



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

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**Code for design of steam system in chemical plant
(English Translation)**

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1 General

1.0.1

In order to implement the "Energy Conservation Law of the People's Republic of China", implement the national energy industry policy, reduce the total energy consumption of the steam system, improve the design level of the steam system, and ensure the safety and reliability of the system, flexible operation, advanced technology and reasonable economy, this specification is formulated.

1.0.2

This code is applicable to the design of the steam system of the pure heat supply steam system of the chemical plant, and the steam system of the heat and power (power) cogeneration steam system with a unit capacity of 100MW or less.

1.0.3

The design of the steam system in chemical plants shall not only comply with this

specification, but also comply with the current relevant national standards.

2.0.1 Steam system steam system

In the production process of chemical plants, it is responsible for steam production, transportation, recovery and utilization of condensed water and process waste heat, providing thermal power, various devices and equipment connected in the form of steam or thermal energy, and with the help of a unified, Coordinated, balanced system.

2.0.2 Steam users without used steam return

Steam taken from the system cannot be returned to the user of the system in the form of steam after use.

2.0.3 Steam users with used steam return

The steam taken from the system can still return to the steam user in the form of steam after the parameters are changed after use.

2.0.4 Heat users heat users

The general term for gas consumers and gas users.

2.0.5 Steam sources

Fuel boilers, waste heat boilers, flash expansion vessels and other steam generating equipment, including external steam.

2.0.6 Fuel-fired boilers

Refers to boilers that burn gas, liquid, and solid fuels to generate steam.

2.0.7 Heat recovery steam generators

Use the heat generated in the industrial production process, gas turbine (power generation or work) exhaust heat, waste gas and waste combustion and other equipment to generate steam.

2.0.8 Start-up boilers

Boilers that provide steam for start-up of process units.

2.0.9 by-produced steam the steam produced by the industrial production process or the steam produced by the waste heat boiler.

2.0.10 Process residual heat process residual heat

The abundant heat generated during the production process of the process unit.

2.0.11 Heat consumption for power supply

The system uses steam as power to directly drive steam turbines or reciprocating machines and other equipment to output heat energy consumed per kilowatt hour (kJ/kW·h).

2.0.12 Heat consumption for electricity generation

In the system, the steam turbine drives the generator to generate electric energy, and the heat energy (kJ/kW·h) consumed per kilowatt-hour electric energy (kW·h) output on the generator terminal.

2.0.13 Heat consumption for heat supply

The amount of fuel consumed by the heating system to provide 1GJ of heat is converted into standard coal.

2.0.14 Annual utilization ratio

The ratio of the annual utilization hours of equipment to the total statistical hours of the year.

3 Basic Regulations

3.0.1

The system design should be based on various production conditions of process equipment, etc., to achieve safe operation, energy saving, environmental protection, flexible control, and convenient maintenance.

3.0.2

System parameters and grades should be based on design conditions such as process steam load, parameters, steam engine pumps and by-product steam, implement the principle of energy cascade utilization, combine the requirements of various working conditions in chemical production, and take into account the power equipment parameters. Determined after technical and economic comparison.

3.0.3

The steam turbine type, number, parameters and capacity of the driving machine pump shall be determined according to the requirements of steam balance, and its steam consumption shall be calculated.

3.0.4

The parameters and capacities of the steam boilers and start-up (auxiliary) boilers to be used in the system shall be selected and determined according to the steam balance calculation.

3.0.5

Utilization of waste heat According to the economical and reasonable demand of the steam system of the chemical plant, the way and means of waste heat utilization in the process equipment shall be determined.

3.0.6

The recovery and utilization of system steam condensate should be determined according to the needs and possibilities of the steam system of the chemical plant.

4.1 System type

4.1.1

When cogeneration of heat and electricity (power) cannot be implemented, a pure heating system should be used.

4.1.2

In the heating system of cogeneration of heat and power (work), the heating steam should be mainly supplied by the extraction and exhaust steam of the steam turbine generator set and (or) the steam turbine driving the process machine pump.

4.1.3

For the heating system including gas turbine, the gas turbine drives the generator or drives the compressor, and the exhaust gas of the gas turbine should be used for steam generated by the waste heat boiler to enter the system or be used as combustion air for the process heating furnace.

4.2 System Scale

4.2.1

The system is classified by capacity.

- 1 The total steam load of the steam system is less than or equal to 60t/h, and it should be a small system;
- 2 The total steam load of the steam system is 61t/h~200t/h, which should be a medium-sized system;
- 3 If the total steam load of the steam system is greater than 200t/h, it should be a large system.