

ICS 27.010
CCS F01



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

GB/T 15914-2021

Replacing GB/T 15914-1995

**Monitoring and testing method for energy saving of steam
heating equipments**

蒸汽加热设备节能监测方法

Issued on: March 9, 2021

Implemented on: October 1, 2021

**Issued by: State Administration for Market Regulation;
Standardization Administration of China**

Table of Contents

- 1 Scope
- 2 Normative references
- 3 Terms and definitions
- 4 Energy-saving monitoring and inspection
- 5 Energy-saving monitoring test
 - 5.1 Energy-saving monitoring test items
 - 5.2 Energy-saving monitoring requirements
- 6 Energy-saving monitoring and calculation methods
- 7 Energy-saving monitoring indicators
- Appendix B
- Appendix C

1 Scope

GB/T 15914-2021 is the Chinese national standard on monitoring and testing method for energy saving of steam heating equipments, 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 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 October 2021. Classification: ICS 27.010, CCS F01. 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.

This standard specifies energy-saving monitoring methods, energy-saving monitoring content and energy-saving monitoring evaluation indicators for energy utilization of steam heating equipment. This standard applies to direct heating or indirect heating with steam power greater than or equal to 325kW or steam load greater than or equal to 0.5t/h. Hot steam equipment mainly includes cooking, evaporation and distillation, drying and comprehensive steam equipment. This standard does not apply to steam powered equipment.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article. For undated reference documents, the latest version (including all amendments) is applicable to this document.

GB/T 8222 General rules for electric energy balance of electrical equipment

GB 17167 General rules for the provision and management of energy measuring instruments for energy-consuming units

GB/T 30839.4 Energy consumption grading of industrial electric heating devices Part

3 Terms and definitions

The following terms and definitions defined in GB/T 8222 and GB/T 30839.4 apply to this document.

3.1 Feedliquid The liquid after mixing water and solution with medicine and materials.

3.2 Refluxliquidratio The ratio of the amount of reflux liquid to the amount of distillate in the distillation process.

3.3 Comprehensive steam equipment equipment for the whole steam heating process. It is a large-scale steam equipment that uses steam as a heat source to complete the entire production process of cooking, washing, bleaching, etc. and drying.

3.4 Exhauststeam The secondary steam generated after steam is boiled or evaporated for more than one time, and the low enthalpy steam released by the equipment.

3.5 Overflowwater In the multi-tank rinsing process, the clean water is automatically discharged from the last tank and the reverse inverted tank (rinsing material) flows to the first tank, and flows continuously from the overflow of the first tank. Out of the washing water.

3.6 Directheating The steam is in direct contact with the heated material to complete the heat exchange process.

3.7 Indirect heating The process of heat exchange between the steam and the heated material through the intermediate heating medium.

3.8 Thermal efficiency The ratio of effective use of heat to input heat.

3.9 Surface temperaturerise When the steam heating equipment reaches a thermally stable state, the difference between the temperature at any measurement point on the outside surface of the equipment and the ambient temperature.

4 Energy-saving monitoring and inspection

4.1 Monitoring and inspection of steam heating equipment should be carried out under normal conditions.

4.2 The steam heating equipment should be equipped with corresponding temperature monitoring instruments for drainage, exhaust steam, overflow water, exhaust and other parameters according to the monitoring needs.

4.3 The steam heating equipment under test should have complete technical documents such as instructions for use, operating accounts, and monitoring reports.

4.4 The online monitoring instrument is fully equipped and should meet the relevant requirements of GB 17167.

4.5 Steam heating equipment should have a thermal efficiency test report issued by a qualified professional organization.

5.1 Energy-saving monitoring test items

5.1.1 The energy-saving monitoring project for cooking equipment should include the following.

- a) Hydrophobic temperature (indirect cooking equipment);
- b) Exhaust steam temperature;
- c) Overflow water temperature;
- d) The surface temperature of the equipment rises.

5.1.2 The energy-saving monitoring project for evaporation and distillation equipment should include the following.

- a) Hydrophobic temperature;
- b) Deviation of reflux ratio (distillation equipment);
- c) The final exhaust steam temperature (evaporation equipment);
- d) The surface temperature of the equipment rises.

5.1.3 The energy-saving monitoring project for drying equipment should include the following.

- a) Hydrophobic temperature;
- b) exhaust temperature;
- c) The surface temperature of the equipment rises.

5.2 Energy-saving monitoring requirements

5.2.1 Energy-saving monitoring should be carried out under normal production conditions of

steam heating equipment.

5.2.2 The energy-saving monitoring project test of steam heating equipment should be carried out when the thermal working condition of the equipment is stable or the periodic equipment reaches the peak of steam consumption. The time should not be less than 1h.

5.2.3 In the thermal efficiency monitoring of steam heating equipment, the continuous production equipment is tested for 2 hours after the thermal conditions are stable; for the periodic production equipment Test a production cycle.

5.2.4 The instruments and meters used for monitoring should be within the verification/calibration cycle, and the accuracy level should meet the following requirements.

- a) The meter for measuring the amount of steam is not less than 2.5;
- b) The measuring steam pressure gauge is not less than 0.5 grade;
- c) The meter for measuring the temperature of steam and material liquid is not lower than Class B;
- d) The liquid flow meter for measuring the return flow is not less than 1.0;
- e) Measuring the temperature of exhaust steam, exhaust steam, equipment external surface and overflow water temperature not less than 2.0;
- f) The electronic scale for measuring the quality of materials shall not be lower than grade.

5.3 Energy-saving monitoring cycle The monitoring interval of steam heating equipment should not exceed three years.

6 Energy-saving monitoring and calculation methods

6.1 Hydrophobic temperature Open the bypass valve after the steam heating equipment trap (should be installed before monitoring), use a temperature meter to test every 20 minutes, whichever is The average value is the drainage temperature; where the steam runs straight, the monitoring is unqualified.

6.2 Exhaust steam temperature At 0.3m from the exhaust steam outlet of the last heat-absorbing surface of the steam heater, use a temperature meter to measure it every 20 minutes, and take the average value as the exhaust steam. Steam temperature.

6.3 Overflow water temperature At the overflow water outlet of the container, measure it every 20 minutes with a temperature meter, and take the average value as the overflow water temperature.

6.4 Exhaust temperature In the measuring hole within 0.3m of the exhaust of the drying equipment, a temperature meter is used to test every 20 minutes, and the average value is