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Third edition
2022-11

Corrosion tests in artificial atmosphere at very low concentrations of polluting gas(es)

*Essais de corrosion en atmosphère artificielle à très faible
concentration en gaz polluants*



Reference number
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Contents

| | Page |
|---|-----------|
| Foreword..... | iv |
| Introduction..... | v |
| 1 Scope..... | 1 |
| 2 Normative references..... | 1 |
| 3 Terms and definitions..... | 1 |
| 4 Apparatus..... | 1 |
| 5 Test methods..... | 2 |
| 5.1 Test severity..... | 2 |
| 5.1.1 General..... | 2 |
| 5.1.2 Suggested test methods..... | 2 |
| 5.1.3 Test duration..... | 3 |
| 5.2 Treatment of the specimens prior to testing (see Clause 6)..... | 3 |
| 5.3 Examination of the specimens prior to testing..... | 3 |
| 5.4 Filling of the test chamber..... | 3 |
| 5.5 Procedure..... | 4 |
| 5.5.1 Exposure time..... | 4 |
| 5.5.2 Test duration..... | 4 |
| 5.5.3 Test procedure..... | 4 |
| 5.6 Monitoring of test behaviour..... | 5 |
| 5.7 Post-test storage..... | 5 |
| 6 Information to be given in the relevant specification..... | 5 |
| 7 Expression of results..... | 5 |
| 8 Test report..... | 5 |
| Annex A (normative) Specifications for apparatus for corrosion tests in artificial atmosphere..... | 7 |
| Annex B (informative) Typical apparatus for polluting gas corrosion tests..... | 10 |
| Bibliography..... | 11 |

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*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 262, *Metallic and other inorganic coatings*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 10062:2006), which has been technically revised.

The main changes compared to the previous edition are as follows:

- simplified method has been deleted due to safety issues for operator;
- warnings about each gas have been added in [5.1.2](#);
- [Annex A](#) has been changed to normative annex;
- the installation environment has been added to [Annex A](#).

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

Products with, for example, sensitive electrical functions, can, during storage or operation in indoor locations, be affected by atmospheric corrosion dependent on climatic factors such as temperature, relative humidity, air velocity and rate of change caused by temperature and humidity. Additionally, gaseous pollutants can seriously affect the rate of corrosion, as well as the occurrence of different corrosion mechanisms. Contaminants on the surface, such as salt, dust, oil and compounds liberated from plastics, can also affect the rate and mechanism of corrosion.

Different corrosion-promoting gaseous pollutants dominate in different field environments:

- sulfur dioxide and nitrogen oxides in atmospheres influenced by combustion of fossil fuels and in traffic environments,
- hydrogen sulfide in atmospheres in the vicinity of petrochemical and steel industry, decaying organic matter, stagnant waters and animal shelters, and
- hydrogen sulfide and chlorine compounds in the vicinity of pulp and paper industry; if chlorine is used for bleaching.

Those gaseous pollutants are known to act as single corrosion-promoting factors. However, in atmospheres where more than one gaseous pollutant is present, synergistic effects can be initiated. As a result, a considerable increase in the corrosion rate can occur, compared to the case when the different gaseous pollutants act as single corrosion-promoting factors.

This document is intended to

- a) specify a general method using atmospheres polluted by one or more gases at very low volume fractions $\leq 10^{-6}$ under specified conditions of temperature and relative humidity, so as to avoid condensation phenomena during the test,
- b) specify the test apparatus and procedure required to achieve the best possible reproducibility, and
- c) assess performance under test conditions which accelerate corrosion; as knowledge of operating conditions proceeds, more suitable pollutants or pollutant mixtures can be used.

This document is not intended to be used for comparative testing as a means of ranking different materials relative to each other with respect to corrosion resistance or as a means of predicting long-term corrosion resistance of the tested material.