

ICS 91.120.10
CCS P 31



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

GB 50264-2013

Replacing GB 50264-1997

**Design Code for Insulation Engineering of Industrial Equipment
and Pipe**

工业设备及管道绝热工程设计规范

(English Translation)

Issued on: March 14, 2013

Implemented on: October 1, 2013

Issued by: Ministry of Housing and Urban-Rural Development

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1.0.1

This code is formulated in order to meet the requirements of production process and energy saving and emission reduction, improve working condition and economic benefit and guarantee the design quality of thermal insulation engineering.

1.0.2

This code is applicable to design of industrial equipment and insulation engineering of pipeline with outside surface temperature at $-196^{\circ}\text{C}\sim 850^{\circ}\text{C}$.

This code is inapplicable to the design of equipment and pipeline in the nuclear energy, aviation and space system for special purpose and of pipeline insulation engineering in buildings, refrigeratory and buried type.

1.0.3

Thermal insulation design shall meet the following requirements:

1 In design of insulation engineering, materials shall be in conformity with current relevant national standard and selected depending on operating environment, materials of insulating equipment and pipeline and surface temperature. For new materials, they shall pass the test by the national legal inspection department before being used.

2 Thermal insulation design shall be subjected to calculation according to the requirements of technology, energy saving, anti-condensation and economical efficiency and the thermal insulation construction shall be determined.

1.0.4

Design of industrial equipment and pipeline insulation engineering shall not only meet the requirements of this code but also comply with those in the national current standards.

2.1.1 Thermal insulation

A general term for heat and cold insulation.

2.1.2 Heat insulation

Cladding on the external surface to reduce equipment, pipeline and its accessories to radiate heat to surrounding environment or lower surface temperature.

2.1.3 Cold insulation

Cladding on the external surface to reduce the heat of surrounding environment into the low-temperature equipment and pipeline and prevent their outer wall surface against condensing.

2.1.4 Thermal insulation layer

Thermal insulation material and its products which play a key role in keeping the medium temperature stable.

2.1.5 Rigid insulation

The products can basically maintain the original state when being used, at the load of 2×10^{-3} MPa, condensability ratio is less than 6% and they can not be bendable.

2.1.6 Semi-rigid insulation

At the load of 2×10^{-3} MPa, products condensability is between 6% and 30%. When being bent 90° , the products can recover the shape.

2.1.7 Soft insulation

At load of 2×10^{-3} MPa, product condensability is above 30% and the products can be bent over 90° without damages.

2.1.8 Thermal insulation construction

It consists of thermal insulation layer, vapor barrier and protective jacket.

2.1.9 Economic thickness

The calculation thickness when the sum of expenses for annual heat radiation loss after insulation and annual amortized expenses for insulation engineering investment is minimum value.

2.1.10 Design service life

Number of years selected for calculating economic thickness or the number of years for normal use of insulation engineering.

2.1.11 Maximum service temperature

Maximum temperature thermal insulation product can bear when normal use is guaranteed.

2.1.12 Cold bridge

Parts buried in cold insulation layer, with so large heat flux density to lead to much loss of cooling capacity.

2.2 Symbols

C - - Heat capacity of media ;

Cp - - Heat capacity of pipe wall;

D - - Inside diameter of pipeline;

D0 - - External diameter of pipeline or equipment;

D1 - - External diameter of internal thermal insulation layer;

D2 - - External diameter of external thermal insulation layer;

Fi - - Loss of insulation material and tax coefficient;

i - - Annual (compound) rate;

K - - Correction factor of cold insulation thickness;

Kr - - thermal loss additional coefficient at the place where the pipeline passes through the hanger;

n - - Years of interest accrual or depreciation life;

PE - - A general term for energy cost, heat price and cold price;

PH - - Heat price;

Pc - - Cold price;

Pc1 - - Cold price at (Ta~-39°C);

Pc2 - - Cold price at (-40°C~-196°C);

Pi - - Unit price of insulation material to factory;

P9 - - Unit price of protective jacket materials;

PT - - Unit cost of thermal insulation construction;

q - - Heat loss expressed by pipeline length per meter;

[q] - - Maximum allowable heat loss in pipeline length per meter;