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oSIST prEN ISO 22479:2022

01-april-2022

Korozija kovin in zlitin - Korozijski preskus s SO2 v vlažni atmosferi (metoda s stalno (fiksno) koncentracijo plina) (ISO 22479:2019)

Corrosion of metals and alloys - Sulfur dioxide test in a humid atmosphere (fixed gas method) (ISO 22479:2019)

Korrosion von Metallen und Legierungen - Prüfung mit Schwefeldioxid in feuchter Atmosphäre (fixed gas method) (ISO 22479:2019)

Corrosion des métaux et alliages - Essai au dioxyde de soufre en atmosphère humide (méthode avec volume fixe de gaz) (ISO 22479:2019)

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Ta slovenski standard je istoveten z: **prEN ISO 22479**

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ICS:

77.060	Korozija kovin	Corrosion of metals

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2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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INTERNATIONAL STANDARD

ISO 22479

First edition
2019-05

Corrosion of metals and alloys — Sulfur dioxide test in a humid atmosphere (fixed gas method)

Corrosion des métaux et alliages — Essai au dioxyde de soufre en atmosphère humide (méthode avec volume fixe de gaz)

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Contents

Page

iTeh STANDARD PREVIEW
(standards.iteh.ai)
oSIST prEN ISO 22479:2022
https://standards.iteh.ai/catalog/standards/sist/ce2d52ca-ed6d-4de-94c4-08923f7fae7d/osist-pren-iso-22479-2022

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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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 156, *Corrosion of metals and alloys*.

This first edition of ISO 22479 cancels and replaces ISO 3231:1993 and ISO 6988:1985, which have been combined and technically revised. The main changes compared with the previous edition are as follows:

oSIST prEN ISO 22479:2022
https://standards.iteh.ai/catalog/standards/sist/ce2d52ca-
2022

— the method of generating sulfur dioxide from reagents has been deleted because of the risk of exposure to toxic chemicals.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

A humid atmosphere containing sulfur dioxide induces corrosion of many metals.

The results obtained in this document 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. Similarly, performances of different materials in this document should not be taken as a direct guide to the relative corrosion resistance of these materials in service.

It is appropriate to test only the same corrosion protection systems at the same time in one test procedure, because an interaction between samples can't be prevented. When testing different corrosion protection systems with different materials, it should be taken into account that the influence of sulfur dioxide often can be different.

The term “fixed gas method” means that at the beginning of the test a fixed volume of gas is introduced into a cabinet of fixed volume.

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PREVIEW
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oSIST prEN ISO 22479:2022
https://standards.iteh.ai/catalog/standards/sist/ce2d52ca-ee1f-4d0e-94c4-08923f7fae7d/osist-pren-iso-22479-2022

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Corrosion of metals and alloys — Sulfur dioxide test in a humid atmosphere (fixed gas method)

WARNING — This document does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices.

1 Scope

This document specifies a method for assessing the resistance of materials or products to a humid atmosphere containing sulfur dioxide.

This method is applicable to testing metals and alloys, metallic and non-organic coatings and organic coatings.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

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

ISO 2808, *Paints and varnishes — Determination of film thickness*

ISO 8044, *Corrosion of metals and alloys — Basic terms and definitions*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8044 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Principle

The test specimens are exposed to a humid atmosphere containing sulfur dioxide. The sulfur dioxide dissolved by the moisture condenses on the test specimen surface and causes corrosion.

5 Apparatus

5.1 Component protection.

All components in contact with sulfur dioxide in a humid atmosphere shall be made of corrosion resistant materials, and shall themselves not emit any gas or vapour likely to influence corrosion of the test specimens.

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5.2 Test cabinet.

The preferred capacity of the test cabinet is (300 ± 10) l. When agreed between the interested parties, other capacities may be used. In these cases, the size and/or number of test specimens, the volume of gas and the quantity of water shall be properly arranged in accordance with the capacity of the test cabinet.

The upper part of the cabinet shall be designed so that drops of condensed water formed on its surface do not fall on the test specimens being tested. An inclination of the upper part of the test cabinet of about 12° or more to the horizontal plane provides a suitable safeguard. The test specimens may be placed at different levels within the cabinet, as long as the solution does not drip from the test specimens or their supports at one level onto other test specimens placed below.

The temperature in the test cabinet is controlled by heating the floor and lower part of the side walls of the test cabinet. The temperature shall be measured at least 250 mm from the side walls and at least 150 mm below the upper part (lid).

A gas inlet port shall be less than 50 mm above the water surface. The test cabinet shall be hermetically leak-tight.

A pressure relief valve shall be placed in or near the upper part of the test cabinet.

The exhaust gas and the released gas from the pressure relief valve shall be treated as appropriate.

NOTE Relevant regulatory limitations can apply.

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A drain port shall be provided in the test cabinet.

