



Designation: D 6867 – 03

# Standard Specification for Perfluoroalkoxy (PFA)-Fluoropolymer Tubing<sup>1</sup>

This standard is issued under the fixed designation D 6867; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification covers tubing produced from PFA Fluoropolymer resins which are cited in Specification D 3307. This document specifies tubing dimensional tolerances, tensile properties and related electrical properties as noted in the appropriate tables when tested in accordance with the methods cited in this specification. This specification is for virgin material only and does not address recycled material, as it is not appropriate for PFA tubing.

NOTE 1—Abbreviations are in accordance with Terminology D 1600.  
NOTE 2—There is no similar ISO standard.

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

1.3 The following safety hazards caveat pertains only to the test methods portion, Section 7, of this specification. *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 requirements prior to use.*

## 2. Referenced Documents

### 2.1 ASTM Standards:

- D 618 Practice for Conditioning Plastics for Testing<sup>2</sup>
- D 792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement<sup>2</sup>
- D 883 Terminology Relating to Plastics<sup>2</sup>
- D 1600 Terminology for Abbreviated Terms Relating to Plastics<sup>2</sup>
- D 1675 Test Method for Polytetrafluoroethylene Tubing<sup>3</sup>
- D 3307 Specification for Perfluoroalkoxy (PFA)-Fluorocarbon Molding and Extrusion Materials<sup>4</sup>
- D 4894 Specification for Polytetrafluoroethylene (PTFE) Granular Molding and Ram Extrusion Materials<sup>5</sup>

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.15 on Thermoplastic Materials.

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<sup>2</sup> Annual Book of ASTM Standards, Vol 08.01.

<sup>3</sup> Annual Book of ASTM Standards, Vol 10.01.

<sup>4</sup> Annual Book of ASTM Standards, Vol 08.02.

<sup>5</sup> Annual Book of ASTM Standards, Vol 08.03.

IEEE/ASTM SI 10 Standard for Use of the International System of Units (SI): The Modern Metric System<sup>6</sup>

## 3. Terminology

3.1 *Definitions*—Definitions are in accordance with Terminology D 883 unless otherwise specified.

3.1.1 *lot, n*—one continuous production run or a uniform blend of two or more production runs of one size sheet or molded basic shape.

## 4. Physical Requirements

4.1 The tubing shall be made of PFA-fluoropolymer resin meeting the requirements of Specification D 3307.

4.2 The inside diameter and wall thickness and tolerances of the tubing shall be as shown in Table 1, when determined in accordance with 7.1.3.1 and 7.1.3.2.

4.3 The specific gravity of the tubing shall be between 2.12 and 2.17 inclusive when determined in accordance with 7.1.4.

4.4 The tubing shall have a minimum tensile strength of 10.0 MPa [1500 psi] and a minimum elongation of 200 % when determined in accordance with 7.1.5.

4.5 The tubing shall remain free from cracks and exhibit no splitting when tested for dimensional stability in accordance with 7.1.6.

## 5. Sampling

5.1 Sampling shall be statistically adequate to satisfy the requirements of 8.2.

## 6. Number of Tests and Retests

6.1 One set of five test specimens shall be considered sufficient for testing each batch. The average result of the specimens tested shall conform to the requirements of this specification.

## 7. Test Methods

7.1 The properties enumerated in this specification shall be determined in accordance with the following methods.

7.1.1 *Conditioning*—Condition the test specimens at  $23 \pm 2^\circ\text{C}$  [ $73.4 \pm 3.6^\circ\text{F}$ ] for a period of at least 4 h prior to test. If the test material has been exposed to temperatures below  $20^\circ\text{C}$  within 24 h prior to test, the conditioning shall be for at least 24 h and as outlined in Practice D 618.

<sup>6</sup> Available from ASTM International Headquarters, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959.