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

GB/T 16508.1-2022

Replacing GB/T 16508.1-2013

Shell boilers - Part 1: General requirements

锅壳锅炉 第1部分：总则

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1 Scope

GB/T 16508.1-2022 is the Chinese national standard on shell boilers - part 1: general requirements, in the field of energy and heat transfer engineering. 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 2022 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 October 2022. Classification: ICS 27.060.30, CCS J98. 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.

1.1 This document specifies the general technical requirements for shell boiler range, boiler rated parameters, design and calculation, manufacturing and inspection, installation and operation, performance test, energy saving and environmental protection.

1.2 This document applies to the following range of stationary shell boilers.

a) Steam boilers with rated steam pressure greater than or equal to

0.1 MPa;

b) Hot water boilers with rated outlet pressure greater than or equal to

0.1 MPa and rated thermal power greater than or equal to

0.1 MW.

1.3 For the once-through boilers and waste heat boilers containing shell boiler elements, it shall be implemented according to this document.

1.4 This document does not apply to the following devices.

a) Portable shell boilers;

b) Cooling devices to meet the cooling needs of equipment and process flow.

1.5 For stationary shell boilers with rated pressure less than

0.1 MPa, refer to this document.

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 753, Steam condition series for utility boilers

GB/T 1921, Parameters for industrial steam boilers

GB/T 2900.48, Electrotechnical terminology of boilers

GB 3095, Ambient air quality standards

GB 3096, Environmental quality standard for noise

GB/T 3166, Parameters for hot water boilers

GB 4053 (all parts), Safety requirements for fixed steel ladders and platform

GB 8978, Integrated wastewater discharge standard

GB/T 10180, Thermal performance test code for industrial boilers

GB/T 10863, Thermal test method for gas pass heat recovery boiler

3 Terms, definitions and symbols

3.1 Terms and definitions For the purposes of this document, the terms and definitions defined in GB/T 2900.48 as well as the followings apply.

3.1.7 instrument A device used alone or in combination with other equipment for display or measurement.

3.1.8 rated pressure The working fluid pressure at the outlet of the boiler that shall be guaranteed during long-term continuous operation within the specified water supply pressure and load range, that is, the rated working pressure or rated outlet pressure marked on the boiler nameplate.

3.2 Symbols The following symbols apply to this document.

4 Responsibility

4.1 User The user shall determine the technical requirements for the boiler according to various factors related to the use state. Provide the following conditions required for design and manufacture to the manufacturer in written form.

4.2 Manufacturer The manufacturer shall ensure that the boiler meets the reasonable requirements of the user. Be responsible for implementing the requirements of this document and complying with the following requirements.

a) According to the principles of being safe, energy-saving and environment

4.3 Installer The responsibilities of the installer are as follows:

5.1 Boiler range

5.1.1 Overview The boiler range referred to in this document includes boiler proper, piping within the range, safety appurtenance and instruments, auxiliary equipment (auxiliary machine) and systems, etc. Refer to the definition in

3.1.2 for the boiler proper. See the definitions in 5.1.2~

5.1.4 for piping, safety appurtenance and instruments, auxiliary equipment (auxiliary machine) and systems within the scope of the boiler.

5.1.2 Piping within boiler range

5.1.4 Auxiliary equipment (auxiliary machine) and system The auxiliary equipment (auxiliary machine) and systems of the boiler include fuel feeding equipment, air supply (induction) equipment, flue gas treatment equipment, ash (slag) collection and removal devices, water supply and water treatment equipment as well as all related control devices, monitoring equipment and the corresponding functional systems composed of them.

6 Rated parameters of boilers

6.1 The rated parameters of boilers include rated evaporation (t/h) or rated thermal power (MW), rated pressure (gauge pressure) and rated temperature.

6.2 The rated parameters of boilers can be selected according to the following standards.

7.1 Material

7.1.1 The selection of boiler materials shall meet the requirements of GB/T 16508.2. Use within the scope of use specified in the standard.

7.1.2 The determination of the allowable stress of the material is as follows:

7.1.3 The setting and selection of boiler safety appurtenance and instruments shall meet the requirements of GB/T 16508.5.

7.1.4 The design or selection of combustion equipment shall meet the requirements of GB/T 16508.6.

7.1.5 Auxiliary equipment (auxiliary machine) and appurtenance for boilers shall meet the following requirements.

7.1.6 Other parts of the boiler shall meet the following requirements.

8 Manufacturing and inspection

8.1 Boiler manufacturer shall formulate a perfect quality plan. The content shall at least include the manufacturing and assembly process, inspection and test items, and qualification indicators of the main pressure elements (pressure component) of the boiler.

9 Installation and operation

9.1 The site installation, installation process inspection, commissioning and acceptance of the boiler shall meet the requirements of GB/T 16508.7.

10 Performance test

10.1 The thermal performance test method of the boiler shall be carried out according to the requirements of GB/T 10180. For condensing boilers, it shall be carried out according to the requirements of NB/T 47066.

10.3 The initial emission concentration test of boiler air pollutants shall be carried out according to the method specified in GB 13271.

11 Energy saving and environmental protection