



Designation: D 4067 – 9603

Standard Specification Classification System for Reinforced and Filled Poly(Phenylene Sulfide) (PPS) Injection Molding and Extrusion Materials Using ASTM Methods¹

This standard is issued under the fixed designation D 4067; 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 (ϵ) indicates an editorial change since the last revision or reappraisal.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This ~~spe~~ classification system covers reinforced and filled poly(phenylene sulfide) materials suitable for injection molding and extrusion.

1.2 This ~~spe~~ classification system is not intended for the selection of materials, but only as a means to call out plastic materials to be used for the manufacture of parts. The selection of these materials ~~is to~~ shall be made by personnel with expertise in the plastics field where the environment, inherent properties of the materials, performance of the parts, part design, manufacturing process, and economics are considered.

1.3 The properties included in this ~~spe~~ classification system are those required to identify the compositions covered. ~~There may be~~ If necessary, other requirements ~~necessary to identify~~ identifying particular characteristics important to specific ~~applications. These will~~ applications shall be agreed upon between the user and the supplier designated by using the suffixes as given in Section 5 or Classification System D 4000.

1.4 The values stated in SI units are to be regarded as the standard.

1.5 This precautionary statement pertains only to the test method portion of this ~~spe~~ classification system, Section 132. *This standard does not purport to address all of the safety concerns 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.*

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

¹ This ~~spe~~ classification system is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.15 on Thermoplastic Materials (~~Section D20.15.17~~).

Current edition approved ~~March~~ September 10, 1996; 2003. Published ~~July 1996~~ November 2003. Originally published as D 4067 – 82; approved in 1982. Last previous edition approved in 1996 as D 4067 – 936.

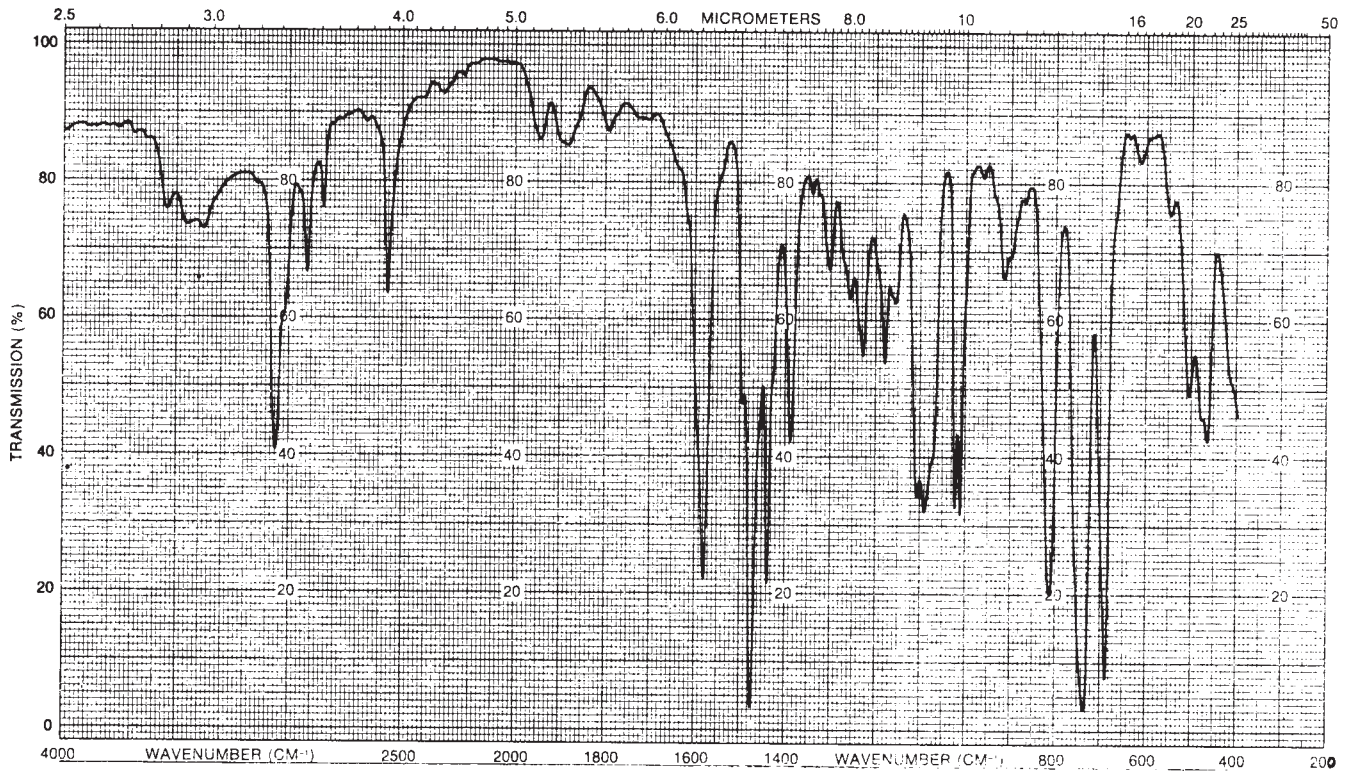
***A Summary of Changes section appears at the end of this standard.**

