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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Test Method for Corrosion Resistance of Ferrous Metal Fastener Assemblies Used in Roofing and Waterproofing¹

This standard is issued under the fixed designation D 6294; 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 This test method covers components of ferrous metal fastener assemblies, excluding those of stainless steel, such as fasteners, stress plates, and batten bars used in low slope roofing and waterproofing, to a sulfurous acid environment. This test method evaluates relative corrosion resistance of the components by determination of percentage of rust or white rust.

1.2 The components may or may not have a surface treatment applied.

1.3 A limiting factor is the subjectiveness when determining actual percentage of rust or white rust corrosion.

1.4 Other performance characteristics of ferrous metal components such as abrasion resistance of barrier coatings are not evaluated in this method.

1.5 This test method was developed based on Practice G 87.

1.6 The values stated in SI units are to be regarded as the standard. The inch-pound values given in parentheses may be approximate, and are presented for information purposes.

1.7 *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:

D 16 Terminology Relating to Paint, Varnish, Lacquer, and Related Products²

D 1079 Terminology Relating to Roofing, Waterproofing, and Bituminous Materials³

G 15 Definitions of Terms Relating to Corrosion and Corrosion Testing⁴

G 87 Practice for Conducting Moist SO₂ Tests⁴

3. Terminology

3.1 Definitions:

¹ This test method is under the jurisdiction of ASTM Committee D-8 on Roofing, Waterproofing and Bituminous Materials and is the direct responsibility of Subcommittee D08.20 on Roofing Membrane Systems.

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² Annual Book of ASTM Standards, Vol 06.01.

³ Annual Book of ASTM Standards, Vol 04.04.

⁴ Annual Book of ASTM Standards, Vol 03.02.

3.1.1 For definitions of terms used in this method, see Terminology D 1079 and Definitions G 15 and Terminology D 16.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *barrier*—any material limiting passage through itself of solids, liquids, semi-solids, gases, vapors, or forms of energy such as ultraviolet light.

3.2.2 *surface treatment*—a process by which the surface of the ferrous metal component is treated with a barrier coating to inhibit corrosion. Examples of barrier coatings for ferrous metal components include galvanization, zinc plating with or without yellow or clear chromate sealer, cadmium, mechanical zinc plating and organic or inorganic polymers.

4. Summary of Test Method

4.1 This test method exposes ferrous metal specimens to 15 or 30 (24) h cycles consisting of the following:

4.1.1 Eight (8) h exposure to the sulfur dioxide atmosphere in a closed chamber.

4.1.2 An intermediate step of rinsing with distilled water, and

4.1.3 Sixteen (16) h of drying under vented conditions at controlled temperature and humidity.

4.2 After drying, the test specimens are visually examined to evaluate the percentage of rust or white rust that formed on the surface.

4.3 The total surface area of the components exposed in the chamber is $0.5 \pm 0.1 \text{ m}^2$ ($775 \pm 155 \text{ in.}^2$).

5. Significance and Use

5.1 It is important to evaluate the corrosion resistance of ferrous metal components used in low-slope roofing and waterproofing because they provide integrity and securement of other system components, such as insulation and membranes. Corrosion of ferrous metal components may result in their early deterioration and may lead to roofing or waterproofing system failure.

5.2 Results from testing ferrous metal components in an acidic atmosphere serve as an indication of the relative corrosion resistance of such components, coated or uncoated, to the environment of the test chamber. The results are not to be construed as a general guideline to the corrosion resistance of such components in other environments or in usage that may be conducive to corrosion.