

**SLOVENSKI STANDARD**  
**oSIST prEN ISO 11844-1:2019**  
**01-januar-2019**

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**Korozija kovin in zlitin - Klasifikacija notranjih atmosfer z nizko korozivnostjo - 1. del: Ugotavljanje in ocenjevanje korozivnosti v zaprtih prostorih (ISO/DIS 11844-1:2018)**

Corrosion of metals and alloys - Classification of low corrosivity of indoor atmospheres - Part 1: Determination and estimation of indoor corrosivity (ISO/DIS 11844-1:2018)

Korrosion von Metallen und Legierungen - Einteilung der Korrosivität in Räumen mit geringer Korrosivität - Teil 1: Bestimmung und Abschätzung der Korrosivität in Räumen (ISO/DIS 11844-1:2018)

Corrosion des métaux et alliages - Classification de la corrosivité faible des atmosphères d'intérieur - Partie 1: Détermination et estimation de la corrosivité des atmosphères d'intérieur (ISO/DIS 11844-1:2018)

**Ta slovenski standard je istoveten z: prEN ISO 11844-1**

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77.060

Korozija kovin

Corrosion of metals

**oSIST prEN ISO 11844-1:2019**

**en,fr,de**



# DRAFT INTERNATIONAL STANDARD

## ISO/DIS 11844-1

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### Corrosion of metals and alloys — Classification of low corrosivity of indoor atmospheres —

#### Part 1: Determination and estimation of indoor corrosivity

*Corrosion des métaux et alliages — Classification de la corrosivité faible des atmosphères d'intérieur —  
Partie 1: Détermination et estimation de la corrosivité des atmosphères d'intérieur*

ICS: 77.060

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## ISO/DIS 11844-1:2018(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.

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](http://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](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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](http://www.iso.org/iso/foreword.html).

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](http://www.iso.org/members.html).

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

This second edition cancels and replaces the first edition (ISO 11844-1:2006), which has been technically revised.

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

- reference to ISO 16000 in the [Clause 7](#) has been added;
- the model estimates the indoor concentration and deposition of pollutants originating from outdoors was added;
- lead was included as standard specimen with high sensitivity to vapour organic acids.

A list of all parts in the ISO 11844- series can be found on the ISO website.

## Introduction

Metals, alloys and metallic coatings are subject to atmospheric corrosion under the impact of air humidity, especially when gaseous and solid substances of atmospheric pollution co-impact. Corrosivity data are of fundamental importance for derivation of suitable corrosion protection, or for evaluation of serviceability of metal elements of a product.

ISO 9223 classifies the atmospheric environment into six corrosivity categories.

Low-corrosivity indoor atmospheres are indoor atmospheres with C 1 (very low) or C 2 (low) corrosivity categories according to ISO 9223.

The classification in ISO 9223 is too broad for some purposes in low-corrosivity indoor atmospheres, e.g. places where electronic devices, sophisticated technical products, or works of art and historical objects are stored.

For such purposes, it is necessary to subdivide the corrosivity categories C 1 (very low) and C 2 (low) into indoor corrosivity categories in this document.

The evaluation of low-corrosivity indoor atmospheres can be accomplished by direct determination of corrosion attack of selected metals (see ISO 11844-2) or by measurement of environmental parameters (see ISO 11844-3) which may cause corrosion on metals and alloys.

This document describes general procedures for derivation and estimation of indoor corrosivity categories.

A general approach to classification of corrosivity in indoor atmospheres is given in the scheme shown in [Figure 1](#).

