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

CJ/T 395-2012

Gas-fired heating and hot water condensing combi-boilers

冷凝式燃气暖浴两用炉

(English Translation)

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1 Scope

This Standard specifies the gas-fired heating and hot water condensing combi-boilers' (hereinafter referred to as "condensing boilers") terms and definitions;

classification and model; requirements for material, structure and safety;

performance requirements; test method; inspection rules; marking; precaution and instruction; packing; transport and storage.

This Standard is applicable to condensing boilers such as -- rated heat input is not greater than 70kW; maximum heating operating water pressure is not greater than

0.3MPa; the water temperature is not greater than 95°C in the operation; it adopts the blower atmospheric burner or full premix burner. For the condensing boilers of which the rated heat input is greater than 70 kW, it may refer to this Standard.

This Standard is applicable to combi-condensing boilers of heating and hot water, or condensing boilers of heating-only.

This Standard is applicable to the condensing boilers of natural gas, liquefied petroleum gas, and manufactured gas that comply with those specified in GB/T

13611.

This Standard is not applicable to condensing boilers of the following types:

-- Natural draught flue type, and natural draught balance type;

- Outdoor type;
- Volume type;
- Condensing boilers that adopt two sets of independent combustion systems respectively for heating and hot water within the same enclosure, including the boilers with common flue.

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 normative document (including any amendments) applies.

GB/T 13611 Classification and Essential Property of City Gas

GB 25034-2010 Gas-fired Heating and Hot Water Combi-boilers

GB/T 2828.1-2003 Sampling Procedures for Inspection by Attributes - Part 1:

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Sampling Schemes Indexed by Acceptance Quality Limit (AQL) for Lot-by-lot
Inspection

3 Terms and Definitions

For the purposes of this document, the terms and definitions defined in GB 25034-2010 AND the following terms and definitions apply.

3.1

Condensing gas-fired heating and hot water combi-boilers

The heating and hot water combi-device or heating-only device, in which the water vapor in the combustion flue gas is partially condensated, and the latent heat that is released during the condensation process is effectively utilized.

3.2

Reference conditions

The dry gas of which the reference conditions are: temperature is 15°C; absolute pressure is 101.325 kPa.

The laboratory environment conditions are: temperature is 20°C; air humidity is 70%; absolute pressure is 101.325 kPa.

3.3

Condensate

The liquid that is formed by condensation of flue gas in the heat exchange.

3.4

Rated condensing output

The design heat output, in kW, when the supply- and return-water-temperature of the condensing boilers are being operated at 50°C/30°C respectively, under the reference conditions specified in this Standard.

3.5

Max-allowable working temperature

The temperature the materials can withstand over a long period of time, under working conditions.

3.6

Running for condensing condition

The condition when the condensing boilers are operated such that the supply- and return-water-temperature is 50°C/30°C respectively, under the reference conditions

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The condensate produced during the operation of the condensing boilers shall be discharged after being collected or treated by the neutralizing treatment device. The condensate after being treated by the neutralizing treatment device shall keep the pH value between 6.5 and 8.5.

5.3.3 Collection and discharge of condensate

The structure to collect and discharge the condensate shall comply with the following provisions:

- a) It shall be easily installed, disassembled, inspected and cleaned, and difficult to block;
- b) The internal diameter of the condensate discharge system shall be at least 13mm;
- c) For the water-sealed condensate collecting device, the water trap has a seal of at least 25mm at the maximum flue duct length specified by the manufacturer;
- d) The condensate collecting device shall be sealed well to avoid the leakage on the surface;
- e) The condensate collecting device shall be able to prevent the leakage of flue gas during the operation of the condensing boilers;

- f) The surfaces in contact with condensates (except provided drains, water traps, neutralization system and siphons) shall be designed to prevent the condensate retention.
- g) The device to monitor the blocking of the condensate should be arranged;
- h) The condensate discharge pipe shall be the standard accessories of the condensing boilers.

5.4 Device for limiting flue gas system temperature

The temperature limitation of flue gas system of condensing boilers shall comply with the following provisions:

- a) For plastic flue duct, it shall adopt the device to limit the temperature in the flue gas system; the condensing boilers shall be closed safely before the flue gas temperature reaches that given by the temperature limiting device;
- b) The temperature limiting device shall not be adjustable.

6.1 General

The performance requirement for the condensing boilers shall comply with all the requirements in Chapter 6 of GB 25034-2010, except 6.7. And it shall comply with the following requirements in this Chapter.

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Under test conditions in 7.6.2:

- a) For the boilers without range-rating device, the heating efficiency, corresponding to rated heat input, shall not be less than $(97 + \lg P_n)\%$.
- b) For the boilers with range-rating device, the heat efficiency, corresponding to maximum heat input, shall not be less than $(97 + \lg P_{\max})\%$ and that, corresponding to the arithmetic mean of maximum rated heat input and minimum rated heat input, shall not be less than $(97 + \lg P_a)\%$.

Note 1: P_n is rated heat output, in kW.

Note 2: $P_{\max}$ is maximum heat output, in kW.

Note 3: P_a is the arithmetic mean of the maximum rated heat output and the minimum heat output for the boilers with range-rating device, in kW.

6.6.3 Heating efficiency at Running for condensing condition under part load

Under the test conditions of 7.6.3:

- a) For the boilers without range-rating device, the heating efficiency, corresponding to 30% of rated heat input, shall not be less than $(97 + \lg P_n)\%$;