



Designation: D7233 – 08

Standard Test Method for Testing Fracture of Level Paintbrush Filaments¹

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1. Scope

1.1 This test method covers a procedure for determining the number of fractures present when paintbrush filaments are bent.

1.2 This method is applicable only to monofilaments with consistent longitudinal cross sectional dimensions commonly referred to as “level” filaments.

1.3 The values derived are in percent fractured filaments. For example, 2 fractured out of 18 filaments tested = $\frac{2}{18}$ or 11 %.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.5 *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. Summary of Test Method

2.1 Filaments are clamped in place and bent to a specific displacement. While bent and still in the fixture, they are evaluated for fracture by visually determining whether the filaments have cracked or been permanently deformed and will not recover to virtually straight filaments. (See Fig. 1 and Fig. 2).

3. Significance and Use

3.1 This method is intended to evaluate filaments for suitability of use in paintbrushes prior to manufacture. Filament fracture resistance is very important because paintbrushes are bent or flexed during painting and it is necessary that the filaments are not permanently deformed with usage.

4. Apparatus²

4.1 The apparatus for this method is shown in Fig. 3. Filaments are secured between two clamps. The handwheel on the front of the gauge is rotated to bring the ends of the filaments toward each other as measured by the dial indicator at the top of the gauge.

4.2 The device is very delicate and care should be used in its operation. To prevent instrument damage, the clamps must not be brought together closer than a reading of 0.750 in. (19.0 mm) on the dial indicator.

5. Sampling, Test Specimens and Test Units

5.1 Record the polymer type, filament size and filament cross-sectional shape.

5.2 The sample filaments shall be conditioned for one (1) h at $73.5 \pm 3.5^\circ\text{F}$ ($23.0 \pm 2.0^\circ\text{C}$) and 50 ± 5 % relative humidity.

5.3 The sample filaments shall be cut to a minimum of 1.5 in. (38.1 mm).

5.4 The distance between clamps on the test unit shall be 1.0 in. (25.4 mm) at a reading of 0.0 (zero deflection). (See Fig. 4.)

6. Procedure

6.1 Select three distinct sections of the bundle, box or lot of filaments to be evaluated. Do not include filaments from the perimeter of a bundle. Pull six (6) filaments from each section at equally dispersed intervals.

6.2 Set the clamps in a parallel horizontal position with the dial indicator set at 0.0 (zero deflection). (See Fig. 4.)

6.3 Place the six (6) filaments in the clamps. Be sure that no filament overlaps or is on top of another filament. Close clamps to secure.

6.4 Rotate the handwheel counterclockwise to deflect the filaments until the dial indicator reads 0.650 in. (16.5 mm) travel distance (see Fig. 5).

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 D01.61 on Paint Application Tools.

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² The sole source of supply of the assembled fracture gauge test device known to the committee at this time is T. S. Simms and Co., 33 Bridge Rd., St. John, New Brunswick, Canada. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.