



# SLOVENSKI STANDARD

## SIST EN ISO 9227:2006

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### Korozijsko preskušanje v umetnih atmosferah – Korozijski preskusi v slani komori (ISO 9227:2006)

Corrosion tests in artificial atmospheres - Salt spray tests (ISO 9227:2006)

Korrosionsprüfungen in künstlichen Atmosphären - Salzprühnebelprüfungen (ISO 9227:2006)

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Essais de corrosion en atmosphères artificielles - Essais aux brouillards salins (ISO 9227:2006)

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Corrosion of metals

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**en**

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## Corrosion tests in artificial atmospheres - Salt spray tests (ISO 9227:2006)

Essais de corrosion en atmosphères artificielles - Essais  
aux brouillards salins (ISO 9227:2006)

Korrosionsprüfungen in künstlichen Atmosphären -  
Salzprühnebelprüfungen (ISO 9227:2006)

This European Standard was approved by CEN on 7 July 2006.

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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 Central Secretariat has the same status as the official versions.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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**EN ISO 9227:2006 (E)****Foreword**

This document (EN ISO 9227:2006) has been prepared by Technical Committee ISO/TC 35 "Paints and varnishes" in collaboration with Technical Committee CEN/TC 139 "Paints and varnishes", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by January 2007, and conflicting national standards shall be withdrawn at the latest by January 2007.

This document supersedes EN ISO 7253:2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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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**Corrosion tests in artificial  
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*Essais de corrosion en atmosphères artificielles — Essais aux  
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## ISO 9227:2006(E)

## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 9227 was prepared by Technical Committee ISO/TC 156, *Corrosion of metals and alloys*, in collaboration with ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*, and ISO/TC 107, *Metallic and other inorganic coatings*, Subcommittee SC 7, *Corrosion tests*.

This second edition cancels and replaces the first edition (ISO 9227:1990) and ISO 7253:1996, which have been technically revised.

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## Introduction

There is seldom a direct relation 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 metallic 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.

Nevertheless, the method described gives a means of checking that the comparative quality of a metallic material, with or without corrosion protection, is maintained.

Salt spray tests are generally suitable as corrosion protection tests for rapid analysis for discontinuities, pores and damage in organic and inorganic coatings. 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.

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.

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# Corrosion tests in artificial atmospheres — Salt spray tests

## 1 Scope

This International Standard specifies the apparatus, the reagents and the procedure to be used in conducting the neutral salt spray (NSS), acetic acid salt spray (AASS) and copper-accelerated acetic acid salt spray (CASS) tests for assessment of the corrosion resistance of metallic materials, with or without permanent or temporary corrosion protection.

It also describes the method employed to evaluate the corrosivity of the test-cabinet environment.

It does not specify the dimensions of test specimens, the exposure period to be used for a particular product, or the interpretation of results. Such details are provided in the appropriate product specifications.

The salt spray tests are particularly useful for detecting discontinuities, such as pores and other defects in certain metallic, organic, anodic oxide and conversion coatings.

The neutral salt spray test applies to:

- metals and their alloys;
- metallic coatings (anodic and cathodic);
- conversion coatings;
- anodic oxide coatings;
- organic coatings on metallic materials.

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The acetic acid salt spray test is especially useful for testing decorative coatings of copper + nickel + chromium, or nickel + chromium. It has also been found suitable for testing anodic coatings on aluminum.

The copper-accelerated acetic acid salt spray test is useful for testing decorative coatings of copper + nickel + chromium, or nickel + chromium. It has also been found suitable for testing anodic coatings on aluminum.

The salt spray methods are all suitable for checking that the comparative quality of a metallic material, with or without corrosion protection, is maintained. They are not intended to be used for comparative testing, to rank different materials relative to each other with respect to corrosion resistance.

**ISO 9227:2006(E)****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.

ISO 1514:2004, *Paints and varnishes — Standard panels for testing*

ISO 2808:—<sup>1)</sup>, *Paints and varnishes — Determination of film thickness*

ISO 3574:1999, *Cold-reduced carbon steel sheet of commercial and drawing qualities*

ISO 8407:—<sup>2)</sup>, *Corrosion of metals and alloys — Removal of corrosion products from corrosion test specimens*

ISO 17872:—<sup>3)</sup>, *Paints and varnishes — Guidelines for the introduction of scribe marks through coatings on metallic panels for corrosion testing*

**3 Test solutions****3.1 Preparation of the sodium chloride solution**

Dissolve a sufficient mass of sodium chloride in distilled or deionized water with a conductivity not higher than 20  $\mu\text{S}/\text{cm}$  at  $25\text{ }^\circ\text{C} \pm 2\text{ }^\circ\text{C}$  to produce a concentration of  $50\text{ g/l} \pm 5\text{ g/l}$ . The sodium chloride concentration of the sprayed solution collected shall be  $50\text{ g/l} \pm 5\text{ g/l}$ . The specific gravity range for a  $50\text{ g/l} \pm 5\text{ g/l}$  solution is 1,029 to 1,036 at  $25\text{ }^\circ\text{C}$ .

The sodium chloride shall contain less than 0,001 % mass fraction of copper and less than 0,001 % mass fraction of nickel, as determined by atomic absorption spectrophotometry or another analytical method of similar sensitivity. It shall not contain more than 0,1 % of a mass fraction of sodium iodide, or more than 0,5 % of a mass fraction of total impurities calculated for dry salt.

NOTE If the pH of prepared solution at  $25\text{ }^\circ\text{C} \pm 2\text{ }^\circ\text{C}$  is outside the range 6,0 to 7,0, investigate the presence of undesirable impurities in the salt and/or the water.

**3.2 pH adjustment****3.2.1 pH of the salt solution**

Adjust the pH of the salt solution to the desired value on the basis of the pH of the sprayed solution collected.

**3.2.2 NSS test**

Adjust the pH of the salt solution (3.1) so that the pH of the sprayed solution collected within the test cabinet (4.2) is 6,5 to 7,2 at  $25\text{ }^\circ\text{C} \pm 2\text{ }^\circ\text{C}$ . Check the pH using electrometric measurement or in routine checks, with a short-range pH paper, which can be read in increments or 0,3 pH units or less. Make any necessary correction by adding hydrochloric acid, sodium hydroxide or sodium bicarbonate solution of analytical grade.

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1) To be published. (Revision of ISO 2808:1997)

2) To be published. (Revision of ISO 8407:1991)

3) To be published.