Designation: D4673 – 16

Standard Classification System for and Basis for Specification for Acrylonitrile–Butadiene–Styrene (ABS) Plastics and Alloys Molding and Extrusion Materials[1]

This standard is issued under the fixed designation D4673; 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.

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

1. Scope*

1.1 This classification system covers only ABS materials and ABS alloys suitable for injection molding and extrusion. Some of these compositions are also suitable for compression molding. Recycle ABS and alloys will be addressed in a separate standard.

1.2 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. Materials are to be selected by personnel with expertise in the plastics field where the economics, the environment to be encountered, the inherent properties of the materials, the part design, the part performance required, and the manufacturing process to be employed all enter into the selection.

1.3 The properties included in this classification system are those required to identify the compositions covered. Other requirements necessary to identify particular characteristics important to specialized applications are addressed by using the suffixes given in Section 5.

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

1.5 The following precautionary caveat pertains only to the test methods portion, Section 12, 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.*

NOTE 1—This standard and ISO 2580 address the same subject matter, but differ in technical content.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D256 Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
D618 Practice for Conditioning Plastics for Testing
D638 Test Method for Tensile Properties of Plastics
D648 Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position (Withdrawn 2016)[3]
D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
D883 Terminology Relating to Plastics
D1003 Test Method for Haze and Luminous Transmittance of Transparent Plastics
D1525 Test Method for Vicat Softening Temperature of Plastics
D3641 Practice for Injection Molding Test Specimens of Thermoplastic Molding and Extrusion Materials
D3892 Practice for Packaging/Packing of Plastics
D4000 Classification System for Specifying Plastic Materials
D5630 Test Method for Ash Content in Plastics
E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

2.2 *ISO Standards:*[4]

ISO 75-1 Plastics—Determination of Temperature of Deflection Under Load—Part 1: General Test Methods
ISO 75-2 Plastics—Determination of Temperature of Deflection Under Load—Part 2: Plastics and Ebonite
ISO 179 Plastics—Determination of Charpy Impact Strength of Rigid Materials

[1] This classification system 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.

[3] The last approved version of this historical standard is referenced on www.astm.org.

[4] 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**

ISO 291 Plastics—Standard Atmosphere for Conditioning and Testing
ISO 294 Plastics—Injection Moulding Test Specimen of Thermoplastics Materials
ISO 306 Plastics—Determination of Vicat Softening Temperature
ISO/DIS 527-1 Plastics—Determination of Tensile Properties—Part 1: General Principles
ISO/DIS 527-2 Plastics—Determination of Tensile Properties—Part 2: Testing Conditions
ISO 2580-2 Acrylonitrile/Butadiene/Styrene (ABS) Moulding and Extrusion Materials, Part 2: Preparation of Test Specimens and Determination of Properties
ISO 20753 Plastics—Test Specimens

3. Terminology

3.1 *Definitions*—Definitions of technical terms used in this classification system are in accordance with Terminology D883.

4. Classification

4.1 ABS materials, based on three or more monomers, are grouped rather than rigidly classified. These groups are then subdivided by class and then grades. In cases in which a resin meets the requirements of more than one group, the supplier will determine the specific callout(s). Table ABS has both ASTM procedure method and ISO procedure versions for callout under the preferred test system.

TABLE ABS ASTM/ISO Values, Requirements, Natural Color Only[A]

NOTE 1—For property test parameters, see Section 12.

