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Vitreous and porcelain enamels — Determination of surface scratch hardness according to the Mohs scale

Émaux vitrifiés — Détermination de la dureté superficielle suivant l'échelle de Mohs

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

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This document was prepared by Technical Committee ISO/TC 107, *Metallic and other inorganic coatings,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 262, *Metallic and other inorganic coatings, including for corrosion protection and corrosion testing of metals and alloys*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Vitreous and porcelain enamels — Determination of surface scratch hardness according to the Mohs scale

1 Scope

This document specifies a method of test for determining the scratch hardness of the surface of vitreous and porcelain enamels.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 28764, *Vitreous and porcelain enamels — Production of specimens for testing enamels on sheet steel, sheet aluminium and cast iron*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
Mohs scale
hardness scale of minerals, characterising the scratch resistance of various minerals through the ability of a harder mineral to scratch a softer mineral

4 Principle

The scratch hardness on the Mohs scale, of vitreous and porcelain enamels is determined by drawing certain minerals of defined hardness, on the Mohs scale, by hand over their surface.

5 Reference minerals

Reference minerals and their Mohs scale hardness are listed in Table 1.

Table 1 — Reference minerals and their Mohs scale hardness

Mineral	Mohs scale hardness
Talc	1
Gypsum	2
Calcite	3
Fluorspar	4
Apatite	5
Felspar	6
Quartz	7
Topaz	8
Corundum	9
Diamond	10

6 Test specimen

The test specimen shall be prepared in accordance with ISO 28764.

7 Procedure

7.1 Place the test specimen of the enamel that is under test on a firm support with the vitreous and porcelain enamel coating uppermost.

7.2 By hand, draw across the surface of the test specimen a sharp edge of the reference mineral, starting with fluorspar, applying a uniform effort such that at the end of the test either the edge of the reference mineral or the surface of the test specimen is damaged. Scratch the surface of the test specimen two times with a sharp edge of the reference mineral.

7.3 Examine the test specimen visually for scratches.

7.4 If there are no scratches, repeat steps given in 7.1 to 7.3 with the reference mineral of the next highest Mohs scale hardness.

8 Assessment of result

For each test specimen, note the mineral of highest Mohs scale hardness that produces no scratches.

In the case of a test specimen having variable scratch hardness, note the lowest Mohs scale hardness.

9 Test report

The test report shall include the following:

a) all information necessary for identification of the test specimen;

b) reference to this document, i.e. ISO 6769:2022;

c) reference minerals used;

d) results of the test as specified in Clause 8, expressed as the Mohs scale hardness for each test specimen;

e) any unusual features (anomalies) observed during the test;

f) any deviations from the procedure specified;

g) date of the test.