
**Vitreous and porcelain enamels —
High voltage test**

Émaux vitrifiés — Essai sous haute tension



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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

ISO 2746 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 262, *Metallic and other inorganic coatings*, in collaboration with Technical Committee ISO/TC 107, *Metallic and other inorganic coatings*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 2746:1998) which has been technically revised. This edition has also been adopted as a European standard, which supersedes EN 14430:2004.

Introduction

There are two different objectives for high voltage testing of vitreous and porcelain enamels.

Test A is used to detect and locate defects, which extend down to the metal base (e.g. open pores). This is a non-destructive test usually applied to thin enamel coatings. The test serves to monitor either that the parts produced are free from defects at the chosen test voltage, or to count the number of existing defects, e.g. to determine the defect density (defects/m²) of enamelled architecture panels.

Test B is used to detect and locate defects, which extend down to the metal base (e.g. open pores) and to detect weak spots. This is a destructive test, i.e. the test can generate open pores with an electric discharge through weak spots in the enamel coating. This test is usually applied to thick enamel coatings and serves:

- a) to verify that an enamel coating is safe to be used under highly corrosive conditions, e.g. to test the enamel coating of vessels used in the chemical industry, or
- b) to verify that the enamel coating is safe to be used as a dielectric.

Test A and test B require the same test equipment (see [Clause 5](#)) and follow the same test procedure (see [Clause 8](#)). However, for test B the applied voltage is higher than in test A (see [Clause 7](#)).

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1 Scope

This International Standard describes two test methods of high voltage testing:

- Test A is used to detect and locate defects in vitreous and porcelain enamels;
- Test B is used to detect and locate defects and weak spots in vitreous and porcelain enamels.

The tests are performed using DC or pulsed DC high voltage.

The tests are applicable to dry surfaces of enamel coatings. In the case of moist surfaces, care should be taken to ensure that the locating of any defects is correctly performed.

Since test voltages depend on the coating thickness, the test method, especially with test A, may not be suitable for test specimens for which the coating thickness varies to a large extent.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2178, *Non-magnetic coatings on magnetic substrates — Measurement of coating thickness — Magnetic method*

ISO 2360, *Non-conductive coatings on non-magnetic electrically conductive basis materials — Measurement of coating thickness — Amplitude-sensitive eddy-current method*

IEC/TS 60479-1, *Effects of current on human beings and livestock — Part 1: General aspects*

IEC/TS 60479-2, *Effects of current on human beings and livestock — Part 2: Special aspects*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

defect

area of an enamel layer where an open path connects the enamel surface with the metal basis

Note 1 to entry: Examples of defects are cracks or pores.