

BS EN ISO 19063-1:2015



BSI Standards Publication

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

Part 1: Designation system and basis for specifications

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**National foreword**

This British Standard is the UK implementation of EN ISO 19063-1:2015. It supersedes BS EN ISO 2897-1:1999 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/82, Thermoplastic materials.

A list of organizations represented on this committee can be obtained on request to its secretary.

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## **European foreword**

This document (EN ISO 19063-1:2015) 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 NBN.

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of an identical text or by endorsement, at the latest by June 2016, and conflicting national standards shall be withdrawn at the latest by June 2016.

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### **Endorsement notice**

The text of ISO 19063-1:2015 has been approved by CEN as EN ISO 19063-1:2015 without any modification.

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## 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](http://www.iso.org/directives)).

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

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

This first edition of ISO 19063-1 cancels and replaces ISO 2897-1:1997, which has been technically revised to introduce a new designation system.

The revised designation system is published under a new ISO number, as many existing documents refer to ISO 2897-1. If the existing ISO 2897-1 would be replaced by the new designation system, these documents would refer to the incorrect designation system.

In order to give users time to switch from ISO 2897-1 to ISO 19063-1, any designation system according to ISO 2897-1 is to be phased out in 5 to 10 years. During this period, ISO 2897-2 will effectively be Part 2 of this International Standard.

ISO 19063 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*

## Introduction

ISO 2897-1 is complex and does not fit with daily practice anymore. In practice, ISO 1043 (all parts) and ISO 11469 are, in combination, “improperly” being used as a designation system for, e.g. marking. The aim of this International Standard is to simplify the data block system and to connect more to ISO 1043 (all parts) and ISO 11469, where the first two blocks are used for generic identification and marking of products.





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

## Part 1: Designation system and basis for specifications

### 1 Scope

This part of ISO 19063 establishes a system of designation for impact-resistant polystyrene (PS-I) moulding and extrusion materials, which may be used as the basis for specifications.

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 mass-flow rate;
- c) Charpy notched impact strength;
- d) flexural modulus;

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

This part of ISO 19063 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 colorants, additives, fillers, etc.

This part of ISO 19063 does not apply to expandable materials.

It is not intended to imply that materials having the same designation give necessarily the same performance. This part of ISO 19063 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 will be determined in accordance with the test methods specified in ISO 2897-2, if suitable.

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 [3.1](#)).

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 1043-2, *Plastics — Symbols and abbreviated terms — Part 2: Fillers and reinforcing materials*

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

### 3 Designation system

#### 3.1 General

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 five data blocks comprising the following information:

- Data block 1: Identification of the plastic by its abbreviated term (PS-I) in accordance with ISO 1043-1 (see [3.2](#));
- Data block 2: Fillers or reinforcing materials and their nominal content (see [3.3](#));
- Data block 3: First letter: Intended application and/or method of processing (see [3.4](#)).  
 Letters 2 to 8: Important properties, additives, and supplementary information (see [3.4](#));
- Data block 4: Designatory properties (see [3.5](#));
- Data block 5: For the purpose of specifications, a fifth data block may be added containing additional information (see [3.6](#)).

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 (,,).

#### 3.2 Data block 1

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

#### 3.3 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 1](#) (in accordance with ISO 1043-2). For the filler material of metal, it is represented by a two-code-letter in position 1. Subsequently (without a space), the mass content may be given by a two-figure-number in positions 3 and 4. The first figure-number is presented by 0 and the second figure-number is the figure of the mass content if the mass content of filler and/or reinforcing material is less than 10 %.

Mixtures of filler materials or forms may be indicated by combining the relevant codes using the sign “+” within parentheses followed by the total filler content outside the parenthesis. For example, a mixture of 25 % glass fibres (GF) and 10 % mineral powder (MD) would be indicated by (GF+MD)35 or (GF25+MD10).

**Table 1 — Code-letters for fillers and reinforcing materials in data block 2**

Code-letter	Material (Position 1)	Form (Position 2)
<b>B</b>	Boron	Beads, spheres, balls
<b>C</b>	Carbon <sup>a</sup>	
<b>D</b>		Fines, powder
<b>F</b>		Fibre
<b>G</b>	Glass	Ground
<b>H</b>		Whiskers
<b>K</b>	Calcium carbonate	
<b>L</b>	Cellulose	
<b>M</b>	Mineral <sup>a</sup>	
<b>ME</b>	Metal <sup>b</sup>	
<b>S</b>	Synthetic organic <sup>a</sup>	Flakes
<b>T</b>	Talcum	
<b>X</b>	Not specified	Not specified
<b>Z</b>	Others <sup>a</sup>	Others

<sup>a</sup> These materials may be identified after the code-letter, e.g. by chemical symbol or additional codes to be agreed upon.

