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Second edition
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Plastics — Impact-resistant polystyrene (PS-I) moulding and extrusion materials —

Part 1:

Designation system and basis for specifications

*Plastiques — Polystyrènes résistants au choc (PS-I) pour moulage et
extrusion —*

Partie 1: Système de désignation et base de spécification

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Reference number
ISO 2897-1:1997(E)

ISO 2897-1:1997(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.

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.

International Standard ISO 2897-1 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

This second edition cancels and replaces the first edition (ISO 2897-1:1990), the text of which has been brought into accordance with the standard SC 9 frame text.

ISO 2897 consists of the following parts, under the general title *Plastics — Impact-resistant polystyrene (PS-I) moulding and extrusion materials*:

- *Part 1: Designation system and basis for specifications*
- *Part 2: Preparation of test specimens and determination of properties*

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Plastics — Impact-resistant polystyrene (PS-I) moulding and extrusion materials —

Part 1: Designation system and basis for specifications

1 Scope

1.1 This part of ISO 2897 establishes a system of designation for impact-resistant polystyrene (PS-I) thermoplastic materials, which may be used as the basis for specifications.

1.2 The types of impact-resistant polystyrene plastic are differentiated from each other by a classification system based on appropriate levels of the designatory properties

- a) Vicat softening temperature
- b) melt flow rate
- c) Izod impact strength
- d) flexural modulus

and on information about the intended application and/or method of processing, important properties, additives and colourants.

1.3 This part of ISO 2897 is applicable to all impact-resistant polystyrene plastics with a two-phase polymer system comprised of a continuous phase, consisting of polystyrene and/or a copolymer of styrene with an alkyl-substituted styrene, and a dispersed elastomeric phase based on butadiene.

It applies to materials ready for normal use, unmodified or modified by colourants, additives, fillers, etc.

This part of ISO 2897 does not apply to expandable materials.

1.4 It is not intended to imply that materials having the same designation give necessarily the same performance. This part of ISO 2897 does not provide engineering data, performance data or data on processing conditions which may be required to specify a material for a particular application and/or method of processing.

If such additional properties are required, they shall be determined in accordance with the test methods specified in part 2 of this International Standard, if suitable.

1.5 In order to specify a thermoplastic material for a particular application or to ensure reproducible processing, additional requirements may be given in data block 5 (see clause 3, introductory paragraph).

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 2897. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 2897 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1043-1:1997, *Plastics — Symbols and abbreviated terms — Part 1: Basic polymers and their special characteristics.*

ISO 2897-2:1994, *Plastics — Impact-resistant polystyrene (PS-I) moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties.*

3 Designation system

The designation system for thermoplastics is based on the following standardized 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 5 data blocks comprising the following information:

- Data block 1: Identification of the plastic by its symbol PS-I in accordance with ISO 1043-1 (see 3.1).
- Data block 2: Position 1: Intended application or method of processing (see 3.2).
Positions 2 to 8: Important properties, additives and supplementary information (see 3.2).
- Data block 3: Designatory properties (see 3.3).
- Data block 4: Fillers or reinforcing materials and their nominal content (not included in this standard).
- Data block 5: For the purpose of specifications, a fifth data block may be added containing additional information.

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 (,,).

3.1 Data block 1

In this data block, after the hyphen, impact-resistant polystyrene plastics are identified by the symbol "PS-I", in accordance with ISO 1043-1.

3.2 Data block 2

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 1.

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.

Table 1 — Code-letters used in data block 2

Code-letter	Position 1	Code-letter	Positions 2 to 8
		A	Processing stabilized
		B	Antiblocking
		C	Coloured
E	Extrusion		
F	Extrusion of films	F	Special burning characteristics
G	General use	G	Granules
		H	Heat-ageing stabilized
		L	Light or weather stabilized
M	Moulding		
		N	Natural (no colour added)
		R	Mould release agent
		S	Lubricated
		T	Transparent
X	No indication		
		Z	Antistatic

3.3 Data block 3

In this data block, the range of the Vicat softening temperature is represented by a 3-figure code-number (see 3.3.1), the range of the melt mass-flow rate by a 2-figure code-number (see 3.3.2), the range of the Izod impact strength by a 2-figure code-number (see 3.3.3) and the range of the flexural modulus by a 2-figure code-number (see 3.3.4). 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 will designate 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 have to be provided for currently available polymers.

