



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

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Safety valves and bursting disc safety devices in combination

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1 Scope

This Standard specifies the application and design, installation, determination of adjusted factor of discharge capacity, application of adjusted factor of discharge capacity, identification, quality certificate, packaging and transportation of the combination of safety valve and bursting disc safety device (hereinafter referred to as the combination device).

This Standard applies to the series combination structure where the distance from the outlet side of the bursting disc safety device to the inlet side of the safety valve is not more than 5 times the pipe diameter.

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 567.1, Bursting disc safety devices - Part 1: Basic requirement

GB/T 567.2, Bursting disc safety devices - Part 2: Application, selection and installation

GB/T 12241, Safety valves - General requirements (GB/T 12241-2005, ISO 4126-1:1991, MOD)

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

GB/T 12243, Spring loaded safety valves

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 567.1, GB/T 567.2 and GB/T 12241 as well as the followings apply.

3.1 combination device

A bursting disc safety device is a safety relief device installed in 5 pipe diameters on the inlet side of the safety valve (from the outlet side of the bursting disc holder to the inlet side of the safety valve).

3.2 combination device discharge capacity factor; K_d

The ratio of the measured actual emissions of the combination device to the theoretically calculated emissions.

3.3 adjusted factor of combination device discharge capacity; F_d

The factor used to correct the discharge capacity of the combination device.

4 Application and design

4.1 The combination device is used to prevent overpressure of pressure vessels, pipelines and other closed vessels, mainly for the following purposes:

- a) Prevent safety valve corrosion, scaling, or other conditions that affect safety valve performance;
- b) Prevent safety valve leakage;

c) Prevent material loss after the bursting disc is blasted.

4.2 The discharge capacity of the combination device shall be such that the pressure of

the protected equipment does not exceed the allowable limit pressure specified in the corresponding standard.

4.5 The maximum burst pressure of the bursting disc safety device shall not be greater

than 110% of the set pressure of the safety valve or 0.01MPa (whichever is the larger value between the two). The minimum burst pressure shall not be less than 90% of the set pressure of the safety valve. The designer shall determine the design burst pressure of the bursting disc safety device according to the design pressure of the protected system.

4.6 The minimum net relief area of the bursting disc in the combination device shall be

larger than the flow passage area of the safety valve.

4.7 Bursting discs shall not be made of brittle materials. The bursting disc shall not

produce fragments or fall off when it bursts.

4.8 When the combination device is used for liquid medium, the type of bursting disc

safety device and safety valve shall be determined by the manufacturer.

4.9 The cavity between the bursting disc safety device and the safety valve shall be

provided with an exhaust valve, a pressure gauge or other alarm indicators. It is used to

6 Determination of adjusted factor of discharge capacity

6.1 Test requirements

6.1.1 When the combination device is used for compressible fluids, the test shall use superheated steam, air or other compressible fluids with known properties whose superheat degree is not more than 10°C.

6.1.2 When the combination device is used for liquids, the test medium is water or other liquids of known properties.

6.1.3 It shall use the safety valve with the largest flow area for that model and size to test.

6.1.4 It shall use the bursting disc safety device with the minimum burst pressure of this model and size to test.

6.1.5 The measured adjusted factor of discharge capacity applies to the combination device of the same design as tested. However, the external shape of the holder may be disregarded.

6.2 Test device The test device shall meet the requirements of GB/T 12242.

6.3 Test methods

6.3.1 Single specification method The single specification method requires the following:

- a) It is used to test the combination device of specific design (specification and model are known);
- b) Select three bursting discs with the same design bursting pressure to test the combination device separately according to the steps in 6.4;
- c) The test results obtained by the above test methods can be used in the three-specification method.

6.3.2 Three-specification method The three-specification method requires the following:

- a) It is used to test the combination device that requires serialized mass production.

The F_d value measured by this method can cover the entire type of product range (including different specifications, different pressures);

- b) It shall test the combination device of three consecutive specifications;
- c) For each of the three specifications of bursting disc safety devices, take three bursting discs with the same design bursting pressure to test the combination device according to the steps in 6.4 (9 pieces in total). The same pair of grippers are allowed to be tested for each size of bursting disc.

6.4 Test steps

6.4.1 According to the relevant requirements of GB/T 12242, in the absence of a bursting disc safety device, conduct tests to determine the discharge capacity factor of the individual safety valve.

6.4.2 Install the bursting disc safety device on the inlet side of the safety valve. Blast the bursting disc according to the requirements of 6.4.3. Then actuate the safety valve.

6.4.3 The combination device shall be tested as follows:

- a) Mount the combination device on the test device. The pressure on the inlet side is increased to 90% of the expected minimum burst pressure. Hold the pressure not less than