2. Referenced Documents

2.1 ASTM Standards:²

D 149256 Test Methods for Dielectric Breakdown Voltage and Dielectric Strength Determining the Izod Pendulum Impact Resistance of Solid Electrical Insulating Materials at Commercial Power Frequencies² Plastics²

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, Vol 10.01, volume information, refer to the standard's Document Summary page on the ASTM website.



Phase—Liquid
 Cell thickness—0.025 mm
 Sample—Pyrolyzate
 Prism—NaCl

FIG. 1 Infrared Spectrum of Poly(phenylene-S sulfide) Pyrolyzate

- ~~D-150 Test Methods 618 Practice for AC Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulating Materials Conditioning Plastics for Testing²~~
- ~~D 25638 Test Methods for Impact Resistance Tensile Properties of Plastics and Electrical Insulating Materials³²~~
- ~~D 257648 Test Methods for DC Resistance or Conductance Deflection Temperature of Insulating Materials Plastics Under Flexural Load in the Edgewise Position²~~
- ~~D 47950 Test Methods for High Voltage, Low Current, Dry Arc Resistance Flexural Properties of S Unreinforced and Reinforced Plastics and Electrical Insulating Materials²~~
- ~~D-618 Practice 792 Test Methods for Conditioning Plastics Density and Electrical Insulating Materials for Testing³ Specific Gravity (Relative Density) of Plastics by Displacement²~~
- ~~D-638 Test Method for Tensile Properties of 883 Terminology Relating to Plastics²~~
- ~~D 641238 Test Method for Deflection Temperature Melt Flow Rates of Plastics Under Flexural Load³ Thermoplastics by Extrusion Plastometer²~~
- ~~D-790 Test Methods 1600 Terminology for Flexural Properties of Unreinforced and Reinforced Abbreviated Terms Relating to Plastics and Electrical Insulating Materials³²~~
- ~~D-792 Test Methods 1898 - 68(1989) Practice for Specific Gravity (Relative Density) and Density Sampling of Plastics by Displacement³³~~

³ Discontinued; see *1997 Annual Book of ASTM Standards*, Vol 08.01.

- ~~D-883 Terminology Relating to Plastics³ 3418 Test Method for Transition Temperatures of Polymers by Differential Scanning Calorimetry²~~
- ~~D-1600 Terminology 3641 Practice for Abbreviated Terms Relating to Plastics³ Injection Molding Test Specimens of Thermoplastic Molding and Extrusion Materials²~~
- ~~D-1897 Practice 3835 Test Method for Injection Molding Test Specimens Determination of Thermoplastic Molding and Extrusion Properties of Polymeric Materials by Means of a Capillary Rheometer²~~
- ~~D-138982 Practice for Sampling Packaging/Packing of Plastics²~~
- ~~D-3418 Test Method 4000 Classification System for Transition Temperatures of Polymers by Thermal Analysis⁴ Specifying Plastic Materials²~~
- ~~D-3892 Practice 5630 Test Method for Packaging/Packing of Ash Content in Plastics~~
- ~~D-4000 Classification System for Specifying Plastic Materials^{4,2}~~
- E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specification²
- E 595 Test Method for Total Mass Loss and Collected Volatile Condensable Materials from Outgassing in a Vacuum Environment²
- E 662 Test Method for Specific Optical Density of Smoke Generated by Solid Materials
- ~~F-814 Test Method for Specific Optical Density of Smoke Generated by Solid Materials for Aerospace Applications^{6,2}~~
- 2.2 *Military Standards:*
- ~~MIL-STD-105 Sampling Procedures and Tables for Inspection by Attributes~~
- ~~4~~

Annual Book of ASTM Standards, Vol 08.02.