3.3.1 Vicat softening temperature

The Vicat softening temperature shall be determined in accordance with ISO 2897-2.

The possible values of the Vicat softening temperature are divided into 6 ranges, each represented by a 3-figure code-number as specified in table 2.

Table 2 — Ranges of Vicat softening temperature in data block 3

Code-number	Range of Vicat softening temperature °C
078	≤ 80
083	> 80 but ≤ 85
088	> 85 but ≤ 90
093	> 90 but ≤ 95
098	> 95 but ≤ 100
103	> 100

3.3.2 Melt flow rate

The melt mass-flow rate (MFR) shall be determined in accordance with ISO 2897-2.

The possible values of melt mass-flow rate are divided into 4 ranges, each represented by a 2-figure code-number as specified in table 3.

Table 3 — Ranges of melt mass-flow rate in data block 3

Code-number	Range of melt mass-flow rate (MFR) g/10 min
03	≤ 4
06	> 4 but ≤ 8
12	> 8 but ≤ 16
20	> 16

NOTE — Melt mass-flow rate (MFR) will be replaced by melt volume-flow rate (MVR) at the next five-year revision of this part of ISO 2897.

3.3.3 Izod impact strength

The Izod impact strength shall be determined in accordance with ISO 2897-2.

The possible values of Izod impact strength are divided into 5 ranges, each represented by a 2-figure code-number as specified in table 4.

Table 4 — Ranges of Izod impact strength in data block 3

Code-number	Range of Izod impact strength kJ/m ²
02	> 1,5 but ≤ 3
04	> 3 but ≤ 6
07	> 6 but ≤ 9
10	> 9 but ≤ 12
15	> 12

NOTE — After 1998, only Charpy impact strength will be used for designation, and consequently Izod impact strength will be cancelled.

3.3.4 Flexural modulus

The flexural modulus shall be determined in accordance with ISO 2897-2.

The possible values of the flexural modulus are divided into 4 ranges, each represented by a 2-figure code-number as specified in table 5.

Table 5 — Ranges of flexural modulus in data block 3

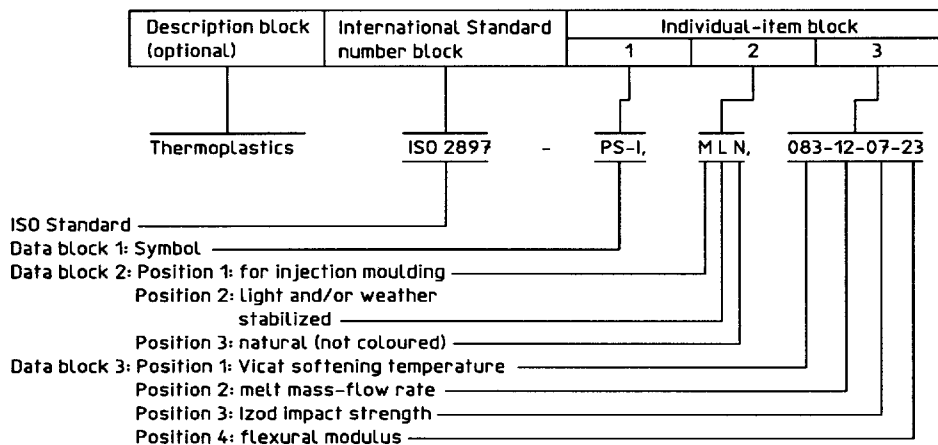
Code-number	Range of flexural modulus MPa
12	≤ 1 500
18	> 1 500 but ≤ 2 000
23	> 2 000 but ≤ 2 500
30	> 2 500

3.4 Data block 5

Indication of additional requirements in this optional data block is a way of transforming the designation of a material into a specification for a particular application. This may be done for example by reference to a suitable national standard or to a standard-like, generally established specification.

4 Example of a designation

An impact-resistant polystyrene (PS-I) thermoplastic material, intended for injection moulding (M), light and/or weather stabilized (L), natural (not coloured) (N), with a Vicat softening temperature VST/B50 of 84 °C (083), a melt mass-flow rate of 14 g/10 min (12), an Izod impact strength of 8 kJ/m² (07) and a flexural modulus of 2 200 MPa (23), would be designated:



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Descriptors: plastics, moulding materials, extrusion materials, thermoplastic resins, polystyrene, designation.

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