
**Plastics — Poly(vinyl alcohol) (PVAL)
materials —**

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

Plastiques — Matériaux en poly(alcool de vinyle) (PVAL) —

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 15023 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 15023-1 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

ISO 15023 consists of the following parts, under the general title *Plastics — Poly(vinyl alcohol) (PVAL) materials*:

- Part 1: *Designation system and basis for specifications*
- Part 2: *Determination of properties*

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Plastics — Poly(vinyl alcohol) (PVAL) materials —

Part 1:

Designation system and basis for specifications

1 Scope

1.1 This part of ISO 15023 establishes a system of designation for poly(vinyl alcohol) (PVAL) materials which may be used as the basis for specifications.

1.2 The types of poly(vinyl alcohol) (PVAL) materials are differentiated from each other by a classification system based on the designatory properties:

- a) degree of hydrolysis
- b) viscosity of aqueous solution under defined conditions

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

1.3 This part of ISO 15023 is applicable to poly(vinyl alcohol) (PVAL) materials with a degree of hydrolysis not less than 70 mol%.

It applies to materials ready for normal use in the form of powder, granules or pellets, and to materials 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 15023 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 described in ISO 15023-2, as appropriate.

1.5 In order to specify a 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 15023. 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 15023 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*

ISO 15023-2:—²⁾, *Plastics — Poly(vinyl alcohol) (PVAL) materials — Part 2: Determination of properties*

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

2) To be published.

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 coding, the individual-item block is subdivided into 5 data blocks comprising the following information:

- Data block 1: Identification of the plastic by its symbol PVAL in accordance with ISO 1043-1 (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 four 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, poly(vinyl alcohol) polymers are identified by the symbol PVAL in accordance with ISO 1043-1.

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 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.

Table 1 — Code-letters used in data block 2

Code-letter	Position 1	Code-letter	Positions 2 to 8
A	Adhesives	A	Processing stabilized
B	Blow moulding	B	Antiblocking
B1	Extrusion blow moulding		
B2	Injection blow moulding		
C	Calendering	C	Coloured
		D	Powder
E	Extrusion		
F	Films	F	Special burning characteristics
G	General use	G	Granules
		G1	Pellets
		G2	Lentils
		G3	Beads
H	Coating	H	Heat-ageing stabilized
		K1	Anticorrosive agent
		K2	Fungus proof
		K3	Antifoaming agent
L	Monofilament extrusion		
M	Moulding	N	Natural (no colour added)
N	Emulsification	P	Impact modified
		R	Mould release agent
		S	Lubricated
V	Thermoforming	V	Heat shrinkable
		W	Stabilized against hydrolysis
X	No indication	X	Crosslinkable
Y	Textile yarns, spinning	Y	Increased electrical conductivity
		Z	Antistatic

3.4 Data block 3

3.4.1 General

In this data block, the degree of hydrolysis is represented by a three-figure code-number (see 3.4.2) and the viscosity by a two-figure code-number (see 3.4.3).

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 the combinations of the values of the designatory properties may be possible for currently available polymers.

3.4.2 Degree of hydrolysis

The degree of hydrolysis shall be determined in accordance with annex D of ISO 15023-2:—.

The possible values of the degree of hydrolysis are divided into 11 ranges, each represented by a three-figure code-number as specified in Table 2.

Table 2 — Code-numbers used for the degree of hydrolysis in data block 3

Code-number	Range of hydrolysis value mol%
100	≥ 99
098	≥ 97 but < 99
096	≥ 95 but < 97
094	≥ 93 but < 95
092	≥ 91 but < 93
090	≥ 89 but < 91
088	≥ 87 but < 89
086	≥ 85 but < 87
083	≥ 80 but < 85
078	≥ 75 but < 80
073	> 70 but < 75

3.4.3 Viscosity of 4 % aqueous solution

The viscosity of a 4 % aqueous solution shall be determined in accordance with annex E of ISO 15023-2:—.

The possible values of the viscosity are divided into 10 ranges, each represented by a two-figure code-number as specified in Table 3.

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

Code-number	Range of viscosity mPa · s
01	≤ 2
03	> 2 but ≤ 4
05	> 4 but ≤ 6
08	> 6 but ≤ 10
13	> 10 but ≤ 16
20	> 16 but ≤ 24
27	> 24 but ≤ 30
35	> 30 but ≤ 40
50	> 40 but ≤ 60
60	> 60

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 4. Subsequently (without a space), the mass content may be given by a two-figure code-number in positions 3 and 4.

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

Code-letter	Material	Code-letter	Form
B	Boron compound	B	Beads, spheres, balls
C	Carbon ^a	C	Chips, cuttings
E	Clay	D	Powder
G	Glass	F	Fibre
K	Calcium carbonate	G	Ground
L	Cellulose ^a	H	Whiskers
M	Mineral ^{a, b} , metal ^a	L	Layer
P	Mica ^a	N	Non-woven fabric
Q	Silicon compound	P	Paper
S	Synthetic, organic ^a	S	Scales, flakes
T	Talc	X	Not specified
W	Wood	Y	Yarn
X	Not specified	Z	Others ^a
Z	Others ^a		

^a These materials may be further defined by their chemical symbol, for example, or additional symbol 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 should be designated more precisely if a symbol is available. 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 25 % glass fibre (GF) and 10 % mineral powder (MD) would be indicated by (GF25+MD10).

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.