
**Cylinders in bundles for permanent and
liquefiable gases (excluding acetylene) —
Inspection at time of filling**

*Bouteilles à gaz sur cadres pour gaz permanents et liquéfiés (à l'exclusion de
l'acétylène) — Contrôle au moment du remplissage*



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International Standard ISO 11755 was prepared by Technical Committee ISO/TC 58, *Gas cylinders*, Subcommittee SC 4, *Operational requirements for gas cylinders*.

Annex A of this International Standard is for information only.

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Introduction

Transportable gas cylinder bundles require inspection at time of filling in order to establish that:

- the manifolded cylinders have no serious defects;
- the bundle frame has no serious defects;
- the accessories [i.e. piping, fittings, hoses, individual cylinder valves (if present)] are in good working order;
- the common inlet/outlet valve and the connection fittings are correct and function satisfactorily;
- the cylinders of the bundle and the accessories are suitable for common filling and emptying of the gas to be filled and for the intended filling conditions.

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Cylinders in bundles for permanent and liquefiable gases (excluding acetylene) — Inspection at time of filling

1 Scope

This International Standard applies to single gas cylinders of water capacity up to 150 l manifolded to a bundle. It specifies minimum requirements for inspection at time of filling which reflect current practice and experience.

This International Standard applies to cylinders for permanent and liquefied gases.

This International Standard does not apply to cylinder bundles for acetylene gas.

This International Standard does not deal with inspecting or testing for internal cylinder contamination, nor does it deal with bundles permanently fixed on trailers and rail cars.

2 Definitions

For the purposes of this International Standard, the following definitions apply.

2.1 cylinder bundle: Assembly whereby single cylinders, with or without valves, are mounted in a frame for common transport, storage and application, and are manifolded by means of accessories for common filling and emptying of the bundle.

2.2 accessories: Parts, such as piping, fittings, hoses, cylinder valves, isolation valves, etc., which are necessary for manifolding for common filling and emptying of the bundle.

2.3 frame: Structure to hold and position the single cylinders together in order to enable handling and transport as a unit.

NOTE — The frame can consist of several components which ensure the protection of the cylinders and accessories.

2.4 permanent gas: Gas which has a critical temperature below -10 °C .

2.5 liquefiable gas: Gas which is liquefiable by pressure at a critical temperature of -10 °C or higher.

2.6 filling pressure: Pressure to which a cylinder is filled at the time of filling.

NOTE — Filling pressure varies according to the gas temperature in the cylinder, which is dependent on the charging parameters and the ambient conditions. This concept is normally used for permanent gases.

2.7 working pressure: Settled pressure at a uniform temperature of 288 K (15 °C) and for a full gas cylinder.

NOTE — This concept is normally used for permanent gases.

2.8 working pressure of the bundle: Lowest working pressure of any cylinder within the bundle.

2.9 tare: Mass of the total bundle construction, including gas cylinders and accessories, and excluding the mass of those parts which are removed during filling.

2.10 filling weight: Maximum mass of the gas allowed to be filled into the bundle.

NOTE — The filling weight is product-specific.

3 Filling inspection

Each cylinder bundle shall be submitted to an inspection prior to, during, and immediately after filling. The items in 3.1 to 3.3 shall be covered by a filling inspection.

3.1 Prior to filling

- establishment of serviceable condition;
- identification of the cylinder bundle;
- establishment of cylinder bundle owner, if required;
- establishment of valve integrity and suitability;
- establishment of filling conditions.

3.2 During filling

- leak test;
- check valve operation.

3.3 After filling

- check that fill weight/volume is correct;
- check for leakage;
- establishment that content identification is correct.

4 Inspection of items prior to filling

4.1 Establishment of serviceable condition

Establish that each bundle is in a serviceable condition by visual examination of the following:

- before a cylinder bundle is taken to the filling point, it shall be established that the cylinder bundle is reasonably clean and reasonably free of foreign material;
- the visible parts of the gas cylinders shall not exhibit any serious abnormalities such as are burns, severe corrosion, heat/fire damage, or significant mechanical damage;
- the visible parts of the bundle frame and accessories shall not exhibit any serious abnormalities such as severe corrosion, heat/fire damage, or significant mechanical damage;
- it shall be ensured that all transport and handling devices (crane hooks, forklift slots, wheels, etc.) and valve protection devices are in place and in safe condition;
- the cylinders shall be securely clamped into the bundle frame.

