

SVENSK STANDARD

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Vitreous and porcelain enamels – Determination of crack formation temperature in the thermal shock testing of enamels for the chemical industry (ISO 13807:1999, incl. Cor 1:2000)



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The European Standard EN ISO 13807:2009 has the status of a Swedish Standard. This document contains the official English version of EN ISO 13807:2009.

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EUROPEAN STANDARD
NORME EUROPÉENNE
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EN ISO 13807

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English Version

Vitreous and porcelain enamels - Determination of crack formation temperature in the thermal shock testing of enamels for the chemical industry (ISO 13807:1999, including Cor 1:2000)

Émaux vitrifiés - Détermination de la température de fissuration par choc thermique d'émaux pour l'industrie chimique (ISO 13807:1999, Cor 1:2000 inclus)

Aluminium-Emails - Bestimmung der Rissbildungstemperatur von Chemie-Emails beim Abschreckversuch (ISO 13807:1999, einschließlich Cor 1:2000)

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SS-EN ISO 13807:2009 (E)**Foreword**

The text of ISO 13807:1999, including Cor 1:2000 has been prepared by Technical Committee ISO/TC 107 “Metallic and other inorganic coatings” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 13807:2009 by Technical Committee CEN/TC 262 “Metallic and other inorganic coatings” the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2009, and conflicting national standards shall be withdrawn at the latest by July 2009.

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Endorsement notice

The text of ISO 13807:1999, including Cor 1:2000 has been approved by CEN as a EN ISO 13807:2009 without any modification.

Vitreous and porcelain enamels — Determination of crack formation temperature in the thermal shock testing of enamels for the chemical industry

1 Scope

This International Standard specifies a test method for the determination of the crack formation temperature of enamels for the chemical industry by subjecting enamelled steel specimens to thermal shock using cold water.

The value of the crack formation temperature measured according to this test method is not valid for the finished component (see annex A). It is a parameter of vitreous and porcelain enamels for comparing the relative quality of different enamel formulations.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 2746, *Vitreous and porcelain enamels — Enamelled articles for service under highly corrosive conditions — High voltage test.*

ISO 2808, *Paints and varnishes — Determination of film thickness.*

ISO 3819, *Laboratory glassware — Beakers.*

ISO 10141, *Vitreous and porcelain enamels — Vocabulary.*

3 Terms and definitions

For the purposes of this International Standard, the terms and definitions given in ISO 10141 as well as the following apply.

3.1

crack formation temperature

thermal shock temperature at which the first damage to the enamel occurs in the form of cracks and/or chipping

3.2

thermal shock temperature

temperature of the specimen immediately before quenching with cold water

SS-EN ISO 13807:2009 (E)**4 Designation**

The test method for the determination of the crack formation temperature of enamels for the chemical industry by the thermal shock test described in this International Standard is designated as follows:

Test ISO 13807

5 Principle

The specimen is heated to the thermal shock temperature in a drying oven. After reaching the thermal shock temperature, the enamelled surface is covered by water at a temperature between 10 °C and 30 °C. Then the specimen is dried and visually examined for damage. To make cracks visible, the entire enamel surface is sprayed with electrostatically charged talcum powder. If no damage to the enamel is found after the first thermal shock test, the test shall be repeated at a thermal shock temperature 10 °C higher than in the previous test.

6 Apparatus

- 6.1 Drying oven**, capable of maintaining temperatures of at least 300 °C.
- 6.2 Low-form beaker**, having a capacity of 2 000 ml meeting the requirements of ISO 3819.
- 6.3 Spray gun**, equipped with a hard-rubber nozzle for electrostatically charging the talcum powder.

7 Specimens**7.1 Shape and preparation of specimens**

Specimens shall be square sheet metal plates with a thickness of at least 10 mm and an edge length of 150 mm that have been enamelled on one side.

Alternatively, specimens as shown in Figure 1 made of 10MnTi3 low-alloyed enamelling structural steel may be used. The steel shall have the following nominal composition (% mass fraction):

- carbon, $\leq 0,12$ %;
- manganese, 0,40 % to 1,00 %;
- titanium 0,10 % to 0,16 %;
- phosphorus $\leq 0,035$ %;
- sulphur, $\leq 0,030$ %.

During the enamelling process, these specimens shall be held in the horizontal position by means of a rod inserted in the 5 mm hole. The ground coat shall cover the entire surface. The cover coat may be applied only to the top and convex surface (radius 8 mm).

NOTE Besides the determination of crack formation temperature, enamelled specimens shown in Figure 1 may also be used for corrosion tests in closed systems according to ISO 13806.