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**NATIONAL STANDARD OF THE
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Spring loaded safety valve for cryogenic service

低温介质用弹簧直接载荷式安全阀

(English Translation)

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Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This Standard, with the use of the redrafting method, is compiled with reference to BS EN 13648-1:2008, Cryogenic vessels - Safety devices for protection against excessive pressure - Part 1. Safety valves for cryogenic service. It is not equivalent to BS EN 13648-1:2008.

This Standard was proposed by China Machinery Industry Federation.

This Standard shall be under the jurisdiction of National Technical Committee

503 on Safety Devices for Protection against Excessive Pressure of

Standardization Administration of China (SAC/TC 503).

The drafting organizations of this Standard. Beijing Aerospace Petrochemical Technology and Equipment Company.

Organizations that participate in the drafting of this Standard. Yuming Valve Group Co., Ltd., Hangzhou Hangyang Tooling Valve Co., Ltd., National Engineering Research Center for Special Pump and Valve, Yongyi Valve Group Co., Ltd., Wujiang Dongwu Machine Co., Ltd., The Boiler & Pressure Vessel Safety Inspection Institute of Henan Province.

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Spring loaded safety valve for cryogenic service

1 Scope

This Standard specifies the terms and definitions, structural form and structural length, technical requirements, inspection methods, inspection rules, signs, protection, packaging, transportation, and storage of spring loaded safety valve for cryogenic service (hereinafter referred to as "safety valve").

This Standard applies to safety valves for cryogenic gas service, of which the nominal pressure is PN16 ~ PN100; the nominal size is DN15 ~ DN200; the temperature is not less than -196 °C; the minimum set pressure is 0.1 MPa.

2 Normative references

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

GB/T 228.1, Metallic materials - Tensile testing - Part 1. Method of test at room temperature (GB/T 228.1-2010, ISO 6892-1:2009, MOD)

GB/T 229, Metallic materials - Charpy pendulum impact test method (GB/T 229-2007, ISO 148-1:2006, MOD)

GB/T 12225, General purpose industrial valves - Specification of copper alloy castings

GB/T 12230, General purpose industrial valves - Specification of stainless steel castings

3 Terms and definitions

Terms and definitions determined by GB/T 12241 are applicable to this document.

4.1 Structural form

The typical structural form of the safety valve is shown in Figure 1.

Notes.

4.2 Structural length

The structural length of the safety valve is in accordance with the provisions of JB/T 2203.

5.1 General requirements

In addition to meeting the requirements of this Standard, safety valves shall also meet the requirements of GB/T 12241 and GB/T 12243. If these standards differ from the requirements of this Standard, this Standard shall prevail.

5.3.1 General

The materials that are used for the safety valve shall be selected according to the operating temperature and material properties, and shall meet the following requirements.

5.3.2.1 Cryogenic steel castings are in accordance with JB/T 7248; copper alloy

castings are in accordance with GB/T 12225; austenitic stainless steel castings are in accordance with GB/T 12230. The visual quality of steel castings is in accordance with the provisions of JB/T 7927.

5.3.3.1 Non-metallic materials shall meet the minimum operating temperature

requirements, be able to pass normal and low temperature tests, and have compatibility with oxygen.

5.4 Non-destructive testing

Non-destructive testing shall be in accordance with the provisions of JB/T 7248 and meet the corresponding requirements.

5.5 Degreasing

Before assembly, all parts shall be cleaned, and degreased if necessary.

5.6.4 Mechanical characteristics

The mechanical characteristics of the safety valve shall meet the requirements of GB/T 12243.

5.6.5 Displacement

The displacement calculation of the safety valve is in accordance with GB/T 12241.

5.6.6 Cryogenic tightness

The cryogenic leakage rate of the safety valve shall not be greater than the specifications in Table 1.

6.1 Normal temperature test

The normal temperature test items are in accordance with the requirements of Table 2; the normal temperature test methods shall meet the requirements of GB/T 12241, GB/T 12242 and GB/T 12243.

6.2 Materials

For the materials of the pressure-containing parts, the analysis of the chemical composition is in accordance with the relevant standards; the mechanical property test is in accordance with the provisions of GB/T 228.1; the cryogenic impact test is in accordance with the provisions of GB/T 229.

6.3.5 Tightness test procedure

After the safety valve pops up, open the globe valve on the test vessel land; when the pressure is reduced to 70% of the set pressure of the safety valve, close the globe valve, to allow the cryogenic medium in the system to naturally vaporize the pressure; maintain the pressure in the test vessel at 90% of the set pressure through the globe valve; observe the leakage at the outlet of the