4.2 Identification of the cylinder bundle

Before filling a bundle, verify that:

- the bundle and cylinders are permitted to be filled in the country of the filling station;
- all gas cylinders of the cylinder bundle have an unexpired test data;

- the cylinder bundle and all of the manifolded cylinders are suitable for the intended gas content and filling pressure or filling weight;
- the contents indicated on the cylinder bundle correspond with any attached labels, and, if applicable, colour coding (any disagreement between content indicators and colour coding must be resolved prior to filling).

NOTE — Data which may appear permanently marked on cylinder bundles are given in annex A.

4.3 Identification of owner, if required

When necessary, establish the identity of the owner of the cylinder bundle before filling, and obtain his authorization to fill the cylinder bundle.

4.4 Establishment of valve integrity and suitability

Before filling a bundle, establish that the installed main isolation valve and the connection fitting are suitable and in a satisfactory condition, i.e.

- correct outlet installed for the intended gas and working pressure;
- valve is free of contaminants;
- valve is easy to operate;
- outlet thread is undamaged;
- safety device, if required, is undamaged;
- handwheel, or key-operated spindle, is essentially undamaged and correctly fixed;
- valve attaches correctly to the filling connector.

If, in addition to the main isolation valve, individual cylinder valves are mounted, all individual cylinder valves shall be open before filling.

5 Inspection of items during filling

During the filling cycle of a bundle, the filler shall ascertain:

- that the main isolation valve and, if installed, the individual cylinder valves are not blocked and that the operation is progressing satisfactorily;
- that valves and connections (e.g. threaded) of the accessories are leaktight.

5.1 Filling permanent gases

The filler shall ensure that the gas cylinder bundle is filled to a pressure which is consistent with the working pressure of the bundle. Consideration shall be given to ambient and cylinder temperatures and to the temperature developed in the gas cylinders during filling.

5.2 Filling liquefiable gases

The bundle shall be filled either by mass to a specified filling weight, or by volume to a specified level in each cylinder.

If the bundle is filled by mass, the filler shall ensure the presence of a valid tare and filling weight identified according to the requirements of the relevant standard/specification.

If the bundle cylinders are filled to a specified level, the fill level of each cylinder shall be checked by a secondary method unless the specified level is controlled by a dip tube, in which case the secondary method to check each cylinder is not required.

Filling shall be accomplished in a manner that distributes the gas among the cylinders in the bundle so that no cylinder will be overfilled. If the bundle is filled as a unit, the individual gas cylinder valves shall be fixed permanently open.

NOTE — The filling methods used may differ depending on whether or not individual gas cylinder valves are used.

6 Inspection of items after filling

6.1 After filling, close the main isolation valve and, if required, the individual cylinder valves, and

- check that the main isolation valve does not leak;
- check that all connections (e.g. threaded) of the accessories do not leak;
- check that the cylinder valves do not leak;
- close the main isolation valve outlet with a protection cap, if required;
- check that any individual cylinder valve is in the correct position (open or closed) in accordance with national authority.

6.2 After disconnecting from the filling line, verify the mass of the full bundle, filled by mass, by use of an appropriate balance which is calibrated periodically.

6.3 After the bundle is filled, verify that the contained gas is correctly identified on the bundle.

When colour-coding is mandatory, verify that correct coding is used.

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Annex A (informative)

Bundle identification data

Data which may appear permanently marked on the bundle are given below.

A.1 Filling data

Filling data may include:

A.1.1 For permanent gases

- identification of gas or group of gases;
- maximum working pressure at 15 °C.

A.1.2 For liquefiable gases

- identification of gas;
- tare;
- filling weight.

A.2 Inspection data

Inspection data may include:

- month and year of last or next retest of cylinders;
- inspection mark of authorized testing organization;
- month and year of test at time of bundle manufacture.

A.3 Other data

Other data may include:

- owner's name/serial number;
- sign of identification of type approval, if required;
- bundle manufacturer's name/serial number;
- gross mass (for reasons of transport);
- total water capacity;
- total gas volume;
- test pressure of the lowest rated of any of the gas cylinders in the bundle;
- appropriate hazard symbols.