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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 46054-2025

**Corrosion of metals and alloys - Electrochemical
measurements - Test method for monitoring atmospheric
corrosion**

金属和合金的腐蚀 电化学测量 监测大气腐蚀的试验方法
(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is equivalent to ISO 22858:2020 "Corrosion of metals and alloys - Electrochemical measurement - Test methods for monitoring atmospheric corrosion".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Iron and Steel Association.

This document is under the jurisdiction of the National Steel Standardization Technical Committee (SAC/TC183).

Introduction

This document provides methodological guidance for monitoring atmospheric corrosion using electrochemical sensors, which are used for long-term measurements of thin-film electrolytes.

The method measures the electrical conductivity, corrosion current, or coating condition. It assesses the corrosion current in real time, relating it to specific environmental conditions. A resistance sensor is used.

Alternatively, mass loss techniques may not be able to measure instantaneous corrosion current. The techniques described in this document are alternatives to other methods used to assess atmospheric corrosion.

This complements quasi-methods such as the mass loss sample method, the resistance sensor method, or the coating test sample method. These continuous records of material condition can...

Used for atmospheric corrosion research, material corrosion resistance evaluation, or structural corrosion management.

Electrochemical Measurement of Corrosion of Metals and Alloys Test methods for monitoring atmospheric corrosion

1 Scope

This document describes a test method for measuring atmospheric corrosion using a two-electrode electrochemical sensor. This document specifies the methods employed.

Electrochemical sensors with or without organic coatings. These sensors are suitable for use in laboratory test chambers, outdoor exposure environments, and service environments.

Corrosion measurements were performed.

This document applies to measuring the corrosion rate (i.e., self-corrosion rate), galvanic corrosion rate, and conductivity of thin liquid films on uncoupled metal surfaces.

Barrier properties of the machine coating.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

ISO 4618 Paints and varnishes - Terms and definitions Note. GB/T 5206-2015 Paints and varnishes - Terms and definitions (ISO 4618:2014, IDT) ISO 4628 (all parts) Evaluation of aging of paint and varnish coatings. number and size of defects and degree of uniformity of appearance.

Note: GB/T 30789 (all parts) Evaluation of aging of paint and varnish coatings - Identification of the number and size of defects and the degree of uniformity of appearance changes.

[ISO 4628 (all parts)] Note. GB/T 10123-2022 Corrosion terminology for metals and alloys (ISO 8044:2020, IDT) ISO 9223 Corrosion of metals and alloys - Atmospheric corrosivity - Part 1: Classification, determination and evaluation Note. GB/T 19292.1-2018 Corrosion of metals and alloys - Atmospheric corrosivity - Part 1: Classification, determination and evaluation (ISO 9223:2012, IDT)

3 Terms and Definitions

The terms and definitions defined in ISO 4618, ISO 4628 (all parts), ISO 8044 and ISO 9223, as well as the following terms and definitions, apply to this document.

document.

A device for measuring corrosion by measuring the ratio of the potential difference across a conductor to the current flowing through it.

Note: In ISO 15091:2019, 3.1 defines resistance as the ratio of the voltage difference across a conductor to the current flowing through it.

Corrosion measurement devices involving anodic and cathodic reactions.