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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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## 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](http://www.iso.org/directives)).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

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](http://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;