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ISO ~~19062-1:2015(E)~~

Plastics -- Acrylonitrile-butadiene-styrene (ABS) moulding and extrusion materials -- Part 1: Designation system and basis for specifications

Plastiques -- Acrylonitrile-butadiène-styrène (ABS) pour moulage et extrusion -- 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.

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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 19062-1 cancels and replaces ISO 2580-1:2002, 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 2580-1. If the existing ISO 2580-1 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 2580-1 to ISO 19062-1, any designation system according to ISO 2580-1 is to be phased out in 5 to 10 years. During this period, ISO 2580-2 will effectively be Part 2 of this International Standard.

ISO 19062 consists of the following parts, under the general title *Plastics — Acrylonitrile-butadiene-styrene (ABS) moulding and extrusion materials*:

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

Introduction

ISO 2580-1 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.

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Plastics — Acrylonitrile-butadiene-styrene (ABS) moulding and extrusion materials — Part 1: Designation system and basis for specifications

1 Scope

This part of ISO 19062 establishes a system of designation for acrylonitrile-butadiene-styrene (ABS) moulding and extrusion materials, which may be used as the basis for specifications.

The types of ABS 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) tensile 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 19062 is applicable to all acrylonitrile-butadiene-styrene materials consisting of a continuous phase based mainly on copolymers of styrene (and/or alkyl-substituted styrene) and acrylonitrile and a dispersed elastomeric phase based mainly on polybutadiene, plus other components, in such quantities as specified in the text.

It applies to ABS 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 19062 does not apply to materials

- a) with a Charpy notched impact strength of less than three kilojoules per square metre,
- b) containing less than 50 % by mass of butadiene in the elastomer of the elastomeric phase, and
- c) containing less than 15 % by mass of acrylonitrile in the continuous phase.

It is not intended to imply that materials having the same designation give necessarily the same performance. This part of ISO 19062 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 2580-2, 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 2580-2, *Plastics — Acrylonitrile-butadiene-styrene (ABS) 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 (ABS) in accordance with ISO 1043-1 and information about the composition of the polymer (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, acrylonitrile-butadiene-styrene plastics are identified by its abbreviated term, ABS, in accordance with ISO 1043-1 and after the hyphen, 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.

Table 1 — Code-numbers used to indicate the composition in data block 1

| Code-number | Composition |
|-------------|--|
| 0 | Monomers and/or polymers other than those of acrylonitrile, butadiene, and styrene (and/or alkyl-substituted styrene) are not incorporated in such quantity as to exceed 5 % by mass of the plastic. |
| 1 | Monomers and/or polymers other than those of acrylonitrile, butadiene, and styrene (and/or alkyl-substituted styrene) are incorporated in such quantity as to exceed 5 % by mass but not to exceed 15 % by mass of the plastic. |
| 2 | Monomers and/or polymers other than those of acrylonitrile, butadiene, and styrene (and/or alkyl-substituted styrene) are incorporated in such quantity as to exceed 15 % by mass but not to exceed 30 % by mass of the plastic. |

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

| Code-letter | Monomer |
|-------------|--|
| A | Acrylate |
| M | Maleic anhydride and other anhydrides |
| P | <i>N</i> -Phenylmaleimide and other maleimides |
| X | Other/unspecified |

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 3 (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 3 — Code-letters for fillers and reinforcing materials in data block 2

| Code-letter | Material (Position 1) | Form (Position 2) |
|-------------|-----------------------|-----------------------|
| B | Boron | Beads, spheres, balls |
| C | Carbon ^a | |
| D | | Fines, powder |
| F | | Fibre |
| G | Glass | Ground |
| H | | Whiskers |
| K | Calcium carbonate | |
| L | Cellulose | |

| | | |
|-----------|--------------------------------|---------------|
| M | Mineral ^a | |
| ME | Metal ^b | |
| S | Synthetic organic ^a | Flakes |
| T | Talcum | |
| X | Not specified | Not specified |
| Z | Others ^a | Others |

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

^b 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 4.

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

Table 4 — Code-letters used in data block 3

| Code-letter | First letter | Letters 2 to 8 |
|-------------|------------------------|-----------------------------------|
| A | | Processing stabilized |
| B | Blow moulding | Antiblocking |
| C | calendering | Coloured |
| D | | Powder |
| E | Extrusion | Expandable |
| F | Extrusion of films | Special burning characteristics |
| G | General use | Granules |
| H | | Heat stabilized |
| K | Cable and wire coating | Metal deactivated |
| L | Monofilament extrusion | Light stabilized |
| M | Moulding | Nucleated |
| N | | Natural (no colour added) |
| P | | Impact modified |
| Q | Compression moulding | |
| R | Rotational moulding | Mould release agent |
| S | Sintering | Lubricated |
| T | Tape manufacture | Transparent |
| X | No indication | |
| Y | | Increased electrical conductivity |
| Z | | 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 tensile 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 2580-2.

The possible values of the VST are divided into six ranges, each represented by a three-figure code-number as specified in Table 5.

Table 5 — Code-numbers for Vicat softening temperature in data block 4

| 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 |

3.5.2 Melt mass-flow rate

The melt mass-flow rate (MFR) shall be determined in accordance with ISO 2580-2. The material for the determination of the MFR 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 MFR are divided into five ranges, each represented by a two-figure code-number as specified in Table 6.

Table 6 — Code-numbers for melt mass-flow rate in data block 4 (measured at 220 °C/10 kg)

| Code-number | Range of melt mass-flow rate g/10 min |
|-------------|--|
| 04 | ≤5 |
| 08 | >5 but ≤10 |
| 15 | >10 but ≤20 |
| 30 | >20 but ≤40 |
| 50 | >40 |