INTERNATIONAL STANDARD

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Plastics — Urea-formaldehyde and urea/melamine-formaldehyde powder moulding compounds (UF- and UF/MF-PMCs) —

Part 1: Designation system and basis for specifications

Plastiques — Poudres à mouler à base d'urée-formaldéhyde et d'urée/mélamine-formaldéhyde (UF- et UF/MF-PMC) —

Partie 1: Système de désignation et base de spécification

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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 14527 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 14527-1 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 12, *Thermosetting materials*.

After a transition period of, at the most, four years, the three parts of ISO 14527 (see below), together with the three parts of ISO 14528, will replace ISO 2112:1990, of which they constitute a technical revision.

ISO 14527 consists of the following parts, under the general title *Plastics — Urea-formaldehyde and urea/melamine-formaldehyde powder moulding compounds (UF- and UF/MF-PMCs)*:

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

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

— *Part 3: Requirements for selected moulding compounds*

Plastics — Urea-formaldehyde and urea/melamine-formaldehyde powder moulding compounds (UF- and UF/MF-PMCs) —

Part 1: Designation system and basis for specifications

1 Scope

1.1 This part of ISO 14527 establishes a data block system for the designation of urea-formaldehyde and urea/melamine-formaldehyde powder moulding compounds (UF- and UF/MF-PMCs).

1.2 The various types of UF- and UF/MF-PMC are differentiated from each other by a classification system based on information about the filler/reinforcement type and content, the intended method of processing, any special properties and those of the special properties used specifically for designation purposes (designatory properties).

1.3 This part of ISO 14527 is applicable to all UF- and UF/MF-PMCs ready for normal use in the form of powder, granules or ground material.

1.4 It is not intended to imply that materials having the same designation necessarily give the same performance. This part of ISO 14527 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 ISO 14527-2, if suitable.

1.5 Whenever general requirement data, as covered by ISO 14527-3, need to be indicated, this is also done using this data block system.

1.6 To ensure that code-letters and code-numbers remain unambiguous, and to avoid conflicts within the system, any new code-letters or code-numbers for use in data block 1, 2 or 3 shall be approved before use by the secretariats of ISO/TC 61/SC 1, SC 12 and SC 13.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 14527. 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 14527 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 75-2:1993, *Plastics — Determination of temperature of deflection under load — Part 2: Plastics and ebonite.*

ISO 179-1:—[1)], *Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test.*

1) To be published. (Revision of ISO 179:1993)

ISO 472:1999, *Plastics — Vocabulary.*

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

ISO 1043-2:—[2], *Plastics — Symbols and abbreviated terms — Part 2: Fillers and reinforcing materials.*

ISO 2112:1990, *Plastics — Aminoplastic moulding materials — Specification.*

ISO 14527-2:1999, *Plastics — Urea-formaldehyde and urea/melamine-formaldehyde powder moulding compounds (UF- and UF/MF-PMCs) — Part 2: Preparation of test specimens and determination of properties.*

ISO 14527-3:1999, *Plastics — Urea-formaldehyde and urea/melamine-formaldehyde powder moulding compounds (UF- and UF/MF-PMCs) — Part 3: Requirements for selected moulding compounds.*

3 Terms and definitions

For the purposes of this part of ISO 14527, the terms and definitions given in ISO 472 and ISO 14527-2 apply, plus the following:

3.1
powder moulding compound
powder, granules or ground material capable of flowing freely through the feed systems of processing machines, as well as moulding compounds in the form of flakes which are normally not thought of as powders

The abbreviation for powder moulding compound is PMC [by analogy with bulk moulding compound (BMC) and sheet moulding compound (SMC)].

3.2
UF-PMC
abbreviation for powder moulding compounds based on urea-formaldehyde resins for both injection and compression moulding

3.3
UF/MF-PMC
abbreviation for powder moulding compounds based on a mixture of urea-formaldehyde and melamine-formaldehyde resins for both injection and compression moulding

4 Designation system

4.1 General

The designation system defined in this part of ISO 14527 is based on the following standardized pattern:

Designation						
Description block	Identity block					
	ISO Standard	Individual-item block				
		Data block 1	Data block 2	Data block 3	Data block 4	Data block 5

2) To be published. (Revision of ISO 1043-2:1988)

The designation consists of an optional description block, reading "PMC", 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: Marking block

Item 1: Identification of the basic polymer by its symbol, in accordance with ISO 1043-1;

Item 2: Nature of the designatory reinforcement materials or fillers, in accordance with ISO 1043-2;

Item 3: Form of the designatory reinforcement materials or fillers, in accordance with ISO 1043-2;

Item 4: Nominal content of the designatory reinforcement materials or fillers, in accordance with Table 1.

