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**Vitreous and porcelain enamels for  
aluminium — Production of specimens  
for testing**

*Émaux vitrifiés déposés sur l'aluminium — Fabrication des échantillons  
pour essais*

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ISO 13804:1999

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## Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 13804 was prepared by Technical Committee ISO/TC 107, *Metallic and other inorganic coatings*.

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# Vitreous and porcelain enamels for aluminium — Production of specimens for testing

## 1 Scope

This International Standard specifies a method for the production of specimens suitable for testing vitreous and porcelain enamel coatings on aluminium, as well as the enamelling process for aluminium materials.

## 2 Normative reference

The following normative document contains 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 edition of the normative document 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.

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ISO 13805, *Vitreous and porcelain enamels for aluminium — Determination of the adhesion of enamels on aluminium under the action of electrolytic solution (spall test)*.

## 3 Specimen shape and size

The specimens shall be flat, enamelled, circular or square plates of high-grade aluminium or of an enamelling-quality aluminium alloy, with a diameter or side length of  $105 \text{ mm} \pm 2 \text{ mm}$ . If only the adherence of enamels for aluminium under the influence of electrolytic solutions, as specified in ISO 13805, is to be determined, then the specimens used may be of any given shape.

When the loss in mass per unit area of the enamel coating is to be determined quantitatively, specially prepared specimens (see clause 4) shall be used, as specimens cut from enamelled articles (see clause 5) may reduce the accuracy of the test method.

## 4 Production of specially prepared specimens

### 4.1 Requirements

Sheet, 2 mm to 3 mm thick, made of high-grade aluminium or of an enamelling-quality aluminium alloy, shall be used as the base metal.

Specimens of aluminium castings shall have a thickness from 3 mm to 5 mm.

The specimens may be provided with a hole 2,5 mm in diameter, the centre of which shall be positioned 3 mm from the edge of each specimen. In the case of square specimens, the hole should be located in a corner.

## 4.2 Enamelling of specimens

Condition the metal for enamelling according to any common method, but use the same method and materials if the specimens are provided for comparison.

Apply the enamel slip to one surface of the specimen by spraying. After firing at a temperature of  $560\text{ }^{\circ}\text{C} \pm 20\text{ }^{\circ}\text{C}$ , the thickness of the coating shall be  $50\text{ }\mu\text{m}$  to  $70\text{ }\mu\text{m}$ .

If a second coat is required, for example, for inspecting appearance, the total thickness of the coating shall not exceed  $80\text{ }\mu\text{m}$ .

## 4.3 Inspection

After enamelling, examine the surface of the specimens visually for flatness and freedom from defects. If the specimens are not flat and defect-free, new specimens shall be prepared.

# 5 Specimens from production articles

## 5.1 Requirement

The specimens shall be taken only from the flat areas of enamelled articles.

## 5.2 Preparation

Before cutting off the specimens remove the enamel along the cutting side on both surfaces, right and left, down to the base metal by grinding. The width of the zone from which the enamel shall be removed is the width of the cutting tool plus 2 mm on each side.

NOTE Grinding machines operating with silicon carbide, corundum or diamond stones are suitable for removing the enamel.

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## Bibliography

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- [2] ISO 2724:1973, *Vitreous and porcelain enamels for cast iron — Production of specimens for testing*.
- [3] DIETZEL, A. H., *Emallierung: Wissenschaftliche Grundlagen und Grundzüge der Technologie (Enamelling: Scientific principles and basic technology)*, Springer, Berlin, Heidelberg, 1981, 247-251.

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