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

*Corrosion des métaux et alliages — Corrosivité des atmosphères —  
Classification, détermination et estimation*





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ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

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## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 9223 was prepared by Technical Committee ISO/TC 156, *Corrosion of metals and alloys*.

This second edition cancels and replaces the first edition (ISO 9223:1992), which has been technically revised.

## Introduction

Metals, alloys and metallic coatings can suffer atmospheric corrosion when their surfaces are wetted. The nature and rate of the attack depends upon the properties of surface-formed electrolytes, particularly with regard to the level and type of gaseous and particulate pollutants in the atmosphere and to the duration of their action on the metallic surface.

The character of the corrosion attack and the corrosion rate are consequences of the corrosion system, which comprises the metallic materials, the atmospheric environment, technical parameters and operation conditions.

The corrosivity category is a technical characteristic which provides a basis for the selection of materials and protective measures in atmospheric environments subject to the demands of the specific application, particularly with regard to service life.

Data on the corrosivity of the atmosphere are essential for the development and specification of optimized corrosion protection for manufactured products.

The corrosivity categories are defined by the first-year corrosion effects on standard specimens as specified in ISO 9226. The corrosivity categories can be assessed in terms of the most significant atmospheric factors influencing the corrosion of metals and alloys.

The measurement of relevant environmental parameters is specified in ISO 9225.

The ways of determining and estimating the corrosivity category of a given location according to this International Standard and the relationships among them are presented in Figure 1. It is necessary to distinguish between corrosivity determination and corrosivity estimation. It is also necessary to distinguish between corrosivity estimation based on application of a dose-response function and that based on comparison with the description of typical atmospheric environments.

This International Standard does not take into consideration the design and mode of operation of the product, which can influence its corrosion resistance, since these effects are highly specific and cannot be generalized. Steps in the choice of optimized corrosion protection measures in atmospheric environments are defined in ISO 11303.

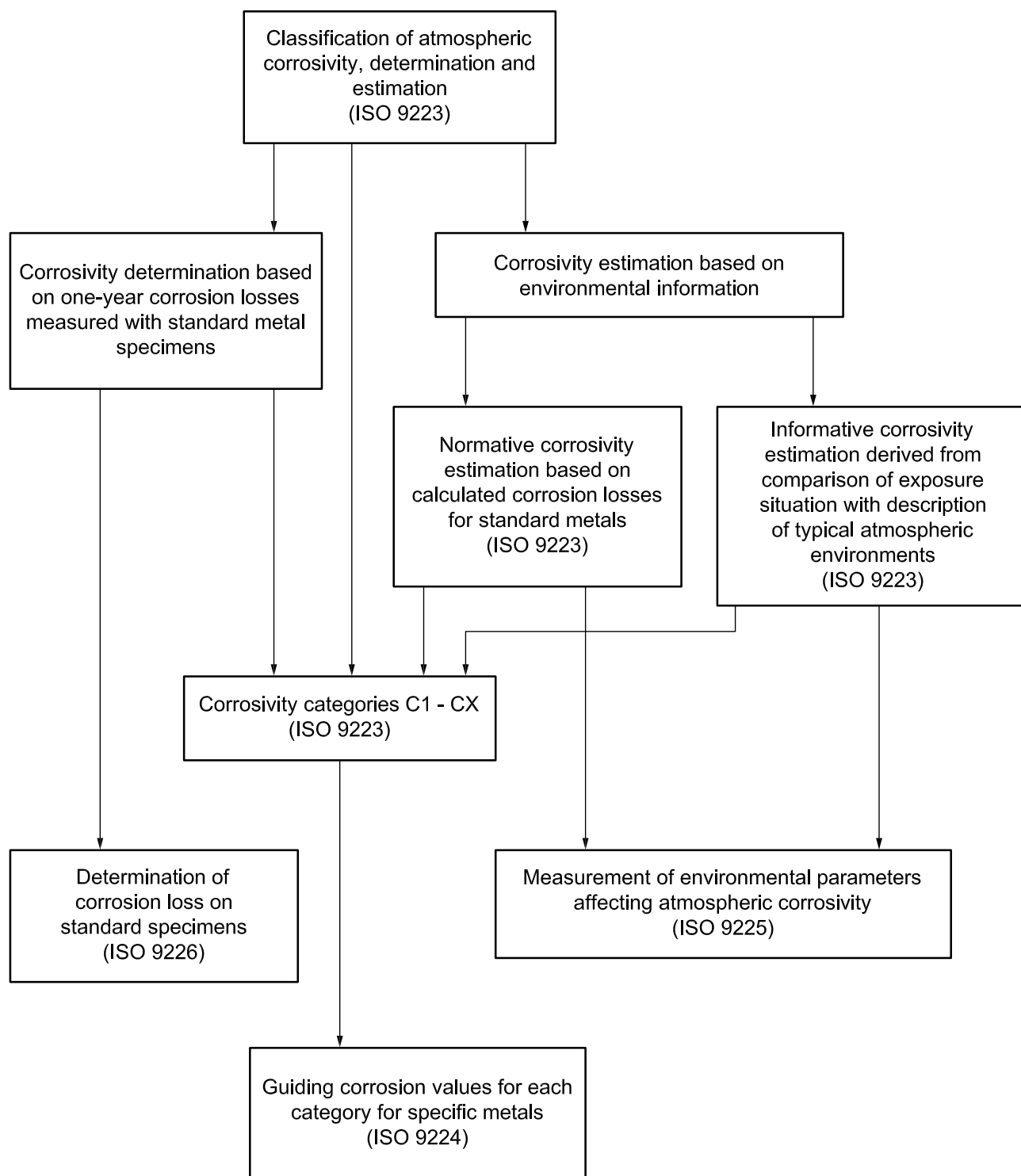


Figure 1 — Classification of atmospheric corrosivity

# Corrosion of metals and alloys — Corrosivity of atmospheres — Classification, determination and estimation

## 1 Scope

This International Standard establishes a classification system for the corrosivity of atmospheric environments. It

- defines corrosivity categories for the atmospheric environments by the first-year corrosion rate of standard specimens,
- gives dose-response functions for normative estimation of the corrosivity category based on the calculated first-year corrosion loss of standard metals, and
- makes possible an informative estimation of the corrosivity category based on knowledge of the local environmental situation.

This International Standard specifies the key factors in the atmospheric corrosion of metals and alloys. These are the temperature-humidity complex, pollution by sulfur dioxide and airborne salinity.

Temperature is also considered an important factor for corrosion in areas outside the temperate macroclimatic zone. The temperature-humidity complex can be evaluated in terms of time of wetness. Corrosion effects of other pollutants (ozone, nitrogen oxides, particulates) can influence the corrosivity and the evaluated one-year corrosion loss, but these factors are not considered decisive in the assessment of corrosivity according to this International Standard.

This International Standard does not characterize the corrosivity of specific service atmospheres, e.g. atmospheres in chemical or metallurgical industries.

The classified corrosivity categories and introduced pollution levels can be directly used for technical and economical analyses of corrosion damage and for a rational choice of corrosion protection measures.

## 2 Normative references

The following referenced documents are indispensable for the application 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 9224, *Corrosion of metals and alloys — Corrosivity of atmospheres — Guiding values for the corrosivity categories*

ISO 11844-1, *Corrosion of metals and alloys — Classification of low corrosivity of indoor atmospheres — Part 1: Determination and estimation of indoor corrosivity*

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