SLOVENSKI STANDARD
SIST EN 1670:2007

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Nadomeġļa:
SIST EN 1670:2000

Stavbno okovje - Korozijska odpornost - Zahteve in preskusne metode

Building hardware - Corrosion resistance - Requirements and test methods

Schlösser und Baubeschläge - Korrosionsbeständigkeit - Anforderungen und Prüfverfahren

Quincaillerie pour le bâtiment - Résistance a la corrosion - Exigences et méthodes d'essai

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EUROPEAN STANDARD

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English Version

Building hardware - Corrosion resistance - Requirements and test methods

Quincaillerie pour le bâtiment - Résistance à la corrosion - Exigences et méthodes d'essai

Schlösser und Baubeschläge - Korrosionsbeständigkeit - Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 12 February 2007.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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Foreword

This document (EN 1670:2007) has been prepared by Technical Committee CEN/TC 33 “Doors, windows, shutters, building hardware and curtain walling”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2007, and conflicting national standards shall be withdrawn at the latest by September 2007.

This document supersedes EN 1670:1998.

CEN/TC 33 have considered previous comments by CEN/TC 262, thereby replacing this European Standard with a new one based solely on the performance testing of building hardware.

The current version has been revised to incorporate clarification of the scope, definitions, requirements and acceptance criteria throughout Annexes A and B.

The current version has also been revised to incorporate new developments in technology for corrosion resistance. The new technology combines specific layers and methods on the surface so that thickness or type of layer are no longer relevant.

This European Standard is one of a series of European Standards dedicated to building hardware products.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Introduction

Corrosion protection alone is not specified in any of the six essential requirements of the Construction Products Directive but is an implicit requirement for durability. This European Standard provides for the corrosion resistance of all building hardware, classified according to application.

Wherever reference is made to classes they are considered to be technical classes and not classes according to Article 3(2) of the Construction Products Directive (89/106/EEC).

The performance tests incorporated in this European Standard are considered to be reproducible and as such will provide a consistent and objective assessment of the performance of these products throughout CEN Member States.

A full contribution to the preparation of this European Standard has been made by the European manufacturers' organisation "ARGE".

NOTE This European Standard does not include testing for corrosion by sulfur dioxide which is covered by EN ISO 6988.

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1 Scope

This European Standard specifies the requirements for the corrosion resistance of building hardware for doors, windows, shutters and curtain walling.

This European Standard provides a method of classification of corrosion resistance of building hardware based on performance in a neutral salt spray test (EN ISO 9227).

This European Standard specifies requirements for both coated and uncoated surfaces and five grades of corrosion resistance being laid down in accordance with the different conditions of use grades 1 to 5. A grade 0 is also included for which no requirements have been specified. Requirements for levels of corrosion resistance which are higher than those laid down for grade 5 have not been included in this European Standard and are subject to agreement where required.

This European Standard also applies to the metal fasteners required for fixing building hardware if specified.

Screws and fastenings which are sold with a hardware product which conforms to this European Standard should also conform to this European Standard.

NOTE 1 The term "grade" used in this European Standard corresponds to the term "class" which is used in ISO standards.

NOTE 2 There is seldom a direct relationship between resistance to the action of salt spray and resistance to corrosion in other media, because several factors influencing the progress of corrosion, such as the formation of protective films, vary greatly with the conditions encountered. Therefore, the test results should not be regarded as a direct guide to the corrosion resistance of the tested materials in all environments where these materials may be used. Also, the performance of different materials during the test should not be taken as a direct guide to the corrosion resistance of these materials in service.

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The method described in this European Standard gives a means of checking that the comparative quality of a material, with or without corrosion protection, is maintained.

In addition, for quality control purposes, comparison can be made between specimens coated with the same coating. As comparative tests, however, salt spray tests are only suitable if the coatings are sufficiently similar in nature.

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It is often not possible to use results gained from salt spray testing as a comparative guide to the long-term behaviour of different coating systems as the corrosion stress during these tests differs significantly from the corrosion stresses encountered in practice.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN ISO 4628-2, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 2: Assessment of degree of blistering (ISO 4628-2:2003)*

EN ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests (ISO 9227:2006)*

3 Terms and definitions

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

3.1
building hardware products
products made with different kinds of material and components, where each type of material has its own specification (regarding corrosion resistance)

NOTE Often a finished product consists of an assembly of components where one or more components can be made with a specific material.