A typical test cabinet is shown in Figure 1. Another example of test cabinet is shown in Figure A.1.

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The test cabinet shall be installed in a room free from dust, draughts, corrosive gas and direct solar radiation, at a room temperature of (23 ± 5) °C and at a relative humidity of less than 75 %.

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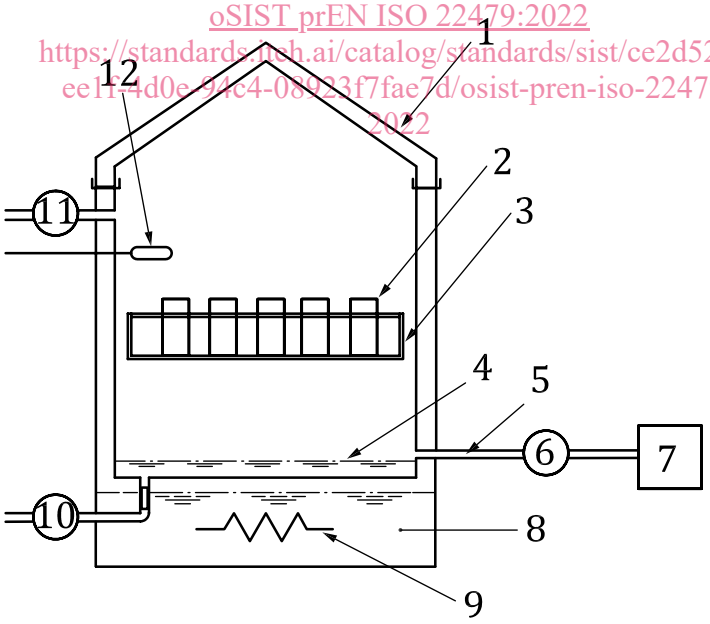

Key

1	lid	5	gas inlet port	9	heater
2	test specimens	6	flowmeter	10	drain port
3	specimen supports	7	source of sulfur dioxide	11	pressure relief valve
4	water inside the cabinet	8	water tank	12	temperature measurement

Figure 1 — Typical test cabinet

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5.3 Source of sulfur dioxide.

The source of sulfur dioxide should be a gas cylinder with a volume concentration of more than 99,9 %. It shall be fitted with appropriate regulating and measuring apparatus to ensure the supply of the correct volume of gas. The volume of gas delivered into the test cabinet should be measured by a calibrated flow meter. Another measuring instrument works with squeezing out a viscous liquid paraffin for the volume of the gas for 0,2, 1,0 and 2,0 l.

WARNING — Sulfur dioxide (CAS no. 7446-09-5) is toxic, corrosive and irritating. Handling of sulfur dioxide shall be restricted to skilled personnel or conducted under their control. The apparatus shall be used and maintained by skilled personnel, not only so that the procedures can be performed correctly, but also because of the hazards to health and safety that are involved.

5.4 Conditioning of a new cabinet.

In order to minimize the effect from the material of the cabinet by sulfur dioxide, a new cabinet shall be operated at least one test cycle in accordance with the procedures given in 8.2 to 8.5 without test specimens. The conditioning shall conform to Table 1, with 2,0 l of sulfur dioxide.

6 Test specimens

6.1 General

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The number, type, surface roughness, thickness of coatings, shape and dimensions of test specimens shall be selected according to the specification for the materials or product being tested. When not specified, details concerning the test specimens shall be agreed between the interested parties.

6.2 Dimensions

A typical specimen size is 150 mm × 100 mm by 0,75 mm to 1,25 mm thickness.

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6.3 Preparation

6.3.1 Metals and alloys

Thoroughly clean the test specimens before testing. The cleaning method depends on the nature of the surface and the contaminants. Abrasives shall not include the use of any abrasives or solvents that may attack the surface of the test specimens. Take care that the test specimens are not recontaminated after cleaning, by excessive or careless handling.

If test specimens are cut from a large coated article, the cutting shall be carried out in such a way that the coating is not damaged, especially in the area adjacent to the cut. Unless otherwise specified, the cut edges should be adequately protected by coating with a suitable medium that is stable under the conditions of test, such as wax or adhesive tape.

6.3.2 Paints and varnishes

Unless otherwise specified or agreed, the test specimens shall be prepared in accordance with ISO 1514 and then coated by the specified method with the product or system under test. The back and edges of the test specimens should be coated with the product or system under test.

Dry (or cure) and age (if applicable) each coated test specimen for the specified time and under the specified conditions and, unless otherwise specified, condition them at a temperature of (23 ± 2) °C and a relative humidity of (50 ± 5) % for at least 16 h, with free circulation of air and not exposed to direct sunlight. The test procedure shall then be carried out as soon as possible.

Determine the thickness, in micrometres, of the dried coating by one of the non-destructive procedures described in ISO 2808.

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