



SLOVENSKI STANDARD
SIST ENV 1965-2:1998

01-februar-1998

Konstruksijska lepila - Korozija - 2. del: Ugotavljanje in klasifikacija korozivnosti na medeninasti testni podlagi

Structural adhesives - Corrosion - Part 2: Determination and classification of corrosion to a brass substrate

Struktur Klebstoffe - Korrosion - Teil 2: Bestimmung und Klassifikation der Korrosion eines Messingmaterials

Adhésifs structuraux - Corrosion - Partie 2: Détermination et classification de la corrosion d'un substrat en laiton

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Ta slovenski standard je istoveten z: ENV 1965-2:1995

ICS:

77.060	Korozija kovin	Corrosion of metals
83.180	Lepila	Adhesives

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en

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EUROPEAN PRESTANDARD

ENV 1965-2

PRÉNORME EUROPÉENNE

EUROPÄISCHE VORNORM

June 1995

ICS 77.060; 83.180

Descriptors: adhesives, tests, determination, corrosion, chemical attack, brasses, classifications

English version

**Structural adhesives - Corrosion - Part 2:
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REPUBLIKA SLOVENIJA
MINISTRSTVO ZA ZNANOST IN TEHNOLOGIJO
Urad RS za standardizacijo in meroslovje
LJUBLJANA

SIST.....ENV.....1965-2.....

PREVZET PO METODI RAZGLASITVE

-02- 1998

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Ref. No. ENV 1965-2:1995 E

Foreword

This European Prestandard has been prepared by the Technical Committee CEN/TC 193 "Adhesives", of which the secretariat is held by AFNOR.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to announce this European Prestandard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This part of the present European Prestandard describes a method to determine the ability of an adhesive to corrode a brass substrate under the influence of an applied voltage and high humidity. The temperature, humidity, aging period and applied voltage are chosen to ensure the maximum differentiation between the corrosivity of different adhesives and are not intended to represent any particular service condition.

2 Normative references

This European Prestandard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed here after. For dated references, subsequent amendments to or revisions of any of these publications apply to this European prestandard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- | | |
|----------------------|--|
| EN 923 ¹⁾ | Adhesives - Terms and definitions. |
| ISO 291:1977 | Plastics - Standard atmospheres for conditioning and testing. |
| ISO 426:1983 | Wrought copper - Zinc alloys - Chemical composition and forms of wrought products. |
| ISO 8044:1989 | Corrosion of metals and alloys - Vocabulary. |
| IEC 426:1973 | Test methods for determining electrolytic corrosion with insulating materials. |

3 Definition

For the purpose of this Prestandard, the following definition applies :

corrosion : is a destructive attack on metals which may be chemical or electrochemical in nature. The described method measures essentially an electrochemical attack.

4 Principe

Two brass electrodes are held in contact with a flat sample of the cured adhesive. The assembly is placed in an environment with a relative humidity of 92 % at 42 °C and a direct current voltage of 100 volts is applied across the electrodes for four days. Following this the brass surface is examined and the extent of the tarnishing and/or corrosion decided on the basis of discolouration.

¹⁾ In course of preparation.

5 Materials required

5.1 Solvent

Any pure alcohol, solvent : for example isopropyl alcohol or ethyl alcohol.

5.2 Brass electrode

Consisting of 0,1 mm thick brass, Ms63F45 or Ms63F55 of width 10 mm. The length of the foil shall be adapted to the test equipment in accordance with ISO 426.

5.3 Etching solution

Consisting of 73 % sulphuric acid, 25 % nitric acid, 0,5 % sodium chloride, 0,5 % lustrous carbon black.

5.4 Conditioning chamber

Capable of maintaining a hot/humid climate in accordance with ISO 291.

5.5 Direct current source

(100 ± 5) volts, e.g. a battery, or rectifying equipment with a maximum permissible electrodyne alternating current not greater than 1 %.

5.6 Magnifier

With a magnification of 2,5 times.

5.7 Electrode and clamping (in accordance with figure 1)

This shall be constructed from inert insulating materials which do not cause additional corrosion under the test conditions. The brass test foils shall make contact with the entire test area of the specimen with a pressure of about 0,1 MPa.

