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Corrosion of metals and alloys — General principles for corrosion testing

*Corrosion des métaux et alliages — Principes généraux des essais de
corrosion*



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Foreword

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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.

International Standard ISO 11845 was prepared by Technical Committee ISO/TC 156, *Corrosion of metals and alloys*.

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Introduction

The existence of a wide range of corrosion tests, partly as a function of the various materials and corrosive media in existence, calls for guidance in the general procedures which should be utilized. Corrosion tests, if they are to evaluate and give comparable results, must be carried out according to established conditions. Conditions deviating from these must be precisely quoted, taking into account all the details given in this International Standard. The most relevant results on corrosion behaviour of metals can normally be obtained from long term tests under conditions close to those obtained in practice.

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Corrosion of metals and alloys — General principles for corrosion testing

1 Scope

1.1 This International Standard contains the most important general guidelines for carrying out corrosion tests under conditions of constant immersion. However some of these general principles may also be applicable to other types of corrosion testing.

1.2 This International Standard does not cover important procedures for stress corrosion testing such as those given in ISO 7539. (See annex A.)

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 8407:1991, *Corrosion of metals and alloys — Removal of corrosion products from corrosion test specimens*.

3 General principles

3.1 Corrosion tests are generally carried out as comparative tests, i.e. a number of materials or corrosive media are compared under the given test conditions. It is, however, also advisable to include reference materials or reference solutions whose behaviour under practical conditions of attack are known. It is important to have a clear understanding of the objectives of any corrosion testing programme and to

make a judicious choice of the most practical methods in order to evaluate corrosion damage.

3.2 During the tests, the degree of attack as a function of time is observed and, as far as possible, quantitatively recorded. The objective of most types of testing should be to determine the state of the specimens on more than three separate occasions apart from the start of the test. The duration of tests should be such that, on completion of the test, a clear result is obtained concerning the behaviour of the material and, where applicable, the reference material under the given test conditions. If necessary, additional tests extending beyond the time originally planned may be required.

3.3 Because results often exhibit considerable scatter, a single value provides little useful information. For this reason, whenever possible, every test result should be verified by taking the mean of at least three tests per measurement point. For this purpose, each specimen should be used only once.

3.4 The test conditions should, as far as possible, be matched to the practical conditions under which the material and the corrosive media will be used, except for short-duration tests as detailed in 3.5. This applies:

- a) to the material, in relation to its shape, surface condition, grain structure, etc., for details see clause 4;
- b) to the corrosive medium, in relation to concentration, temperatures, etc., for details see clause 9).

3.5 In the case of short-duration corrosion tests, the object is to achieve usable results in the shortest possible time by intensifying the attack conditions.