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

MIL-P-46174 (MR) Plastic Molding Material, Polyphenylene Sulfide, Glass Fiber Reinforced
 MIL-M-24519 Molding Plastics, Electrical, Thermoplastic

2.3 *Underwriters Laboratories*:⁵

UL Standard 94 Tests for Flammability ISO Standard:⁵

ISO 527-2 Plastics—Determination of Plastic Materials Tensile Properties—Part 2: Test Conditions for Parts in Devices
 Moulding and Appliances

UL Standard 746A Polymeric Materials—Short-Term Property Evaluation Extrusion Plastics

TABLE A Physical Property Requirements

Designation Order	Property/ASTM Test Method	Units	0	1	2	3	4	5	6	7	8	9
1	Tensile strength, min D 638 ^A	MPa ^B	C	60	80	110	120	130	160	180	200	D
2	Flexural modulus, min D 790 ^E	MPa ^B	C	7 000	10 000	12 000	14 000	17 000	20 000	23 000	26 000	D
3	Izod impact strength, min D 256 ^F	J/m ^G	C	28	40	52	70	80	90	100	110	D
4	Flexural strength, min D 790 ^E	MPa ^B	C	85	105	135	165	195	225	255	285	D
5	Density, min D 792	g/cm ³	C	1.40	1.50	1.60	1.70	1.80	1.90	2.0	2.10	D
5	Density, min D 792	g/cm ³	C	1.40	1.50	1.60	1.70	1.80	1.90	2.00	2.10	D

^A Type I or type IV specimens, 3.18 mm thickness, crosshead speed of 5 mm/min. Values in Table A were generated using type IV specimens. mm/min.

^B MPa × 145 = psi.

^C Unspecified.

^D Specific value (must be shown).

^E Tangent modulus of elasticity. Test specimens are 3.18 by 12.7 mm and tested by Method I, Procedure A (Tangent) with a crosshead speed of 1.3 mm/min ± 50 % with a span to depth ratio of 16/1.

^F Test specimens are 3.18 mm thick with a notch radius of 0.25 mm and tested by Method A.

^G J/m × 18.73 × 10⁻³ = ft-lbf/in.

3. Terminology

3.1 Definitions:

3.1.1 The definitions used in this specification system are in accordance with Terminology D 883 and Terminology D 1600.

4. Classification

4.1 There is currently no group, class, or grade distinction and no basic property table is given.

NOTE 12—Where no basic property table exists, the generic family designation will be followed by three zeros, for example: PPS 000.

4.1.1 Table A shall be used to specify the physical property requirements ~~which that~~ shall be shown by a six-character designation. The designation shall consist of the letter A and the five digits comprising the cell numbers for the property requirements in the order as they appear in Table A.

4.1.1.1 Although the

4.1.1.1 The values listed are necessary to include the range of properties available in existing ~~materials, users should materials.~~ However, this does not infer imply that every possible combination of ~~the~~ properties exists or can be obtained with the current state of technology.

4.2 A single letter shall be used to indicate the major category of the reinforcement, along with two numbers that indicate the percentage of additive(s) by mass, with the tolerances as tabulated below:

Category	Material	Tolerance (Based on the total mass)
C	Carbon and graphite fiber-reinforced	±2 percentage points
G	Glass-reinforced ≤15 % glass content	±2 percentage points
	>15 % glass content	
G	Glass-reinforced ≤15 % glass content	±2 percentage points
	>15 % glass content	±3 percentage points
L	Lubricants (such as PTFE, graphite, silicone, and molybdenum disulfide)	By agreement between the supplier and the user.
L	Lubricants (such as PTFE, graphite, silicone, and molybdenum disulfide) or lubricants with fillers/reinforcements	By agreement between the supplier and the user.
M	Mineral-reinforced	±2 percentage points
R	Reinforced-combination/mixtures of reinforcements or other fillers/reinforcements.	±3 percentage points based on the total reinforcement.