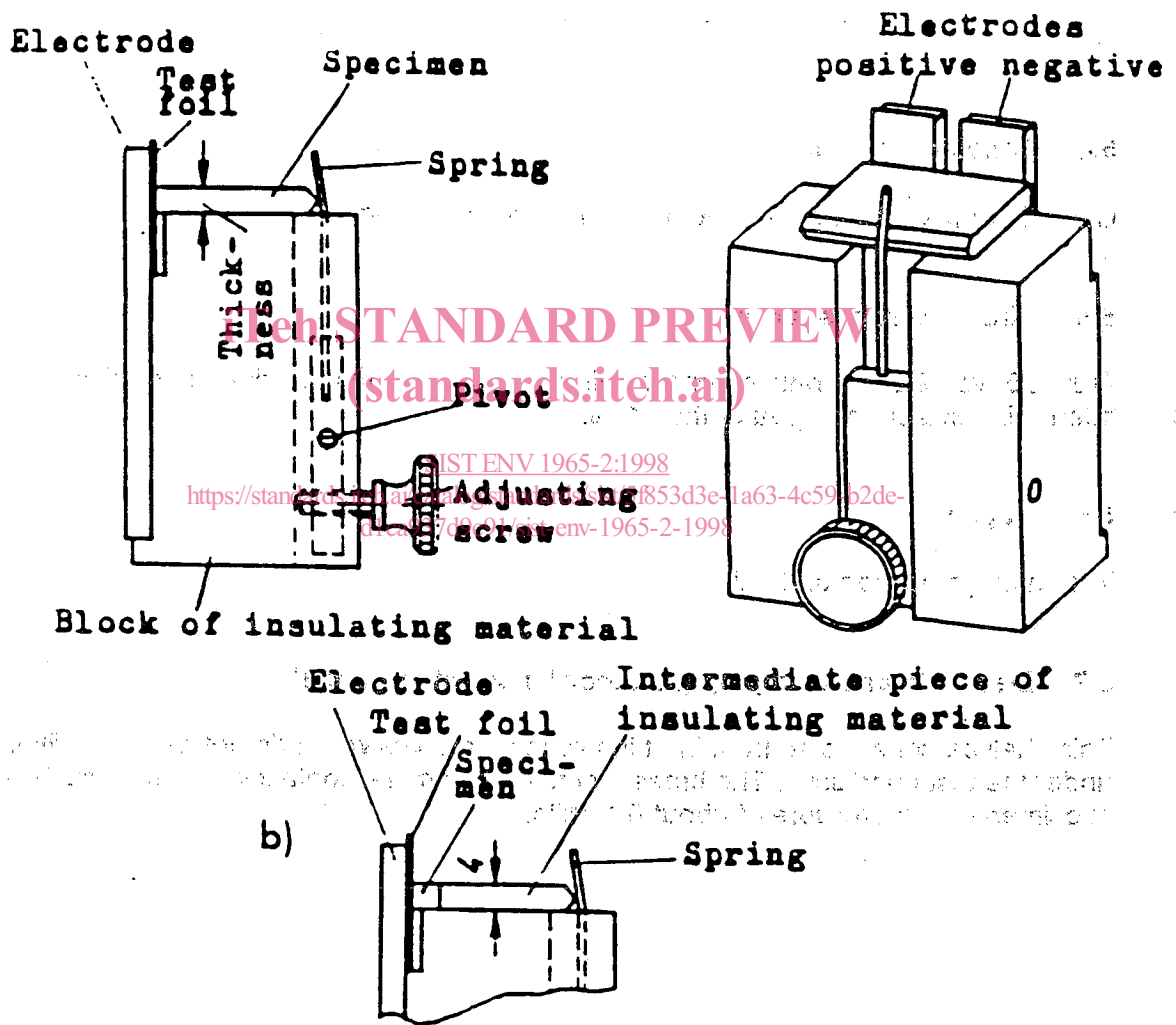


Figure 1 : Test equipment for assessing the effect of electrolytic corrosion

6 Preparation of the brass substrate

Degrease strips of the foil, about 200 mm long and without any flash, with acetone solvent. Immediately afterwards immerse in the pickling liquid (maintained at 15.-25 °C) for 15 s. Rinse the foil under running water to remove the pickling liquid. Repeat this procedure as necessary until the brass foil has an even, dull lustre. Immediately afterwards immerse the strip in pure alcohol, dry with blotting paper and cut into pieces of suitable length.

7 Test specimens

The thickness of the specimens shall correspond to the relevant product thickness. The test surfaces shall be machined and flat and be at right angles to the edges. The material to be tested should protrude a few tenths of a millimetre beyond the holding plates. Remove any flash left following machining with a sharp knife. Finally clean the machined specimens with pure alcohol.

NOTE : The pickling liquid should be freshly made and used only once. The roughness of the brass surface has an influence on colouration and can lead to faulty assessments. An even, dull surface reveals more marked colourations than a semi-matt or glossy surface.

CAUTION : The pickling liquid is corrosive.

A minimum of three test specimens shall be used for each evaluation.

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8 Procedure

Ensure that the surface of the electrode in contact with the brass test foils is not discoloured.

Insert the specimens and test foils in the test equipment using tweezers. Do not handle them under any circumstances.

Preheat the test equipment with specimens and test foils in position to 42 - 45 °C and place it in the warm humid environment. This is to ensure that condensation on the specimen is avoided. This is critical as liquid water in contact with the test specimens and foils can form an electrolyte, significantly increasing the rate of electrolytic corrosion.

Place the preheated, assembled, test fixture in the warm humid environment and connect to the direct current source.

Continue aging under these conditions for four days.

On completion of the above aging, remove the test equipment from the humidity chamber and cool it to room temperature.

The test foils should then be removed and the face in contact with the test specimen examined with a magnifying glass.

Particular attention should be paid to the positive pole which should be examined for signs of the green products of corrosion, red colouration (start of dezincification, see ISO 8044 for definition) or tarnishing. The negative pole should also be examined for signs of discolouration.

NOTE : With some materials, colourations occur during these tests which are not due to electrolytic corrosion and are recognizable as light brown to dark brown layers (tarnishing). These non-corrosive colourations consist of a uniform covering over the width of the test area on the brass foils and occur both at the positive and negative electrodes and result without the application of direct current. Therefore, it is possible to confirm that these colourations are not caused by electrolysis by placing the test equipment in the humidity cabinet but without applying the direct current.

9 Discolouration/corrosion

This is graded as follows, following the above described examinations :

ENV 1965-2

Plus pole grade A.....to..... B (see annex A)

Minus pole grade 1 to 4.