



Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical- Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes¹

This standard is issued under the fixed designation C580; 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 This test method covers the determination of flexural strength and modulus of elasticity in flexure of cured chemical-resistant materials in the form of molded rectangular beams. These materials include mortars, brick and tile grouts, structural grouts, machinery grouts, monolithic surfacings (60 mils or greater), and polymer concretes. These materials shall be based on resin, silicate, silica, or sulfur binders.

1.2 A bar of rectangular cross section is tested in flexure as a simple beam in center point loading: the bar rests on two supports and the load is applied by means of a loading nose midway between supports.

1.3 Method A outlines the testing procedure generally used for systems containing aggregate less than 0.2 in. (5 mm) in size. Method B covers the testing procedure generally used for systems containing aggregate from 0.2 to 0.4 in. (10 mm) in size. Method C is used for systems containing aggregate larger than 0.4 in.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

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.*

¹ This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.46 on Industrial Protective Coatings.

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2. Referenced Documents

2.1 ASTM Standards:²

C904 Terminology Relating to Chemical-Resistant Nonmetallic Materials

C1312 Practice for Making and Conditioning Chemical-Resistant Sulfur Polymer Cement Concrete Test Specimens in the Laboratory

E4 Practices for Force Verification of Testing Machines

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, see Terminology C904.

4. Significance and Use

4.1 This test method is generally applicable to rigid and semirigid materials. Although flexural strength cannot be determined for those materials that do not break, tangent modulus of elasticity can be determined.

4.2 The results obtained by this test method should serve as a guide in, but not as the sole basis for, selection of a chemical-resistant material for a particular application. No attempt has been made to incorporate into this test method all the various factors that may affect the performance of a material when subjected to actual service.

4.3 In addition to the tangent modulus of elasticity, a secant modulus is calculated at the point on the stress-strain (load-deflection) graph where the strain is 50 % of the maximum strain.

5. Apparatus

5.1 *Weighing Equipment*, shall be capable of weighing materials or specimens to ± 0.3 % accuracy.

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.