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

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**Bursting disc safety devices - Part 2: Application, selection and
installation**

爆破片安全装置 第2部分：应用、选择与安装

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1 Scope

1.1 This part of GB 567 lays down the basic technical requirements for the application, the selection and the installation of bursting disc safety devices.

1.2 This part applies to the following bursting disc safety devices: bursting disc safety devices used on pressure vessels, pressure piping or other closed pressure-bearing equipment (pressure-bearing equipment for short) to prevent overpressure or excessive vacuum; bursting disc safety devices in which the bursting pressure of the disc is not greater than 500 MPa and not less than 0.001 MPa.

1.3 This part does not apply to the following bursting disc safety devices: those on pressure-bearing equipment where the pressure may rise sharply during operation and the reaction rate reaches detonation; those with special requirements for national defence and military equipment.

NOTE Detonation: when the combustion rate of a substance is extremely fast and reaches 1 000 m/s or more, a phenomenon fundamentally different from ordinary combustion and explosion is produced; that phenomenon is called detonation.

2 Normative references

The following documents are indispensable for the application of this document. For dated references only the edition cited applies; for undated references the latest edition, all amendments included, applies.

GB 567.1-2012 Bursting disc safety devices - Part 1: Basic requirements.

GB 567.4 Bursting disc safety devices - Part 4: Type test.

3 Terms and definitions

The terms and definitions given in GB 567.1 and the following apply to this document.

3.1 maximum allowable operating pressure. The maximum gauge pressure that the top of the protected pressure-bearing equipment is allowed to bear at the design temperature. That pressure is calculated from the effective thickness of each pressure-bearing element of the protected equipment, taking account of all the loads borne by the element, and the smallest value is taken.

3.2 operating pressure. The highest pressure that the top of the protected pressure-bearing equipment may reach under normal operating conditions.

3.3 operating ratio. The ratio of the operating pressure of the protected pressure-bearing equipment to the minimum bursting pressure of the bursting disc.

3.4 pressure relief system. The system that allows the fluid to be relieved safely when the fluid inside the protected pressure-bearing equipment is overpressured, including valves, piping, the pressure relief device and the relief pipe.

3.5 relieving pressure. The maximum pressure that can be reached on the inlet side of the relief device during the pressure relief process.

3.6 relieving temperature. The temperature on the inlet side of the relief device during the pressure relief process.

3.7 replacement period. The interval of time from the installation and use of a bursting disc to its replacement.

4 Application

4.1.1 Besides meeting the requirements of this part, the application of bursting disc safety devices shall comply with the provisions of the corresponding safety technical regulations.

4.1.2 A bursting disc safety device may be used on its own, or it may be used in combination with a safety valve as part of a combined relief device.

4.2.1 A bursting disc safety device shall be used on its own as the overpressure relief device on protected pressure-bearing equipment meeting any one of the following conditions: a) the pressure inside the vessel rises rapidly and the safety valve cannot react in time; b) the design does not allow any slight leakage of the medium inside the vessel; c) deposits or sticky gelatinous matter produced by the medium inside the vessel may cause the safety valve to fail; d) the effect of low temperature prevents the safety valve from working properly; e) the safety valve is unsuitable for reasons such as too large a relief area or too high (or too low) a relieving pressure.

4.2.2 Where the relevant standards for mobile pressure vessels have special provisions, as for tube trailers and tube bundle containers, the protected pressure-bearing equipment may use a bursting disc safety device as the sole overpressure relief device.

4.2.3 Protected pressure-bearing equipment used in places where overpressure occurs frequently or where the temperature fluctuates widely shall not use a bursting disc safety device on its own as the overpressure relief device.