NOTE 23—This part of the system uses the type and percentage of additive to designate the modification of the basic material. To facilitate this designation, the type and percentage of additive can be shown on the supplier's technical data sheet unless it is proprietary in nature. If necessary, additional requirements shall be indicated by the use of the suffix part of the system, as given in Section 5. Special agreements on tolerances may be needed below 5 % levels.

NOTE 34—An example of this classification system for a poly(phenylene sulfide) material is as follows: The designation PPS000G40A42043 would indicate the following material requirements from Table A:

PPS000	≠	polyphenylene sulfide material,
PPS000	=	poly(phenylene sulfide) material,
G40	=	glass-reinforced at 40 % nominal level,
A	=	Table A physical property requirements,
4	=	tensile strength, min 120 MPa,
2	=	flexural modulus, min 10 000 MPa,
0	≠	unspecified,
0	=	Izod impact strength, unspecified,
4	=	flexural strength, min 165 MPa, and
3	=	density, min 1.60 g/cm ³ .

If no properties are specified, the designation would be PPS000G40A00000.

5. Suffixes

5.1 When additional requirements are ~~needed, based on the application,~~ needed that are not covered by the basic requirements or cell table requirements, they shall be indicated through the use of suffixes:

<u>E</u>	≠	<i>Electrical requirements as designated by the following digits:</i>
		First Digit

<u>E</u>	=	<i>Electrical suffixes. Electrical, flammability or other requirements shall be designated by the appropriate suffix from Table 3 of Classification System D 4000.</i>
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5.1.1 If applicable, heat deflection temperature shall be designated using t
Y = Heat deflection temperature as designated by the following digits:
First Digit

0	≠	Specimen to be specified by user
---	---	----------------------------------

1 = Test Method D 648, 1820 kPa

Second Digit

- 0
- ≠
- To be specified by user
- 1
- ≠
- Meets Requirements, Table 1, Column A
- 2
- ≠
- Meets Requirements, Table 1, Column B
- 3
- ≠
- Meets Requirements, Table 1, Column C
- 4
- ≠
- Meets Requirements, Table 1, Column D
- 5
- ≠
- Meets Requirements, Table 1, Column E
- 6
- ≠
- Meets Requirements, Table 1, Column F
- 7
- ≠
- Meets Requirements, Table 1, Column G
- 8
- ≠
- Meets Requirements, Table 1, Column H
- 9
- ≠
- Meets Requirements, Table 1, Column I
- F
- ≠

~~Flammability requirements as designated by the following digits:~~

~~First Digit 1 = minimum of 260°C~~
~~0~~
~~=~~
~~to be specified by user~~
~~1~~
~~=~~
~~product is tested according to UL 94 at 3.05 mm~~
~~2 = other minimum thickness~~
~~2~~
~~=~~
~~product is tested according to UL 94 at 1.47 mm minimum thickness~~
~~3~~
~~=~~

~~product is tested according to UL 94 at 0.71 mm minimum thickness~~

Second Digit

0	=	to be specified by user
1	=	UL 94V-0 flammability class
2	=	UL 94V-1 flammability class
3	=	UL 94V-2 flammability class
4	=	UL 94-5V flammability class

~~temperature (°C) - specify~~

~~NOTE 4—**Precaution:** By publication of this specification and its use of flammability ratings, ASTM does not intend that their use in any way reflects hazards presented under actual fire conditions.~~

~~Y = Heat deflection temperature as designated by the following digits:~~

First Digit

~~1 = Test Method D 648, 1820 kPa~~

Second Digit

~~1 = minimum of 260°C—High heat deflection temperatures may be obtained by heat 5—Heat treating the test specimens at 260°C for 4-h.~~

~~5.1.1 Additional suffixes will be added h is permitted to this specification as required. See Table 3 of Classification D 4000.~~

~~NOTE 5—If the requirements for the polyphenylene sulfide material in Note 3 also included electrical requirements, the following example indicates the call-out: PPS000G40A42043E12~~

PPS000G40A42043E12	=	Same as Note 3
E	=	electrical requirements
0	=	Specimen to be specified by user
2	=	property requirements of Table 1, —Column B

~~achieve high heat deflection temperatures.~~

6. Basic Requirements

6.1 Basic requirements from Table A, as they apply, are always in effect unless superseded by specific suffix requirements, which always take precedence.

