



Standard Guide for Conducting Corrosion Tests in Field Applications¹

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1. Scope

1.1 This guide covers procedures for conducting corrosion tests in plant equipment or systems under operating conditions to evaluate the corrosion resistance of engineering materials. It does not cover electrochemical methods for determining corrosion rates.

1.1.1 While intended primarily for immersion tests, general guidelines provided can be applicable for exposure of test specimens in plant atmospheres, provided that placement and orientation of the test specimens is non-restrictive to air circulation.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* See also 10.4.2.

2. Referenced Documents

2.1 ASTM Standards:²

A262 Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels

E3 Guide for Preparation of Metallographic Specimens

G1 Practice for Preparing, Cleaning, and Evaluating Corrosion Test Specimens

G15 Terminology Relating to Corrosion and Corrosion Testing (Withdrawn 2010)³

G16 Guide for Applying Statistics to Analysis of Corrosion Data

G30 Practice for Making and Using U-Bend Stress-Corrosion Test Specimens

G36 Practice for Evaluating Stress-Corrosion-Cracking Resistance of Metals and Alloys in a Boiling Magnesium Chloride Solution

G37 Practice for Use of Mattsson's Solution of pH 7.2 to Evaluate the Stress-Corrosion Cracking Susceptibility of Copper-Zinc Alloys

G41 Practice for Determining Cracking Susceptibility of Metals Exposed Under Stress to a Hot Salt Environment

G44 Practice for Exposure of Metals and Alloys by Alternate Immersion in Neutral 3.5 % Sodium Chloride Solution

G46 Guide for Examination and Evaluation of Pitting Corrosion

G47 Test Method for Determining Susceptibility to Stress-Corrosion Cracking of 2XXX and 7XXX Aluminum Alloy Products

G58 Practice for Preparation of Stress-Corrosion Test Specimens for Weldments

G78 Guide for Crevice Corrosion Testing of Iron-Base and Nickel-Base Stainless Alloys in Seawater and Other Chloride-Containing Aqueous Environments

2.2 NACE Standard:⁴

RP0497 Field Corrosion Evaluation Using Metallic Test Specimens

3. Significance and Use

NOTE 1—This guide is consistent with NACE Standard RP0497.

3.1 Observations and data derived from corrosion testing are used to determine the average rate of corrosion or other types of attack, or both (see Terminology G15), that occur during the exposure interval. The data may be used as part of an evaluation of candidate materials of construction for use in similar service or for replacement materials in existing facilities.

3.2 The data developed from in-plant tests may also be used as guide lines to the behavior of existing plant materials for the purpose of scheduling maintenance and repairs.

3.3 Corrosion rate data derived from a single exposure generally do not provide information on corrosion rate change

¹ This guide is under the jurisdiction of ASTM Committee G01 on Corrosion of Metals and is the direct responsibility of Subcommittee G01.14 on Corrosion of Metals in Construction Materials.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from NACE International (NACE), 1440 South Creek Dr., Houston, TX 77084-4906, <http://www.nace.org>.