



Designation: D2287 – 11

Standard Specification for Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds¹

This standard is issued under the fixed designation D2287; 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 specification covers nonrigid vinyl chloride polymer and copolymer classes in which the resin portion of the composition contains at least 90 % vinyl chloride. The remaining 10 % can include one or more monomers copolymerized with vinyl chloride or consist of other resins mechanically blended with polyvinyl chloride or copolymers thereof.

1.2 These nonrigid vinyl compounds are defined by a hardness range and include the necessary stabilizers, plasticizers, fillers, dyes, and pigments to meet the designated requirements.

1.3 This specification includes nonrigid vinyl chloride compounds recommended for compression molding, injection molding, and extrusion, but it must be recognized that particular compounds are not suitable for all these means of fabrication.

NOTE 1—This standard and ISO 2898-1 and ISO 2898-2 address the same subject matter, but differ in technical content.

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 *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.*

1.6 The text of this specification references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of this specification.

1.7 Recycle PVC plastics meeting the requirements of this specification may be used in some applications. Refer to the

specific requirements in the Materials and Manufacture section of the applicable product standard.

2. Referenced Documents

2.1 ASTM Standards:²

D257 Test Methods for DC Resistance or Conductance of Insulating Materials

D618 Practice for Conditioning Plastics for Testing

D635 Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position

D638 Test Method for Tensile Properties of Plastics

D746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact

D792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement

D883 Terminology Relating to Plastics

D1203 Test Methods for Volatile Loss From Plastics Using Activated Carbon Methods

D1600 Terminology for Abbreviated Terms Relating to Plastics

D2240 Test Method for Rubber Property—Durometer Hardness

D3182 Practice for Rubber—Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets

D3892 Practice for Packaging/Packing of Plastics

2.2 ISO Standards:³

ISO 2898-1 Plastics—Plasticide Compounds of Homopolymers and Copolymers of Vinyl Chloride (PVC-P)

ISO 2898-2 Plastics—Plasticide Compounds of Homopolymers and Copolymers of Vinyl Chloride (PVC-P)—Part 2 Preparation of Test Specimens and Determination of Properties

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.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

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

3. Terminology

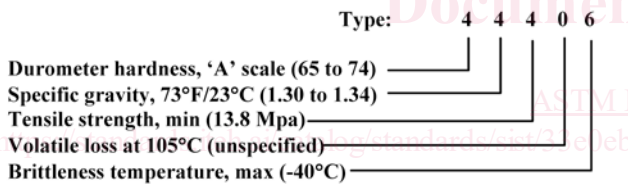
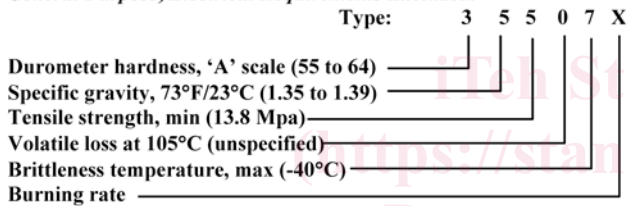
3.1 General—Definitions are in accordance with Terminology D883 and abbreviations with Terminology D1600, unless otherwise indicated.

4. Classification

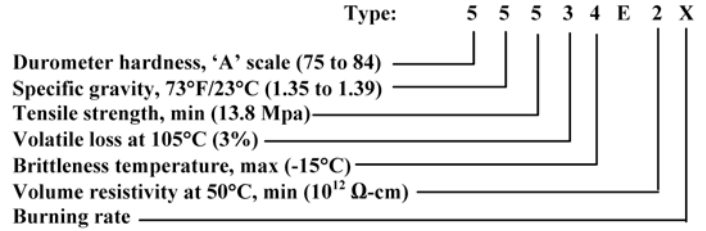
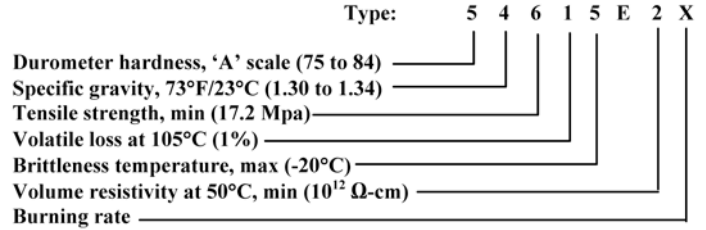
4.1 Provision is made in this specification for the identification of vinyl chloride polymers and copolymers by use of Terminology D1600. Additionally, there is provision for distinguishing electrical grades and burning rate by suffix. The system of classification provided in Table 1 permits characterization and identification of all compounds having properties within the ranges of the combinations that may be selected from the table. Following type identification in accordance with Terminology D1600, grades are designated by the cell number for each property in the order in which they are listed in Table 1, including the suffixes identifying electrical grades and flammability when required. When a property is not specified, a "0" is entered as the cell number unless identification is terminated prior to that point.

NOTE 2—The manner in which selected materials are identified is illustrated by the examples given below:

General-Purpose, Electrical Requirements Excluded:



Electrical Grades, E Requirement Included:



NOTE 3—The cell-type format provides means for close characterization and specification of material properties, alone or in combination, for a broad range of materials. This format, however, is subject to possible misapplication since unobtainable property combinations can be selected if the user is not familiar with commercially available materials. The manufacturer should be consulted.

5. General Requirements

5.1 Material shall be of uniform composition and be so compounded as to meet the requirements designated for it.

5.2 The designated material shall contain the ingredients necessary to permit satisfactory processing with appropriate equipment under recommended or commercially acceptable conditions. There shall be no separation of components under conditions of application normal for these compounds.

6. Significance and Use

6.1 Means for selecting and identifying nonrigid vinyl chloride compounds are provided in Table 1. The properties enumerated in this table and the tests defined are expected to

TABLE 1 Detail Grade Requirements

Designation Order No.	Property and Unit	Cell Limits									
		0	1	2	3	4	5	6	7	8	9
1	Durometer hardness, A scale	unspecified	<45	45 to 54	55 to 64	65 to 74	75 to 84	85 to 94	94	...	...
2	Specific gravity (nominal), 73°F/23°C	unspecified	<1.20	1.20 to 1.24	1.25 to 1.29	1.30 to 1.34	1.35 to 1.39	1.40 to 1.44	1.45 to 1.49	1.50 to 1.59	>1.59
3	Tensile strength, min:										
	MPa		<6.9	6.9	8.8	10.8	13.8	17.2	20.7	24.1	>24.1
	psi		<1000	1000	1285	1575	2000	2500	3000	3500	>3500
4	Volatile loss at 105°C, max, %	unspecified	1.0	2.0	3.0	4.0	5.0	6.0	7.0	>7.0	
5	Brittleness temperature, max, °C	unspecified	0	-5	-10	-15	-20	-30	-40	-50	-60
E	Volume resistivity at 50°C, min, Ω-cm	unspecified	10 ¹¹	10 ¹²	10 ¹³	...	...	...	...	...	...
X	Burning rate	unspecified	... ^A	...	...	...	...	...	...	...	...

^A When tested in accordance with Test Method D635, the compounds of this cell unit designation shall yield the following results: average extent of burning of <25 mm; average time of burning of <10 s.