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

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Replacing GB/T 12242-2005

Pressure relief devices - Performance test code

压力释放装置 性能试验方法

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1 Scope

GB/T 12242-2021 is the Chinese national standard on pressure relief devices - performance test code, 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 9 March 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has

been in force since 1 October 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 test methods for the operating performance test (including mechanical characteristics), displacement and resistance coefficient of the pressure release device. This document is applicable to test procedures with various import and export conditions, and the test medium is steam and gas whose physical properties are known. (Air) or liquid (water); including reclosing and non reclosing pressure relief devices, as follows:

- a) safety valve,
- b) Bursting disc device,
- c) Break/shear pin device,
- d) Fusible plug device. When the parties involved in the test agree to accept the terms of this document, this document can also be applied to other pressure relief devices.

2 Normative references

The contents of the following documents constitute the indispensable clauses of this document through normative references in the text. Among them, dated quotations Only the version corresponding to that date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to This document.

GB/T 2624.1 Use a differential pressure device installed in a circular cross-section pipe to measure the flow of fluid in a full pipe. Part

3 Terms and definitions

The following terms and definitions defined in GB/T 12241 apply to this document.

3.1 General terms

3.1.1 Pressure relief device A device used to prevent the pressure of the internal medium from rising to exceed the predetermined maximum pressure when the pressure vessel is in an emergency or abnormal situation.

3.1.2 Pressure relief valve pressure relief valve; PRV A valve used to prevent the pressure of the internal medium from rising to exceed the predetermined maximum pressure when the pressure vessel is in an emergency or abnormal situation.

3.1.3 Field test fieldtesting In order to determine some or all of the working characteristics

of the pressure relief device, the test of the pressure relief device installed on the system.

3.1.4 In-service testing In order to determine some or all of the working characteristics of the pressure relief device, use system pressure or use an external pressure source (with or without auxiliary Lifting device) A test of a pressure relief device installed on the system that is protecting the system.

3.1.5 Displacement test flowcapacitytesting Determining the operating characteristics of the pressure relief device includes a test to measure the displacement.

3.1.6 Benchtesting A test on a pressurized system to determine the set pressure of the pressure relief device and the tightness of the closure.

3.2 Types of pressure relief devices

3.2.1 Reclosing pressure-Relieving devices Designed as a pressure release device that is driven by the inlet static pressure and re-closes after returning to normal working conditions.

Note. The structure types are spring direct load type, pilot type, power operation type.

3.2.2 Non-reclosing pressure relief device A pressure release device that remains open after an action can provide a means of manual reset.

Note. Non-reclosing pressure release devices include rupture discs, breaking pins, bending pins, shear pins, and fusible plugs.

3.2.2.1 Rupture disk device The function of a non-reclosing pressure release device driven by the static pressure difference between the inlet and outlet of the device is realized by the blasting of the pressure-bearing piece.

3.3 Characteristic dimensions of pressure relief device

3.3.1 Dischargearea The minimum cross-sectional area of the fluid passage when the valve is discharged.

3.3.2 Nozzlearea The minimum cross-sectional area of the flow path from the inlet end of the valve to the sealing surface of the closing member.

3.3.3 Nozzlediameter Corresponds to the diameter of the flow channel area.

3.3.4 Curtainarea When the valve flap rises above the valve seat, the cylindrical or conical discharge channel area is formed between the sealing surfaces.

Note. The area of the curtain is shown in Figure 1.

3.3.7 Seatangle The angle between the valve axis and the sealing surface.

Note. The bevel angle of the sealing surface of the flat sealing valve is 90°.

3.4 Characteristic dimensions of non-reclosing pressure relief devices

3.4.1 Net flow area The area of the flow rate is determined after the non-reclosing pressure release device operates.

Note. The (minimum) net flow area of a rupture disc is the calculated net area after it is completely ruptured, and it has an appropriate tolerance, because some structural parts of the rupture disc may reduce its net circulation area.

3.5 Action and displacement characteristics of the pressure release device

3.5.1 Set pressure The inlet static pressure raised by the pressure release device, under which the device exhibits the definition of opening pressure, sudden jump pressure, and starting leakage pressure. One of the action characteristics of force, burst pressure, and breaking pressure (for a specific device design, the applicable action characteristics are determined by the device manufacturer. set).

3.5.2 Overpressure The pressure increase exceeding the set pressure of the pressure release valve, at which the safety valve reaches the opening height specified by the manufacturer.

Note. The excess pressure is usually expressed as a percentage of the set pressure.

3.5.3 Re-seating pressure After the pressure release valve is discharged, the disc contacts the valve seat again, that is, the pressure when the opening height becomes zero.

3.5.4 Blowdown The difference between the set pressure and the return pressure.

Note. The opening and closing pressure difference is expressed as a percentage of the set pressure or in pressure units.

3.5.5 Discharge pressure Set pressure plus over pressure.

3.5.6 Rated discharge pressure The inlet static pressure when measuring the displacement of the pressure release device.

3.5.7 Backpressure The static pressure generated at the outlet of the pressure relief device due to the presence of pressure in the exhaust system.

3.5.8 Built-upbackpressure The pressure generated at the outlet of the device as the medium flows through the pressure relief device into the discharge system.

3.5.9 Superimposedbackpressure The pressure that exists at the outlet of the pressure relief device immediately before it operates.

Note. The additional back pressure is caused by other pressure sources in the exhaust system.

3.5.10 Burst pressure When the bursting disc device operates, its inlet static pressure.