3.2
significant surface
parts of the surface of a product that are visible or exposed when the product is installed and can be touched by a ball 20 mm $^{+1}_{0}$ mm in diameter and those other surfaces on which a specified corrosion resistance is essential to ensure the continuance of correct function

4 Classification

Corrosion resistance of building hardware products shall be classified according to the following grading system:

grade 0	no defined corrosion resistance;
grade 1	low corrosion resistance;
grade 2	moderate corrosion resistance;
grade 3	high corrosion resistance;
grade 4	very high corrosion resistance;
grade 5	exceptionally high corrosion resistance.

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See Annex A for the meaning of this classification and its application to particular service conditions.

NOTE Grade 0 is applicable to products for which a defined corrosion resistance is not required.

5 Requirements

5.1 General

The following requirements shall not apply to grade 0 finishes for which no defined corrosion resistance is relevant.

5.2 General test requirements

The product standard shall provide the method to specify the requirements for corrosion resistance including the acceptance criteria for appearance and functionality as required in 5.3 and 5.4.

Where no product standards exist, the manufacturer may declare compliance with this European Standard for functionality and/or appearance.

Some product standards may need to distinguish specific requirements for appearance and function. The specific requirements will be made known in the appropriate product standard.

It shall also be stated whether such tests are to be carried out on samples which have previously been subjected to other test procedures or are to be subjected to other test procedures afterwards, or whether the corrosion tests are to be performed on fresh samples.

The products shall be exposed to a neutral salt spray test in accordance with EN ISO 9227, the grades for corrosion resistance being given below.

— grade 1: 24 h $^{+1}_{-0}$ h;

— grade 2: 48 h $^{+1}_{-0}$ h;

— grade 3: 96 h $^{+1}_{-0}$ h;

— grade 4: 240 h $^{+1}_{-0}$ h;

— grade 5: 480 h $^{+1}_{-0}$ h.

5.3 Functional acceptance condition

After the corrosion test, the product shall be capable of functioning normally as required by the relevant product standard if available.

5.4 Appearance acceptance condition

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5.4.1 General

Surfaces shall show no sign of tarnish, visible to unaided normal or corrected vision as blackening or adverse discolouration of the surface – this does not include an acceptable patina.

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NOTE Corrosion of the base metal substrate should not be confused with surface corrosion of its finish. In the case of steel substrates, corrosion is rust of a reddish brown appearance. Corrosion of aluminium or zinc alloy substances is white and corrosion of brass or bronze substrates is green.

5.4.2 Degree of rust

Surfaces shall withstand exposure for the time specified without corrosion of the base metal substrate visible to unaided normal or corrected vision excepting an average of one spot per 650 mm^2 of significant surface and without any spots larger than 1,5 mm in any direction.

5.4.3 Degree of blistering

The degree of blistering of surfaces shall not be greater than density 2 and the size of any blisters shall not exceed size 3 as both designated in EN ISO 4628-2.

6 Test conditions

6.1 General conditions

a) Any corrosion tests required shall be carried out on products assembled or in the models as normally supplied.

b) When the specimen is under test, the product shall be placed in the test cabinet in its normal orientation in use. If a normal orientation cannot be defined, the specimen shall be placed as specified in EN ISO 9227. If this is not possible because of the size or shape of the specimen, it shall be placed so as to minimize the disruption of flow of the atmosphere within the test cabinet.

6.2 Treatment following the corrosion test

If there are no instructions in a relevant product standard, follow the process defined in EN ISO 9227.

7 Marking

The corrosion resistance of building hardware is normally designated within the marking for that specific building hardware. Where no hardware standard is available, the product shall be marked by specifying the number of this European Standard followed by the grade achieved.

EXAMPLE EN 1670: grade 1.

The marking shall be quoted in the literature relevant to the hardware or on its labelling or packaging, or by marking the product itself, or optionally by more than one of these methods.

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