



Standard Test Methods for Compressive Creep of Chemical-Resistant Polymer Machinery Grouts¹

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1. Scope

1.1 These test methods cover a quantitative, comparative test for compressive creep of chemical-resistant grouting materials under a sustained load at a test temperature. Constant load is maintained using a bolt and spring washers. Measurements are made at laboratory temperature after exposure periods at the selected test temperature.

1.2 Test Method A outlines the molding techniques for an unbonded test specimen. Test Method B covers the molding techniques for a bonded test specimen.

1.3 *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.*

1.4 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:

C 904 Terminology Relating to Chemical-Resistant Non-metallic Materials²

E 4 Practices for Force Verification of Testing Machines³

3. Terminology

3.1 **Definitions**—For definitions of terms used in these test methods, see Terminology C 904.

4. Significance and Use

4.1 These test methods provide a means of measuring the total compressive deflection of chemical-resistant, machinery-grout materials under a sustained load at the test temperature. Test stress and temperature can be selected to simulate anticipated use conditions. For the purposes of these tests, creep is

considered to be the compressive deflection in inches per inch, which occurs after the initial loading of the specimen at laboratory temperature. *The results do not necessarily correlate for different specimen thicknesses.* No correlation has been established to actual-use conditions.

5. Apparatus

5.1 **Steel Loading Plates**—Steel plates, as described, are used for loading the grout during the test. They may, also, be part of the mold used to cast the grout specimen.

5.1.1 Two steel plates are required for each test specimen. The plates shall be 4¼ to 5 in. (11 to 13 cm) square by 1 in. (25 mm) thick. A 1½-in. (30-mm) diameter hole shall be drilled in the center of the plates. The edges of the plates and holes shall be deburred.

5.1.2 One of the steel plates shall have four ¼-in. (6-mm) measuring holes (one in each corner) with the center ½ in. (13 mm) in from each edge.

5.2 **Bolt Assembly**—A 1-in. (24-mm) diameter by 7.5 in. (19 cm) long, high-strength steel bolt, and nut, flat washers, and spring washers are used to maintain the test load.

5.3 **Belleville Spring Washers**—Four washers are required for each test. These shall be high carbon steel with dimensions of 1⅞ by 2¼ in. (5.7 by 6.0 cm) outside diameter by 0.159-in. (4.0-mm) thickness, with 0.039-in. (1.0-mm) dish. These washers will have an approximate spring rate of 153 000 lb/in. (27 300 kg/cm) and a rated load of 5793 lb (2630 kg) when flattened.

5.4 **Grout Mold**, suitable to cast the 4-in. (10-cm) diameter by 2 in. $\pm$ 0.1 in. (5 cm) thick grout specimen with a 1½-in. diameter center hole as shown in Fig. 1. The faces must be parallel to within 0.030 in. (0.75 mm) over the 4-in. diameter specimen contact area (see 5.3). The mold may utilize the steel loading plates.

5.4.1 For the bonded method, the plates are used as mold end plates.

5.5 **Compression Machine or Apparatus**, capable of applying the test load to within ± 2.0 %.

5.6 **Depth Micrometer**, readable to 0.0001 in. (2.5 μ) with adjustable shaft length capable of reading approximately 3-in. (7.6-cm) depth.

5.7 **Indicating Caliper**, readable to 0.001 in. (25 μ).

¹ These test methods are under the jurisdiction of ASTM Committee C03 on Chemical-Resistant Nonmetallic Materials and are the direct responsibility of Subcommittee C03.01 on Test Methods.

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² *Annual Book of ASTM Standards*, Vol 04.05.

³ *Annual Book of ASTM Standards*, Vol 03.01.