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# International Standard



# 4530

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## Vitreous and porcelain enamelled manufactured articles — Determination of resistance to heat

*Pièces manufacturées recouvertes d'émaux vitrifiés — Détermination de la résistance à la chaleur*

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**Descriptors** : non metallic coatings, porcelain enamels, vitreous enamels, tests, thermal resistance.

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4530 was developed by Technical Committee ISO/TC 107, *Metallic and other non-organic coatings*, and was circulated to the member bodies in January 1982.

It has been approved by the member bodies of the following countries:

Australia	Ireland	South Africa, Rep. of
Czechoslovakia	Italy	Spain
Egypt, Arab Rep. of	Japan	Switzerland
France	Korea, Rep. of	United Kingdom
Germany, F.R.	Mexico	USA
Hungary	Netherlands	USSR
India	Romania	

The member body of the following country expressed disapproval of the document on technical grounds :

Poland

# Vitreous and porcelain enamelled manufactured articles — Determination of resistance to heat

## 0 Introduction

The method of test specified requires to be completed, for any particular application, by the following supplementary information. This information shall be derived from the International Standard or national standard or other document relating to the vitreous and porcelain manufactured articles under test or, if appropriate, shall be the subject of agreement between the interested parties :

- a) test temperature;
- b) type of heating (direct and/or radiant);
- c) temperature measuring points;
- d) rate of temperature increase;
- e) duration of maintaining the test temperature;
- f) number of single heating and cooling tests;
- g) what kind of damage to the vitreous and porcelain enamel finishes are to be considered in evaluating the resistance of the vitreous and porcelain enamelled manufactured articles to heat.

## 1 Scope and field of application

This International Standard lays down basic conditions concerning the method for determining the resistance of vitreous and porcelain enamelled manufactured articles to heat.

The method is applicable to vitreous and porcelain enamelled manufactured articles that will, in service, be subjected to high temperature, for example to some cooker components, exhaust pipe silencers, gas heating chimneys.

## 2 Principle

Submission of an article to a series of single heating and cooling tests in which it is heated to an agreed surface temperature and then, after a period of maintaining this temperature, allowed to cool to room temperature. Examination of the article for any defects caused by heating.

## 3 Apparatus

- 3.1 Heat source**, suitable for direct or radiant heating of the article to the test temperature.
- 3.2 Surface contact pyrometer**, accurate to  $\pm 2$  °C.
- 3.3 Stop watch.**

## 4 Sampling

- 4.1** The articles to be tested shall be used as specimens without any modification.

- 4.2** The specimens shall be representative of the entire consignment. The method of sampling shall be agreed upon between the interested parties.

## 5 Procedure

- 5.1** Heat the article under normal service conditions either by direct and/or radiant heat to the agreed test temperature  $\pm 5$  °C. The agreed test temperature should be 50 °C above the highest temperature which the article will encounter in service. The rate of heating should be such that the temperature of the vitreous and porcelain enamelled surfaces rises at a uniform agreed rate, for example between 30 and 40 °C/min. Measure the temperature at the agreed measuring points by means of a suitable surface contact pyrometer.

- 5.2** As soon as the required test temperature has been attained, maintain the article at this temperature for the agreed duration. Then remove the heat source and allow the article to cool under normal service conditions to ambient temperature.

- 5.3** Examine the article and note the occurrence of any cracking, flaking or blistering.

- 5.4** If no damage occurs, repeat the heating and cooling treatment until damage occurs or the agreed number of single heating and cooling tests has been carried out.

## 6 Test report

The test report shall include the following information :

- a) reference to this International Standard;
- b) the description and identification of the articles tested;
- c) method of sampling;
- d) number of articles tested;
- e) type of heat source used (direct or radiant);
- f) the type of surface contact pyrometer;
- g) the kind of thermal distribution and temperature measuring points used;
- h) the test temperature;
- j) the duration of maintaining test temperature;
- k) the number of single heating and cooling tests applied;
- m) whether damage occurred;
- n) a description of damage to the vitreous and porcelain enamel finishes, if any, and a photograph, if necessary.

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