



Designation: D 5740 – 03

Standard Guide for Writing Material Standards in the Classification D 4000 Format¹

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INTRODUCTION

This guide has been prepared to aid in the writing of material standards using the Classification D 4000 format. The following template is included which might be used directly for a draft document simply by filling in the blanks. See appendixes for additional explanatory information.

Standard Classification System for _____ Molding and Extrusion Materials (_____)

1. Scope*

1.1 This classification system covers ___ materials suitable for _____. The inclusion or exclusion of recycled plastics in this classification system must be addressed here.

1.2 The properties included in this standard are those required to identify the compositions covered. There may be other requirements necessary to identify particular characteristics important to specialized applications. These may be specified by using the suffixes as given in Section 5.

1.3 This classification system and subsequent line callout (specification) are intended to provide a means of calling out plastic materials used in the fabrication of end items or parts. It is not intended for the selection of materials. Material selection should be made by those having expertise in the plastic field after careful consideration of the design and the performance required of the part, the environment to which it will be exposed, the fabrication process to be employed, the costs involved, and the inherent properties of the material other than those covered by this standard.

NOTE 1—Insert **Note 1** here to show the appropriate ISO equivalency statement.

1.4 The following precautionary caveat pertains only to the test method portion, Section 11, of this classification system: *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.*

¹ This guide is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.94 on Government/Industry Standardization.

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2. Referenced Documents

2.1 *ASTM Standards:*

D 618 Practice for Conditioning Plastics for Testing²

D 883 Terminology Relating to Plastics²

D 1600 Terminology for Abbreviated Terms Relating to Plastics²

D 3892 Practice for Packaging/Packing of Plastics³

D 4000 Classification System for Specifying Plastic Materials³

D 4066 Specification for Nylon Injection and Extrusion Materials (PA)³

D 5033 Guide for Development of ASTM Standards Relating to Recycling and Use of Recycled Plastics⁴

NOTE 2—Omit if use of recycled plastic is not allowed.

D 5630 Test Method for Ash Content in Plastics⁴

D 6779 Classification System for Polyamide Molding and Extrusion Materials (PA)⁴

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications⁵

2.2 *ISO Standards:*⁶

ISO 3451–1 Plastics—Determination of Ash Content—Part 1: General Methods

3. Terminology

3.1 Except for the terms defined below, the terminology used in this classification system is in accordance with Terminologies D 883 and D 1600.

² *Annual Book of ASTM Standards*, Vol 08.01.

³ *Annual Book of ASTM Standards*, Vol 08.02.

⁴ *Annual Book of ASTM Standards*, Vol 08.03.

⁵ *Annual Book of ASTM Standards*, Vol 14.02.

⁶ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

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

4. Classification

4.1 ___ materials are classified into groups according to their composition. These groups are subdivided into classes and grades as shown in the Basic Property Table (Table ___). An example of a basic property table can be found in Specification D 4066. The property table should contain a footnote referring to Section ___ for reference to specimen source and preparation.

NOTE 3—An example of this classification system is given as follows: The designation ___ indicates the following:

- _ = ___ as found in Terminology D 1600,
- _ = ___ (group),
- _ = ___ (class), and
- _ = requirements given Table ___ (grade).

4.1.1 Reinforced, filled, and lubricated versions of ___ materials that are found in Table ___ are classified according to the reinforcement used and the nominal level, by weight percent, of the reinforcement. The grade is identified by a single letter that indicates the filler or reinforcement used and two digits, in multiples of 5, that indicate the nominal quantity in percent by weight. Thus, a grade containing 35 % glass reinforcement would be indicated by ___ G35. This designation indicates

- _ = ___ as found in Terminology D 1600,
- _ = ___ (group),
- _ = ___ (class), and
- _ = 35 % glass reinforcement and requirements given Table ___ (grade).

The reinforcement letter designations and associated tolerance levels are shown in the following table:

TABLE 1 Reinforcement-Filler^A Symbols^B and Tolerances

Symbol	Material	Tolerance
C	Carbon and graphite	±2 %
D	Alumina trihydrate	±2 %
E	Clay	±2 %
F	Cellulose	±2 %
G	Glass	±2 %
H	Aramid	±2 %
J	Boron	±2 %
K	Calcium carbonate	±2 %
L	Lubricants (for example: PTFE, graphite)	Depends upon material and process—to be specified.
M	Mineral	±2 %
N	Natural organic (for example: cotton, sisal, hemp, flax)	±2 %
P	Mica	±2 %
Q	Silica	±2 %
R	Combinations of reinforcements and/or fillers	±2 %
S	Synthetic organic	±2 %
T	Talcum	±2 %
V	Metal	±2 %
W	Wood	±2 %
X	Not specified	To be specified

^AAsh content of filled and/or reinforced materials may be determined using either Test Method D 5630 or ISO 3451-1 where applicable.

^BAdditional symbols may be added to this table as required.

NOTE 4—This part of the classification system uses the percent of reinforcements or additives, or both, in the callout of the modified basic

material. The types and percentages of reinforcements and additives should be shown on the supplier's technical data sheet unless they are proprietary in nature. If necessary, additional callout of these reinforcements and additives can be accomplished by use of the suffix part of the system (see Section 5).

4.1.2 To facilitate incorporation of future or special materials the “other” category for group (00), class (0), and grade (0) is shown in Table ___.

4.2 Reinforced, filled, and lubricated versions of ___ materials that are not in Table ___ are classified in accordance with Tables ___ and A or B. Table ___ is used to specify the Group or the group and class of ___ and Table A or B is used to specify the property requirements.

4.2.1 Reinforced, filled, and lubricated variations of the basic materials are identified by a single letter from **Table 1** that indicates the filler and/or reinforcement used and two digits that indicate the nominal quantity in percent by weight. A second letter, from Table 1a, when desired, is used to indicate the form or structure of the reinforcement and/or filler, but is not used for functional mixtures. Thus, a letter designation G for glass, E for beads or spheres or balls, and 33 for percent by weight, GE33, specifies a reinforced or filled material with 33 percent by weight in the form of glass beads, spheres, or balls. The reinforcement letter designations and associated tolerance levels are shown in the previous table. Form and structure letter designations are shown in the following table:

TABLE 1a Symbols for the Form or Structure of Fillers and Reinforcing Materials

Symbol	Form or Structure
C	Chips, cuttings
D	Fines, powders
E	Beads, spheres, balls
F	Fiber
G	Ground
H	Whisker
K	Knitted fabric
L	Layer
M	Mat (fabric, thick)
N	Non-woven (fabric, thin)
P	Paper
R	Roving
S	Flake
T	Cord
V	Veneer
W	Woven fabric
Y	Yarn
X	Not specified

4.2.2 Specific requirements for reinforced, filled, or lubricated ___ materials shall be shown by a six-character designation. The designation will consist of the letter “A” or “B” and the five digits comprising the cell numbers for the property requirements in the order as they appear in Tables A or B.

4.2.2.1 Although the values listed are necessary to include the range of properties available in existing materials, users should not infer that every possible combination of the properties exists or can be obtained.

4.2.3 When the grade of the basic material is not known, or is not important, the use of the “0” grade classification shall be used for the reinforced materials in this system.