INTERNATIONAL STANDARD

ISO 8257-1

Second edition
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Plastics — Poly(methyl methacrylate) (PMMA) moulding and extrusion materials —

Part 1:
Designation system and basis for specifications

Plastiques — Poly(méthacrylate de méthyle) (PMMA) pour moulage et extrusion —

Partie 1: Système de désignation et base de spécification

Reference number
ISO 8257-1:1998(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 8257-1 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

This second edition cancels and replaces the first edition (ISO 8257-1:1987), which has been technically revised.

ISO 8257 consists of the following parts, under the general title *Plastics — Poly(methyl methacrylate) (PMMA) 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 — Poly(methyl methacrylate) (PMMA) moulding and extrusion materials —

Part 1:
Designation system and basis for specifications

1 Scope

1.1 This part of ISO 8257 establishes a system of designation for poly(methyl methacrylate) (PMMA) thermoplastic materials, which may be used as the basis for specifications.

1.2 The types of PMMA plastics are differentiated from each other by the classification system based on appropriate levels of the designatory properties

a) Vicat softening temperature,

b) melt mass-flow rate,

c) viscosity number (optional),

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

1.3 This part of ISO 8257 is applicable to all poly(methyl methacrylate) homopolymers and to copolymers of methyl methacrylate (MMA) containing at least 80 % (*m/m*) of MMA and not more than 20 % (*m/m*) of acrylic esters or other monomers.

It applies to materials ready for normal use in the form of beads, granules and pellets and to materials unmodified or modified by colorants, additives, etc.

This part of ISO 8257 does not apply to PMMA modified with elastomers.

1.4 It is not intended to imply that materials having the same designation give necessarily the same performance. This part of ISO 8257 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 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 8257. 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 8257 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 472:—[1], *Plastics — Vocabulary.*

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

ISO 8257-2:1990, *Plastics — Poly(methyl methacrylate) (PMMA) moulding and extrusion materials — Part 2: preparation of test specimens and determination of properties.*

3 Designation and specification system

The designation and specification system for thermoplastics is based on the following standardized pattern:

<table>
<tr><th colspan="7">Designation</th></tr>
<tr><td rowspan="3">Description block
(optional)</td><td colspan="6">Identity block</td></tr>
<tr><td rowspan="2">International Standard number block</td><td colspan="5">Individual-item block</td></tr>
<tr><td>Data block 1</td><td>Data block 2</td><td>Data block 3</td><td>Data block 4</td><td>Data block 5</td></tr>
</table>

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 symbol PMMA 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 part of ISO 8257) (see 3.4).

— Data block 5: For the purpose of specifications, a fifth data block may be added containing additional information.

This 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 (,,).

1) To be published. (Revision of ISO 472:1988)

3.1 Data block 1

In this data block, after the hyphen, poly(methyl methacrylate) plastics are identified by the symbol "PMMA", in accordance with ISO 1043-1.

3.2 Data block 2

In this data block, information about the intended application and/or method of processing is given in position 1 and information about important properties, additives and colorants 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.

3.3 Data block 3

In this data block, the range of the Vicat softening temperature is represented by a three-figure code number (see 3.3.1), the melt mass-flow rate by a three-figure code-number (see 3.3.2) and, optionally, the viscosity number by a two-figure code-number (see 3.3.3). The two (or three) code-numbers, are separated from each other by a hyphen.

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 either side of, the range limit because of manufacturing tolerances, the designation is not affected.

NOTE — Not all the combinations of values of the designatory properties are available with currently offered polymers.

3.3.1 Vicat softening temperature

The Vicat softening temperature shall be determined in accordance with ISO 8257-2.

The possible values of the Vicat softening temperature (VST) are divided into eight ranges, each represented by a three-figure code number, as specified in table 2.

3.3.2 Melt flow rate

The melt mass-flow rate (MFR) shall be determined in accordance with ISO 8257-2.

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

3.3.3 Viscosity number (optional)

If required, the viscosity number (VN) shall be determined in accordance with ISO 8257-2.

