

Periodic inspection, testing and maintenance of transportable gas containers (excluding dissolved acetylene container) —

**Part 2: Specification for welded steel
containers of water capacity 0.5 L up
to 150 L**

ICS 23.020.30

Committees responsible for this British Standard

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 Aluminium Federation
 Associated Offices Technical Committee
 British Compressed Gases Association
 British Fire Consortium
 British Fire Protection Systems Association Ltd.
 British Railways Board
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 Chief and Assistant Chief Fire Officers' Association
 Department of Trade and Industry [Mechanical Engineering and Manufacturing Technology Division (Mmt)]
 Department of Trade and Industry (National Engineering Laboratory)
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 Health and Safety Executive
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Foreword

This Part of BS 5430 has been prepared under the direction of the Pressure Vessel Standards Policy Committee. It incorporates changes found to be necessary from experience in the 1977 edition, which is withdrawn.

This Part of BS 5430 covers the periodic inspection, testing and maintenance of transportable gas containers (excluding dissolved acetylene) for welded steel containers of water capacity 0.5 L up to 150 L. Smaller containers are covered only as far as it is practicable to apply the requirements of the standard to them. Other Parts of BS 5430 include:

- *Part 1: Specification for seamless steel containers of water capacity 0.5 litres and above;*
- *Part 3: Specification for seamless aluminium alloy containers of water capacity 0.5 litres and above;*
- *Part 6:¹⁾ Specification for seamless containers under 0.5 litre water capacity.*

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 16, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

¹⁾ In preparation.

1 Scope

This Part of BS 5430 specifies requirements for the periodic inspection, testing and maintenance of transportable welded steel gas containers (excluding dissolved acetylene) for containers of water capacity 0.5 L up to 150 L inclusive; it also applies, as far as practicable, to containers of less than 0.5 L water capacity.

This Part of BS 5430 includes requirements for welded steel gas cylinders used for liquefied petroleum gas (LPG). Users of such cylinders, that are dedicated for use with LPG, may instead apply the requirements of BS EN 1439 and BS EN 1440.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purpose of this Part of BS 5430 the following definitions apply.

2.1

liquefiable gas

a gas that is liquefiable by pressure at $-10\text{ }^{\circ}\text{C}$ but which is completely vapourized at $17.5\text{ }^{\circ}\text{C}$ at 1 013 mbar²⁾

NOTE Certain toxic substances that are liquid at 1 013 mbar pressure at $0\text{ }^{\circ}\text{C}$ but that are completely vapourized at or below $30\text{ }^{\circ}\text{C}$ at that pressure are also treated as low pressure liquefiable gases and are included in Table 1.

2.2

high pressure liquefiable gas

a gas that has a critical temperature between $-10\text{ }^{\circ}\text{C}$ and $70\text{ }^{\circ}\text{C}$ inclusive

2.3

low pressure liquefiable gas

a gas that has a critical temperature above $70\text{ }^{\circ}\text{C}$

2.4

permanent gas

a gas that has a critical temperature below $-10\text{ }^{\circ}\text{C}$

2.5

corrosion

a chemical reaction on material that results in the removal of the surface of the material

NOTE Corrosion may exist in many forms, such as:

- a) chemical attack where the metal is dissolved by the reagents [such attack may be general over the complete surface, localized (causing pitting), or a combination of the two];
- b) rusting caused by the combined action of moisture and air.

2.6

inspection

an examination by a competent person using appropriate equipment but not including hydraulic pressure testing

2.7

competent person

a person who through training, practical experience and an understanding of the equipment is able to verify compliance with this British Standard

2.8

testing station

suitably equipped premises staffed by competent persons to undertake the periodic inspection and testing of gas containers in accordance with this British Standard

3 General requirements

3.1 No gas container complying with the requirements of this Part of BS 5430 shall be refilled unless it has been inspected and tested in accordance with clauses 5, 6 and 7 at the intervals given in Table 1.

NOTE It is the responsibility of the testing station to verify compliance with this standard. It is the responsibility of the filler to ensure that containers have been inspected and tested prior to filling.

3.2 The owner, user or filler of gas containers shall not be relieved from the obligation to ensure that at all times his containers are not damaged or corroded and shall refer all those suspected of damage or corrosion for further inspection and testing before the prescribed interval has elapsed.

3.3 The requirement for inspection and testing shall be satisfied if a container is inspected and tested on its first receipt by a filler after the specified interval has elapsed.

NOTE There is no general requirement for the user to return a gas container before the contents have been used even though the test interval may have lapsed. However, in the case of containers used for emergency purposes where long periods may elapse before use, e.g. fire extinguishers, resuscitation and self-contained breathing apparatus, it is the responsibility of the owner or user to empty the container and submit it for inspection and testing within the specified interval.

3.4 Containers due for inspection and testing shall be identified from the date of manufacture, or from the date of the last periodic test, marked on the container or valve. The date shall indicate a month and a year, or a quarter and a year or yearly (see clause 9).

²⁾ 1 bar = 10^5 N/mm^2 = 100 kPa.

A container shall fall due for inspection and test on its first receipt by a filler after the expiry of the interval in Table 1, taken from the end of the interval stamped on the container. For example, if the container were tested in March 1984 and stamped by year and quarter it would, if subject to a five year test interval, fall due for retest at its first receipt by a filler after 31 March 1989.

