



Standard Test Method for Creep Relaxation of Laminated Composite Gasket Materials¹

This standard is issued under the fixed designation F1276; 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 provides a means of measuring the amount of creep relaxation of a laminated composite gasket material at a predetermined time after a compressive stress has been applied.

1.2 Creep relaxation is measured by means of a calibrated bolt with dial indicator.

1.3 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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

A193/A193M Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications

B637 Specification for Precipitation-Hardening and Cold Worked Nickel Alloy Bars, Forgings, and Forging Stock for Moderate or High Temperature Service

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

F38 Test Methods for Creep Relaxation of a Gasket Material

F104 Classification System for Nonmetallic Gasket Materials

F868 Classification for Laminated Composite Gasket Materials

2.2 ASTM Adjuncts:

Relaxometer, Method B (Adjunct to Test Method **F38**)³

3. Summary of Test Method

3.1 In this test method, the specimen is subjected to a compressive stress between two platens, with the stress applied by a nut and bolt. Run at room or elevated temperatures, the stress is determined by measuring the change in length of the calibrated bolt with a dial indicator. The bolt length is measured at the beginning of the test and at the end of the test. The percent relaxation is calculated from this.

4. Significance and Use

4.1 This test method is designed to compare related materials under controlled conditions and their ability to maintain a given compressive stress as a function of time. A portion of the torque loss on the bolted flange is a result of creep relaxation. Torque loss can also be caused by elongation of the bolts, distortion of the flanges, and vibration; therefore, the results obtained should be correlated with field results. This test method may be used as a routine test when agreed upon between the user and the producer.

5. Apparatus

5.1 *Relaxometer*,⁴ composed of two platens, special drilled and calibrated bolt, washer and nut composed of Specification **A193/A193M** Grade B7 or Specification **B637** Grade UNS N07718, or other alloys of construction that would satisfy the calibration Procedure (see Annex) for the test temperature specified and a dial indicator assembly as shown in **Fig. 1**.

5.2 *Box End Wrench*.

5.3 *Steel Blanking Die*.

6. Test Specimens

6.1 Specimen size shall be 10.16 ± 0.381 mm (0.400 ± 0.015 in.) wide by 31.75 ± 0.381 mm (1.250 ± 0.015 in.) long.

¹ This test method is under the jurisdiction of ASTM Committee **F03** on Gaskets and is the direct responsibility of Subcommittee **F03.20** on Mechanical Test Methods.

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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 Detailed working drawings of this apparatus are available from ASTM Headquarters, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959 USA. Order Adjunct No. 12-600-381-00.

⁴ Dario P. Bernasconi, 40 Farrington St., Stoughton, MA 02072, and Donald G. Johnson, Metal Samples, P.O. Box 8, Munford, AL 36268, are suppliers of the relaxometer.