



Standard Guide for Accelerated Corrosion Testing for Mechanical Fasteners¹

This standard is issued under the fixed designation F2832; 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 guide covers test procedures for performing accelerated tests to evaluate relative corrosion resistance of various coatings applied to mechanical fasteners. Corrosion mechanisms such as general and crevice corrosion may be evaluated with this method. Test duration may be selected to achieve any desired level of corrosion exposure and provides a frame of reference to determine relative coating resistance to corrosion. Fasteners tightened to a desired tension and subjected to this test procedure may be evaluated to simulate a variety of service conditions. Without large amounts of accumulated field results, it is difficult to relate test duration or the number of test cycles to actual service life for a given application.

1.2 This standard is not intended to cover tests of driven fasteners such as nails, staples, screws and lag bolts.

1.3 *Units*—The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *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:²

A480/A480M Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip

B117 Practice for Operating Salt Spray (Fog) Apparatus

B605 Specification for Electrodeposited Coatings of Tin-Nickel Alloy

D1193 Specification for Reagent Water

F1470 Practice for Fastener Sampling for Specified Mechanical Properties and Performance Inspection

F1789 Terminology for F16 Mechanical Fasteners

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

2.2 ASME Standard:³

ASME B18.12 – Glossary of Terms for Mechanical Fasteners

2.3 IFI Standards⁴

IFI-170 –Accelerated Corrosion Test for Mechanical Fasteners

3. Terminology

3.1 Definitions for many of the terms used in this standard are included in Terminology **F1789** and ASME B18.12.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *cycle*—a series of events scheduled over a 24-hour period

3.2.2 *phase*—a test period which has elapsed for 8 cycles.

3.2.3 *test duration*—a series of cycles as defined in Section 4.

4. Test Duration

4.1 Test duration is specified as A, B, C, D or E in accordance with **Table 1**.

4.2 A typical cycle is shown in **Table 2**.

5. Apparatus and Materials

5.1 Coupons 25.4 mm wide and 50.8 mm long having a thickness selected from **Table 3** shall be used. Dimensional tolerances of Specification **A480/A480M** shall apply. Coupons shall have a plain finish and be manufactured from AISI-1008 steel grade. Coupons shall be included with fasteners to be tested to verify that uniform amounts of corrosion have been produced by tests. Refer to **Fig. 1**, **Fig. 1 (a)** and **Fig. 1(b)** and **Table 3**. Inclusion of a metal loss coupon assists in making

¹ This guide is under the jurisdiction of ASTM Committee **F16** on Fasteners and is the direct responsibility of Subcommittee **F16.01** on Test Methods.

Current edition approved Sept. 1, 2016. Published September 2016. Originally approved in 2011. Last previous edition approved in 2011 as F2832– 11. DOI: 10.1520/F2832–11

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 Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Two Park Ave., New York, NY 10016-5990, <http://www.asme.org>.

⁴ Available from Industrial Fasteners Institute (IFI), 6363 Oak Tree Blvd. Independence, OH 44131 <http://www.indfast.org>.