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

3.4 Data block 4

This data block, employed to represent filler and/or reinforcing materials, is not used in this part of ISO 8257.

3.5 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 generally established specification.

Table 1 — Code-letters used in data block 2

Code-letter	Position 1	Code-letter	Positions 2 to 8
		A	Processing stabilized
		C	Coloured [2]
D	Disc manufacture [1]	**D**	Beads [3]
E	Extrusion of tubes, profiles and sheet	**E**	Expandable
F	Extrusion of film and thin sheeting	**F**	Special burning characteristics
G	General use	**G**	Pellets, granules [3]
H	Coating	**H**	Heat-ageing stabilized
L	Monofilament extrusion	**L**	Light and/or weather stabilized
M	Injection moulding		
		N	Natural (not coloured)
Q	Compression moulding		
R	Rotational moulding	**R**	Moulding release agent
S	Powder coating or sintering	**S**	Lubricated
		T	Controlled transparency
X	No indication		
		Z	Antistatic

1) In this part of ISO 8257, video disc manufacture.

2) C1 = coloured but transparent

2) C2 = coloured and non-transparent

3) For the correct definition of beads, pellets and granules, see ISO 472.

Table 2 — Code-numbers used for Vicat softening temperature in data block 3

Code-number	Range of VST °C
076	⩽ 80
084	> 80 but ⩽ 88
092	> 88 but ⩽ 96
100	> 96 but ⩽ 104
108	> 104 but ⩽ 112
116	> 112 but ⩽ 120
124	> 120 but ⩽ 128
132	> 128

Table 3 — Code-numbers used for melt flow rate in data block 3

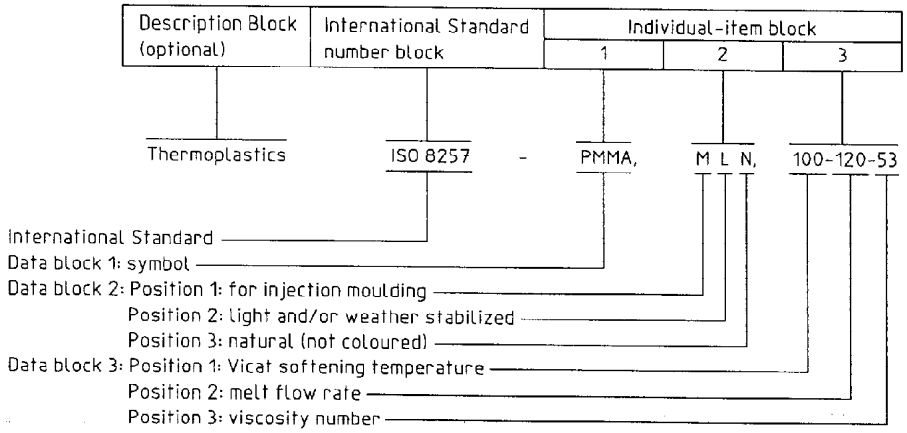
Code-number	Range of MFR g/10 min
005	≤ 1
015	> 1 but ≤ 2
030	> 2 but ≤ 4
060	> 4 but ≤ 8
120	> 8 but ≤ 16
240	> 16

Table 4 — Code-numbers used for viscosity number in data block 3

Code-number	Range of VN ml/g (optional)
43	≤ 48
53	> 48 but ≤ 58
63	> 58 but ≤ 68
73	> 68 but ≤ 78
83	> 78 but ≤ 88
93	> 88

4 Example of a designation

A PMMA intended for injection-moulding material (M), light stabilized (L), natural (not coloured) (N), with a Vicat softening temperature of 101 °C (100), a melt flow rate of 10 g/10 min (120) and a viscosity number of 50 ml/g (53), would be designated:



Designation: (Thermoplastics) ISO 8257-PMMA,MLN,100-120-53

ICS 83.080.20

Descriptors: plastics, thermoplastic resins, moulding materials, extrusion materials, polymethylmethacrylates, designation, alphanumeric codes, specifications, data blocks.

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