
International Standard



8289

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Vitreous and porcelain enamels — Low voltage test for detecting and locating defects

Émaux vitrifiés — Essai à basse tension de détection et de localisation des défauts

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Foreword

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International Standard ISO 8289 was prepared by Technical Committee ISO/TC 107, *Metallic and other non-organic coatings*.

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Vitreous and porcelain enamels — Low voltage test for detecting and locating defects

1 Scope and field of application

This International Standard specifies a method of test for detecting and locating defects which extend down to the basis metal, in vitreous and porcelain enamelled articles, using a low voltage.

NOTE — The low voltage test is not intended as an alternative to the high voltage test specified in ISO 2746, but is a non-destructive test method for detecting defects (see clause 3).

2 References

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

IEC 86-2, *Primary batteries — Part 2: Specification sheets*.

3 Definition

For the purpose of this International Standard, the following definition applies.

defects: Pores, tears, cracks or spalls, which penetrate to the basis metal.

NOTE — In certain areas the defects may be unavoidably caused during the production of the article, for example burning tool marks.

4 Principle

Testing is carried out with low voltage, contact being made with the defect by means of an electrolyte (conductive fluid). Readings indicating the presence of a defect may be made with an electrical measuring instrument or acoustically with headphones. Additionally, the defects may be made visible by colour effects.

5 Test fluid

Dissolve $3 \pm 0,5$ g of sodium chloride in 100 ml of tap water and add two drops of a liquid dishwashing detergent.

If the defects are to be made visible by means of a colour effect, add about 1 ml of 0,5 % (*m/m*) phenolphthalein ethanolic solution.

6 Apparatus

6.1 Power source

6.1.1 Testing with direct current

Use a 9 V battery device, capable of being adjusted in the range 0 to 9 V. A transistor radio battery 6 F 100 complying with the requirements of IEC 86-2 with a voltage divider is suitable.

6.1.2 Testing with alternating current

An alternating voltage which can be continuously adjusted between 0 V and the maximum value (about 5 V).

NOTE — The signal frequency superimposed on the alternating voltage lies within the audio range (for example between 600 and 900 Hz).

6.2 Test electrode

The test electrode consists of a sponge made of plastic, cellulose or similar material, soaked with the test fluid (clause 5). Its size will depend on the desired accuracy of location. It is conductively connected, via a metal lead, to the positive pole of the apparatus.

For quick testing (coarse scanning) of large enamelled surfaces, test electrodes with an area up to 100 cm² are suitable. For the accurate location of defects, test electrodes with an area of a maximum of 1 cm² are required.

NOTE — A large test electrode suitable for quick testing may also be used for locating defects, possibly using an increased sensitivity, if the enamelled surface is only touched by a corner of the test electrode.

6.3 Means of indicating the defects

If direct current is used, the current flow through the defects may be detected by means of a short-circuit-proof microammeter.

If alternating current is used, the current flowing through the defects may be detected as an acoustic signal by means of headphones. The intensity (sound level) of the signal depends on the magnitude of the current flowing through the defects.

Other methods of indication may also be used.