7. General Requirements

7.1 The plastics composition shall be uniform and shall conform to the requirements specified herein. The color and form of the material shall be as agreed upon between the supplier and the user.

8. Detail Requirements

8.1 Test specimens for the various materials shall conform to the requirements prescribed in Table A and suffix requirements as they apply.

8.2 For the purpose of determining conformance with this spe classification system, all specified limits in this spe classification system are absolute limits, as defined in Practice E 29.

~~8.2.1 With~~

8.2.1 In the absolute method, an observed value or a calculated value is not rounded off, but is to be compared directly to the specified limiting value. Conformance or nonconformance with the specification is based on this comparison.

9. Sampling

9.1 Unless otherwise agreed upon between the user and the supplier, the materials shall be sampled in accordance with the sampling procedure prescribed in Practice D 1898 - 68(1989). Adequate statistical sampling shall be considered an acceptable

~~alternative. A batch or lot of resin shall be considered as a unit of manufacture as prepared for shipment, and may consist of a shipment. It is acceptable to blend of two or more production runs to create a batch or batches. lot.~~

10. Number of Tests

~~10.1 The number of tests shall be conducted as agreed upon between the user and the supplier.~~

11. Specimen Preparation

~~11.1 Unless otherwise specified,~~

~~10.1 The test specimens shall be prepared by injection molding in accordance with Practice D 1897. Unless otherwise recommended, minimum mold D 3641. Processing conditions are:~~

Drying	2 h at 135°C
Plastic melt temperature shall be 121°C and stock	305–335°C
Plastic melt temperature	305 - 335°C
Mold temperature shall be 316 ± 6°C.	140°C minimum
12.	
Mold temperature	140°C minimum
Average injection velocity	200 ± 100 mm/s
Plastic Hold Pressure	600 bar minimum

11. Conditioning

~~121.1 Conditioning—Condition test specimens at 23 ± 2°C and 50 ± 5 % relative humidity for not less than 40 h prior to testing in accordance with Procedure A of Practice D 618, where conditioning is specified.~~

~~121.2 Test Conditions—Conduct tests in the standard laboratory atmosphere of 23 ± 2°C and 50 ± 5 % relative humidity unless otherwise specified.~~

132. Test Methods

~~132.1 Determine the properties of the material according to the test methods in 2.1, using the specimens and protocols specified in Table A and applicable Suffixes, as required.~~

~~12.1.1 The number of tests shall be consistent with the requirements of Section 9 and paragraph 13.4.~~

~~12.2 Reinforcement Concentrations—Test Method D 5630, using a temperature of 815°C for inorganic fillers/reinforcements. Carbon fiber, graphite fiber, and other organic reinforcements require special methods that shall be agreed upon between the supplier and the user.~~

13. Inspection and Certification

~~13.1 Inspection and certification of the material supplied with reference to a specification based on this classification system shall be for conformance to the requirements specified herein.~~

~~13.2 Lot-acceptance inspection shall be the basis on which acceptance or rejection of the lot is made. The lot-acceptance inspection shall consist of apparent shear viscosity (Test Method D 3835) or flow rate (Test Method D 1238, 315/5.0); reinforcement or filler content (Test Method D 5630); and, tensile strength (Test Method D 638, Type 1 bar or ISO 527-2, Type 1A bar).~~

~~13.3 Periodic check inspection with reference to a specification based upon this classification system shall consist of the tests for all requirements of the material under the specification. Inspection frequency shall be adequate to ensure the material is certifiable in accordance with 13.4.~~

~~13.4 Certification shall be that the material was manufactured by a process in statistical control; sampled, tested, and inspected in accordance with this classification system; and that the average values for the lot meet the requirements of the specification (line callout).~~

