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**Plastics — Symbols and abbreviated  
terms —**

Part 1:  
**Basic polymers and their special  
characteristics**

**iTeh STANDARD PREVIEW**  
*Plastiques — Symboles et termes abrégés —*  
*(standards.iteh.ai)* *Partie 1: Polymères de base et leurs caractéristiques spéciales*

ISO 1043-1:2011

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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 2.

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

ISO 1043-1 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 1, *Terminology*.

This fourth edition cancels and replaces the third edition (ISO 1043-1:2001), which has been technically revised.

ISO 1043 consists of the following parts, under the general title *Plastics — Symbols and abbreviated terms*:

- *Part 1: Basic polymers and their special characteristics* <sup>ISO 1043-1:2011</sup>  
<https://standards.iteh.ai/catalog/standards/sist/5f7ce815-e4fa-40bf-8b6e-9d43b133d115/iso-1043-1-2011>
- *Part 2: Fillers and reinforcing materials*
- *Part 3: Plasticizers*
- *Part 4: Flame retardants*

# Plastics — Symbols and abbreviated terms —

## Part 1: Basic polymers and their special characteristics

### 1 Scope

This part of ISO 1043 defines abbreviated terms for the basic polymers used in plastics, symbols for components of these terms, and symbols for special characteristics of plastics. It includes only those abbreviated terms that have come into established use and its aim is both to prevent the occurrence of more than one abbreviated term for a given plastic and to prevent a given abbreviated term being interpreted in more than one way.

NOTE 1 For symbols and abbreviated terms for fillers and reinforcing materials, see ISO 1043-2, for plasticizers see ISO 1043-3, and for flame retardants see ISO 1043-4. Nomenclature for rubbers and latices is given in ISO 1629. Nomenclature for thermoplastic elastomers is given in ISO 18064.

NOTE 2 Guidance for the preparation of new abbreviated terms is given in Annex A, and reference lists of symbols for the components of plastics terms used to form the abbreviated terms for plastics are given in Annex B.

NOTE 3 A classification of abbreviated terms for polymers grouped by type is given in Annex C.

### 2 Normative references

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The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 472, *Plastics — Vocabulary*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 472 and the following apply.

#### 3.1

##### abbreviated term

term resulting from the omission of any part of a term while designating the same concept

### 4 Use of symbols and abbreviated terms

4.1 Abbreviated terms for homopolymers, copolymers and natural polymers are given in Clause 5, symbols for special characteristics are given in Clause 6, the symbol for plastics recycle is given in Clause 7, and examples of the use of symbols are given in Clause 8.

4.2 To distinguish the essential molecular characteristics within a given generic type of plastics material, additional symbols, with guidance for their use, are provided. The use of symbols for describing properties that can only be ascertained subjectively should be avoided since this can lead to confusion.

4.3 The abbreviated terms are primarily intended to be a convenient shorthand for chemical names in publications and other written matter. The abbreviated terms are also useful for indicating the type of basic polymer in materials and products, e.g. ABS moulding material, PA film, PE sheeting and PVC pipe.

4.4 Only capital letters shall be used for symbols and abbreviated terms.

4.5 The first appearance of an abbreviated term in a text shall be enclosed in parentheses and shall be preceded by the term written in full.

4.6 The rules of the International Union of Pure and Applied Chemistry (IUPAC) for source-based names of polymers recommend the use of parentheses when the prefix “poly” is used with a monomer name consisting of two or more words. This practice is followed in this part of ISO 1043, but in common usage the enclosing marks are often omitted.

4.7 No attempt is made formally to systematize a shorthand terminology of polymers. Terminology and formulae designations for scientific literature in the field of natural and synthetic polymers have been elaborated by the Commission on Macromolecular Nomenclature of IUPAC. Any abbreviated terms published by this Commission are, in general, the same as in this part of ISO 1043.

## 5 Abbreviated terms for homopolymers, copolymers and natural polymers

The following list gives the preferred abbreviated terms for plastics materials, using the component symbols given in Annex B. For some established materials, the abbreviated terms are supplemented by symbols for special characteristics as defined in Clause 6.

For some materials, alternative abbreviated terms are often still used, and for information these are included after the name of the material.

