Corrosion tests in artificial atmospheres - Accelerated corrosion tests involving alternate exposure to corrosion-promoting gases, neutral salt-spray and drying (ISO 21207:2015)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 21207:2022 sisaldab Euroopa standardi EN ISO 21207:2022 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 21207:2022 consists of the English text of the European standard EN ISO 21207:2022.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 22.06.2022.	Date of Availability of the European standard is 22.06.2022.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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Corrosion tests in artificial atmospheres - Accelerated corrosion tests involving alternate exposure to corrosion-promoting gases, neutral salt-spray and drying (ISO 21207:2015)

Essais de corrosion en atmosphères artificielles - Essais de corrosion accélérée par expositions alternées à des gaz oxydants ou au brouillard salin neutre et à un séchage (ISO 21207:2015)

Korrosionsprüfungen in künstlichen Atmosphären - Beschleunigte Korrosionstests mit alternativer Einwirkung von korrosionsfördernden Gasen, neutraler Salzsprühung und Trocknung (ISO 21207:2015)

This European Standard was approved by CEN on 20 June 2022.

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European foreword

The text of ISO 21207:2015 has been prepared by Technical Committee ISO/TC 156 "Corrosion of metals and alloys" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 21207:2022 by Technical Committee CEN/TC 262 "Metallic and other inorganic coatings, including for corrosion protection and corrosion testing of metals and alloys" the secretariat of which is held by BSI.

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 December 2022, and conflicting national standards shall be withdrawn at the latest by December 2022.

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

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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Endorsement notice

The text of ISO 21207:2015 has been approved by CEN as EN ISO 21207:2022 without any modification.

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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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 156, *Corrosion of metals and alloys*.

This second edition cancels and replaces the first edition (ISO 21207:2004), of which it constitutes a minor revision. It also incorporates the Technical Corrigendum ISO 21207:2004/Cor 1:2008.

Introduction

Corrosion of metallic materials with or without corrosion protection is influenced by many environmental factors, the importance of which can vary with the type of metallic material and with the type of environment. Laboratory tests are designed to simulate the effects of the most important factors that enhance the corrosion of metallic materials.

The accelerated corrosion test methods described in this International Standard, methods A and B, are designed to simulate and enhance the environmental influence of exposure to an outdoor climate where salt-contaminated conditions and corrosion-promoting gases from an industrial or a traffic environment occur which might promote corrosion. Test method A simulates a moderately aggressive traffic environment while test method B simulates a more severe industrial or traffic environment.

Test method A involves exposure of the test objects to the following test cycle:

a) neutral salt spray testing (ISO 9227) for 2 h in a mist of a sodium chloride salt solution of mass fraction 5 % at 35 °C, followed by drying for 22 h in a standard laboratory climate;

b) exposure for 120 h in a test atmosphere containing a mixture of corrosion-promoting gases, volume fraction of NO_2 equal to $1{,}5 \times 10^{-6}$ and of SO_2 equal to $0{,}5 \times 10^{-6}$, at a relative humidity of 95 % and at a temperature of 25 °C, followed by drying for 24 h in a standard laboratory climate.

Test method B involves exposure of the test objects to the following test cycle:

a) neutral salt spray testing (ISO 9227) for 2 h in a mist of a sodium chloride salt solution of mass fraction 5 % at 35 °C, followed by drying for 22 h in a standard laboratory climate;

b) exposure for 48 h in a test atmosphere containing a mixture of corrosion-promoting gases, volume fraction of NO_2 equal to 10×10^{-6} and of SO_2 equal to 5×10^{-6}, at a relative humidity of 95 % and at a temperature of 25 °C;

c) neutral salt spray testing (ISO 9227) for 2 h in a mist of a sodium chloride salt solution of mass fraction 5 % at 35 °C, followed by drying for 22 h in a standard laboratory climate;

d) exposure for 72 h in a test atmosphere containing a mixture of corrosion-promoting gases, volume fraction of NO_2 equal to 10×10^{-6} and of SO_2 equal to 5×10^{-6}, at a relative humidity of 95 % and at a temperature of 25 °C.

The results obtained do not permit far-reaching conclusions on the corrosion resistance of the tested product under the whole range of environmental conditions in which it may be used.

Corrosion tests in artificial atmospheres — Accelerated corrosion tests involving alternate exposure to corrosion-promoting gases, neutral salt-spray and drying

1 Scope

This International Standard defines two accelerated corrosion test methods to be used in assessing the corrosion resistance of products with metals in environments where there is a significant influence of chloride ions, mainly as sodium chloride from a marine source or by winter road de-icing salt, and of corrosion-promoting gases from industrial or traffic air pollution.

This International Standard specifies both the test apparatus and test procedures to be used in executing the accelerated corrosion tests.

The methods are especially suitable for assessing the corrosion resistance of sensitive products with metals, e.g. electronic components, used in traffic and industrial environments.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8407, *Corrosion of metals and alloys — Removal of corrosion products from corrosion test specimens*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

ISO 10062, *Corrosion tests in artificial atmosphere at very low concentrations of polluting gas(es)*

ISO 10289, *Methods for corrosion testing of metallic and other inorganic coatings on metallic substrates — Rating of test specimens and manufactured articles subjected to corrosion tests*

3 Apparatus and reagents

3.1 Exposure of test objects to mixtures of NO_2 and SO_2 at a relative humidity of 95 % and a temperature of 25 °C.

The climatic cabinet with inner chamber and gas flow system shall comply with the requirements of ISO 10062.

The equipment used for testing shall be constructed for the following reasons.

a) The inner chamber and gas flow system consist of inert materials, e.g. PTFE (polytetrafluoroethylene) or glass, to avoid or minimize adsorption of hostile gases on surfaces other than of that of the test panels.

b) Airflow and hostile gas injection system are designed to ensure uniform test conditions in the inner chamber or working space of cabinet.

   In the most common design of test equipment, the test atmosphere in the working space is obtained by continuously introducing the necessary quantity of the mixture of corrosion-promoting gases into a damp airflow to obtain the required concentration. The corrosion-promoting gases and conditioned air are mixed outside the cabinet. The conditioned air is taken from the outer chamber of the climatic cabinet. The airflow after injection of the corrosion-promoting gases is then mixed