~~13.5 A report of test results shall be furnished when requested. The report shall consist of results of the lot-acceptance inspection for the shipment and may include the results of the most recent periodic-check inspection. If requested, the report shall include that recycled, reconstituted, recycled-regrind, recovered or reprocessed, or both, poly(phenylene sulfide) plastic was used and the nominal weight percent.~~

14. Rejection and Rehearing

~~14.1 Material that fails to conform to the requirements as agreed upon between the user and the supplier may be rejected. If any failure occurs, the materials may be retested to establish conformity in accordance with the agreement between the user and supplier. Rejection should be reported to the supplier promptly and in writing. In case of dissatisfaction with the results of the test, the supplier may make claim for a rehearing.~~

15. Certification and Inspection

~~15.1 Certification and Lot Acceptance Inspection—Certification and lot acceptance of the material shall be made as agreed upon between the user and the supplier or as part of the purchase order or contract.~~

~~15.2 Periodic Check Inspection—The periodic check inspection shall consist of the tests specified for all requirements of the material under this specification or as agreed upon between the user and the supplier.~~

~~15.3 Reports—When specified in the purchase order or contract, a report of the test results shall be furnished at a frequency agreed upon between the user and the supplier.~~

16. Packaging and Marking

16.1 Provisions of Practice D 3892 apply for packaging, packing, and marking of containers for plastic materials. Other packaging or marking, or both, is acceptable when agreed upon by the purchaser and the supplier.

15. Keywords

15.1 plastic materials; poly(phenylene sulfide)

SUPPLEMENTARY REQUIREMENTS

The following supplementary items ~~may~~ shall become part of this ~~spe~~ classification system when applicable, as agreed upon between the user and the supplier.

S1. *Approval*—Material submitted by a new supplier shall be approved by the user. Material or test specimens submitted by the supplier and intended for evaluation, shall be accompanied by the supplier’s laboratory test report.

S1.1 *New Sources*—The user may elect to accept shipment temporarily on the supplier’s certification.

S2. *Infrared Spectrophotometry or Thermal Analysis, or Both*—~~A~~If requested by the option of the user, infrared or thermal analysis, or both, may shall be conducted on materials supplied to this ~~spe~~ classification system. The curves established for initial approval shall constitute the reference standard and shall be kept on file at the user’s laboratory. All samples ~~should~~ shall produce curves that correspond to the reference standard when tested under the same conditions as those specified on the master set of curves.

S2.1 In the event such analyses are to be designated as required of the supplier, this must appear on the part drawing or purchase contract, or both, as agreed upon between user and supplier.

NOTE S00006—A useful procedure for IR is to place approximately 0.5 g of finely divided sample into a ~~pyrex~~ test tube and to rapidly apply heat in order to pyrolyze the sample. Pyrolysis vapors will that condense on the cooler portions of the tube ~~and can then be removed for appropriate IR analysis.~~

NOTE S00007—Melting characteristics of PPS materials shall be determined by Test Method D 3418 with reference standards agreed upon by the user and supplier. Appropriate Suffix Designations consistent with ~~Standard~~ Classification System D 4000 shall be used to define requirements for Melting Point.

S3. *Outgassing and Smoke Generation:*

S3.1 ~~A~~In aircraft and A aerospace applications ~~may that~~ require specification of outgassing, or in combustion modes the amount of smoke generated. ~~T~~, these requirements shall be agreed upon by the user and supplier with limiting values clearly defined using the Standard D 4000 Suffix System.

S3.1.1 *Specific Optical Density* —~~When—If~~ required, shall be determined by Test Method E 662 in both the flaming and smoldering modes. Maxima, D_{max} shall be stipulated using the Suffix System of ~~Standard~~ Classification System D 4000.

S3.1.2 *Outgassing*—~~When—If~~ required for aerospace applications, shall be determined in accordance with Test Method E 595. Requirements shall be defined using an appropriate Suffix designation.

S3.1.3 *Smoke Density*—When required for aerospace applications, the maximum specific optical smoke density shall be determined according to Test Method F 814. Requirements shall be defined using an appropriate Suffix designation.