Abbreviated term	Term for material	ISO 1043-1:2011
AB	acrylonitrile-butadiene plastic	<a href="https://standards.iteh.ai/catalog/standards/sist/5f7ce815-e4fa-40bf-8b6e-33d115/iso-1043-1-2011">https://standards.iteh.ai/catalog/standards/sist/5f7ce815-e4fa-40bf-8b6e-33d115/iso-1043-1-2011</a>
ABAK	acrylonitrile-butadiene-acrylate plastic; preferred term for <b>ABA</b>	
ABS	acrylonitrile-butadiene-styrene plastic	
ACS	acrylonitrile-(chlorinated polyethylene)-styrene; preferred term for <b>ACPES</b>	
AEPDS	acrylonitrile-(ethylene-propylene-diene)-styrene plastic; preferred term for <b>AEPDMS</b>	
AMMA	acrylonitrile-(methyl methacrylate) plastic	
ASA	acrylonitrile-styrene-acrylate plastic	
CA	cellulose acetate	
CAB	cellulose acetate butyrate	
CAP	cellulose acetate propionate	
CEF	cellulose formaldehyde	
CF	cresol-formaldehyde resin	
CMC	carboxymethyl cellulose	
CN	cellulose nitrate	
COC	cycloolefin copolymer	
CP	cellulose propionate	
CTA	cellulose triacetate	
EAA	ethylene-(acrylic acid) plastic	
EBAK	ethylene-(butyl acrylate) plastic; preferred term for <b>EBA</b>	
EC	ethyl cellulose	
EEAK	ethylene-(ethyl acrylate) plastic; preferred term for <b>EEA</b>	
EMA	ethylene-(methacrylic acid) plastic	
EP	epoxide; epoxy resin	
E/P	ethylene-propylene plastic; preferred term for <b>EPM</b>	

<b>ETFE</b>	ethylene-tetrafluoroethylene plastic
<b>EVAC</b> <sup>1)</sup>	ethylene-(vinyl acetate) plastic; preferred term for <b>EVA</b>
<b>EVOH</b>	ethylene-(vinyl alcohol) plastic
<b>FEP</b>	perfluoro(ethylene-propylene) plastic; preferred term for <b>PFEP</b>
<b>FF</b>	furan-formaldehyde resin
<b>HBV</b>	poly(3-hydroxybutyrate)-co-(3-hydroxyvalerate)
<b>LCP</b>	liquid-crystal polymer
<b>MABS</b>	(methyl methacrylate)-acrylonitrile-butadiene-styrene plastic
<b>MBS</b>	(methyl methacrylate)-butadiene-styrene plastic
<b>MC</b>	methyl cellulose
<b>MF</b>	melamine-formaldehyde resin
<b>MP</b>	melamine-phenol resin
<b>MSAN</b>	$\alpha$ -methylstyrene-acrylonitrile plastic
<b>PA</b>	polyamide
<b>PAA</b>	poly(acrylic acid)
<b>PAEK</b>	polyaryletherketone
<b>PAI</b>	polyamidimide
<b>PAK</b>	polyacrylate
<b>PAN</b>	polyacrylonitrile
<b>PAR</b>	polyarylate
<b>PARA</b>	polyarylamide
<b>PB</b>	polybutene
<b>PBAK</b>	poly(butyl acrylate)
<b>PBD</b>	1,2-polybutadiene
<b>PBN</b>	poly(butylene naphthalate)
<b>PBS</b>	poly(butylene succinate)
<b>PBSA</b>	poly(butylene succinate adipate)
<b>PBT</b>	poly(butylene terephthalate)
<b>PC</b>	polycarbonate
<b>PCCE</b>	poly(cyclohexylene dimethylene cyclohexanedicarboxylate)
<b>PCO</b>	polycycloolefin
<b>PCL</b>	polycaprolactone
<b>PCT</b>	poly(cyclohexylene dimethylene terephthalate)
<b>PCTFE</b>	polychlorotrifluoroethylene
<b>PDAP</b>	poly(diallyl phthalate)
<b>PDCPD</b>	polydicyclopentadiene
<b>PE</b>	polyethylene
<b>PE-C</b> <sup>2)</sup>	polyethylene, chlorinated; preferred term for <b>CPE</b>
<b>PE-HD</b>	polyethylene, high density; preferred term for <b>HDPE</b>
<b>PE-LD</b>	polyethylene, low density; preferred term for <b>LDPE</b>
<b>PE-LLD</b>	polyethylene, linear low density; preferred term for <b>LLDPE</b>
<b>PE-MD</b>	polyethylene, medium density; preferred term for <b>MDPE</b>
<b>PE-UHMW</b>	polyethylene, ultra high molecular weight; preferred term for <b>UHMWPE</b>
<b>PE-VLD</b>	polyethylene, very low density; preferred term for <b>VLDPE</b>
<b>PEC</b>	polyestercarbonate
<b>PEEK</b>	polyetheretherketone
<b>PEEST</b>	polyetherester

1) In ISO 1629, the abbreviated term for ethylene-(vinyl acetate) copolymer is EVM.

