INTERNATIONAL STANDARD

ISO 24025-1

First edition
2020-05

Plastics — Sulfone polymer moulding and extrusion materials —

Part 1: Designation system and basis for specifications

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Plastiques — Matériaux à base de polymères sulfone pour moulage et extrusion —
Partie 1: Système de désignation et base de spécifications

ISO 24025-1:2020
https://standards.iteh.ai/catalog/standards/sist/b85a5511-b3e9-428d-ae71-49565cda127f/iso-24025-1-2020

Reference number
ISO 24025-1:2020(E)

© ISO 2020

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 24025-1:2020
https://standards.iteh.ai/catalog/standards/sist/b85a5511-b3e9-428d-ae71-49565cda127f/iso-24025-1-2020

COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

© ISO 2020 – All rights reserved

Contents

Page

Foreword ..... **iv**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **2**

4 Designation system **2**
4.1 General 2
4.2 Data block 1 2
4.3 Data block 2 3
4.4 Data block 3 3
4.5 Data block 4 4
4.5.1 General 4
4.5.2 Temperature of deflection under load 4
4.5.3 Melt volume-flow rate 5
4.5.4 Charpy notched impact strength 6
4.5.5 Tensile modulus 6
4.5.6 Yield stress 7
4.6 Data block 5 7

5 Examples of designations **7**
5.1 Designation only 7
5.2 Designation transformed into a specification 8

Bibliography **10**

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO 24025-1:2020
https://standards.iteh.ai/catalog/standards/sist/b85a5511-b3e9-428d-ae71-49565cda127f/iso-24025-1-2020

© ISO 2020 – All rights reserved

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.

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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of 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 www.iso.org/iso/foreword.html.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 249, *Plastics*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 24025-1:2020
https://standards.iteh.ai/catalog/standards/sist/685a5511-b3e9-428d-ae71-f9565cda127f/iso-24025-1-2020

This first edition of ISO 24025-1 cancels and replaces ISO 25137-1:2009, which has been technically revised.

The main changes compared to the previous edition are as follows:

— in Clause 2, reference to ISO 25137-2 has been changed to ISO 24025-2;

— Clause 3 has been added;

— in Clause 4, the positions of data block have been changed;

— in Clause 5, the positions of data block have been changed.

A list of all parts in the ISO 24025 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

 © ISO 2020 – All rights reserved

Plastics — Sulfone polymer moulding and extrusion materials —

Part 1:
Designation system and basis for specifications

1 Scope

This document establishes a system of designation for sulfone polymer moulding and extrusion materials, including polysulfone (PSU), polyethersulfone (PESU) and polyphenylsulfone (PPSU), which can be used as the basis for specifications.

The types of sulfone polymer materials are differentiated from each other by a classification system based on appropriate levels of the designatory properties

a) temperature of deflection under load,

b) melt mass-flow rate,

c) Charpy notched impact strength,

d) tensile modulus, and

e) yield stress,

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO 24025-1:2020
https://standards.iteh.ai/catalog/standards/sist/25c751d3-d3b1-428b-ae71-10565a1d1258/iso-24025-1-2020

and on information about composition, intended application and/or method of processing, important properties, additives, colorants, fillers and reinforcing materials.

This document is applicable to all sulfone polymers that contain ether oxygen, which is a necessary component of the polymers as in the diphenyl sulfone moiety. It applies to sulfone polymer materials ready for normal use in the form of powder, granules or pellets, unmodified or modified by colorants, additives, fillers, etc.

This document not intended to imply that materials having the same designation necessarily give the same performance. It does not provide engineering data, performance data or data on processing conditions which can be required to specify a material for a particular application and/or method of processing.

If such additional properties are required, they are determined in accordance with the test methods specified in ISO 24025-1, if suitable.

In order to specify a thermoplastic material for a particular application or to ensure reproducible processing, the requirements are 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 1043-1, *Plastics — Symbols and abbreviated terms — Part 1: Basic polymers and their special characteristics*

ISO 24025-2, *Plastics — Sulfone polymer moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties*

© ISO 2020 – All rights reserved

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

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

4 Designation system

4.1 General

The designation system for thermoplastics is based on the following standardized pattern.

Designation						
Designation 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

iTeh STANDARD PREVIEW
(standards.iteh.ai)

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.

ISO 24025-1:2020
https://standards.iteh.ai/catalog/standards/sist/b85a5511-b3e9-428d-ae71-49565cda127f/iso-24025-1-2020

Data block 1: Identification of the plastic by its symbol PSU, PESU or PPSU in accordance with ISO 1043-1 and information about the composition of the polymer(see 4.2).

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

Data block 3: Position 1: Intended application or method of processing (see 4.4).

Positions 2 to 8: Important properties, additives and supplementary information (see 4.4).

Data block 4: Designatory properties (see 4.5).

Data block 5: For the purpose of alternative specifications, a fifth data block may be added containing additional information (see 4.6).

The first character of the individual-item block shall be a hyphen. The data blocks shall be separated from each other by commas.

If a data block is not used, this shall be indicated by doubling the separation sign, i.e. by two commas (,,).

4.2 Data block 1

In this data block, after the hyphen, the polymer is identified by its abbreviated term PSU, PESU or PPSU, in accordance with ISO 1043-1, giving information on the composition as indicated in Table 1.

