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**Gas cylinders — Cylinder valves with  
integrated pressure regulators —  
Specification and type testing**

*Bouteilles à gaz — Robinets de bouteilles avec détendeur intégré —  
Spécifications et essais de type*



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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 22435 was prepared by Technical Committee ISO/TC 58, *Gas cylinders*, Subcommittee SC 2, *Cylinder fittings*.

## Introduction

Cylinder valves with integrated pressure regulators are used to reduce the high cylinder pressure to a lower pressure suitable for use.

These functions cover a wide range of inlet and outlet pressures and flows which require specific design characteristics. It is important that the operating characteristics of these valves be specified and tested in a defined manner.

Such valves are more complicated than conventional cylinder valves yet subject to the same environmental and transportation conditions. These conditions should be borne in mind at the design and development stage.

This International Standard pays particular attention to

- suitability of materials,
- safety (mechanical strength, safe relief of excess pressure and resistance to ignition),
- gas-specificity,
- cleanliness,
- testing,
- identification, and
- information supplied.

# Gas cylinders — Cylinder valves with integrated pressure regulators — Specification and type testing

## 1 Scope

This International Standard applies to cylinder valves with integrated pressure regulators (VIPR) intended to be fitted to gas cylinders that convey compressed, liquefied or dissolved gases.

This International Standard is not intended for medical applications (see ISO 10524-3). Further, additional specific requirements for valves fitted with safety valves and bursting discs (see EN 14513) and for valves fitted with residual pressure valves (see ISO 15996) are not covered by this International Standard.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2503:1998, *Gas welding equipment — Pressure regulators for gas cylinders used in welding, cutting and allied processes up to 300 bar*

ISO 3253, *Gas welding equipment — Hose connections for equipment for welding, cutting and allied processes*

ISO 5145, *Cylinder valve outlets for gases and gas mixtures — Selection and dimensioning*

ISO 5171, *Pressure gauges used in welding, cutting and allied processes*

ISO 7289, *Quick-action couplings with shut-off valves for gas welding, cutting and allied processes*

ISO 7291:1999, *Gas welding equipment — Pressure regulators for manifold systems used in welding, cutting and allied processes up to 300 bar*

ISO/TR 7470, *Valve outlets for gas cylinders — List of provisions which are either standardized or in use*

ISO 9090, *Gas tightness of equipment for gas welding and allied processes*

ISO 10156, *Gases and gas mixtures — Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets*

ISO 10920, *Gas cylinders — 25E taper thread for connection of valves to gas cylinders — Specification*

ISO 11114-1, *Transportable gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 1: Metallic materials*

ISO 11114-2, *Transportable gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 2: Non-metallic materials*

ISO 11114-3, *Transportable gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 3: Autogenous ignition test in oxygen atmosphere*

ISO 11117, *Gas cylinders — Valve protection caps and valve guards for industrial and medical gas cylinders — Design, construction and tests*

ISO 13341, *Transportable gas cylinders — Fitting of valves to gas cylinders*

ISO 15001, *Anaesthetic and respiratory equipment — Compatibility with oxygen*

ISO 15996, *Gas cylinders — Residual pressure valves — General requirements and type testing*

EN 13918, *Gas welding equipment — Integrated flowmeter regulators used on cylinders for welding, cutting and allied processes — Classification, specification and tests*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

#### 3.1

##### **adjustable pressure regulator**

device that has been provided with a means of operator adjustment of the delivery pressure under normal use

#### 3.2

##### **closure pressure**

$P_4$

stabilized outlet pressure, one minute after cessation of the flow, from a pressure regulator by which the flow has been set to a standard discharge

#### 3.3

##### **cylinder valve with integrated pressure regulator**

##### **VIPR**

device intended to be permanently fitted to a gas cylinder connection and comprising a shut-off valve system and pressure reduction system

#### 3.4

##### **filling port**

point on the device through which the cylinder is filled

#### 3.5

##### **flow characteristic**

variation of the outlet pressure in relation to the rate of flow from zero to maximum capacity flow of the pressure regulator with the inlet pressure remaining constant

#### 3.6

##### **flow gauge**

device that measures pressure and that is calibrated in units of flow

#### 3.7

##### **flowmeter**

device that measures and indicates the flow of a specific gas or gas mixture

#### 3.8

##### **hysteresis**

lagging of the outlet pressure (effect) when the flow (cause) is varied so that at a constant inlet pressure the values of outlet pressure measured with increasing flow do not coincide with the values of outlet pressure measured with decreasing flow