Designation: G 48 – 03

Standard Test Methods for Pitting and Crevice Corrosion Resistance of Stainless Steels and Related Alloys by Use of Ferric Chloride Solution[1]

This standard is issued under the fixed designation G 48; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 These test methods cover procedures for the determination of the resistance of stainless steels and related alloys to pitting and crevice corrosion (see Terminology G 15) when exposed to oxidizing chloride environments. Six procedures are described and identified as Methods A, B, C, D, E, and F.

1.1.1 *Method A*—Ferric chloride pitting test.

1.1.2 *Method B*—Ferric chloride crevice test.

1.1.3 *Method C*—Critical pitting temperature test for nickel-base and chromium-bearing alloys.

1.1.4 *Method D*—Critical crevice temperature test for nickel-base and chromium-bearing alloys.

1.1.5 *Method E*—Critical pitting temperature test for stainless steels.

1.1.6 *Method F*—Critical crevice temperature test for stainless steels.

1.2 Method A is designed to determine the relative pitting resistance of stainless steels and nickel-base, chromium-bearing alloys, whereas Method B can be used for determining both the pitting and crevice corrosion resistance of these alloys. Methods C, D, E and F allow for a ranking of alloys by minimum (critical) temperature to cause initiation of pitting corrosion and crevice corrosion, respectively, of stainless steels, nickel-base and chromium-bearing alloys in a standard ferric chloride solution.

1.3 These tests may be used to determine the effects of alloying additives, heat treatment, and surface finishes on pitting and crevice corrosion resistance.

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

1.5 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*

A 262 Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels[2]

D 1193 Specification for Reagent Water[3]

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method[4]

E 1338 Guide for the Identification of Metals and Alloys in Computerized Material Property Databases[5]

G 1 Practice for Preparing, Cleaning, and Evaluating Corrosion Test Specimens[6]

G 15 Terminology Relating to Corrosion and Corrosion Testing[6]

G 46 Guide for Examination and Evaluation of Pitting Corrosion[6]

G 107 Guide for Formats for Collection and Compilation of Corrosion Data for Metals for Computerized Database Input[6]

3. Terminology

3.1 *Definition of Terms Specific to This Standard:*

3.1.1 *critical crevice temperature*, *n*—the minimum temperature (°C) to produce crevice attack at least 0.025-mm (0.001-in.) deep on the bold surface of the specimen beneath the crevice washer, edge attack ignored.

3.1.2 *critical pitting temperature*, *n*— the minimum temperature (°C) to produce pitting attack at least 0.025-mm (0.001-in.) deep on the bold surface of the specimen, edge attack ignored.

3.2 The terminology used herein, if not specifically defined otherwise, shall be in accordance with Terminology G 15.

[1] These test methods are under the jurisdiction of ASTM Committee G01 on Corrosion of Metals, and are the direct responsibility of Subcommittee G01.05 on Laboratory Corrosion Tests.

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[2] *Annual Book of ASTM Standards*, Vol 01.03.

[3] *Annual Book of ASTM Standards*, Vol 11.01.

[4] *Annual Book of ASTM Standards*, Vol 14.02.

[5] *Annual Book of ASTM Standards*, Vol 02.05.

[6] *Annual Book of ASTM Standards*, Vol 03.02.

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