S4 Quality Assurance Provisions for Government/Military Procurement

S4.1 Selection of acceptance quality level (AQL) and of inspection level (IL) shall be made with consideration of the specific use requirements. This is discussed in the section on Comparison of Sampling Plans and the Scope section of the General Sampling Procedures of Practice D 1898, with reference to MIL-STD-105. In the absence of contrary requirements the following values shall apply:

	IL	AQL
Testing (polymer unfabricated)	S-1 ^A	As agreed between the purchaser and supplier
<u>designation. A</u> Samples shall be drawn from the required number of units and pooled for preparation of molded samples for property evaluation.		

S5 Government/Military Packaging

S5.1 Materials shall be packaged and marked in accordance with Practice D 3892. Other packaging or marking, or both, may be used when agreed to by the purchaser and the supplier.

APPENDIX

(Nonmandatory Information)

X1. CROSS REFERENCE FROM MIL-P-46174 (MR) TO ASTM-SPE CLASSIFICATION SYSTEM D 4067

X1.1 This ~~spe classification system~~ contains pertinent specification items from MIL-P-46174 (MR) and MIL-M-24519, for plastic molding material, poly(phenylene sulfide), glass reinforced. (MIL-P-46174(MR) has been cancelled, replaced with Classification System D 4067. The MIL-P-46174(MR) information included here is for historical reference only.)

X1.2 The following cross reference designations are believed to accurately provide comparable callout information relative to the intent of the designated military specifications. It is recommended that someone knowledgeable in the requirements of the military specifications review this information before use.

ASTM D4067

 PPS000G15A21221
 PPS000G15A21221 EA117ED041EE020

MIL-P-46174 (MR)

 Class 15 Grade A
 Class 15 Grade E

ASTM D4067

 PPS000G30A32332
 PPS000G30A32332 EA117ED041EE020
 PPS000G40A43443
 PPS000G40A43443 EA117ED041EE020
 PPS000G50A54454
 PPS000G50A54454 EA117ED041EE020

MIL-P-46174 (MR)

 Class 30 Grade A
 Class 30 Grade E
 Class 40 Grade A
 Class 40 Grade E
 Class 50 Grade A
 Class 50 Grade E

ASTM D4067

 PPS000A00330E01EA124

MIL-M-24519

 GST-40F

X1.3 —~~Should~~ If additional property requirements need to be specified, appropriate suffixes are to be used as needed.

SUMMARY OF CHANGES

This section identifies the location of selected changes to this classification system. For the convenience of the user, Committee D20 has highlighted those changes that may impact the use of this classification system. This section may also include descriptions of the changes or reasons for the changes, or both.

- (1) Five year review conducted (April 2003).
- (2) Changed title from a “Standard Specification” to a “Standard Classification System” and added “Using ASTM Methods.”
- (3) Changed all occurrences of “polyphenylene sulfide” to “poly(phenylene sulfide),” including title.
- (4) Added ISO equivalency statement.
- (5) Revised Referenced Documents section.
- (6) Removed permissive language in 1.3, 4.1.1.1, 9.1, and numerous places in Supplementary Requirements.
- (7) In footnote A under Table A, removed “Type IV” as a specimen type and removed statement that table values were generated using Type IV specimens.
- (8) In section 4.2, added “or lubricants with fillers/reinforcements” to Material Types under Category L.
- (9) In 5.1, deleted all suffix references except “Y” and added statement advising that other requirements shall be designated using D 4000 suffix protocols.
- (10) In 5.1, moved statement concerning how to obtain high heat deflection temperatures after “1 = minimum of 260°C” to Note 5.
- (11) Added number 2 for second digit of heat deflection temperature designation to 5.1.
- (12) Removed Section 10, revised subsequent section numbers, and added statement on number of tests as 12.1.1.
- (13) Changed practice for injection molding and revised processing conditions in 10.1 (previously 11.1)
- (14) Added 12.1 and 12.1.1 and specified test method in 12.2.
- (15) Deleted previous Section 14 and renumbered subsequent sections.
- (16) Revised previous Section 15 (now section 13), Inspection and Certification.
- (17) Added statement to 14.1.
- (18) Deleted Table 1.
- (19) Deleted S3.1.3, S4, and S5 from Supplementary Requirements section.
- (20) In X1.1, added statement concerning obsolescence of Mil-P-41674(MR).
- (21) Added Keywords and Summary of Changes sections.

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