Group	Description	Class	Description	Grade	Description	Tensile Strength, MPa,[B] Test Method D638/ ISO 527	Modulus, MPa, Test Method Flexural D790/ Tensile ISO 527	Impact		Softening, Test Method D1525, °C, 120°/h	Temperature or ISO 306, °C, 50°/h
								Izod J/m,[C] Test Method D256	Charpy kJ/m^2,[D] ISO 179		
01	Molding	1	medium impact	1		45	2600	40	-	90	85
				2		40	2400	125	6	90	85
				3		40	2200	150	8	90	85
				4		35	2200	80	5	90	85
				5		32	1600	70	3	90	85
				0	other						
		2	high impact	1		35	2100	200	13	90	85
				2		35	2000	250	16	90	85
				3		30	1700	275	19	90	85
				4		30	1700	325	25	90	85
				5		25	1500	400	30	90	85
				6		30	1600	184	12	90	85
				0	other						
		3	high heat	1		45	2300	100	5	115	110
				2		40	2000	125	6	110	105
				3		40	2400	125	6	105	100
				4		35	2000	150	10	105	100
				5		35	2100	80	3	105	100
				6		34	1700	65	2	98	93
				7		32	1800	50	-	105	100
				0	other						
		4	plating[E]	1		45	2500	150	8	105	100
				2		40	2600	80	3	105	100
				3		40	2200	200	13	100	95
				4		35	2000	200	13	95	90
				5		34	2200	80	3	93	88
				0	other						
		5	clear[F]	1		40	2300	80	3	85	80
				0	other						
		6	additive FR[G]	1		40	2200	200	13	85	80
				2		40	2000	150	8	85	80
				3		35	2400	80	3	90	85
				4		30	2000	150	8	90	85
				5		25	1800	80	3	85	80
				0	other						
		0	other	0	other						
02	Extrusion	1	medium impact	1		50	2600	80	3	95	90
				2		45	2400	80	3	90	85
				3		40	2200	150	8	90	85
				4		40	2000	80	3	90	85
				5		35	2200	125	6	90	85
				0	other						
		2	high impact	1		35	2400	200	13	90	85
				2		35	2200	325	25	90	85
				3		30	2000	275	19	90	85
				4		30	2000	360	28	90	85
				5		25	1800	400	30	90	85

Group	Description	Class	Description	Grade	Description	Tensile Strength, MPa,[B] Test Method D638/ ISO 527	Modulus, MPa, Test Method Flexural D790/ Tensile ISO 527	Impact		Softening, Test Method D1525, °C, 120°/h	Temperature or ISO 306, °C, 50°/h
								Izod J/m,[C] Test Method D256	Charpy kJ/m^2,[D] ISO 179		
				6		25	1800	440	34	90	85
				0	other						
		3	FR	1		40	2300	280	19	90	85
				2		35	2000	275	19	90	85
				3		35	2000	210	17	85	80
		0	other	0	other						
03	Alloys ABS/PVC	1		1		50	2700	80	5	100	95
				2		40	1800	200	13	90	85
				3		40	1800	275	19	80	75
				4		35	2000	400	30	70	65
				5		50	2100	440	34	110	105
				6		35	2000	475	38	70	65
				7		45	2400	200	13	80	75
				0	other						
		0	other	0	other						
04	Alloys ABS/PC	1	medium impact	1		55	2200	360	28	115	110
				2		55	2400	325	25	110	105
				3		50	2200	275	21	120	115
				4		45	2100	275	21	110	105
				5		40	1900	70	3	105	100
				0	other						
		2	high impact	1		55	2400	400	30	125	120
				2		50	2300	400	30	115	110
				3		50	2200	475	39	125	120
				4		48	2100	275	21	110	105
				5		45	2000	255	19	119	114
				0	other						
		3	high heat	1		60	2400	275	21	140	135
				2		55	2400	400	30	130	125
				3		55	2000	500	41	125	120
				4		50	2300	360	28	135	130
				5		45	2100	600	50	130	125
				6		45	2000	325	25	128	123
				7		45	2000	325	25	119	114
				0	other						
		4	plating	1		50	2300	440	36	130	125
				2		45	2200	400	30	120	115
				3		45	2100	360	28	110	105
				0	other						
		5	additive FR	1		60	2400	125	6	110	105
				2		55	2400	200	13	110	105
				3		55	2400	400	30	90	85
				4		50	2000	440	36	110	105
				5		45	2100	275	21	110	105
				6		40	2000	440	36	110	105
				0	other						
		0	other	0	other						

[A] All cell values are minimums.
[B] MPa × 145 = psi.
[C] J/m × 18.73 × 10^{-3} = ft·lbf/in.
[D] kJ/m^2 × 0.476 = ft·lbf/in.^{2}. Test configuration 1aE.
[E] Plating grades are those specifically recommended for plating or sputtering applications.
[F] Clear ABS has a light transmission of 70 % minimum. Test Method D1003 is allowed to be used.
[G] Specific flammability requirements shall be specified by the user.