4.3.1 According to the way the bursting disc safety device and the safety valve are connected and to their relative position, three forms of combination can be distinguished: a) the bursting disc safety device in series on the inlet side of the safety valve (see Figure 1a); b) the bursting disc safety device in series on the outlet side of the safety valve (see Figure 1b); c) the bursting disc safety device in parallel with the safety valve (see Figure 1c). The key to Figure 1 is: 1 pressure-bearing equipment; 2 bursting disc safety device; 3 safety valve; 4 indicating device.

4.3.2.1 On protected pressure-bearing equipment in any one of the following situations, the bursting disc safety device shall be in series on the inlet side of the safety valve: a) to avoid the loss of a large quantity of process material or contained medium through rupture of the bursting disc; b) where the safety valve cannot be used directly (for example a corrosive medium, or where leakage is not allowed); c) where a mobile pressure vessel contains a medium of extreme or high degree of toxic hazard or a strongly corrosive medium.

4.3.2.2 When the bursting disc safety device is installed on the inlet side of the safety valve, the following requirements shall be met: a) the relieving capacity of the combined device of bursting disc safety device and safety valve shall not be less than the safety relieving capacity of the protected pressure-bearing equipment; b) the nominal diameter of the bursting disc safety device shall not be less than the pipe diameter on the inlet side of the safety valve, it shall be placed within five pipe diameters of the inlet side of the safety valve, and the pressure loss of the inlet line of the safety valve (that caused by the bursting disc safety device included) shall not exceed 3 % of its set pressure; c) the relief area after the bursting disc has burst shall be greater than the inlet cross-section of the safety valve; d) the bursting disc shall not produce fragments, come loose or throw sparks when it bursts, so as not to hinder the normal discharge function of the safety valve; e) the cavity between the bursting disc safety device and the safety valve shall be fitted with a pressure indicating device, a vent and a suitable warning indicator.

4.3.2.3 For a safety valve with a bursting disc safety device in series on its inlet side, the rated relieving capacity shall be the rated relieving capacity of the single safety valve multiplied by the coefficient 0.9, and that value is taken as the relieving capacity of the combined device.

4.3.3.1 Where the outlet side of the safety valve may be corroded or disturbed by an external pressure source, a bursting disc safety device shall be fitted on the outlet side of

the safety valve to protect its proper operation.

4.3.3.2 A bursting disc safety device fitted on a mobile pressure vessel shall not be placed on the outlet side of the safety valve.

4.3.3.3 When the bursting disc safety device is placed on the outlet side of the safety valve, the following requirements shall be met: a) the relieving capacity of the combined device of bursting disc safety device and safety valve shall not be less than the safety relieving capacity of the protected pressure-bearing equipment; b) the cavity between the bursting disc safety device and the safety valve shall be fitted with a pressure indicating device, a vent and a suitable warning indicator; c) at the bursting temperature, the sum of the design bursting pressure of the bursting disc and the pressure existing inside the relief pipe shall not exceed any one of the following: the set pressure of the safety valve; the design pressure of any pipeline or pipe fitting between the bursting disc safety device and the safety valve; the design pressure of the protected pressure-bearing equipment; d) the relief area after the bursting disc has burst shall be large enough for the flow rate to equal the rated discharge capacity of the safety valve; e) no pipeline other than the one at the bursting disc shall be blocked by the bursting of the disc.

4.3.4.1 On protected pressure-bearing equipment in any one of the following situations, one or more bursting disc safety devices may be set in parallel with the safety valve: a) to prevent a rapid rise of pressure under abnormal working conditions; b) as an auxiliary safety relief device, where an increase of relief area is needed because a fire or an unforeseeable external heat source may be encountered or approached.

4.3.4.2 The relieving capacity of the safety valve and that of the bursting disc safety device shall each be not less than the safety relieving capacity of the protected pressure-bearing equipment.

4.3.4.3 The design bursting pressure of the bursting disc shall be greater than the set pressure of the safety valve.

5 Selection

5.1.1 When a bursting disc safety device is selected, account shall be taken of the pressures borne on both the inlet side and the outlet side of the device and of the pressure difference between them.