<sup>b</sup> The type of metal shall be identified by means of the relevant chemical symbol (s) after the mass content. For example, steel whiskers may be designated "MEH05Fe".

### 3.4 Data block 3

In this data block, information about the method of processing is represented by a code-letter, followed by code-letters about additives, supplementary information, and other characteristics. The code-letters used are specified in [Table 2](#).

If no specific information is given on the method of processing, the letter X shall be used as the first code-letter.

**Table 2 — Code-letters used in data block 3**

Code-letter	First letter	Letters 2 to 8
<b>A</b>		Processing stabilized
<b>B</b>	Blow moulding	Antiblocking
<b>C</b>	Calendering	Coloured
<b>D</b>		Powder
<b>E</b>	Extrusion	Expandable
<b>F</b>	Extrusion of films	Special burning characteristics
<b>G</b>	General use	Granules
<b>H</b>		Heat stabilized
<b>K</b>	Cable and wire coating	Metal deactivated
<b>L</b>	Monofilament extrusion	Light stabilized
<b>M</b>	Moulding	Nucleated
<b>N</b>		Natural (no colour added)
<b>P</b>		Impact modified
<b>Q</b>	Compression moulding	

**Table 2** (continued)

Code-letter	First letter	Letters 2 to 8
<b>R</b>	Rotational moulding	Mould release agent
<b>S</b>	Sintering	Lubricated
<b>T</b>	Tape manufacture	Transparent
<b>X</b>	No indication	
<b>Y</b>		Increased electrical conductivity
<b>Z</b>		Antistatic

### 3.5 Data block 4

In this data block, the range of Vicat softening temperature is represented by a three-figure code-number (see 3.5.1), the range of melt mass-flow rate by a two-figure code-number (see 3.5.2), the range of Charpy notched impact strength by a two-figure code-number (see 3.5.3), and the range of flexural modulus by a two-figure code-number (see 3.5.4). The four 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 may be possible for currently available materials.

#### 3.5.1 Vicat softening temperature

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

The possible values of the VST are divided into six ranges, each represented by a three-figure code-number as specified in Table 3.

**Table 3 — Code-numbers for Vicat softening temperature in data block 4**

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

#### 3.5.2 Melt mass-flow rate

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

The possible values of the MFR are divided into four ranges, each represented by a two-figure code-number as specified in Table 4.

**Table 4 — Code-numbers for melt mass-flow rate in data block 4** (measured at 200 °C/5 kg)

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

### 3.5.3 Charpy notched impact strength

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

The possible values of the Charpy notched impact strength are divided into six ranges, each represented by a two-figure code-number as specified in [Table 5](#).

**Table 5 — Code-numbers for Charpy notched impact strength in data block 4**

Code-number	Range of Charpy notched impact strength kJ/m <sup>2</sup>
02	>1,5 but ≤3
04	>3 but ≤6
07	>6 but ≤9
10	>9 but ≤12
15	>12 but ≤21
25	>21

### 3.5.4 Flexural modulus

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

The possible values of the flexural modulus are divided into four ranges, each represented by a two-figure code-number as specified in [Table 6](#).

**Table 6 — Code-numbers for flexural modulus in data block 4**

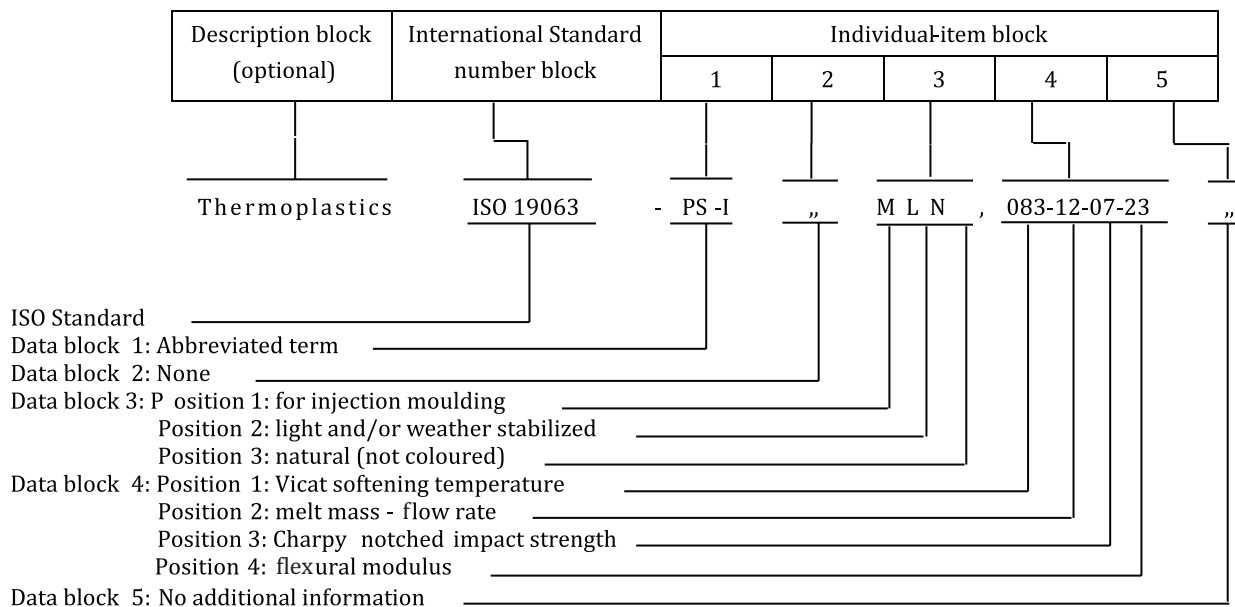
Code-number	Range of flexural modulus MPa
12	≤1 500
18	>1 500 but ≤2 000
23	>2 000 but ≤2 500
30	>2 500

