SLOVENSKI STANDARD
oSIST prEN ISO 11844-2:2019

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Korozija kovin in zlitin - Klasifikacija notranjih atmosfer z nizko korozivnostjo - 2. del: Ugotavljanje napada korozije v zaprtih prostorih (ISO/DIS 11844-2:2018)

Corrosion of metals and alloys - Classification of low corrosivity of indoor atmospheres - Part 2: Determination of corrosion attack in indoor atmospheres (ISO/DIS 11844-2:2018)

Korrosion von Metallen und Legierungen - Einteilung der Korrosivität in Räumen mit geringer Korrosivität - Teil 2: Bestimmung der korrosiven Belastung in Räumen (ISO/DIS 11844-2:2018)

Corrosion des métaux et alliages - Classification de la corrosivité faible des atmosphères d'intérieur - Partie 2: Détermination de l'attaque par corrosion dans les atmosphères d'intérieur (ISO/DIS 11844-2:2018)

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77.060	Korozija kovin	Corrosion of metals

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

Part 2:
Determination of corrosion attack in indoor atmospheres

Corrosion des métaux et alliages — Classification de la corrosivité faible des atmosphères d'intérieur — Partie 2: Détermination de l'attaque par corrosion dans les atmosphères d'intérieur

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Foreword

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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.

ISO 11844-2 was prepared by Technical Committee ISO/TC 156, *Corrosion of metals and alloys*.

ISO 11844 consists of the following parts, under the general title *Corrosion of metals and alloys — Classification of low corrosivity of indoor atmospheres*:

— *Part 1: Determination and estimation of indoor corrosivity;*

— *Part 2: Determination of corrosion attack in indoor atmospheres;*

— *Part 3: Measurement of environmental parameters affecting indoor corrosivity.*

This second edition cancels and replaces the first edition (ISO 11844-2:2006), which has been technically revised.

Introduction

ISO 11844 – Part 2 describes standard specimens, its exposure and evaluation for the derivation of the indoor corrosivity categories.

The determination of the corrosion attack is at the present state of knowledge the most reliable and usually also an economical way for evaluation of corrosivity taking into account all main local environmental influences.

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

Part 2: Determination of corrosion attack in indoor atmospheres

1 Scope

This International Standard specifies methods for determination of corrosion rate with standard specimens of metals in indoor atmospheres with low corrosivity. For this direct method of evaluation corrosivity different sensitive methods can be applied using standard specimens of the following metals: copper, silver, zinc steel and lead. The values obtained from the measurements are used as classification criteria for the determination of indoor atmospheric corrosivity.

2 Normative references

The following referenced documents are indispensable for the application of this document. For datedreferences, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

ANSI/ISA-S71.04:1985, *Environmental conditions for Process, Measurement and Control Systems: Airborne Contaminants*

3 Principle

The corrosivity of the indoor location, e.g. control rooms, electric boxes, storage rooms, during transportation, in museums, etc., is determined from the corrosion rate calculated from the mass change or resistance change per unit area of standard specimens of metals after exposure for a certain time period. Different materials are sensitive to different environmental parameters or their combinations.

4 Methods

The following methods described in Annexes A and B are available for evaluation of the corrosion attack:

— Determination of corrosion rate by mass change measurements (Annex A);

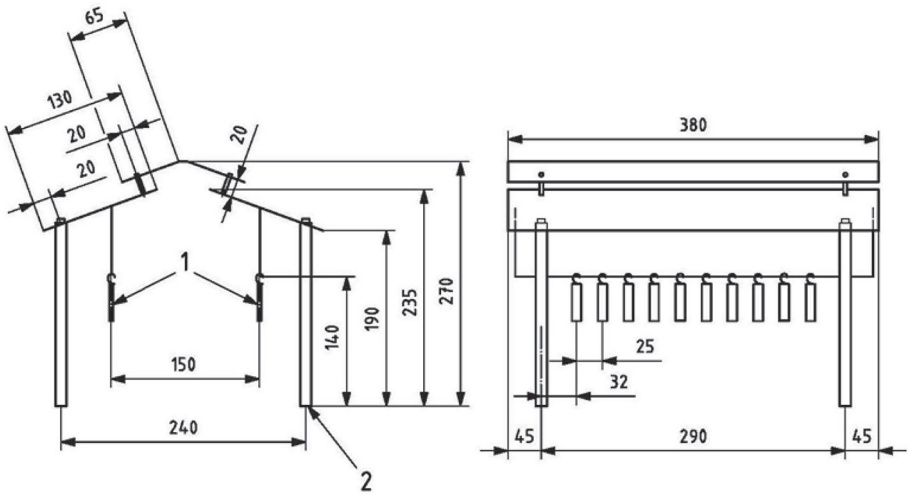
— Determination of corrosion rate by electrolytic cathodic reduction (Annex B).

