



**SLOVENSKI STANDARD**  
**SIST EN ISO 12086-1:2006**

**01-april-2006**

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**SIST EN ISO 12086-1:2000**

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Plastics - Fluoropolymer dispersions and moulding and extrusion materials - Part 1:  
Designation system and basis for specifications (ISO 12086-1:2006)

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Kunststoffe - Fluorpolymerdispersionen, Formmassen und Extrusionsmaterialien - Teil 1:  
Bezeichnungssystem und Basis für Spezifikationen (ISO 12086-1:2006)

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Plastiques - Polymeres fluorés: dispersions et matériaux pour moulage et extrusion -  
Partie 1: Systeme de désignation et base de spécification (ISO 12086-1:2006)

**Ta slovenski standard je istoveten z: EN ISO 12086-1:2006**

**ICS:**

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NORME EUROPÉENNE  
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**EN ISO 12086-1**

February 2006

ICS 83.080.20

Supersedes EN ISO 12086-1:1999

English Version

**Plastics - Fluoropolymer dispersions and moulding and extrusion materials - Part 1: Designation system and basis for specifications (ISO 12086-1:2006)**

Plastiques - Polymères fluorés: dispersions et matériaux pour moulage et extrusion - Partie 1: Système de désignation et base de spécification (ISO 12086-1:2006)

Kunststoffe - Fluoropolymerdispersionen, Formmassen und Extrusionsmaterialien - Teil 1: Bezeichnungssystem und Basis für Spezifikationen (ISO 12086-1:2006)

This European Standard was approved by CEN on 13 February 2006.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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**EN ISO 12086-1:2006 (E)****Foreword**

This document (EN ISO 12086-1:2006) has been prepared by Technical Committee ISO/TC 61 "Plastics" in collaboration with Technical Committee CEN/TC 249 "Plastics", the secretariat of which is held by IBN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2006, and conflicting national standards shall be withdrawn at the latest by August 2006.

This document supersedes EN ISO 12086-1:1999.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

**Endorsement notice**

The text of ISO 12086-1:2006 has been approved by CEN as EN ISO 12086-1:2006 without any modifications.

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ISO  
12086-1

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2006-02-15

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**Plastics — Fluoropolymer dispersions  
and moulding and extrusion materials —**

**Part 1:  
Designation system and basis  
for specifications**

**iTeh STANDARD PREVIEW**

*Plastiques — Polymères fluorés: dispersions et matériaux pour  
moulage et extrusion*  
(standards.iteh.ai)

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

SIST EN ISO 12086-1:2006

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## ISO 12086-1:2006(E)

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 12086-1 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

This second edition cancels and replaces the first edition (ISO 12086-1:1995), which has been technically revised.

ISO 12086 consists of the following parts, under the general title *Plastics — Fluoropolymer dispersions and moulding and extrusion materials*:

- iTeH STANDARD PREVIEW  
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- SIST EN ISO 12086-1:2006  
<https://standards.iteh.ai/catalog/standards/sist/acc85282-8bb6-4289-9244-ed78a3175517/sist-en-iso-12086-1-2006>
- *Part 1: Designation system and basis for specifications*
  - *Part 2: Preparation of test specimens and determination of properties*



# Plastics — Fluoropolymer dispersions and moulding and extrusion materials —

## Part 1: Designation system and basis for specifications

### 1 Scope

**1.1** This part of ISO 12086 establishes a system of designation for fluoropolymer materials that may be used as the basis for specifications. It covers the homopolymers and various copolymers of fluoromonomers used as dispersions and for moulding, extrusion and other specialized applications. This part of ISO 12086 describes the designation system and provides codes and tables of values for the designatory properties. The designation system is applicable both to conventional thermoplastic fluoropolymers, processed by various techniques, and those materials that are processed by the unique operations required for the non-conventional thermoplastic polytetrafluoroethylene. The materials include both the fluorocarbon polymers and the various other fluoropolymers as virgin polymers or processed for reuse or recycling. This part of ISO 12086 also includes an extension of the designation system that provides a basis for specification of the materials. This basis for specification may be used to prepare specifications related to well-defined applications. As explained in Clause 5, these specifications will use data blocks 1 to 4 and, if necessary, data block 5 as a complement, the last-mentioned data block containing the specific requirements in relation to the application. Fluoroelastomers are specifically excluded.

**1.2** Fluoropolymers are long-chain homopolymers and copolymers of fluoromonomers. Fluoropolymers can be modified with small amounts of different fluoromonomers. In general, provided the polymer is not modified with more than five percent by mass of modifying fluoromonomer(s), it can be classed as the base polymer. PVDF is classed as the base polymer when it is modified during polymerization with up to two percent by mass of additional fluoromonomers in the polymer structure. For PTFE, up to one percent by mass of a modifying comonomer is the limit for the material to be classed as polytetrafluoroethylene. A general discussion of members of the fluoropolymer family is included in Annex C. This part of ISO 12086 is particularly concerned with, but is not limited to, the materials listed in 4.2. The accepted abbreviated term for each material is included in 4.2.