NOTE 2—An example of this classification system is as follows:

The designation ABS0111 would indicate:

ABS = acrylonitrile–butadiene–styrene,
01 (group) = injection-molding resin,
1 (class) = medium impact, and
1 (grade) = requirements given in Table ABS.

4.1.1 To facilitate the incorporation of future or special materials, the "other/unspecified" category (0) for group, class, and grade is shown in Table ABS. The basic properties can be obtained from Cell Table A, B, and C as they apply.

4.2 Reinforced and lubricated versions of the ABS materials are classified in accordance with Table ABS and Cell Table A or where Cell Table A does not reflect the required properties of the ABS material, Cell Table B. Table ABS specifies the unreinforced material and Cell Table A specifies the properties

by either ASTM or ISO procedures after the addition of reinforcements or lubricants at the nominal level indicated.

4.2.1 A single letter shall be used for the major reinforcement or combination, or both, along with two digits that indicate the percentage of addition by mass, with the tolerance as seen in Table 1.

NOTE 3—This part of the system uses percent of reinforcements or additives, or both, in the callout of the modified basic material. The types and percentages of reinforcements and additives are shown on the supplier's technical data sheet unless this information is proprietary in nature. If necessary, additional callout of these reinforcements and additives can be accomplished by the use of the suffix part of the system as described in Section 5.

4.2.2 Specific requirements for reinforced, filled, or lubricated materials 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 in which they appear in Cell Table A.

TABLE 1 Reinforcement-Filler[A] Symbols[B] and Tolerances

Symbol	Material	Tolerance
C	Carbon- and graphite-fiber reinforced	±2 %
G	Glass-reinforced	±2 %
L	Lubricants (for example, PTFE), graphite, silicone and molybdenum disulfide	depends on material and process—to be specified
M	Mineral-reinforced	±2 %
R	Combinations of reinforcements or fillers, or both	±3 % for the total reinforcement

[A]Ash content of filled, or reinforced material, or both, is determined using either Test Method D5630 or ISO 3451-1 where applicable.
[B]Additional symbols will be added to this table as required.

CELL TABLE A Reinforced ABS/Alloys
(For property test parameters, see Section 12.)

Designation Grade	Property	Cell Limits									
		0	1	2	3	4	5	6	7	8	9
1	Tensile strength, MPa[A] , min										
	Test Method D638	unspecified	40	50	60	70	80	90	100	110	[B]
	ISO 527, 1, 2	unspecified	40	50	60	70	80	90	100	110	[B]
2	Modulus, MPa, min										
	Test Methods Flexural	unspecified	3000	4000	5000	6000	7500	9000	11 000	15 000	[B]
	ISO 527 Tensile, chord	unspecified	3000	4000	5000	6000	7500	9000	11 000	15 000	[B]
3	Impact, min										
	Test Method D256, Izod, J/m[C]	unspecified	30	45	60	75	90	105	120	140	[B]
	ISO 179, Charpy, kJ/m^{2}[D]	unspecified	2	3	4	5	6	7	8	10	[B]
4	Heat deflection temperature, °C, min										
	Test Method D648	unspecified	65	85	90	95	100	105	110	115	[B]
	ISO 75	unspecified	65	85	89	94	98	103	108	112	[B]
5	To be determined	unspecified	...	...	...	...	...	...	...	...	

[A]MPa × 145 = psi.
[B]To be specified.
[C]J/m × 18.73 × 10 $^{-3}$ = ft·lbf/in.
[D]kJ/m^{2} × 0.476 = ft lbf/in^{2}. Test configuration 1aE.

CELL TABLE B Unreinforced ABS
(For property test parameters, see Section 12.)

