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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 15382-2021

Replacing GB/T 15382-2009

General specification for gas cylinder valves

气瓶阀通用技术要求

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1 Scope

GB/T 15382 is the Chinese general specification for gas cylinder valves. The valve is the part of a gas cylinder that people handle, and it is the part that fails when a cylinder fails: a valve sheared off a full cylinder turns it into a projectile, and a valve that leaks on a flammable or toxic gas is the beginning of most cylinder incidents. The standard sets the classification and designation of cylinder valves, the requirements on the materials and their compatibility with the gases carried, the design and structural requirements including the connection to the cylinder and the outlet connection, the pressure rating and the requirements on the pressure relief device where one is fitted, the leak tightness requirements internal and external, the operating torque and the endurance, the impact, fire and pressure cycling requirements, the test methods, the inspection rules and the marking, packaging, transport and storage. For a valve maker, a cylinder filler or a gas company operating in China, this is the acceptance text.

This document stipulates the terms and definitions, basic types, technical requirements, inspection and test methods, inspection rules, marking, packaging, transportation, storage, product certificates, product batch inspection quality certificates of gas cylinder valves. This document is applicable to valves for compressed, liquefied, dissolved gas cylinders (hereinafter referred to as valves), whose ambient temperature is $-40\text{ }^{\circ}\text{C} \sim +60\text{ }^{\circ}\text{C}$, whose nominal working pressure is not greater than 35 MPa, which is transportable and refillable. This document does not apply to the valves for welding insulated cylinders, fire extinguishing cylinders, vehicle cylinders, respirator cylinders, liquefied petroleum gas cylinders, liquefied dimethyl ether cylinders, industrial non-refillable welded cylinders.

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, for dated reference documents, only

the version corresponding to the date applies to this document; for undated reference documents, the latest version (including all amendments) applies to this document.

GB/T 197 General purpose metric screw threads - Tolerances

GB/T 228.1 Metallic materials - Tensile testing - Part 1: Method of test at room temperature

GB/T 3863 Industrial oxygen

GB/T 4423 Copper and copper alloy cold-drawn rod and bar

GB/T 7307 Pipe threads with 55 degree thread angle where pressure-tight joints are not made on the threads

GB/T 8335 Special thread for gas cylinders

GB/T 8337 Fusible plug device for gas cylinders

GB/T 13005 Terminology of gas cylinders

5.1.1.5 The liquid chlorine cylinder valve shall be made of materials resistant to hydrochloric acid corrosion.

5.1.2 Valve body material

5.1.2.1 The valve body material shall be made of materials that will not change from plasticity to brittleness (such as copper alloy, austenitic stainless steel, aluminum alloy, nickel alloy, etc.), meanwhile it shall meet the design strength requirements of the valve body. The performance of the material shall comply with corresponding national standards.

5.1.2.2 When selecting brass material for the valve body, its copper content shall be in the range of 57.0% ~ 65.0%, lead content shall be in the range of 0.8% ~ 1.9%, iron content shall be $\leq 0.5\%$. The mechanical properties of the material shall not be lower than those specified in GB/T 4423.

5.1.3 Operating mechanism and operating device materials

5.1.3.1 The valve operating device shall have sufficient strength and fire resistance, which should be made of aluminum alloy material.

5.1.3.2 The materials of the valve stem, valve, connecting plate shall have sufficient strength and corrosion resistance. The valve stem used for liquid chlorine medium shall be made of stainless steel material, that is resistant to hydrochloric acid corrosion, or materials with higher resistance to hydrochloric acid corrosion.

5.1.3.3 The spring placed inside the valve should be made of corrosion-resistant stainless steel.

5.1.3.4 The diaphragm piece of the diaphragm valve shall be made of elastic stainless steel

material, or a combination of media corrosion-resistant material and elastic stainless steel material.

5.1.4 Rubber seal materials

5.1.4.1 Oxygen aging resistance The rubber seal shall be kept in oxygen at a pressure of (2.3 ± 0.2) MPa and a temperature of (70 ± 5) °C for 96 hours; there shall be no visible cracks or aging.

5.1.4.2 Low temperature resistance The rubber seal shall be kept in air at a temperature of (-40 ± 2) °C for 24 hours; there shall have no cracks or other damage.

5.1.5 Non-metallic materials in contact with oxygen or strongly oxidizing gases

5.1.5.1 Non-metallic seals, lubricants, sealants and other materials that come into contact with oxygen or strongly oxidizing gases shall be flame retardant.

5.1.5.2 Non-metallic seals, lubricants, sealants and other materials that come into contact with oxygen or strongly oxidizing gases should be subjected to self-ignition tests, according to the test methods specified in

GB/T 31481. Their self-ignition temperature shall be at least 100 °C higher than the maximum operating temperature.

Note: The maximum operating temperature refers to the highest temperature the valve may be at during use (such as when inflated).

5.1.5.3 Non-metallic seals, lubricants, sealants and other materials that come into contact with oxygen or strongly oxidizing gases shall be subjected to pressure impact tests under pvt pressure, according to the test methods specified in

GB/T 31481; it shall not react with oxygen.

5.1.6 Materials of safety pressure relief devices The material of the safety pressure relief device shall comply with the requirements of GB/T 8337 or GB/T 16918.

5.2 Design and process requirements

5.2.1 The valve shall be able to operate normally within the ambient temperature range of -40 °C ~ $+60$ °C. This temperature range can be appropriately expanded for a short period of time (such as inflating). When the cylinder is used for a long time at a lower or higher temperature, the supplier and the buyer shall sign an agreement and make it clear in the supplier's instructions.

5.2.2 The manufacturer shall specify the design service life of the valve, which is at least one periodic inspection cycle of the gas cylinder.

5.2.3 The valve's inlet and outlet should adopt connection types and sizes that comply with