



Standard Test Method for Roundness of Glass Spheres¹

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1. Scope

1.1 This test method² covers the determination of the percent of true spheres in glass spheres used for retroreflective marking purposes and industrial uses.

1.2 This test method includes two procedures as follows:

1.2.1 *Procedure A*, in which the selected specimen is split into two size ranges or groups prior to separation into true spheres and irregular particles, and

1.2.2 *Procedure B*, in which the selected specimen is split into five size ranges or groups prior to separation.

1.2.3 In determining compliance with specification requirements, either Procedure A or Procedure B may be used. Where tests indicate failure to meet the specified percent of true spheres and irregular particles, the referee test shall be made in accordance with Procedure B.

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:*

E 11 Specification for Wire Cloth and Sieves for Testing Purposes³

3. Summary of Test Method

3.1 The glass particles are mechanically separated into true spheres and irregular particles by controlled vibration on a glass plate fixed at a predetermined slope.

4. Significance and Use

4.1 The roundness of glass spheres is one measurable aspect relating to their performance as a retroreflective media. The function of this test method is to measure the percent of true spheres as related to compliance with applicable specifications.

NOTE 1—This method has been used in other industrial areas outside the intended scope of this test method.

5. Apparatus (Fig. 1)

5.1 *Electrical Feeder-Vibrator*, upon which is mounted a smooth glass panel, 152.4 mm (6 in.) wide and 381 mm (15 in.) long.

5.2 *Hinged Base*, supporting the vibrator and panel in such a manner that the angle of slope of the glass panel with the horizontal may be varied and fixed in any predetermined position.

5.3 *Vibrator*—Means of varying the amplitude or strength of the vibrations transmitted to the glass panel, at a fixed frequency of 60 impulses per second.

5.4 *Feeding Device or Pan*, affixed to the glass panel in such a manner that the selected sample of glass may be evenly dropped at a uniform rate upon the glass panel, from various heights above the panel and at various points on the slope.

5.5 *Collecting Pans or Containers*, at either end of the sloping panel, in which to collect the spheres and irregular particles.

6. Selection of Specimen

6.1 Select a 50-g specimen of the glass spheres to be tested for roundness in one of the following ways:

6.1.1 By mechanically splitting a bag or other container of glass spheres, selected at random from the shipment to be tested, or

6.1.2 By grain or seed-rod selection from the container.

7. Procedure A

7.1 Sieve the selected specimen through a 300- μ m (No. 50) sieve (Note 2). Run the spheres retained on the sieve as one group, and run the spheres passing the sieve as a second group.

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 D01.44 on Traffic Coatings.

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² For information on the development of this test method, reference may be made to the paper by Keeley, A. E., "Roundness Testing of Glass Spheres," *ASTM Bulletin*, No. 174, May, 1951, p. 72.

³ *Annual Book of ASTM Standards*, Vol 14.02.