NOTE As an aid to recognition, coloured discs may be used, located between the valve and the neck of the gas container. Details of a suggested scheme are given in Table 2.

3.5 The equipment and methods used for inspection and testing of containers shall comply with this standard.

NOTE It is emphasized that the inspection is of prime importance for the identification of defects liable to render the container unsafe.

3.6 The test pressure to be applied shall be that stamped on the container with the following exception. Where containers for liquefiable gases of differing diameters and construction materials (and therefore marked with different test pressures) are employed for one specific service, e.g. liquefied petroleum gas, it shall be permissible in order to minimize operational error, to apply a common retest pressure provided that:

- a) the retest pressure is not greater than the stamped test pressure;
- b) the retest pressure is not less than the developed pressure of the contents at the design reference temperature.

NOTE In the case of commercial liquefiable petroleum gas with containers dedicated to this service the common retest pressure is to be not less than 22.5 bar for propane and 7.5 bar for butane.

These pressures apply regardless of the diameter and material of construction of the container.

4 Segregation of containers prior to inspection and testing

A scrutiny of all markings shall be carried out so that the containers can be segregated according to the type of periodic inspection and testing detailed in Table 1 into one of the following categories.

- a) Containers due for external inspection shall comply with clause 5.
- b) Containers due for internal inspection shall comply with clause 6.
- c) Containers due for hydraulic pressure testing shall comply with clause 7.
- d) Containers whose stamp markings do not identify the relevant manufacturing standards or the test requirements shall be set aside and the owner informed accordingly.

e) Containers due for refilling which are received from ships shall be inspected and, if necessary, tested as appropriate, in order that the filler can be advised whether they are suitable for refilling. If they are so suitable they shall be returned to the ship when refilled; if they are not suitable for refilling the ship shall be informed accordingly.

5 Procedure for external inspection

5.1 Preparation

Each container shall have all damaged plastic coating, damaged protective coating, loose paint, corrosion products, tar, oil or other foreign matter removed from the external surfaces by an appropriate method, e.g. wire brushing, shot blasting, water jet abrasive cleaning, chemical cleaning or steam cleaning. Care shall be taken to avoid damaging the containers and its marking or removing an excessive amount of material.

Where a container has been used for a flammable gas it shall be gas free before shot blasting is carried out.

Where a container is to be used for a gas which can be ingested, the cleaning method shall ensure that the container is totally free from residual toxicity before its return to service.

5.2 Checking markings

The markings on each container shall be checked for compliance with statutory or other requirements and shall be re-established as necessary.

NOTE For inadequate markings see Table 5.

5.3 External inspection

Each container shall be inspected for the following defects:

- a) dents, cuts, gouges, bulges, cracks or laminations;
- b) corrosion, special attention being given to the junction between the container base and footing;
- c) damaged valves (containers with damaged valves shall be dealt with in accordance with 6.5.1 and clause 8 and where it is necessary to remove the valve, consideration shall be given to carrying out a full inspection and/or hydraulic test of the container);
- d) other defects, such as depressed or misaligned bungs (valve boss), damaged shrouds, base rings or other fittings, illegible or unauthorized markings, fire damage, electric arc or torch burns etc., unauthorized additions, modifications, repairs or painting.

NOTE Damaged zinc coatings may need to be refurbished (see clause 10).

Table 1 — Intervals between periodic inspection and hydraulic tests

Duty of gas container	Interval between each:			Reference to note
	External inspection in accordance with clause 5	Internal inspection in accordance with clause 6	Hydraulic testing in accordance with clause 7	Note 1
a) Permanent gases, e.g. oxygen, argon, nitrogen, hydrogen, air, helium, xenon, krypton, neon, boron trifluoride	year 5 or 10	year 5 or 10	year 5 or 10	Note 2
b) All gases used in self-contained underwater breathing dress apparatus	2	2	4	
c) All gases used in self-contained breathing apparatus	5	5	5	
d) Town gas, coal gas, other manufactured fuel gases, methane, natural gas, carbon monoxide, fluorine	3 or 5		3 or 10	Note 2
e) Gas mixtures				Note 3
f) Non-corrosive low pressure liquefiable gases, e.g. Ammonia, butadiene, butane, dimethylether, ethylamine, ethyl chloride, ethylene oxide, refrigerant (halocarbon) gases, methylamine, dimethylamine, trimethylamine, methyl bromide, methyl chloride, propane, cyclopropane, propylene, vinyl chloride	a) 5	10	10	
	b) 5	5	—	Note 4
g) Corrosive low pressure liquefiable gases, e.g. boron trichloride, carbonyl chloride, chlorine, chlorine trifluoride, hydrogen cyanide, hydrogen chloride, hydrogen sulphide, nitrogen tetroxide, nitrosyl chloride, sulphur dioxide	5	5	5	
h) Non-corrosive high pressure liquefiable gases, e.g. ethane, ethylene, nitrous oxide, sulphur hexafluoride, chlorotrifluoromethane (R13), bromotrifluoromethane (R13B1)	5	10	10	
i) Gases used for fire extinguishing purposes, e.g. refrigerant gases such as bromochlorodifluoromethane (R12B1), bromotrifluoromethane (R13B1), (with or without permanent gases for pressure padding purposes), carbon dioxide	10 or 20	10 or 20	10 or 20	Note 5
j) Carbon dioxide (excluding fire extinguishing purposes)	5	5	5	