Designation: F 1888 – 02

An American National Standard

Test Method for Compression-Displacement of Baseballs and Softballs[1]

This standard is issued under the fixed designation F 1888; 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 describes a comparative measurement method for baseballs and softballs as defined by a static compression displacement test.

1.2 This test method is based on a slow rate force-displacement measurement.

1.3 This procedure is for baseballs and softballs meeting standards established by the sports' governing bodies.

NOTE 1—Since the compression-displacement of baseballs and softballs can influence the performance characteristics, this test provides a simple method to compare and categorize such balls based on force levels in a standardized compression-displacement test.

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. Terminology

2.1 *Definitions of Terms Specific to This Standard:*

2.1.1 *baseballs and softballs*, *n*—any such ball defined by the rules of the game as published by the sports' governing bodies.

2.1.2 *compression-displacement*, *n*—the reduction in ball diameter under a specified compressive load between two flat plates. Synonymous with *compression-deflection*.

2.1.3 *force*, *n*—the resistance to displacement. The interaction between test machine and ball during compression.

3. Summary of Test Method

3.1 The baseball or softball is placed between two flat-plate surfaces of a compression machine and then compressed to a standard displacement of 6.35-mm (0.25-in.). The compression load (force) applied at the standard displacement is recorded.

4. Significance and Use

4.1 The static compression-displacement of a baseball or softball is a mechanical property which can correlate to dynamic properties.

4.2 This test method is suitable for obtaining data in research and development, quality control, and classifying balls by the compression-displacement.

4.3 Sports associations can use compression-displacement standards in specifications for official baseballs and softballs standards in specifications for official baseballs and softballs for purposes of consistency of performance.

4.4 This same test procedure can be utilized with other compressive forces and the specified force is not necessarily the same as experienced in actual use.

5. Apparatus

5.1 *Compression Device*, to compress the test ball between two flat plates to 6.35 mm (0.25 in.) displacement. Compressive force to 3560 N (800 lb) is sufficient. A means of centering the test ball so that the vertical axis of the ball aligns with the vertical axis of the compression device piston.

5.2 *Compression Force Gage*, to measure the compressive load in newtons or pounds. Device must be able to measure at least 4448 N (1000 lb).

5.3 *Compression-Displacement Gage*, to measure the displacement at the prescribed level of 6.35 mm (0.25 in.).

5.4 *Motor, Drive, and Speed Control*, to drive the compression device to 6.35 mm (0.25 in.) displacement in a time of 12 to 18 s at a constant rate.

6. Conditioning

6.1 *Ball Conditioning*:

6.1.1 Store test balls at the test environmental conditions for at least 24 h prior to testing.

6.1.2 Maintain test environment temperature at 22 ± 2°C (72 ± 4°F).

6.1.3 Maintain test environment relative humidity at 50 ± 10 %.

6.2 *Test Room Conditions*:

6.2.1 Maintain test room temperature at 22 ± 2°C (72 ± 4°F).

[1] This test method is under the jurisdiction of ASTM Committee F08 on Sports Equipment and Facilities and is the direct responsibility of Subcommittee F08.26 on Baseball and Softball Equipment and Facilities.

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6.2.2 Maintain test room relative humidity between 20 and 60 %.

7. Procedure

7.1 Orient the ball in the compression press to align the vertical axis of the ball with the vertical axis of the compressing piston, and orient the ball so that compression occurs between ball seams.

7.2 Activate the compression press until the upper plate is in contact with the ball with a 4.45-N (1-lb) preload for expected compression values less than 667.5 N (150 lb) ± 5 % and a 17.8-N (4-lb) preload for expected compression values greater than 667.5 N (150 lb) ± 5 % applied to the ball.

7.3 Set the compression displacement gage reading to zero.

7.4 Compress the ball to a displacement of 6.35 mm (0.25 in.) in 12 to 18 s at a constant rate and record the peak load force applied at that level of displacement.

7.5 Release the applied load, rotate the ball 90° and repeat 7.1-7.3.

NOTE 2—Depending on the materials of construction, the compression-displacement may change with repeated compressions. For this reason, the procedure is limited to two compressions, on two different axis of the test balls.

8. Calculation

8.1 Ball compression is calculated as the average of the two measured forces required to compress the test ball 6.35 mm (0.25 in.) on two different axis of the ball.

9. Precision and Bias

9.1 Precision and bias evaluations have not been conducted for this test method. When such data are available, a precision and bias section will be added.

10. Keywords

10.1 baseballs; compression-displacement; softballs