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

GB/T 7991.1-2021

**Test method of vitreous and porcelain enamels - Part 1:
Determination of resistance to alkaline liquids**

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foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules of Standardization Documents"

drafted:

This document is part 1 of GB/T 7991 "Test methods for glass-lined layers": GB/T 7991 has released the following parts:

- Part 1: Determination of corrosion resistance to alkaline solutions;
- Part 3: Determination of resistance to sudden changes in temperature;
- Part 4: Determination of mechanical shock resistance;
- Part 5: Thickness measurement by electromagnetic method;
- Part 6: High voltage test;
- Part 7: Determination of the mean coefficient of linear thermal expansion;
- Part 9: Determination of tensile strength;
- Part 10: Determination of lead and cadmium dissolution:

This document replaces GB/T 7988-2013 "Determination of Corrosion Resistance of Glass-Lined Glazes to Alkaline Solution", and is in conformity with GB/T 7988-2013

In addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) Changed the technical requirements for test water (see 5:2, 4:2 of GB/T 7988-2013);
- b) Added the technical requirement of "rubber layer thickness should not be less than 2mm"

for the sample protective cover (see 6:1:4);

c) Changed the technical requirements for constant temperature water baths (see 6:2, 5:2 of GB/T 7988-2013);

d) Deleted "If there are cracks, cracked porcelain, or edge corroded specimens in the two specimens, this phenomenon should be described in the test report:

And the sample should be replaced and re-tested" (see 8:1 of GB/T 7988-2013);

e) The "Calculation formula for the daily corrosion rate of the sample" is deleted (see 8:2 of GB/T 7988-2013);

f) Added "1mol/L hot sodium hydroxide solution corrosion test" (see Chapter 11):

This document is modified to adopt ISO 28706-4:2016 "Determination of chemical resistance of enamels and enamels - Part 4: Testing with cylindrical containers

Determination of Corrosion Resistance to Alkaline Liquids":

A chapter "Terms and Definitions" has been added to this document:

Compared with ISO 28706-4:2016, this document has more structural adjustments:

Comparison list of structure number changes between two files

See Appendix A for the table:

The technical differences between this document and ISO 28706-4:2016 and their reasons are as follows:

--- Delete the normative reference document ISO 48 (see 6:1:4);

--- Replaced ISO 3696 with the normative reference document GB/T 6682, and the degree of consistency between the two documents was modified to accommodate

my country's technical conditions to improve operability (see 5:2);

--- Added normative reference document GB/T 678 (see 5:5);

--- Added normative reference document GB/T 629 (see 5:6);

--- Replaced EN10088-1 with the normative reference document GB/T 20878: There is no consistent correspondence between the two documents:

Adapt to my country's technical conditions and improve operability (see 6:1:6);

--- Replaced ISO 1042 with the normative reference document GB/T 12806, the degree of consistency between the two documents is non-equivalent, to suit the

According to the technical conditions of our country, improve the operability (see 6:9);

--- Replaced ISO 28764 with the normative reference document HG/T 3105, there is no consistent correspondence between the two documents, in order to suit the

According to the technical conditions of our country, improve the operability (see 7:1);

--- Increase the rejection of unqualified samples: Provisions for the removal of quality defects present on the test specimen (see 8:1, 8:2), for the purpose of

Improve the accuracy of the test results, try to avoid the quality defect of the sample during the test process after being corroded by the alkali solution to the test results:

effect;

--- Added "the process of taking the sample out of the desiccator to the end of weighing the sample, the time is not more than 2min" (see 8:9),

In order to avoid the weight gain of the sample by absorbing moisture in the air as much as possible, and improve the accuracy of weighing;

--- Change the heating time of the test device without the test solution in the constant temperature water bath from 10min to 15min (see 8:6),

The purpose is to ensure that the temperature of the test device is consistent with the temperature of the water in the constant temperature water bath, and to improve the accuracy of the test results:

The following editorial changes have been made to this document:

--- In order to harmonize with existing standards, the name of the standard was changed to "Test Methods for Glass-Lined Layers - Part 1: Corrosion Resistance to Alkaline Solutions"

Determination of ";

--- Changed the description sequence of protective sleeve, flange plate, plug, and six-wing nut in 6:1 test device;

--- Changed the subscript of the mass symbol m before and after the weighed sample in the formula:

Please note that some content of this document may be patented: The issuing agency of this document assumes no responsibility for identifying patents:

Introduction

GB/T 7991 aims to accurately measure the performance data of the glass-lined layer, and is intended to consist of 10 parts:

--- Part 1: Determination of corrosion resistance to alkaline solutions;

--- Part 2: Determination of resistance to boiling acid and its vapor corrosion properties;

--- Part 3: Determination of resistance to sudden changes in temperature;

--- Part 4: Determination of mechanical shock resistance;

- Part 5: Thickness measurement by electromagnetic method;
- Part 6: High voltage test;
- Part 7: Determination of the mean coefficient of linear thermal expansion;
- Part 8: Determination of scratch resistance;
- Part 9: Determination of tensile strength;
- Part 10: Determination of lead and cadmium dissolution;

These ten performance parameters are very important to glass-lined equipment, and are directly related to the quality and service life of glass-lined equipment:

This document improves the technical level of the test method and the accuracy of the test results, and can more accurately measure the alkali corrosion resistance of the glass-lined layer

To optimize the formulation of glass-lined glaze, evaluate the rationality and advancement of the firing process of glass-lined equipment, and improve the quality of glass-lined equipment

and service life are very important: In addition, this document is modified using ISO 28706-4:2016 "Enamel and enamel resistance to chemical corrosion"

Determination of Properties Part 4: Determination of Corrosion Resistance to Alkaline Liquids by Cylindrical Containers, in line with international standards, and thus in accordance with this document

When the results of the test are compared with the test results of international standards, the test results are comparable, which can better promote trade, exchanges and

Technical cooperation:

Glass-lined layer test method

Part 1: Determination of corrosion resistance to alkaline solutions

1 Scope

This document describes the test principle for the determination of the corrosion resistance of the glass-lined layer of the glass-lined flat plate specimen, and specifies the reagents, test

Device, sample, test procedure, result calculation and test report:

This document is applicable to the determination of the corrosion resistance of glass-lined layers to alkaline solutions: