INTERNATIONAL STANDARD

ISO 10366-1

Second edition
2002-10-01

Plastics — Methyl methacrylate-acrylonitrile-butadiene-styrene (MABS) moulding and extrusion materials —

Part 1: Designation system and basis for specifications

Plastiques — Méthylméthacrylate-acrylonitrile-butadiène-styrène (MABS) pour moulage et extrusion —

Partie 1: Système de désignation et base de spécifications

Reference number
ISO 10366-1:2002(E)

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 part of ISO 10366 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 10366-1 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

This second edition cancels and replaces the first edition (ISO 10366-1:1993), which has been technically revised.

ISO 10366 consists of the following parts, under the general title *Plastics — Methyl methacrylate-acrylonitrile-butadiene-styrene (MABS) moulding and extrusion materials*:

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

— *Part 2: Preparation of test specimens and determination of properties*

Plastics — Methyl methacrylate-acrylonitrile-butadiene-styrene (MABS) moulding and extrusion materials —

Part 1: Designation system and basis for specifications

1 Scope

1.1 This part of ISO 10366 establishes a system of designation for methyl methacrylate-acrylonitrile-butadiene-styrene (MABS) moulding and extrusion materials, which may be used as the basis for specifications.

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

a) Vicat softening temperature

b) melt volume-flow rate

c) Charpy notched impact strength

d) tensile modulus

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

1.3 I This part of ISO 10366 is applicable to all methyl methacrylate-acrylonitrile-butadiene-styrene materials consisting of a continuous phase based mainly on copolymers of styrene (and/or an alkyl-substituted styrene), acrylonitrile and methyl methacrylate and a dispersed elastomeric phase based on butadiene.

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

1.4 It is not intended to imply that materials having the same designation give necessarily the same performance. This part of ISO 10366 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 3.1).

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 10366. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 10366 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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

ISO 10366-2:—[1)], *Plastics — Methyl methacrylate-acrylonitrile-butadiene-styrene (MABS) 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 standard 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 MABS in accordance with ISO 1043-1 and information about the composition of the polymer (see 3.2).

— Data block 2: Position 1: Intended application and/or method of processing (see 3.3).

Positions 2 to 8: Important properties, additives and supplementary information (see 3.3).

— Data block 3: Designatory properties (see 3.4).

— Data block 4: Fillers or reinforcing materials and their nominal content (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 a comma.

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 10366-2:1994)

3.2 Data block 1

In this data block, after the hyphen, the plastic is identified by its abbreviated term (MABS) in accordance with ISO 1043-1, followed by a hyphen and a single code-letter giving additional information on the composition as specified in Table 1.

Table 1 — Code-letters used for additional information on the composition in data block 1

Code-letter	Range of AN content % by mass	Range of MMA content % by mass
A	< 30	> 10 but $\leqslant 50$
B	< 30	> 50 but $\leqslant 80$
C	$\geqslant 30$	> 10 but $\leqslant 50$
D	$\geqslant 30$	> 50

For the purposes of this part of ISO 10366, the AN content of the continuous phase shall be determined in accordance with ISO 10366-2:—, Annex A.

The MMA content of the compound shall be determined by measurement of the oxygen content.

3.3 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 2.

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

Table 2 — Code-letters used in data block 2

Code-letter	Position 1	Code-letter	Positions 2 to 8
		A	Processing stabilized
B	Blow moulding	**B**	Antiblocking
C	Calendering	**C**	Coloured
		D	Powder
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 deactivated
L	Monofilament extrusion	**L**	Light stabilized
M	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

3.4 Data block 3

3.4.1 General

In this data block, the range of Vicat softening temperature is represented by a three-figure code-number (see 3.4.2), the range of melt volume-flow rate by a two-figure code-number (see 3.4.3), the range of Charpy notched impact strength by a two-figure code-number (see 3.4.4) and the range of tensile modulus by a two-figure code-number (see 3.4.5). 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.

3.4.2 Vicat softening temperature

The Vicat softening temperature (VST) shall be determined in accordance with ISO 10366-2, using test specimens moulded from dry material and stored in a desiccator at 23 °C ± 2 °C until tested.

The possible values of the VST are divided into four 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 3

Code-number	Range of Vicat softening temperature °C
075	⩽ 80
085	> 80 but ⩽ 90
095	> 90 but ⩽ 100
105	> 100

3.4.3 Melt volume-flow rate

The melt volume-flow rate (MVR) shall be determined in accordance with ISO 10366-2. The material for the determination of the MVR shall be conditioned for 4 h at 80 °C ± 2 °C and then stored in a dessicator at 23 °C ± 2 °C until tested.

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

Table 4 — Code-numbers for melt volume-flow rate in data block 3
(measured at 220 °C/10 kg)

Code-number	Range of melt volume-flow rate cm^3/10 min
04	⩽ 5
08	> 5 but ⩽ 10
15	> 10 but ⩽ 20
25	> 20

3.4.4 Charpy notched impact strength

The Charpy notched impact strength shall be determined in accordance with ISO 10366-2.

