



Designation: D7194 – 19 (Reapproved 2024)

Standard Specification for Aerospace Parts Machined from Polychlorotrifluoroethylene (PCTFE)¹

This standard is issued under the fixed designation D7194; 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 specification is intended to be a means of calling out finished machined parts ready for aerospace use. Such parts may also find use in selected commercial applications where there are clear benefits derived from the use of parts with high molecular weight, good molecular weight retention during processing, dimensional stability, controlled crystallinity, and tightly controlled engineering tolerances.

1.2 This specification establishes requirements for parts machined from virgin, unplasticized, 100 % polychlorotrifluoroethylene (PCTFE) homopolymers.

1.3 This specification does not cover parts machined from PCTFE copolymers, PCTFE film or tape less than 0.25-mm (0.010-in.) thick, or modified PCTFE (containing pigments or plasticizers).

1.4 This specification does not allow parts containing recycled material.

1.5 The specification does not cover PCTFE parts intended for general use applications, in which control of dimensional stability, molecular weight, and crystallinity are not as important. For machined PCTFE parts intended for general use, use Specification [D7211](#).

1.6 This specification classifies parts into three classes based upon intended uses and exposures: oxygen-containing media, reactive media, and inert media.

1.7 *Application*—PCTFE components covered by this specification are virgin, 100 % PCTFE resin, free of plasticizers and other additives. The components are combustion resistant in oxygen, dimensionally stable, and meet other specific physical characteristics appropriate for their end use. They are used in valves, regulators, and other devices in oxygen, air, helium, nitrogen, hydrogen, ammonia, and other aerospace media systems. The components typically are used as valve seats, o-rings, seals, and gaskets. They are removed and replaced

during normal maintenance procedures. The components provide reliable sealing surfaces resulting in proper closure of valves and related devices and no leakage from the system into the environment. They will experience static mechanical loading, cyclic mechanical loading, temperatures ranging from cryogenic to 71°C (160°F), and pressures up to 68.9 MPa (10,000, psig) for oxygen and air media, and 103.4 MPa (15,000 psig) for inert media.

1.8 The values stated in SI units are to be regarded as standard. The values in parentheses are for information only.

1.9 The following precautionary caveat pertains only to the test methods portion, Section [13](#), 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—There is no known ISO equivalent to this standard.

1.10 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

- [D618 Practice for Conditioning Plastics for Testing](#)
- [D638 Test Method for Tensile Properties of Plastics](#)
- [D792 Test Methods for Density and Specific Gravity \(Relative Density\) of Plastics by Displacement](#)
- [D883 Terminology Relating to Plastics](#)
- [D1204 Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheet or Film at Elevated Temperature](#)
- [D1430 Classification System for Polychlorotrifluoroethylene \(PCTFE\) Plastics](#)

¹ 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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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.