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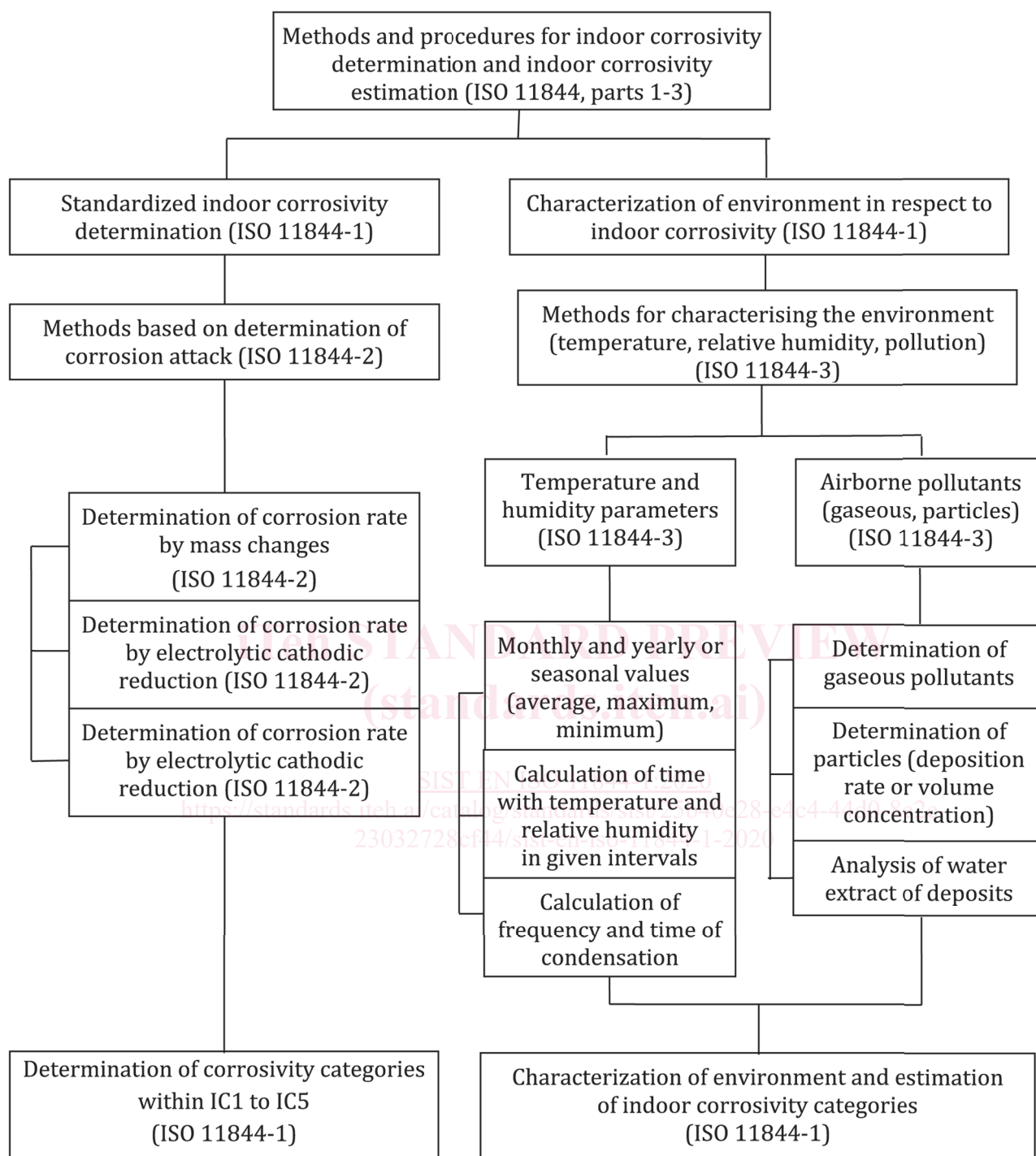


Figure 1 — Scheme for classification of low corrosivity in indoor atmospheres



# Corrosion of metals and alloys — Classification of low corrosivity of indoor atmospheres —

## Part 1: Determination and estimation of indoor corrosivity

### 1 Scope

This document deals with the classification of low corrosivity of indoor atmospheres.

The aim of this document is to characterise indoor atmospheric environments of low corrosivity that can affect metals and metallic coatings during storage, transport, installation or operational use, to set a consistent way of indoor corrosivity classification, and to prescribe procedures for derivation and estimation of indoor corrosivity categories.

This document specifies technical metals, whose corrosion attack after a defined exposure period is used for determination of corrosivity categories of indoor atmospheres of low corrosivity.

This document defines corrosivity categories of indoor atmospheres according to corrosion attack on standard specimens.

This document indicates important parameters of indoor atmospheres that can serve as a basis for an estimation of indoor corrosivity.

Selection of a method for determination of corrosion attack, description of standard specimens, its exposure conditions and evaluation are the subject of ISO 11844-2. Measurement of environmental parameters affecting indoor corrosivity is the subject of ISO 11844-3.

