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# Plastics — Fluoropolymer dispersions and moulding and extrusion materials —

## Part 1: Designation system and basis for specifications

*Plastiques — Polymères fluorés: dispersions et matériaux pour moulage et extrusion —*

*Partie 1: Système de désignation et base de spécification*

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# Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

This first edition of ISO 20568-1 cancels and replaces ISO 12086-1:2006, which has been technically revised to introduce a new designation system.

A list of all the parts in the ISO 20568 series can be found on the ISO website.


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# Plastics — Fluoropolymer dispersions and moulding and extrusion materials —

# Part 1: Designation system and basis for specifications

## 1 Scope

This document establishes a system of designation for fluoropolymer materials, which may be used as the basis for specifications.

The various types of fluoropolymer are differentiated from each other by a classification system based on appropriate levels of the designatory properties and on information about the intended application and/or method of processing, important properties, additives, colorants, fillers and reinforcing materials.

**For polytetrafluoroethylene (PTFE)**

For PTFE granular moulding and ram extrusion materials, and for PTFE resin produced from coagulation of dispersion:

— standard specific gravity (SSG)

— bulk density

— particle size

**For aqueous dispersion of PTFE**

— PTFE percentage in dispersion

— surfactant percentage in dispersion

— surfactant tolerance level

**For melt processable resins**

**For CPT, ECTFE, EFEP, ETFE, FEP, PFA, PVDF, PVF, VDF/CTFE, VDF/HFP, VDF/TFE, VDF/TFE/HFP**

— melting-peak temperature

— melt mass-flow rate

**For PCTFE**

— zero-strength time (ZST)

**For TFE/PDD**

— glass transition temperature ($T_g$)

**For aqueous dispersion of melt processable resins (ETFE, FEP, PFA, PVDF, PVF, VDF/CTFE, VDF/HFP, VDF/TFE, VDF/TFE/HFP)**

— polymer percentage in dispersion

— surfactant percentage in dispersion

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— surfactant tolerance level

The designation system is applicable to all fluoropolymers and blends. It applies to unmodified materials ready for normal use and materials modified, for example, by colorants, additives, fillers, reinforcing materials and polymer modifiers.

It is not intended to imply that materials having the same designation give necessarily the same performance. This document does not provide engineering data, performance data or data on processing conditions which may be required to specify a material. If such additional properties are required, they are intended to be determined in accordance with the test methods specified in ISO 20568-2, if suitable.

In order to specify a thermoplastic material for a particular specification, the requirements are to be given in data block 5 (see 4.1).

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 472, *Plastics — Vocabulary*

ISO 1043-1, *Plastics — Symbols and abbreviated terms — Part 1: Basic polymers and their special characteristics*

ISO 1133-1, *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Part 1: Standard method*

ISO 11357-2, *Plastics — Differential scanning calorimetry (DSC) — Part 2: Determination of glass transition temperature and glass transition step height*

ISO 11357-3, *Plastics — Differential scanning calorimetry (DSC) — Part 3: Determination of temperature and enthalpy of melting and crystallization*

ISO 20568-2, *Plastics — Fluoropolymer dispersions and moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties*

ASTM D1430, *Standard Classification System for Polychlorotrifluoroethylene (PCTFE) Plastics*

ASTM D2116, *Standard Specification for FEP-Fluorocarbon Molding and Extrusion Materials*

ASTM D4441, *Standard Specification for Aqueous Dispersions of Polytetrafluoroethylene*

ASTM D4591, *Standard Test Method for Determining Temperatures and Heats of Transitions of Fluoropolymers by Differential Scanning Calorimetry*

ASTM D4894, *Standard Specification for Polytetrafluoroethylene (PTFE) Granular Molding and Ram Extrusion Materials*

ASTM D4895, *Standard Specification for Polytetrafluoroethylene (PTFE) Resins Produced From Dispersion*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 472 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp


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**3.1**
**melt-processable**
capable of being processed by, for example, injection molding, screw extrusion and other operations typically used with thermoplastics

**3.2**
**presintered resin**
resin that has been treated thermally at or above the melting point of the resin at atmospheric pressure without having been previously preformed

**3.3**
**reprocessed plastic**
material from the manufacture of semifinished forms of fluoropolymers that has been converted to a form suitable for further use

**3.4**
**sintering**
<PTFE> thermal treatment during which the material is melted and recrystallized by cooling, with coalescence occurring during the treatment

**3.5**
**standard specific gravity**
**SSG**
specific gravity of a specimen of PTFE material preformed, sintered and cooled through the crystallization point at a rate of 1 °C per minute in accordance with the appropriate sintering schedule as described in ISO 20568-2

Note 1 to entry: The SSG of unmodified PTFE is inversely related to its molecular mass.

**3.6**
**zero-strength time**
**ZST**
measure of the relative molecular mass of PCTFE

Note 1 to entry: The ZST of PCTFE is proportionally related to its molecular mass.

# 4 Designation and specification system

## 4.1 General

The designation system for thermoplastics is based on the following standard pattern:

| Designation | | | | | | |
|---|---|---|---|---|---|---|
| Description block (optional) | Identity block | | | | | |
| | International Standard number block | Individual-item block | | | | |
| | | Data block 1 | Data block 2 | Data block 3 | Data block 4 | Data block 5 |

The designation consists of an optional description block, reading “Thermoplastics”, and an identity block comprising the International Standard number and an individual-item block. For unambiguous designation, the individual-item block is subdivided into five data blocks comprising the following information:

— Data block 1: Identification of the plastic by its abbreviated term for the fluoropolymer as listed in Table 1 and information about the composition of the polymer (see Table 1 and Table 2).

— Data block 2: Fillers or reinforcing materials and their nominal content (see 4.3).

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