Data block 2: Method of processing

Method of processing for which the moulding compound is intended, designated in accordance with Table 2.

Data block 3: Properties

Item 1: Special properties, in accordance with Table 3;

Item 2: Designatory property No. 1 — impact strength determined in accordance with ISO 179-1;

Item 3: Designatory property No. 2 — temperature resistance determined in accordance with ISO 75-2.

Data block 4: Further information, taken from an international, national or company standard.

Data block 5 (optional): Additional requirements

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 an "X" (= not applicable), but only if another block follows.

For labelling purposes, and provided no other blocks follow, the comma between blocks 1 and 2 can be omitted.

There is no need to fill in data blocks if they are not required.

4.2 Data block 1

Item 1: After the hyphen, urea-formaldehyde or urea/melamine-formaldehyde powder moulding compounds shall be identified by the symbol UF or UF/MF, in accordance with ISO 1043-1.

Mixtures and modifications shall be designated in accordance with ISO 1043-1:1997, subclauses 4 and 5.

The following information shall be restricted to designatory fillers/reinforcements used in the material in question:

Item 2: Nature of filler/reinforcement, in accordance with Table 1.

Item 3: Form of filler/reinforcement, in accordance with Table 1.

Item 4: Nominal content (mass %) of filler/reinforcement, in accordance with Table 1.

Note, in particular, the following:

— the same code-letters have different meanings when used for item 2 and item 3;

— whenever information needs to be indicated only for item 3, an "X" (= not applicable) is required for item 2.

4.3 Data block 2

In this data block, information about the method of processing is given using the code-letters specified in Table 2.

The code-letter used to indicate the intended method of processing in data block 2 shall be selected carefully. Certain brands of material can be processed in more than one way, e.g. either by compression moulding (Q) or by injection moulding (M). Such brands shall be designated "general purpose" (G). The designation of special methods of processing shall be reserved for specially modified materials.

Table 1 — Code-letters and code-numbers used in data block 1

Nature of filler/reinforcement (in accordance with ISO 1043-2)		**Form of filler/reinforcement** (in accordance with ISO 1043-2)		**Percentage content by mass,** w % (m/m)	
		B	Balls; beads; spheres	**05**	$w < 7{,}5$
C	Carbon	**C**	Chips; cuttings	**10**	$7{,}5 \leqslant w < 12{,}5$
D	Aluminium oxide trihydrate	**D**	Fines; powder	**15**	$12{,}5 \leqslant w < 17{,}5$
E	Clay			**20**	$17{,}5 \leqslant w < 22{,}5$
		F	Fibre	**25**	$22{,}5 \leqslant w < 27{,}5$
G	Glass	**G**	Ground	**30**	$27{,}5 \leqslant w < 32{,}5$
K	Calcium carbonate			**35**	$32{,}5 \leqslant w < 37{,}5$
L1	Cellulose			**40**	$37{,}5 \leqslant w < 42{,}5$
L2	Cotton			**45**	$42{,}5 \leqslant w < 47{,}5$
M	Mineral			**50**	$47{,}5 \leqslant w < 52{,}5$
P	Mica			**55**	$52{,}5 \leqslant w < 57{,}5$
Q	Silica			**60**	$57{,}5 \leqslant w < 62{,}5$
R	Recycled material			**65**	$62{,}5 \leqslant w < 67{,}5$
S	Synthetic organic	**S**	Scale; flakes	**70**	$67{,}5 \leqslant w < 72{,}5$
T	Talc			**75**	$72{,}5 \leqslant w < 77{,}5$
W	Wood			**80**	$77{,}5 \leqslant w < 82{,}5$
X	Not specified	**X**	Not specified	**85**	$82{,}5 \leqslant w < 87{,}5$
Z	Others	**Z**	Others	**90**	$87{,}5 \leqslant w < 92{,}5$
				95	$92{,}5 \leqslant w < 97{,}5$

NOTE Mixtures of materials and/or forms may be indicated by combining the relevant codes using the sign "+" and placing the whole between parentheses. For example, a mixture of 20 % glass fibre (GF) and 20 % mineral dust (MD) would be indicated by (GF20+MD20).