### 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.

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

ISO 9223, *Corrosion of metals and alloys — Corrosivity of atmospheres — Classification, determination and estimation*

ISO 11844-2, *Corrosion of metals and alloys — Classification of low corrosivity of indoor atmospheres — Part 2: Determination of corrosion attack in indoor atmospheres*

ISO 11844-3, *Corrosion of metals and alloys — Classification of low corrosivity of indoor atmospheres — Part 3: Measurement of environmental parameters affecting indoor corrosivity*

ISO 16000 (all parts), *Indoor air*

ISO 16000-1:2004, *Indoor air — Part 1: General aspects of sampling strategy*

IEC 60654-4:1987, *Operating conditions for industrial-process measurement and control equipment — Part 4: Corrosive and erosive influences*

IEC 60721 (all parts), *Classification of environmental conditions*

## ISO/DIS 11844-1:2018(E)

### 3 Terms and definitions

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

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

#### 3.1 climate

statistics of temperature, humidity, atmospheric pressure, wind, rainfall, and other meteorological elements in a given location over a long period of time

#### 3.2 atmosphere

mixture of gases, aerosols and particles, that surrounds a given material/object/structure

#### 3.3 indoor atmosphere/environment

atmosphere/environment (combined effect of climate and atmosphere) inside a box, a room or a building

#### 3.4 microclimate

the climate of a small area, specific rooms, part of building, etc. which may be different from that in the general region

#### 3.5 temperature-humidity complex

combined effect of temperature and relative humidity on the corrosivity of the atmosphere

[SOURCE: ISO 9223:2012, definition 3.4] [SIST EN ISO 11844-1:2020  
https://standards.iteh.ai/catalog/standards/sist/25b40e28-e4c4-44d0-8e2e-23032728cf44/sist-en-iso-11844-1-2020](https://standards.iteh.ai/catalog/standards/sist/25b40e28-e4c4-44d0-8e2e-23032728cf44/sist-en-iso-11844-1-2020)

#### 3.6 time of wetness

period during which a metallic surface is covered by adsorptive and/or liquid films of electrolyte that are capable of causing atmospheric corrosion

[SOURCE: ISO 9223:2012, definition 3.5]

#### 3.7 atmospheric pollution

specific corrosion-active substances, gases or suspended particles in the air (both natural and the result of human activity)

#### 3.8 corrosion system

system consisting of one or more metals and those parts of environment that influence corrosion

#### 3.9 corrosion damage

corrosion effect that causes impairment of the function of the metal, the environment or the technical system of which these form a part

#### 3.10 corrosivity

ability of an environment to cause corrosion of a metal in a given corrosion system

**3.11****corrosivity of atmospheres**

ability of the atmosphere to cause corrosion in a given corrosion system (e.g. atmospheric corrosion of a given metal or alloy)

[SOURCE: ISO 9223:2012, definition 3.1]

**4 Symbols and abbreviations**

IC                corrosivity categories of indoor atmospheres.

$r_{\text{corr}}$            corrosion rate derived from mass-loss measurement after an exposure of one year.

$r_{\text{mi}}$             rate of mass increase after an exposure of one year.

**5 Classification of corrosivity****5.1 General**

The corrosivity of indoor atmospheres can be classified either by determination of the corrosion attack on standard specimens of selected standard metals as given in [Clause 6](#) or, where this is not possible, by estimation of corrosivity based on the knowledge of humidity, temperature and pollution conditions as described in [Clause 7](#) and [Annexes B, C and D](#).

Estimation of corrosivity as described in [7.2](#) and [Annexes C and D](#) may lead to wrong conclusions. Therefore, the determination of corrosivity by measurement of the corrosion attack on standard specimens is strongly recommended.

**5.2 Categories of indoor corrosivity**

For the purpose of this document, indoor atmospheres are classified into five corrosivity categories denoted IC 1 to IC 5. The classification is given in [Table 1](#).

**Table 1 — Corrosivity categories of indoor atmospheres**

Indoor corrosivity category	
IC 1	Very low indoor corrosivity
IC 2	Low indoor corrosivity
IC 3	Medium indoor corrosivity
IC 4	High indoor corrosivity
IC 5	Very high indoor corrosivity

**6 Determination of indoor atmospheric corrosivity**

The determination of corrosivity of indoor atmospheres is based on measurements of corrosion attack on standard specimens of four reference metals after an exposure for one year in accordance with ISO 11844-2. From the mass loss or mass increase, the indoor corrosivity category for each metal is determined from [Table 2](#).

In indoor environments when the all conditions (temperature, humidity, air pollutions) vary only in range of  $\pm 5$  % from average value, the exposure period should be shorter, e.g. one month only. It is preferably this month represents the most corrosive period of year.

Metals complement each other in the classification of indoor corrosivity for a given environment.