



Standard Test Methods for Strength of Anchors in Concrete Elements¹

This standard is issued under the fixed designation E488/E488M; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 These test methods address the tensile and shear strengths of post-installed and cast-in-place anchors in test members made of cracked or uncracked concrete. Loadings include quasi-static, seismic, fatigue and shock. Environmental exposures include freezing and thawing, moisture, decreased and elevated temperatures and corrosion. These test methods provide basic testing procedures for use with product-specific evaluation and acceptance standards and are intended to be performed in a testing laboratory. Product-specific evaluation and acceptance standards may add specific details and appropriate parameters as needed to accomplish the testing. Only those tests required by the specifying authority need to be performed.

1.2 These test methods are intended for use with post-installed and cast-in-place anchors designed for installation perpendicular to a plane surface of a test member.

1.3 This standard prescribes separate procedures for static, seismic, fatigue and shock testing. Nothing in this standard, however, shall preclude combined tests incorporating two or more of these types of loading (such as seismic, fatigue and shock tests in series).

1.4 Both inch-pound and SI units are provided in this standard. The testing may be performed in either system and reported in that system and the results converted to the other. However, anchor diameters, threads, and related testing equipment shall be in accordance with either inch-pound or SI provisions.

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:²

- C31/C31M Practice for Making and Curing Concrete Test Specimens in the Field
- C33/C33M Specification for Concrete Aggregates
- C39/C39M Test Method for Compressive Strength of Cylindrical Concrete Specimens
- C42/C42M Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
- C150/C150M Specification for Portland Cement
- C330/C330M Specification for Lightweight Aggregates for Structural Concrete
- E4 Practices for Force Verification of Testing Machines
- E8/E8M Test Methods for Tension Testing of Metallic Materials
- E468 Practice for Presentation of Constant Amplitude Fatigue Test Results for Metallic Materials
- E575 Practice for Reporting Data from Structural Tests of Building Constructions, Elements, Connections, and Assemblies
- E631 Terminology of Building Constructions
- E2265 Terminology for Anchors and Fasteners in Concrete and Masonry
- F606/F606M Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, Direct Tension Indicators, and Rivets
- F1624 Test Method for Measurement of Hydrogen Embrittlement Threshold in Steel by the Incremental Step Loading Technique
- G5 Reference Test Method for Making Potentiodynamic Anodic Polarization Measurements

2.2 ANSI Standards:³

- ANSI B212.15 American National Standard for Cutting Tools—Carbide-Tipped Masonry Drills and Blanks for Carbide-Tipped Masonry Drills

¹ These test methods are under the jurisdiction of ASTM Committee E06 on Performance of Buildings and are the direct responsibility of Subcommittee E06.13 on Structural Performance of Connections in Building Construction.

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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 Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.