Designation Grade	Property	Cell Limits									
		0	1	2	3	4	5	6	7	8	9
1	Tensile strength, MPa[A] , min										
	Test Method D638	unspecified	20	25	30	35	40	45	50	55	[B]
	ISO 527, 1, 2	unspecified	20	25	30	35	40	45	50	55	[B]
2	Modulus, MPa, min										
	Test Methods D790, Flexural	unspecified	1400	1600	1800	2000	2200	2400	2600	2800	[B]
	ISO 527, Tensile, chord	unspecified	1400	1600	1800	2000	2200	2400	2600	2800	[B]
3	Impact, min										
	Test Method D256, Izod, J/m[C]	unspecified	30	100	150	200	250	300	350	400	[B]
	ISO 179, Charpy, kJ/m^{2}[D]	unspecified	1	5	9	13	19	22	25	30	[B]
4	Softening temperature, °C, min										
	Test Method D1525	unspecified	75	90	95	100	105	110	115	120	[B]
	ISO 306	unspecified	70	85	90	95	100	105	110	115	[B]
5	To be determined	unspecified	...	...	...	...	...	...	...	...	

[A]MPa × 145 = psi.
[B]To be specified.
[C]J/m × 18.73 × 10^{-3} = ft·lbf/in.
[D]kJ/m^{2} × 0.476 = ft·lbf/in^{2}. Test configuration 1aE.

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 "0" grade classification shall be used for reinforced materials in this system.

NOTE 4—An example of this classification for a reinforced ABS is as follows:THE DESIGNATION ABS 120G30A55130 INDICATES:

ABS 120	=	Acrylonitrile-butadiene-styrene, molding resin, high impact
G30	=	Glass reinforced at 30 % nominal level,
A	=	Cell Table A, property requirements,
5	=	80 MPa tensile strength, min,
5	=	7500 MPa flexural modulus, D790, or tensile modulus, chord, ISO 527, min,
1	=	30 J/m Izod or 2 kj/m^2 Charpy impact strength, min,
3	=	90°C heat deflection temperature, D648, 89°C, ISO 75 min, and
0	=	unspecified.

If no properties are specified, the designation would be ABS 120G30A00000.

4.3 Cell Table B has been incorporated into this classification system to facilitate the classification of special materials where Table ABS or Cell Table A does not reflect the required properties of ABS material. Cell Table B shall be used in the same manner as Cell Table A.

NOTE 5—An example of a special material using this classification system is as follows:THE DESIGNATION ABS 210B54220 WOULD INDICATE THE FOLLOWING, WITH THE MATERIAL REQUIREMENTS FROM CELL TABLE B:

ABS 210	=	Acrylonitrile–butadiene–styrene, extrusion resin, medium impact,
B	=	Cell Table B property requirements,
5	=	40 MPa tensile strength, min,
4	=	2000 MPa Flexural modulus, D790, or tensile modulus, chord, ISO 527, min,
2	=	100 J/m Izod impact or 5 kj/m^2 Charpy impact strength, min,
2	=	90°C vicat softening point, D1525 or 85°C, ISO 306, min, and
0	=	unspecified.

NOTE 6—Mechanical properties of pigmented or colored ABS or alloy materials can differ from the mechanical properties of natural ABS or alloy material, depending on the choice and concentration of colorants. The main property affected is ductility, as illustrated by a reduction in Izod impact strength and tensile-elongation values. If specific properties of pigmented ABS or alloy materials are necessary, prior testing between the materials supplier and end user should be initiated.

CELL TABLE C Unreinforced ABS Alloy
(For property test parameters, see Section 12.)

Designation Grade	Property	Cell Limits									
		0	1	2	3	4	5	6	7	8	9
1	Tensile strength, MPa[A] , min										
	Test Method D638	unspecified	30	35	40	45	50	55	60	65	[B]
	ISO 527, 1, 2	unspecified	30	35	40	45	50	55	60	65	[B]
2	Modulus, MPa, min										
	Test Methods D790, Flexural	unspecified	1600	1800	2000	2200	2400	2600	2800	3000	[B]
	ISO 527, Tensile, chord	unspecified	1600	1800	2000	2200	2400	2600	2800	3000	[B]
3	Impact, min										
	Test Method D256, Izod, J/m[C]	unspecified	100	200	300	350	450	500	550	600	[B]
	ISO 179, Charpy, kJ/m^2[D]	unspecified	5	13	22	28	36	41	46	50	[B]
4	Softening temperature, °C, min										
	Test Method D1525	unspecified	70	80	90	100	110	120	130	140	[B]
	ISO 306	unspecified	65	75	85	95	105	115	125	135	[B]
5	To be determined	unspecified	...	...	...	...	...	...	...	...	

