force on 1st October 2014.

References:

- 1) BS EN ISO 2503, *Gas welding equipment, Pressure regulators and pressure regulators with flow-metering devices for gas cylinders used in welding, cutting and allied processes up to 300 bar (30 MPa).*
- 2) BS EN ISO 7291, *Gas welding equipment. Pressure regulators for manifold systems used in welding, cutting and allied processes up to 30 MPa (300 bar).*
- 3) BS EN 16129, *Pressure regulators, automatic change-over devices, having a maximum regulated pressure of 4 bar, with a maximum capacity of 150 kg/h, associated safety devices and adaptors for butane, propane, and their mixtures.*
- 4) BCGA Code of Practice 7, *The safe use of oxy-fuel gas equipment (individual portable or mobile cylinder supply).*
- 5) BCGA Technical Information Sheet 18, *Gas Equipment Inspection / Replacement Date Marking.*
- 6) UKLPG, User Information Sheet 28, *Safe use of propane and butane cylinders and cartridges.*

For more information:

British Standards Institute (BSI)
British Compressed Gases Association (BCGA)
UK Liquefied Petroleum Gas Association (UKLPG)

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