

ICS 81.080
CCS Q 40



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

GB/T 3000-2016

Replacing GB/T 3000-1999

**Dense shaped refractory products -- Determination of
permeability to gases**

致密定形耐火制品 透气度试验方法

(English Translation)

Issued on: March 29, 1982

Implemented on: July 1, 2017

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China**

Table of Contents

Foreword

1 Scope

2 Normative reference documents

3 Terms and definitions

Foreword

This standard is drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces GB/T 3000-1999 "Test method for permeability of dense shaped refractory products". Compared with GB/T 3000-1999, the main changes are as follows.

- the requirement for specimens with a height less than 50 mm has been removed (see Note 6.1 of 1999);

- modified the permeability tester diagram (see Figure 1, 1999 version of Figure 1);

- The formula for calculating the air permeability is modified [see equation (3), equation (4), and formula (3) of 1999].

This standard uses the re-drafting method to modify ISO 8841.:1991 "Determination of the air permeability of dense shaped refractory products".

There are technical differences between this standard and ISO 8841.:1991, and the techniques of this standard and ISO 8841.:1991 are listed in Appendix A.

Sexual differences and their causes.

1 Scope

This standard specifies the test method for the permeability of dense shaped refractory products. The determination of the permeability of unshaped refractories can be determined according to this standard get on.

Note: The method specified in this standard takes into account the kinetic viscosity of the gas, so the results obtained are not comparable to those of the previous measurements without considering the viscosity of the gas.

Usually the air permeability is measured and other gases can be used when needed. This standard gives the dynamic viscosity of air and nitrogen.

2 Normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article. For undated references, the latest edition (including all modifications) applies to this document.

GB/T 18930 Refractory Terminology (GB/T 18930-2002, ISO 836.:2001, MOD) GB/T 21389 Cursor, with table and digital caliper

3 Terms and definitions

The following definitions and definitions of the following definitions and definitions apply to this document.

Permeability

The material allows the gas to pass through the performance under differential pressure.

The volume of gas is known to pass through the sample at a given time and the air permeability (μ) is calculated by equation (1).

$\cdot (P_1 - p_2) \cdot$

$(p_1 - p_2)$

Where.

V - the volume of gas passing through the sample, in cubic meters (m³);

t - the time of the gas passing through the specimen in seconds (s);

μ --- permeability of the sample, in square meters (m²);

η --- the kinetic viscosity of the gas at the test temperature in Pa·s (Pa · s);

A - the cross-sectional area of the specimen, in square meters (m²);

δ - the height of the specimen in meters (m);

p - the absolute pressure of the gas in Pa (Pa);

p_1 --- the absolute pressure of the gas entering the sample end in Pa (Pa);

p_2 --- absolute pressure of the gas escaping sample end in Pa (Pa).

Note 1: Equation (1) is consistent with Darcy's law and is derived from Hagen-Poiseuille law.

Note 2: p is the pressure of the gas when the gas volume is measured. In this measuring device, $p = p_1$.

Note 3: Usually

$p_1 p_2$

Very close to 1, when $p_1 - p_2 < 1000\text{Pa}$ when the number can be ignored.

Equation (1) can be rewritten as.