The method described in the informative Annexes C and D are suitable for continuous or periodic monitoring of the corrosion attack:

— Determination of corrosion rate by resistance measurements (Annex C);

— Determination of corrosion rate by quartz crystal micro-balance methodology (Annex D).

Special features of the methods, such as sensitivity, possibility for continuous or periodic assessment of corrosion attack, available space, etc., should be considered when choosing the most suitable methods. Examples of suitable racks for exposure of specimens are given in Figures 1 and 2.

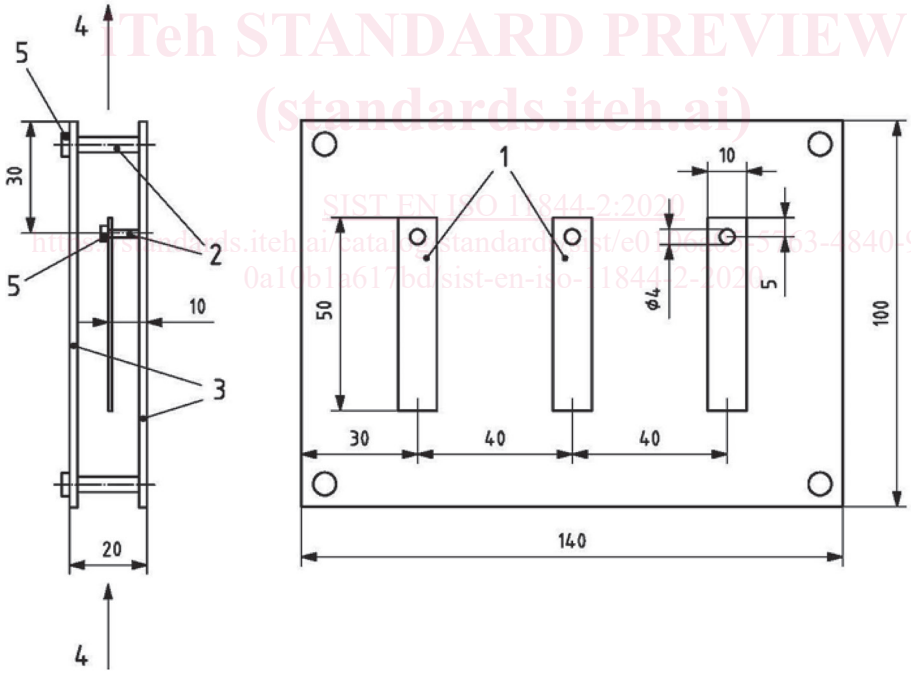


Key

1 specimens

2 support Ø ~ 15

Figure 1 — Examples of exposure racks for sheltered exposure of specimens



Key

1 Specimens

2 Distance pins

3 Plastic plates

4 Open air flow

5 Distance pins

6 Plastic screws

Figure 2 — A mounting plate for unsheltered exposure of specimens

Annex A
(normative)

Determination of corrosion rate by mass change measurement

A.1 Principle

Mass increase measurements can be performed on all metals and comparatively large surfaces can be evaluated. The technique is relatively easy to operate.

The mass loss determination gives a best estimate of the corrosion effect. The method is not yet applicable to all metals. Both mass increase and mass loss determination using an ultramicro-balance has a precision of about ± 10 mg/m^2 with the method described below.

Due to the difficulty of distinguishing corrosion effects from other surface-related phenomena, such as sorption and contamination by particulate matter, the specimens should preferably be exposed under shelter.

A.2 Specimens

It is preferable to use rectangular specimens in the form of flat sheets, as they can be readily weighed. A convenient specimen size is 10 mm · 50 mm. Specimens may be larger provided that they can be accurately weighed. The specimen thickness may preferably be 0,5 mm.

The materials used to prepare the specimens are of following quality,

Silver: 99,98 % min.

Copper: 99,85 % min.

Zinc: 99,45 % min.

Carbon steel: CR 1, max 0,15 % C, max 0,04 % P, max 0,05 % S, max 0,6 % Mn

Lead: 99,97 % min.

The specimens should, before weighing, be prepared as follows:

a) A hole with the diameter 4 mm is cut at the upper side of the specimen.

b) Abrading:

   — Silver and copper with silicon carbide paper to 1 200 P (600 grit),

   — Zinc, carbon steel and lead to 500 P (320 grit).

   NOTE To avoid risk of contamination an abrading paper must not be used for polishing of specimens of different metals.

c) Cleaning in de-ionised water.

d) Degreasing in ethanol in an ultrasonic bath for 5 minutes.

e) Drying.