**1.3** The various types of fluoropolymer are differentiated from each other by a classification system based on the fluoropolymer genus and appropriate levels of the designatory properties, along with information about basic polymer parameters, intended application or method of processing, important properties, additives, colorants, fillers and reinforcing materials. Designatory properties for each fluoropolymer are selected from the general list in 5.4, and those properties to be designated for each fluoropolymer are listed in 5.7 and in Annexes A and B.

**1.4** Provision is made for designation of materials involved in reuse and recycling of the fluoropolymers covered by this part of ISO 12086. A set of designatory properties is provided for reprocessed PTFE because of its special requirements. For non-virgin conventional thermoplastic fluoropolymers, the same designatory properties as used for virgin materials are used with inclusion of the code Z1, Z2 or Z3 in data block 1 as specified in Table 1.

**1.5** It is not intended to imply that materials having the same designation necessarily give the same performance. The converse should also be emphasized, i.e. materials with different designations may be suitable for use in the same application. This part of ISO 12086 does not provide engineering data, performance data or processing conditions which may be required to specify materials for particular end-use applications (see the discussion on use of data block 5 in Clauses 5 and 7). If such additional properties are required, they can be determined in accordance with the test methods specified in ISO 12086-2, if suitable.

## ISO 12086-1:2006(E)

**2 Normative references**

The following referenced documents are indispensable for the application 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 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics*

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

ISO 1043-2, *Plastics — Symbols and abbreviated terms — Part 2: Fillers and reinforcing materials*

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

ISO 1183-1, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method*

ISO 1183-2, *Plastics — Methods for determining the density of non-cellular plastics — Part 2: Density gradient column method*

ISO 12000, *Plastics/rubber — Polymer dispersions and rubber latices (natural and synthetic) — Definitions and review of test methods*

ISO 12086-2, *Plastics — Fluoropolymer dispersions and moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties*

ASTM D 1430, *Standard Classification System for Polychlorotrifluoroethylene (PCTFE) Plastics*

ASTM D 1600, *Standard Terminology for Abbreviated Terms Relating to Plastics*

ASTM D 3222, *Standard Specification for Unmodified Poly(Vinylidene Fluoride) (PVDF) Molding, Extrusion and Coating Materials*

ASTM D 3418, *Standard Test Method for Transition Temperatures of Polymers by Differential Scanning Calorimetry*

ASTM D 3892, *Standard Practice for Packaging/Packing of Plastics*

ASTM D 4591, *Standard Test Method for Determining Temperatures and Heats of Transitions of Fluoropolymers by Differential Scanning Calorimetry*

ASTM D 4895, *Standard Specification for Polytetrafluoroethylene (PTFE) Resin Produced from Dispersion*

ASTM D 5033, *Standard Guide for Development of ASTM Standards Relating to Recycling and Use of Recycled Plastics*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 472 and the following terms and definitions apply. The terms listed in 3.1 to 3.3 are repeated from ISO 472 to be sure there is no misunderstanding.

#### 3.1

##### **dispersion**

heterogeneous system in which a finely divided material is distributed in another material

#### 3.2

##### **fluoroplastic**

plastic based on polymers made with monomers containing one or more atoms of fluorine, or copolymers of such monomers with other monomers, the fluoromonomer being in the greatest amount by mass

#### 3.3

##### **latex**

colloidal aqueous dispersion of a polymeric material

#### 3.4

##### **amorphous**

noncrystalline, or devoid of regular structure

#### 3.5

##### **bulk density**

mass (in grams) per litre of material, measured under the conditions of the test

#### 3.6

##### **copolymer**

polymer formed from two or more types of monomer

#### 3.7

##### **emulsion polymer**

⟨fluoropolymer materials⟩ material isolated from its polymerization medium as a colloidal aqueous dispersion of the polymer solids

NOTE This definition, used in the fluoropolymer industry, is similar to that for “latex” in ISO 472 and is quite different from the definition for “emulsion” in ISO 472.

#### 3.8

##### **fluorocarbon plastic**

plastic based on polymers made from perfluoromonomers only

#### 3.9

##### **fluoroelastomer**

elastomer based on polymers made from monomers containing one or more atoms of fluorine, or copolymers of such monomers with other monomers, the fluoromonomer(s) being in the greatest amount by mass

#### 3.10

##### **fluoropolymer**

synonymous with fluoroplastic (see 3.2)

#### 3.11

##### **melt-processible**

capable of being processed by, for example, injection moulding, screw extrusion and other operations typically used with thermoplastics

**ISO 12086-1:2006(E)****3.12****preforming**

compacting powdered PTFE material under pressure in a mould to produce a solid object, called a preform, that is capable of being handled

NOTE With PTFE, “moulding” and “compaction” are terms used interchangeably with “preforming”.

**3.13****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

**3.14****reprocessed plastic**

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

NOTE 1 This material is often referred to as a byproduct from processing.

NOTE 2 Related definitions are presented in ASTM D 5033.

**3.15****sintering**

⟨PTFE⟩ thermal treatment during which the material is melted and recrystallized by cooling, with coalescence occurring during the treatment

**3.16****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 12086-2

NOTE The SSG of unmodified PTFE is inversely related to its molecular mass.

**3.17****suspension polymer**

polymer isolated from its liquid polymerization medium as a solid having a particle size well above colloidal dimensions

**3.18****zero-strength time****ZST**

measure of the relative molecular mass of PCTFE

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