© ISO 2020 – All rights reserved

Table 1 — Abbreviated terms used for information on the major component (≥75 % by mass) in the composition of the polymer in data block 1

Abbreviated term	Chemical structure of the repeating unit
PSU (polysulfone)	oxy-1,4-phenylenesulfonyl-1,4-phenylene-oxy-1,4-phenylene(dimethylmethylene)-1,4-phenylene
PESU (polyethersulfone)	oxy-1,4-phenylenesulfonyl-1,4-phenylene
PPSU (polyphenylsulfone)	oxybiphenyl-4,4′-diyloxy-1,4-phenylenesulfonyl-1,4-phenylene

4.3 Data block 2

In this data block, the type of filler and/or reinforcing material is represented by a single code-letter in position 1 and its physical form by a second code-letter in position 2, the code-letters being as specified in Table 2. Subsequently (without a space), the mass content may be given by a two-figure number in position 3.

Table 2 — Code-letters for fillers and reinforcing materials in data block 2

Code-letter	Material	Code-letter	Form
B	Boron	B	Balls, beads, spheres
C	Carbon[a]		
		D	Powder
		F	Fibre
G	Glass	G	Granules, ground
		H	Whiskers
K	Chalk		
L	Cellulose		
M	Mineral[a, b], metal[a]		
S	Synthetic, organic[a]	S	Scales, flakes
T	Talc		
X	Not specified	X	Not specified
Z	Others[b]	Z	Others

[a] These materials may be further defined by their chemical symbol, for example, or additional symbols defined in the relevant International Standard. In the case of metals (M), it is essential to indicate the type of metal by means of its chemical symbol.

[b] Mineral fillers shall be designated more precisely if a symbol is available.

Mixtures of materials and/or forms may be indicated by combining the relevant codes using the sign "+" and placing the whole between parentheses. For example, a mixture of 25 % glass fibres (GF) and 8 % mineral powder (MD) would be indicated by (GF25+MD08).

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO 24025-1:2020
https://standards.iteh.ai/catalog/standards/sist/b85a5511-b3c9-428d-ae71-49565cda127f/iso-24025-1-2020

4.4 Data block 3

In this data block, information about intended application and/or method of processing is given in position 1 and information about important properties, additives and colour in positions 2 to 8. The code-letters used are specified in Table 3.

If information is presented in positions 2 to 8 and no specific information is given in position 1, the letter X shall be inserted in position 1.

© ISO 2020 – All rights reserved

Table 3 — Code-letters used in data block 3

Code-letter	Position 1	Code-letter	Positions 2 to 8
		A	Processing stabilized
B	Blow moulding	B	Antiblocking
C	Calendering	C	Coloured
		D	Power
E	Extrusion	E	Expandable
F	Extrusion of films	F	Special burning characteristics
G	General use	G	Granules
		H	Heat stabilized
K	Cable and wire coating	K	Metal deactived
L	Monofilament extrusion	L	Light stabilized
M	Injection moulding	M	Nucleated
		N	Natural (no colour added)
		P	Impact modified
Q	Compression moulding		
R	Rotational moulding	R	Mould release agent
S	Sintering	S	Lubricated
T	Tape manufacture	T	Transparent
X	No indication		
		Y	Increased electrical conductivity
		Z	Antistatic

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO 24025-1:2020
https://standards.iteh.ai/catalog/standards/sist/b85a5511-b3e9-428d-ae71-49565cda127f/iso-24025-1-2020

4.5 Data block 4

4.5.1 General

In this data block, the set of conditions used to anneal specimens before determination of the temperature of deflection under load is represented by a code-letter and the range of the temperature of deflection under load by a three-figure code-number (see 4.5.2), the melt volume-flow rate by a two-figure code-number (see 4.5.3) and the impact strength by a two-figure code-number(see 4.5.4). The code-numbers are separated from each other by hyphens.

If a property value falls on or near a range limit, the manufacturer shall state which range designates the material. If subsequent individual test values lie on, or on either side of, the limit because of manufacturing tolerances, the designation is not affected.

NOTE Not all combinations of the values of the designatory properties can be possible for currently available polymers.

4.5.2 Temperature of deflection under load

The temperature of deflection under load should be determined in accordance with ISO 24025-2 at a stress level of 1,8 MPa, using test specimens moulded from dry material, annealed under one of the sets of conditions given in Table 4 and then conditioned, before the determination, at (23 ± 2) °C and (50 ± 10) % relative humidity for minimum of 24 h.

© ISO 2020 – All rights reserved

Table 4 — Specimen-annealing conditions

Code-letter	Temperature °C	Time h
A	140	4
B	170	1
C	200	1

The possible values of the temperature of deflection under load are divided into 12 ranges, each represented by a three-figure code-number as specified in Table 5.

Table 5 — Code-number for temperature of deflection under load in data block 4

Code-number	Range of temperature of deflection under load °C
145	≤ 150
155	> 150 but ≤ 160
165	> 160 but ≤ 170
175	> 170 but ≤ 180
185	> 180 but ≤ 190
195	> 190 but ≤ 200
205	> 200 but ≤ 210
215	> 210 but ≤ 220
225	> 220 but ≤ 230
235	> 230 but ≤ 240
245	> 240 but ≤ 250
255	> 250

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO 24025-1:2020
https://standards.iteh.ai/catalog/standards/sist/b85a5511-b3e9-428d-ae71-49565cda127f/iso-24025-1-2020

4.5.3 Melt volume-flow rate

The melt mass-flow rate (MFR) shall be determined in accordance with ISO 24025-2 under conditions specified in Table 6. The material for the determination of the MFR shall be dry.

Table 6 — Test condition used for the determination of melt mass-flow rate

Code-letter	Test temperature °C	Nominal load kg
A	343	2,16
B	360	10,00
C	365	5,00
D	380	2,16

The possible values of MFR are divided into 7 ranges, each represented by a two-figure code-number as specified in Table 7.

© ISO 2020 – All rights reserved