## 3.6 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 Examples of designations

**4.1** 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), a Charpy notched impact strength of 8 kJ/m<sup>2</sup> (07), and a flexural modulus of 2 200 MPa (23), would be designated:



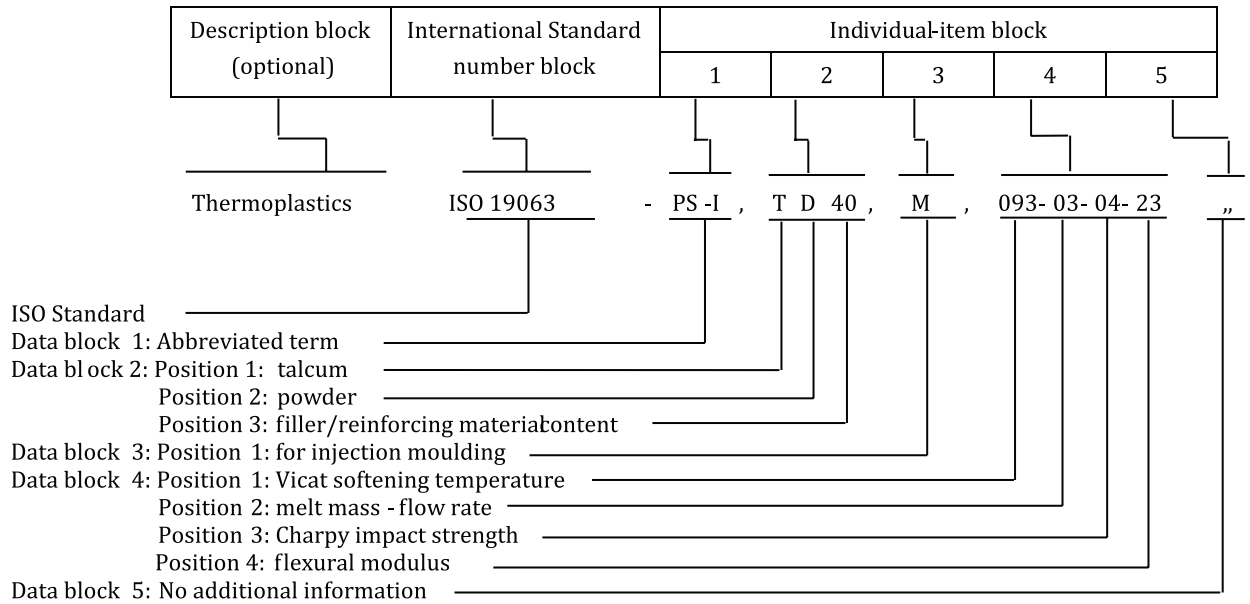
**Designation:** Thermoplastics ISO 19063-PS-I,,MLN,083-12-07-23,,or

ISO 19063-PS-I,,MLN,083-12-07-23,,or

ISO 19063-PS-I,,MLN,083-12-07-23

**Part marking:** >PS-I<

**4.2** An impact-resistant polystyrene (PS-I) thermoplastic material, a mixture of 40 % talcum powder (TD), intended for injection moulding (M), a Vicat softening temperature VST/B50 of 91 °C (093), a melt mass-flow rate of 1,5 g/10 min (03), a Charpy notched impact strength of 6 kJ/m<sup>2</sup> (04), and a flexural modulus of 2 500 MPa (23), would be designated:



**Designation:** Thermoplastics ISO 19063-PS-I,TD40,M,093-03-04-23,,or

ISO 19063-PS-I,TD40,M,093-03-04-23,,or

ISO 19063-PS-I,TD40,M,093-03-04-23

**Part marking:** >PS-I TD40<







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