
Plastics — Acrylonitrile-styrene-acrylate (ASA), acrylonitrile-(ethylene-propylene-diene)-styrene (AEPDS) and acrylonitrile-(chlorinated polyethylene)-styrene (ACS) moulding and extrusion materials —

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

ISO 6402-1:2001

Plastiques — Matériaux pour moulage et extrusion à base d'acrylonitrile-styrène-acrylate (ASA), d'acrylonitrile-(éthylène-propylène-diène)-styrène (AEPDS) et d'acrylonitrile-(polyéthylène chloré)-styrène (ACS) —

Partie 1: Système de désignation et base de spécifications



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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.

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 6402 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 6402-1 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

This third edition cancels and replaces the second edition (ISO 6402-1:1997), which has been technically revised.

ISO 6402 consists of the following parts, under the general title *Plastics — Acrylonitrile-styrene-acrylate (ASA), acrylonitrile-(ethylene-propylene-diene)-styrene (AEPDS) and acrylonitrile-(chlorinated polyethylene)-styrene (ACS) 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 — Acrylonitrile-styrene-acrylate (ASA), acrylonitrile-(ethylene-propylene-diene)-styrene (AEPDS) and acrylonitrile-(chlorinated polyethylene)-styrene (ACS) moulding and extrusion materials —

Part 1: Designation system and basis for specifications

1 Scope

1.1 This part of ISO 6402 establishes a system of designation for acrylonitrile-styrene-acrylate (ASA), acrylonitrile-(ethylene-propylene-diene)-styrene (AEPDS) and acrylonitrile-(chlorinated polyethylene)-styrene (ACS) moulding and extrusion materials, which may be used as the basis for specifications.

1.2 The types of ASA, AEPDS and ACS 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) Izod 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.

1.3 This part of ISO 6402 is applicable to all ASA, AEPDS and ACS materials consisting of a continuous phase mainly based on styrene-acrylonitrile copolymer (SAN) and a dispersed elastomeric phase mainly based on

acrylate (ASA materials),

ethylene-propylene-diene (EPDM) (AEPDS materials),

chlorinated polyethylene (ACS materials),

unincorporated or incorporated with other new components in such quantity as is specified in data block 1.

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

This part of ISO 6402 does not apply to materials

- a) containing less than 10 % by mass of acrylonitrile in the continuous phase;
- b) with an Izod impact strength of less than 3 kJ/m²;
- c) containing more than 5 % by mass of another monomer in the continuous phase (unless specified in accordance with 3.2 and Table 2).

1.4 It is not intended to imply that materials having the same designation give necessarily the same performance. This part of ISO 6402 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 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 6402. 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 6402 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:—¹⁾, *Plastics — Symbols and abbreviated terms — Part 1: Basic polymers and their special characteristics*.
<https://standards.iteh.ai/catalog/standards/sist/1b438becb-1ee5-4b39-b070-2e6cb2028d17/iso-6402-1-2001>

ISO 6402-2:1994, *Plastics — Impact-resistant acrylonitrile/styrene (ASA, AES, ACS) moulding and extrusion materials, excluding butadiene-modified 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

1) To be published. (Revision of ISO 1043-1:1997)

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 symbols (ASA, AEPDS, ACS) in accordance with ISO 1043-1 and information about the composition of the copolymer (see 3.2).
- Data block 2: Position 1: Intended application 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 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, the plastic is identified by its abbreviated term (ASA, AEPDS, ACS) (see 1.3), in accordance with ISO 1043-1, and, after a space, a single-figure code-number indicating the composition, as specified in Table 1, and a code-letter indicating the nature of any additional monomer, as specified in Table 2.

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

Code-number	Composition
0	Monomers other than acrylonitrile, styrene (and/or alkyl-substituted styrene) and acrylate in the case of ASA, EPDM in the case of AEPDS and chlorinated polyethylene in the case of ACS are not incorporated in such quantity as to exceed 5 % by mass of the plastic.
1	Monomers other than acrylonitrile, styrene (and/or alkyl-substituted styrene) and acrylate in the case of ASA, EPDM in the case of AEPDS and chlorinated polyethylene in the case of ACS are incorporated in such quantity as to exceed 5 % by mass but not exceed 30 % by mass of the plastic.
2	Polymers other than those based on acrylonitrile, styrene (and/or alkyl-substituted styrene) and acrylate in the case of ASA, EPDM in the case of AEPDS and chlorinated polyethylene in the case of ACS are incorporated in a quantity less than 15 % by mass of the plastic and in such a manner that SAN is the matrix with the other polymers dispersed therein.

Table 2 — Code-letters used for additional monomers in data block 1

Code-letter	Monomer
A	Acrylate
B	Butadiene
M	Maleic anhydride and other anhydrides
P	<i>N</i> -phenyl maleimide and other maleimides
X	Other/unspecified

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 3.

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 3 — 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 film	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)
		P	Powder
		R	Mould release agent
		S	Lubricated
X	No indication	X	No indication
		Z	Antistatic

3.4 Data block 3

3.4.1 General

In this data block, the range of the Vicat softening temperature is represented by a three-figure code-number (see 3.4.2), the melt volume-flow rate by a two-figure code-number (see 3.4.3), the Izod impact strength by a two-figure code-number (see 3.4.4) and the flexural 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 6402-2.

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

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

Code-number	Range of Vicat softening temperature °C
085	≤ 90
095	> 90 but ≤ 100
105	> 100 but ≤ 110
115	> 110 but ≤ 120
125	> 120 but ≤ 130
135	> 130