

ICS 91.120.10

CCS Q 25



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

GB/T 10296-2008

Replacing GB/T 10296-1988

**Thermal insulation -- Determination of steady-state thermal
transmission properties-pipe insulation apparatus**

绝热层稳态传热性质的测定 圆管法

(English Translation)

Issued on: June 30, 2008

Implemented on: April 1, 2009

Issued by: Standardization Administration of China

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Foreword

This standard is identical with ISO 8497:1994 "Determination of insulation --- steady heat transfer properties - Pipe insulation layer." this standard replaces GB/T 10296-1988 "steady-state heat transfer properties of the insulation measuring tube method." this standard and GB/T 10296-1988 phase comparator major changes are as follows.

--- This standard is identical with ISO 8497:1994, the format and GB/T 10296-1988 there are some differences.

1987 "adiabatic --- physical and definition". --- Definition directly referenced by the referenced ISO 7345 GB 4132 instead. More than two Standards similar standards, you can refer to in order to facilitate the use of GB 4132.

--- Increased introduction.

--- Increased the calibration and calibration tube end caps described.

--- Adds two chapters, "Fix the end cap" Chapter 6, "General Considerations" and Chapter 10.

--- Increase the informative appendix NA, international standards have been introduced by reference to national standards conversions.

NA appendix of this standard is an informative annex.

Please note that some of the content of this standard may involve patents, the issuing authority of this standard should not bear the responsibility to identify these patents.

The standard proposed by China Building Materials Federation.

This standard by the National Standardization Technical Committee heat insulating material (SAC/TC191) centralized.

This standard was drafted. Nanjing glass fiber research institute.

Introduction

If the test results to represent the end-use product performance, heat transfer characteristics of the tubular heat insulating material shall normally be tubular test device Determination, and not determined by a device (such as guarded hot plate apparatus or heat flow meter) flat specimens. The same kind of plate-shaped insulating material preformed Materials and preformed tubular internal geometry of insulating material is inconsistent. Furthermore, the heat transfer performance depends largely on the direction Relationship with the intrinsic characteristics of the material (such as fiber surface or elongated pores) of. Therefore, one-dimensional measurement of heat flow plate specimen may not be representative of the tubular absolutely Hot material dimensional radial heat flow measurements.

Another commodity that should be considered is the inner diameter of the tubular insulation are slightly larger than the outer diameter of the pipe, otherwise it will lead to variations in manufacturing time Induced tubular heat insulating material can not fit in the tube, resulting in a change in the thickness of the air gap. End-use performance tests that provide data, rather than the case of the material properties, the elastic insulating material in the same manner as in the test tubes disposed, thus affecting the air contained in the measurement of the gap in. If performance is measured in the test device flat, flat test device requires a good contact with the plane, the situation is not the case.

Also noteworthy is arranged around the inner tube in the insulating material and the surface of the gas natural convection also cause surface temperature Uneven. And in this case a uniform temperature flat plate device can not be copied.

Note 1: The appearance of similar materials, using a pipe device and tablet device comparison tests, the heat transfer characteristics measured show a different degree of consistency. Show Exhibit more uniform, homogeneous, and (sometimes) the more isotropic high density product, the better the degree of agreement. For some materials, this comparison test Repeatedly to show acceptable consistency, using the measured data tablet device will be described tubular insulating properties of the materials may be possible. one Generally speaking, if there is no consistency to display mentioned above, the tubular test apparatus should be used to obtain data of the tubular heat insulating material.

GB/T 10296-2008/ISO 8497:1994 Determination of steady heat transfer properties of the insulation layer - Pipe

1 Scope

This standard specifies a method is usually higher than the ambient temperature measurement round tubular insulation steady heat transfer properties. This standard it specifies the requirements for the test device without specifying the device design.

This standard applies to the type of specimen, test temperature and environmental regulations in Chapters 5 and 6.

2 Normative references

The following standards contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard, however, encourage the parties to the agreement are based on research Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

ISO 7345. 1987 insulation - Physical quantities and definitions ISO 8301:1991 insulation - steady state thermal resistance and related properties - Heat flow meter apparatus ISO 8302:1991 insulation - Determination of steady-state thermal resistance and related properties - Guarded hot plate apparatus

3 Terms and Definitions

Note 2: The geometry of the tubular insulation material require special terminology differs from the plate-shaped insulating material. The prefix "line" is used to indicate a particular size of a heat insulating material Per unit length (tube axis direction) characteristics. These line characteristic (with "l" is represented) is easy to use, because we know that the tube length and temperature, You can calculate the heat loss.

"Line" does not indicate the direction of heat flow is axial. In this standard direction of heat flow is mainly radial.

ISO 7345. 1987 as well as to determine the following terms and definitions apply to this standard.

Under steady-state conditions, the heat flux density divided by the surface of the pipe line and the ambient air temperature difference. It specifies the size of the insulation material related to hot by the amount of insulating material is passed to a measurement environment.

$Kl = \Phi$

$T_0 - T_a$

Under steady-state conditions, the temperature difference between the heat flux density divided by the line pipe surface and an outer surface of the insulating layer. It specifies the size of the insulating material has Off is the reciprocal of the thermal conductivity of the pipe line.

$Rl = (T_0 - T_2) \Phi / L =$

λ

From the pipe surface to the outer surface of the insulating layer lines the inverse of resistance. It is related to the size and insulation.

$\Lambda = 1/R =$

Φ/L

$T_0 - T_2$

GB/T 10296-2008/ISO 8497:1994