The possible values of the Charpy notched impact strength are divided into five 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 3

Code-number	Range of Charpy notched impact strength kJ/m^2
04	$\geqslant 3$ but $\leqslant 7$
09	> 7 but $\leqslant 14$
16	> 14 but $\leqslant 23$
25	> 23 but $\leqslant 35$
35	> 35

3.4.5 Tensile modulus

The tensile modulus shall be determined in accordance with ISO 10366-2.

The possible values of the tensile modulus are divided into four ranges, each represented by a two-figure code-number as specified in Table 6.

Table 6 — Code-numbers for tensile modulus in data block 3

Code-number	Range of tensile modulus MPa
15	$\leqslant 1\,800$
20	$> 1\,800$ but $\leqslant 2\,300$
25	$> 2\,300$ but $\leqslant 2\,800$
30	$> 2\,800$

3.5 Data block 4

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 7. Subsequently (without a space), the actual content by mass shall be given by a two-figure number in position 3.

Table 7 — Code-letters for fillers and reinforcing materials in data block 4

Code-letter	Material	Code-letter	Form
B	Boron	**B**	Balls, beads, spheres
C	Carbon [a]		
		D	Powder, dry blend
		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.

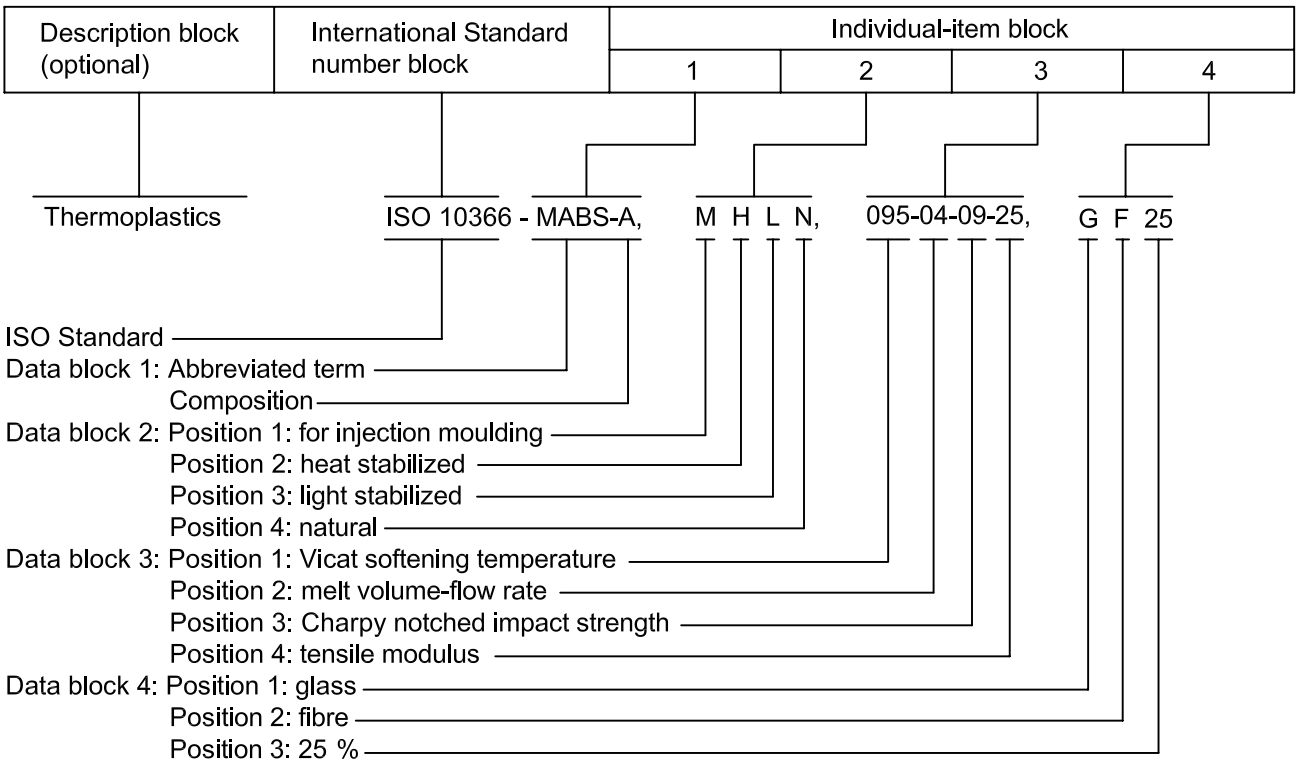
Mixtures of materials or forms may be indicated by combining the relevant codes using the sign "+" and placing the whole between parentheses. For example, a mixture of 25 % glass fibres (GF) and 8 % mineral powder (MD) would be indicated by (GF25+MD08).

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 Example of a designation

A MABS moulding and extrusion material, incorporating < 30 % of AN and > 10 % but ⩽ 50 % of MMA, intended for injection moulding (M), heat stabilized (H), light stabilized (L) and natural (N), having a Vicat softening temperature of 95 °C (095) , a melt volume-flow rate of 0,5 cm^3/10 min (04), a Charpy notched impact strength of 10 kJ/m^2 (09) and a tensile modulus of 2 400 MPa (25) and reinforced with 25 % of glass fibre (GF), would be designated:



Designation: Thermoplastics ISO 10366-MABS-A,MHLN,095-04-09-25,GF25

ICS 83.080.20

Price based on 8 pages