Table 2 — Code-letters used in data block 2 for the method of processing

G	General purpose	**T**	Transfer moulding
M	Injection moulding	**X**	Not specified
Q	Compression moulding	**Z**	Others

4.4 Data block 3

4.4.1 General

In this data block, the special properties (see 4.4.2) are represented by a code-letter as item 1, and the designatory properties (see 4.4.3 and 4.4.4) as items 2 and 3. Items 2 and 3 each start with an oblique stroke.

If the value of a designatory property 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.

Whenever information needs to be indicated only for item 2 and/or 3, an "X" (= not applicable) is required for item 1 and/or 2.

4.4.2 Item 1: Special properties

Any special properties are indicated using a code-letter in accordance with Table 3.

Table 3 — Code-letters used in data block 3

E	Electrical properties	**R**	Containing recycled material
FR	Flame resistance	**T**	Temperature resistance
M	Mechanical properties	**X**	Not specified
N	Nutrition (food contact)	**Z**	Others

4.4.3 Designatory property No. 1 — Impact strength

The impact strength is indicated by the test result obtained from ISO 179-1.

4.4.4 Designatory property No. 2 — Temperature resistance

The temperature resistance is indicated by the test result obtained from ISO 75-2.

4.5 Data block 4

This data block is used for information taken from a suitable international, national or company standard.

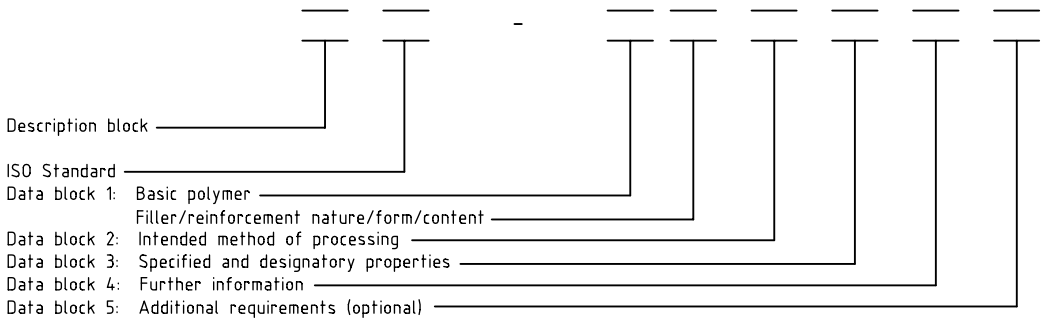
4.6 Data block 5

The inclusion of additional requirements in this data block enables special agreements between a particular supplier and a particular purchaser to be taken into account.

5 Examples of designations

5.1 General

The designation system specified in clause 4 will give a designation of the following general form:



5.2 Examples

EXAMPLE 1

PMC ISO 14527-UF(LD20+MD20),M,E

UF	Urea-formaldehyde resin
LD20	Cellulose powder: 17,5 % (m/m) to 22,5 % (m/m)
MD20	Mineral dust: 17,5 % (m/m) to 22,5 % (m/m)
M	Intended method of processing: Injection moulding
E	Electrical properties meeting the requirements specified for UF(LD+MD),X,E in part 3 of this International Standard

Abbreviated designation for labelling purposes: UF(LD20+MD20),M,E

EXAMPLE 2

PMC ISO 14527-UF/MF(LD20+S20),M

UF/MF	Urea-formaldehyde resin modified with melamine-formaldehyde resin
LD20	Cellulose powder: 17,5 % (m/m) to 22,5 % (m/m)
S20	Synthetic organic filler: 17,5 % (m/m) to 22,5 % (m/m)
M	Intended method of processing: Injection moulding

Abbreviated designation for labelling purposes: UF/MF(LD20+S20),M

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