[A] MPa × 145 = psi.
[B] To be specified.
[C] J/m × 18.73 × 10 $^{-3}$ = ft·lbf/in.
[D] kJ/m^2 × 0.476 = ft·lbf/in ^{2}. Test configuration 1aE.

4.4 Cell Table C has been incorporated into this specification to facilitate the classification of ABS alloy materials where Table ABS or Table B do not reflect the necessary properties. Cell Table C shall be used in the same manner as Cell Table A or B.

NOTE 7—AN EXAMPLE OF AN ABS ALLOY USING THIS CLASSIFICATION SYSTEM IS AS FOLLOWS: THE DESIGNATION ABS 0420C4665 WOULD INDICATE THE FOLLOWING, WITH THE MATERIAL REQUIREMENTS FROM CELL TABLE C:

ABS 0420	=	Acrylonitrile-butadiene-styrene polycarbonate alloy, high impact,
C	=	Cell Table C property requirements,
4	=	45 MPa tensile strength, min, Test Method D638 or ISO 527, 1 and 2,
6	=	2600 MPa flexural modulus, in Test Methods D790 or tensile modulus, chord, ISO 527,
6	=	500 J/m Izod impact strength, min, Test Method D256, or 41 kj/m^2 Charpy impact strength, min, ISO 179,
5	=	110°C vicat softening point, 120°C/h or 105°C at 50°C/h, and
0	=	unspecified.

5. Suffixes

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

5.2 A list of suffixes can be found in Classification System D4000 (Table 3) and are to be used for additional requirements as appropriate. Additional suffixes will be added to that standard as test methods and requirements are developed and requested.

6. Basic Requirements

6.1 Basic requirements from property or cell tables, as they apply, are always in effect unless these requirements are superseded by specific suffix requirements, which always take precedence.

7. General Requirements

7.1 The material composition shall be uniform and shall conform to the requirements specified herein. Specification changes due to the effects of colorants shall be noted by both the materials supplier and the end user and, where necessary, shall be covered by suffixes.

8. Detail Requirements

8.1 Test specimens and testing parameters for the materials shall conform to the requirements prescribed in Table ABS, Cell Table A, B, and C, and suffix requirements as they apply.

8.2 For the purpose of determining conformance, all specified limits for a specification (line callout) based on this classification system are absolute limits, as defined in Practice E29.

8.3 With the absolute method, an observed value or a calculated value is not rounded, but is to be compared directly with the limiting value. Conformance or nonconformance is based on this comparison.

NOTE 8—Specimen dimensions and specific test procedure requirement for ISO test methods are found in Section 12.

9. Sampling

9.1 Sampling shall be statistically adequate to satisfy the requirements of 13.4.

9.2 A batch or lot is construed as a unit of manufacture as prepared for shipment and can consist of a blend of two or more "production runs."

10. Specimen Preparation

10.1 The test specimens shall be molded by the injection process using procedures from Practice D3641 or ISO 294 as a guide. It is recommended the resin be dried from 2 to 4 h at 80°C for ABS resins or 100°C for ABS/PC alloy resins.

NOTE 9—Recommended moisture levels are 0.1 % or less for injection molding and 0.05 % or less for extrusion to avoid surface defects.

10.1.1 The following conditions shall be used for molding specimens using procedures from Practice D3641:

	General ABS	Additive FR ABS
Melt temperature	250 ± 5°C	220 ± 5°C
Mold temperature	55 ± 5°C	55 ± 5°C
Injection velocity	200 ± 100 mm/s	200 ± 100 mm/s

	High Heat ABS Reinforced ABS	ABS/PC Alloy Reinforced Alloy
	255 ± 5°C	270 ± 10°C
	55 ± 5°C	80 ± 10°C
	200 ± 100 mm/s	200 ± 100 mm/s

NOTE 10—ISO 2580 conditions are as follows: 250°C melt ±2°C, 60°C mold at ±2°C, and 200 ± 100 mm/s injection velocity flow front for general grades, 220°C melt for FR grades and 270°C melt for high heat grades with no changes in mold temperature or injection velocity.

