



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

GB/T 20801.6-2020

Pressure piping code - Industrial piping - Part 6: Safeguarding

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1 Scope

This Part of GB/T 20801 specifies the basic requirements for safety protection devices, such as safety relief devices, flame arresters, fire emergency block valves and mechanical interlocking devices, of the pressure piping system, and safety protection.

For other safety protection requirements, which are not specified in this Part, refer to other parts of GB/T 20801 and the provisions of relevant national regulations, standards and specifications.

This Part applies to the safety protection of pressure piping systems that are defined by the scope of GB/T 20801.1.

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 12158, General guideline for preventing electrostatic accidents

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

GB/T 15605, Guide for pressure venting of dust explosions

GB/T 15706, Safety of machinery - General principles for design - Risk assessment and risk reduction

GB/T 20801.1-2020, Pressure piping code - Industrial piping - Part 1.

General

GB/T 20801.2-2020, Pressure piping code - Industrial piping - Part 2.

Materials

GB/T 20801.3-2020, Pressure piping code - Industrial piping - Part 3. Design and calculation

GB/T 20801.4-2020, Pressure piping code - Industrial piping - Part 4.

Fabrication and assembly

GB/T 20801.5-2020, Pressure piping code - Industrial piping - Part 5.

Inspection and testing

3 Terms and definitions

Terms and definitions determined by GB/T 20801.1-2020, GB/T 20801.2-2020,

GB/T 20801.3-2020, GB/T 20801.4-2020, GB/T 20801.5-2020, and the following ones are applicable to this document.

3.1 Safety protection device

The mechanical (physical) protection devices that function in the event of failure of automatic control instruments and manual intervention according to the analysis of the safety protection layer (see Appendix A).

3.2 Safety relief device

The device that is started by the static pressure of the inlet or the static pressure difference between the inlet and outlet to release the fluid to prevent the pressure in the system from exceeding the predetermined safe value in the case of non-fire or fire accidents.

3.3 Safety valve

The valve that is controlled by spring action or pilot valves. When the static pressure at the inlet (static pressure difference between the inlet and outlet for ordinary valves) exceeds the set pressure, the valve opens to release the fluid to prevent the pressure in the system from exceeding the predetermined safe value. When the pressure drops to the re-seating

pressure, the valve can be

4.1.1 The safety relief device shall prevent overpressure accidents in any part

of the independent pressure system. Designers should use various process hazard assessment (PHA) methods to study all possible overpressure conditions in the specific process. When identifying various overpressure conditions, the following guidelines shall be followed.

4.1.2 Automatic control instruments and alarm interlocking devices shall not

replace safety relief devices as the system's overpressure protection facilities.

When emissions are not allowed or safety relief devices cannot be installed, all overpressure conditions can be evaluated and analyzed through process hazard sources, and a system design method, i.e., intrinsic safety design or high integrity protection system (HIPS), can be used to eliminate the cause of system overpressure or perform system overpressure protection.

4.1.3 Equipment or piping systems that meet the following conditions shall be

equipped with safety relief devices.

4.1.4 The independent pressure system shall be equipped with one or more

parallel safety relief devices at appropriate locations.

4.1.5 The determination of relevant pressures of the safety relief device shall

meet the following requirements.

4.2.1 Under typical overpressure conditions, the required relief capacity shall

be determined according to the criteria in Table 2.

4.3.1 Block valves should not be installed at the inlet and outlet of the safety

relief device. When it is necessary to install due to the inspection and maintenance of the safety relief device, the following requirements shall be met.

4.3.2 The inlet piping of the safety relief device shall meet the following

requirements.

4.3.3 The outlet piping of the safety relief device shall meet the following

requirements.

4.4.1 For the safety relief device, the relief medium, the process overpressure

conditions and the performance of the safety relief device shall be considered when selecting the appropriate form of the safety relief device. See Appendix C. The selection of the safety relief device shall comply with the relevant standards.

4.4.2 Safety relief device products shall comply with the relevant standards

such as TSG ZF001, TSG ZF003 and GB/T 12242.

5.1.1 Flame arrestor products and applications shall comply with relevant

standards such as ISO 16852 and PD CEN/TR 16793.

5.1.2 In the process equipment, there are a large number of non-electrical

equipment and piping systems in potentially explosive environments. Flame arrestor is the main safety protection device for explosion-proof of non-electrical equipment. It has the function of preventing explosion, preventing explosion from spreading through piping, and preventing deflagration from developing into detonation. Refer to Appendix D for the types and selection of flame arresters.

5.2 Flame arrestor settings

The following equipment and piping systems shall be equipped with flame arresters.

5.3 MESG and explosion group of combustible gas and vapour

According to MESG, combustible gas and vapour are divided into 7 explosion groups, as shown in Table 3. The gap of the flame arrestor shall be smaller than the MESG of combustible gas and vapour.

6.1.1 Fire emergency block valves should be installed at the exit end of key

storage tanks such as large-scale, liquefied gas and acute toxicity category 1 and category 2 chemicals.

6.2.1 Mechanical interlocking is a high-integrity safety protection device that

prevents major accidents caused by human error. Products shall comply with relevant standards such as GB/T 15706.

6.2.2 When operational errors in operation and maintenance may cause major

accidents, mechanical interlocking devices should be installed.