

Corrosion of metals and alloys - Determination of  
bimetallic corrosion in atmospheric exposure corrosion  
tests (ISO 7441:2015)

## EESTI STANDARDI EESSÕNA

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ICS 77.060

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English Version

Corrosion of metals and alloys - Determination of bimetallic  
corrosion in atmospheric exposure corrosion tests (ISO  
7441:2015)

Corrosion des métaux et alliages - Détermination de la  
corrosion bimétallique par des essais d'exposition de  
corrosion atmosphérique (ISO 7441:2015)

Korrosion von Metallen und Legierungen - Bestimmung der  
Kontaktkorrosion durch Freibewitterungsversuche (ISO  
7441:2015)

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## Foreword

This document (EN ISO 7441:2015) has been prepared by Technical Committee ISO/TC 156 "Corrosion of metals and alloys" in collaboration with Technical Committee CEN/TC 262 "Metallic and other inorganic coatings" 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of an identical text or by endorsement, at the latest by July 2015, and conflicting national standards shall be withdrawn at the latest by July 2015.

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### Endorsement notice

The text of ISO 7441:2015 has been approved by CEN as EN ISO 7441:2015 without any modification.

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## Introduction

Bimetallic corrosion occurs when a metal in electrical contact with a more noble metal corrodes at a higher rate than it would in the same environment but without this contact.

Bimetallic corrosion in the atmosphere, in contrast to that in electrolytes, is characterized by a large potential drop between the anode and the cathode. Therefore, bimetallic corrosion is usually limited to a distance within about 0,5 cm from the point of contact<sup>[1]</sup>.

The determination of bimetallic corrosion in atmospheric exposure tests can be made with several methods, each with its own advantages. Three standardized tests are compared and described in this International Standard:

- rectangular plates;
- washers;
- wire on bolt.

The standard starts with an overview and comparison of the three methods, with the purpose of aiding the selection of an appropriate test method. Test procedures for the rectangular plate and washer test are included in this standard since no independent standard describes these methods while those who wish to use the wire on bolt test need to consult ASTM G116 for a complete description of the method.

The standard describes how to derive the bimetallic effect, which is a relative measure of the bimetallic corrosion of a metal compared to the corrosion of the same metal but without the bimetallic effect. A high galvanic effect does not necessarily mean that the bimetallic corrosion rate is high. Therefore, valuable complementary information is the classification of the corrosivity of the test site according to ISO 9223<sup>[2]</sup>.

# Corrosion of metals and alloys — Determination of bimetallic corrosion in atmospheric exposure corrosion tests

## 1 Scope

This International Standard specifies and compares methods for the determination of bimetallic corrosion of metals and coated metals in atmospheric exposure corrosion tests.

NOTE In the text of this International Standard, the term “metal” is used for both metals and alloys, and the term “coated metal” for metals and alloys with metallic and non-metallic inorganic coatings.

The methods are intended for the determination of the amount and type of corrosion effect, arising in natural atmospheres, caused by contact with different metals.

## 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 1456, *Metallic and other inorganic coatings — Electrodeposited coatings of nickel, nickel plus chromium, copper plus nickel and of copper plus nickel plus chromium*

ISO 2081, *Metallic and other inorganic coatings — Electroplated coatings of zinc with supplementary treatments on iron or steel*

ISO 7599, *Anodizing of aluminium and its alloys — General specifications for anodic oxidation coatings on aluminium*

ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

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

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

ISO 8565, *Metals and alloys — Atmospheric corrosion testing — General requirements*

ISO 15510, *Stainless steels — Chemical composition*

ASTM G116, *Standard Practice for Conducting Wire-on-Bolt Test for Atmospheric Galvanic Corrosion*

## 3 Terms and definitions

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

### 3.1

#### test specimens

specimens that are exposed for evaluation of bimetallic corrosion caused by contact with different materials