



Standard Test Method for Compressibility and Recovery of Laminated Composite Gasket Materials¹

This standard is issued under the fixed designation F 806; 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 covers determination of the short-time compressibility and recovery at room temperature of laminated composite gasket materials.

1.2 This test method is not intended as a test for compressibility under prolonged stress application, that is “creep,” or for recovery following such prolonged stress application, the inverse of which is generally referred to as “compression set.” Also, it is only intended for tests at room temperature.

1.3 The values stated in SI units are to be regarded as the standard. The inch-pound units 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:

F 104 Classification System for Nonmetallic Gasket Materials²

3. Significance and Use

3.1 This test method is designed to compare related laminated composite gasket materials under controlled conditions and their short-time compressibility and recovery at room temperature. It measures compressibility with a matched pair of opposing upper and lower penetrators which provide better precision and bias than methods using an upper penetrator and a lower anvil. It is difficult to prepare undistorted test specimens from laminated composite gasket materials which will lay flat on an anvil. Also, with many composites having rigid inner layers the load on the upper penetrator is distributed over the bottom anvil area resulting in a lower than actual compressibility reading. This test method may be used as a routine test method when agreed upon between the purchaser and the producer.

¹ This test method is under the jurisdiction of ASTM Committee F-3 on Gaskets and is the direct responsibility of Subcommittee F03.20 on Mechanical Test Methods.

Current edition approved July 10, 1999. Published August 1999. Originally published as F 806 – 83. Last previous edition F 806 – 99.

² *Annual Book of ASTM Standards*, Vol 09.02.

4. Apparatus³

4.1 The testing machine⁴ shall consist of the following components.

4.1.1 *Penetrators*— A matched pair of opposing steel cylinders (within ± 0.025 mm (0.001 in.)) specified for the type of material being tested, with the cylinder ends hardened and ground. Penetrator diameters for various types of laminated composite gasket materials are shown in Table 1.

4.1.2 *Dial*—An indicating dial, or dials, graduated in 0.025 mm (0.001 in.) to show the thickness of the specimen during the test. Readings shall be estimated to the nearest 0.0025 mm (0.0001 in.).

4.1.3 *Preload*, shall include the weight of the penetrator itself and added weights to give the value specified within ± 1 %. A 22.2-N (5-lbf) preload shall be used.

4.1.4 *Loading Device*— A device for applying a specified major load to the upper end of the penetrator, which may consist of an arrangement of dead weights, a hydraulic cylinder, an air cylinder, or any other device capable of applying the major load at a slow uniform rate and to an accuracy of ± 1 %. The major load shall be in addition to the specified preload. Major loads for various types of laminated composite gasket materials are shown in Table 1.

5. Test Specimen

5.1 The test specimen may be either circular or rectangular in shape. The minimum size shall be 12.7 mm (0.5 in.) larger than the penetrator diameter being used, and the maximum size shall be 38.1 mm (1.5 in.) larger than it. The thickness shall be that of the laminated composite gasket. Take care that the specimen is flat, especially around the planned contact point of the opposing penetrators.

6. Conditioning

6.1 When all nonmetallic layers of the laminated composite are the same type, condition in accordance with that type as shown in Table 1.

6.2 When the nonmetallic layers of the laminated composite are of different types, the specimen shall be conditioned for 22 h in a controlled-humidity room or in a closed chamber of air

³ Blueprints are available from ASTM Headquarters. Order PCN-12-608060-20.

⁴ A list of recommended suppliers, by Subcommittee F03.20, is available through ASTM.