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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 12243-2021

Replacing GB/T 12243-2005

Spring loaded safety valves

弹簧直接载荷式安全阀

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1 Scope

GB/T 12243-2021 is the Chinese national standard on spring loaded safety valves, in the field of environment and health protection, safety. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 30 April 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 November 2021. Classification: ICS 13.240, CCS J16. This page is published from the official record of the

standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the design, performance, test and inspection, appearance, mark and lead seal, protection, storage and transportation for spring loaded safety valves (hereinafter referred to as safety valves). This document is applicable to safety valves for steam with a set pressure of 0.1MPa~42.0MPa, and flow passage diameters greater than or equal to 15mm, as well as safety valves for gas and liquids with a diameter greater than or equal to 7mm. This document is applicable to safety valves whose discharge medium temperature is not lower than -29°C.

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.

GB/T 9440, Malleable iron castings

GB/T 12224, General requirements for industrial steel valves

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

GB/T 12227, General purpose industrial valve - Specification of spheroidal graphite iron castings

GB/T 12228, General purpose industrial valves - Specification of carbon steel forgings

GB/T 12229, General purpose industrial valves - Specification of spheroidal graphite iron castings

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

GB/T 12241, Safety valves - General requirements

GB/T 12242, Pressure relief devices - Performance test code

GB/T 23935, Design of cylindrical helical springs

JB/T 2203, Center-to-face dimensions of spring loaded safety valve

JB/T 5263, Specification for steel casting for power station valves

JB/T 6439, Methods of magnetic examination for valves

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 12241 as well as the followings apply.

3.1 full-lift safety valve A safety valve that the actual discharge area is the flow channel area.

3.2 low-lift safety valve A safety valve that the actual discharge area is the curtain area.

3.3 discharge area The smallest cross-sectional area in the fluid passage when the valve is vented.

3.4 flow-rating pressure The static pressure at the inlet of the valve when measuring the displacement of the safety valve.

4.1 General

4.1.1 The design of the safety valve shall comply with the provisions of GB/T 12241.

4.1.2 The applicable temperature range of the safety valve shall be determined according to its structure (such as spring heat insulation and cold insulation), material, medium working characteristics, and temperature change limit value during discharge. The safety valve shall work normally within the marked temperature range.

4.1.3 When the safety valve used for compressible gas medium is in the discharge state, due to the phenomenon of condensation and frost due to temperature drop, the suitability of its structure and materials shall be fully considered. Prevent jamming and other phenomena during the action of the disc.

4.2 End connection The end connection of the safety valve shall be in accordance with the provisions of GB/T 12241.Safety valves with threaded end connections shall be provided with wrench flats for easy installation.

4.3 Structural length and verticality limit deviation The structural length of the safety valve is in accordance with the provisions of JB/T 2203 or the requirements of the order contract. The structural length and the limit deviation of the verticality of the end face of the inlet and outlet flanges shall be in accordance with the regulations in Figure 1 and Table 1.

4.4 Valve body

4.4.1 The design of the valve body shall ensure that the safety valve does not undergo any harmful deformation under the strength test and working conditions and is easy to manufacture and maintain.

4.4.2 The reaction force when the safety valve discharges shall be considered. Reinforcement measures need to be taken on the inlet or outlet flange of the valve, such as. adopting the thickness of the flange adjacent to the higher pressure grade or the flange adjacent to the nominal size of the larger grade.

4.5 Valve seat and disc

4.5.1 The material of the valve seat and disc shall be shock-resistant and medium-resistant. Cast iron materials shall not be used.

4.5.2 The sealing secondary material can be the material of the valve seat and the disc body. It can also be welded with another alloy material, or inlaid with non-metallic elastic sealing material.

4.5.3 The sealing surface of the valve seat and disc shall be in the form of a plane. When the tapered sealing surface is used, the angle between the sealing surface and the valve axis is preferably 45°.

4.6 Spring

4.6.1 The requirements for springs shall not be lower than those specified in GB/T 12241.When 4.6.2~

4.6.15 is inconsistent with the requirements stipulated in GB/T 12241, the regulations in 4.6.2~

4.6.15 shall be followed.

4.6.2 The slenderness ratio (ratio of free height to middle diameter) of the spring shall be less than 3.7.

4.7.2 Valve seat and disc

4.7.2.1 The corrosion resistance of the valve seat and disc body material shall not be lower than that of the valve body material. Iron materials are not allowed. It shall be suitable for the discharge condition of the safety valve.

4.7.2.2 Safety valve seats for steam and saturated water with nominal pressure greater than or equal to 10MPa and operating temperature greater than 370°C shall be forged or rolled materials.

4.7.3 Guide sleeve The material of the guide sleeve shall have good wear resistance and corrosion resistance. It shall be suitable for the discharge condition of the safety valve.

4.7.4 Spring The material of the spring shall be selected according to GB/T 23935 and meet the requirements of the corresponding standards.

4.8 Non-destructive testing The non-destructive testing of safety valves shall be in accordance with the provisions in Annex A.

5 Performance

5.1 Set pressure deviation The set pressure deviation of the safety valve shall be in accordance with the provisions in Table 4 and Table 5.