This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: D5575 – 18

Standard Classification System for Copolymers of Vinylidene Fluoride (VDF) with Other Fluorinated Monomers[1]

This standard is issued under the fixed designation D5575; 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.

1. Scope*

1.1 This classification system covers both developing property designations and specifications for thermoplastic compositions consisting of vinylidene fluoride (VDF) polymers modified with other fluoromonomers and property-enhancing additives. The other fluoromonomers include one or more of the following: hexafluoropropylene (HFP), tetrafluoroethylene (TFE), and chlorotrifluoroethylene (CTFE). The additives are those that improve its flame resistance, processing, or physical properties. However, these additives are not normally considered to be reinforcing. This classification system covers thermoplastic compositions supplied in pellet or powder forms.

1.2 A designation or specification applies only to the virgin polymers prepared from vinylidene fluoride (>50 weight %) with one or more of the following comonomers: hexafluoropropylene, tetrafluoroethylene, and chlorotrifluoroethylene. Some polymers contain additives to enhance certain properties.

1.3 This system constitutes a line callout as a means of designating and specifying properties of VDF-based copolymers. At least four of the designated properties are used to define a polymer's specification. Specification criteria from international documents can be used if their criteria match designation properties currently used by this classification system.[2] This classification system is not intended for the selection of materials.

1.4 The manufacturer of the virgin resin shall establish the designation of a resin based on the property value criteria in this classification system.

1.5 The minimum specification properties are established by this classification system. Additional specification properties, based on the designation properties cited, can be established by the resin supplier and customer.

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

1.7 The property tests are intended to provide information for specifications of modified VDF-copolymer compositions. It is not the purpose of this classification system to provide engineering data for design purposes.

NOTE 1—Although the values listed in Table 1, Table 2, Table 3, Table 4, and Table 5 are necessary to include the range of properties available in existing materials, they are not to be interpreted as implying that every possible combination of the properties exists or can be obtained. It is possible for a user or designer, using Tables 1-5, to call out property relationships that are physically impossible to occur in a copolymer made using current technology.

NOTE 2—Many of these polymers exhibit polymorphism.[3] The type and extent of crystalline structure will vary with the thermomechanical history of the sample. Properties vary based on the technique used to prepare the specimens.

1.8 Test methods used in this classification system can result in the incidental production of hazardous materials. Modified VDF polymer fluoroplastics melt between 90 and 182°C (194 and 359°F) and are thermally stable up to about 350°C (662°F), or somewhat higher, depending on the composition. (**Warning—**Evolution of corrosive, colorless, and toxic hydrogen fluoride can occur under certain conditions.)

1.9 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* See Warning in 1.8 and Section 10 for specific hazards statements.

NOTE 3—Many, but not all of the codes and specifications found in this classification system are also in ISO 12086-1 and ISO 12086-2.

1.10 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the*

[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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This standard is needed to cover commercial products outside the scope of Specification D3222.

[2] Fluoropolymer property specification data from international standards can include properties intentionally excluded from this classification system (for example, composition). The only property criteria from other documents that can be used are those having similar properties allowed under the designation system.

[3] Lovinger, A. J., "Poly(vinylidene fluoride)," *Developments in Crystalline Polymers,* Vol 1, Chapter 5, D.C. Bassett, Ed., Applied Science, London, 1982.

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

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