



Designation: D 6456 – 99

## Standard Specification for Finished Parts Made from Polyimide Resin<sup>1</sup>

This standard is issued under the fixed designation D 6456; 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 reappraisal. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

### 1. Scope

1.1 This specification is intended to be a means of calling out finished plastic parts ready for industrial or consumer use.

1.2 This specification covers finished parts and shapes from which parts are machined, made from a semi-crystalline polyimide (PI).

1.3 This specification is intended to replace MIL-R-46198 and Provisional Standard Specification PS 93.

NOTE 1—There is no similar or equivalent ISO standard.

1.4 This specification covers parts made from semi-crystalline polyimide, which is a thermosetting material that shows no softening or melting by DMA (D 4065) at or below 260°C (500°F).

1.5 Since PI is a thermoset resin, no provisions are included for recycled products.

1.6 The classification system outlined in this specification is intended to be identical to that used by Department of Defense for over 20 years. No changes are intended at this time.

1.7 The values are stated in SI units and are regarded as the standard in all property and dimensional tables. For reference purposes, inch-pound units are stated in parentheses.

1.8 *Application*—Parts in this specification are generally used for applications requiring the following combination of properties: low coefficient of friction, and low thermal expansion coupled with heat resistance for continuous operation at temperatures up to 260°C (500°F) and for short-term excursions upward to 482°C (900°F).

1.9 The following precautionary caveat pertains only to the test method portion, Section 12, 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 limitations prior to use.*

### 2. Referenced Documents

#### 2.1 ASTM Standards:

D 638 Test Method for Tensile Properties of Plastics<sup>2</sup>

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.20 on Plastic Products. Current edition approved Aug. 10, 1999. Published October 1999.

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

D 695 Test Method for Compressive Properties of Rigid Plastics<sup>2</sup>

D 790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials<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 1708 Test Method for Tensile Properties of Plastics by Use of Microtensile Specimens<sup>2</sup>

D 3892 Practice for Packaging/Packing of Plastics<sup>3</sup>

D 4065 Practice for Determining and Reporting Dynamic Mechanical Properties of Plastics<sup>3</sup>

E 8 Test Methods for Tension Testing of Metallic Materials<sup>4</sup>

#### 2.2 ANSI Standard:

Z1.4 Standard for Sampling Plans and Tables for Inspection by Attributes<sup>5,6</sup>

#### 2.3 Military Standards:

MIL-R-46198<sup>7</sup>

MIL-STD 129<sup>7</sup>

### 3. Terminology

3.1 *Definitions*—Terms are defined in accordance with Terminologies D 883 and D 1600 unless otherwise indicated.

### 4. Classification

4.1 Product shape and size as defined in the applicable purchase order.

4.2 The type of product shall be categorized by type and class depending on resin and filler compositions defined as follows:

Type I	Unfilled base resin
Type II	Resin with graphite filler
Class 1	15 % by weight graphite filler, nominal
Class 2	40 % by weight graphite filler, nominal

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 08.02.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 03.01.

<sup>5</sup> Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

<sup>6</sup> Replaced MIL-STD-105.

<sup>7</sup> Available from Standardization Documents Order Desk, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.