NOTE 11—The average injection velocity is calculated using the following formula:

$$\frac{\pi d^{2} Va}{4ns} \quad (1)$$

where:

d = screw diameter,
Va = screw advance speed,
n = number of cavities, and
s = cross-sectional area.

10.2 The use of test specimens from the gate end of the mold shall be avoided.

11. Conditioning

11.1 Test specimens shall be conditioned in the Standard Laboratory Atmosphere in accordance with Procedure A of Practice D618 with the exception that specimens do not need to be in racks or hung separately or, when tested by ISO methods, conditioned in accordance with ISO 291. Shorter times of conditioning the test specimen may be used if it is demonstrated that no significant differences in data occur when performing the required tests. The minimum conditioning time shall be 24 h for periodic-check inspection.

11.2 Conduct tests in the standard laboratory atmosphere in accordance with Practice D618, Procedure A, unless otherwise specified.

12. Test Methods

12.1 The tensile strength at yield shall be determined on a Type I (ASTM) or Type I a or b (ISO 527) or the universal test bar (ISO 20753) injection molded specimen tested at 5 mm/min ABS for Test Method D638 or 50 mm/min for ISO 527. ABS alloys shall be tested at 50 mm/min for both Test Method D638 and ISO 527 methods.

12.2 The modulus shall be determined on an injection molded specimen 12.5 by 3.2 mm using 50 ± 1 mm span, tangent, at 1.3 mm/min for flexural modulus, Test Methods D790, or Type I a or b (ISO) injection molded specimen, chord modulus, at 1 mm/min for ISO 527.

12.3 For impact, all specimens shall be taken from the dead end (opposite gate) of a straight-sided bar or the middle of a Type I tensile bar for D256, Izod or from center of multipurpose test specimen (ISO 20753) for Charpy impact, ISO 179.

12.4 All specimens for thermal testing, either deflection temperature under load or vicat softening temperature, shall be unannealed.

12.5 The vicat softening point shall be determined for a 1 kg load, 12.5 by 3.2 mm injection molded specimen at 2°C/min for Test Method D1525 or 50 N load, 10 by 4 mm injection molded specimen at 50°C/h for ISO 306.

12.6 The heat-deflection temperature shall be determined for a 1.82 MPa load on a 3.2 mm (Test Method D648) or 4 mm (ISO 75) thickness unannealed specimen. Testing is allowed to be run either edgewise or flatwise.

12.7 The glass content of glass-reinforced materials shall be determined in accordance with Test Method D5630.

13. Certification And Inspection

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 those tests that ensure process control during manufacture: melt viscosity, impact, or composition, as they apply.

13.3 Periodic-check inspection shall consist of the tests specified for all requirements of the material under this classification system. The inspection frequency shall be adequate to ensure that 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 meet the requirements of the specification (line callout).

NOTE 12—The ASTM publication *Manual on Presentation of Data and Control Chart Analysis, 8th Edition*,[5] provides detailed information about statistical process control.

13.5 A report of the test results shall be furnished when requested. The report shall consist of the results of the lot-acceptance inspection for the shipment and the results of the most recent periodic-check inspection.

14. Packaging and Marking

14.1 For packing, packaging, and marking, the provisions of Practice D3892 apply.

15. Keywords

15.1 ABS; ABS/PC; ABS/PVC alloys; classification system; line callout; plastics

[5] Available from ASTM International. Order stock number: MNL7-8TH-EB.

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. (April 1, 2016)

(1) Removed permissive language throughout standard.
(2) Added reference to Practice E29 to 8.2.
(3) Removed reference to Practice E105 in 9.1.
(4) Updated 11.2 to reference Procedure A of D618 to update humidity tolerance.
(5) Added Note 12 to 13.4.
(6) Updated test specimen reference from ISO 3167 to ISO 20753.
(7) Corrected wording of ISO equivalency statement.
(8) Corrected Note 7 table reference to Cell Table C.
(9) Note 12 reference updated to 8th edition, Number MNL7-8TH-EB.
(10) Changed Footnote B for Tables A, B, and C to: "To be specified."
(11) Updated language in 5.1 to clarify where to find allowed suffixes.
(12) Added Table 1 title and footnotes.