2) In ISO 1629, the abbreviated term for chlorinated polyethylene is CM.

PEI	polyetherimide
PEK	polyetherketone
PEN	poly(ethylene naphthalate)
PEOX	poly(ethylene oxide)
PES	poly(ethylene succinate)
PESTUR	polyesterurethane
PESU	polyethersulfone
PET	poly(ethylene terephthalate)
PEUR	polyetherurethane
PF	phenol-formaldehyde resin
PFA	perfluoro(alkyl vinyl ether)-tetrafluoroethylene plastic
PHA	polyhydroxyalkanoate
PHB	poly(3-hydroxybutyrate)
PI	polyimide
PIB <sup>3)</sup>	polyisobutylene
PIR	polyisocyanurate
PK	polyketone
PLA	poly(lactic acid)
PMI	polymethacrylimide
PMMA	poly(methyl methacrylate)
PMMI	poly( <i>N</i> -methylmethacrylimide)
PMP	poly(4-methylpent-1-ene)
PMS	poly( $\alpha$ -methylstyrene)
POM	polyoxymethylene; polyacetal; polyformaldehyde
PP	polypropylene
PP-E	polypropylene, expandable; preferred term for <b>EPP</b>
PP-HI	polypropylene, high impact; preferred term for <b>HIPP</b>
PPE	poly(phenylene ether)
PPOX	poly(propylene oxide)
PPS	poly(phenylene sulfide)
PPSU	poly(phenylene sulfone)
PS	polystyrene
PS-E	polystyrene, expandable; preferred term for <b>EPS</b>
PS-HI	polystyrene, high impact; preferred term for <b>HIPS</b>
PS-S	polystyrene, sulfonated
PSU	polysulfone
PTFE	polytetrafluoroethylene
PTT	poly(trimethylene terephthalate)
PUR	polyurethane
PVAC	poly(vinyl acetate)
PVAL	poly(vinyl alcohol); preferred term for <b>PVOH</b>
PVB	poly(vinyl butyral)
PVC	poly(vinyl chloride)
PVC-C	poly(vinyl chloride), chlorinated; preferred term for <b>CPVC</b>
PVC-U	poly(vinyl chloride), unplasticized; preferred term for <b>UPVC</b>
PVDC	poly(vinylidene chloride)
PVDF	poly(vinylidene fluoride)
PVF	poly(vinyl fluoride)

3) In ISO 1629, the abbreviated term for polyisobutylene is IM.



<b>PVFM</b>	poly(vinyl formal)
<b>PVK</b>	poly( <i>N</i> -vinylcarbazole)
<b>PVP</b>	poly( <i>N</i> -vinylpyrrolidone)
<b>SAN</b>	styrene-acrylonitrile plastic
<b>SB</b>	styrene-butadiene plastic
<b>SI<sup>4)</sup></b>	silicone plastic
<b>SMAH</b>	styrene-(maleic anhydride) plastic; preferred term for <b>S/MA</b> or <b>SMA</b>
<b>SMS</b>	styrene- $\alpha$ -methylstyrene plastic
<b>UF</b>	urea-formaldehyde resin
<b>UP</b>	unsaturated polyester resin
<b>VCE</b>	(vinyl chloride)-ethylene plastic
<b>VCMAK</b>	(vinyl chloride)-ethylene-(methyl acrylate) plastic; preferred term for <b>VCEMA</b>
<b>VCEVAC</b>	(vinyl chloride)-ethylene-(vinyl acetate) plastic
<b>VCKMAK</b>	(vinyl chloride)-(methyl acrylate) plastic; preferred term for <b>VCMA</b>
<b>VCMMA</b>	(vinyl chloride)-(methyl methacrylate) plastic
<b>VCOAK</b>	(vinyl chloride)-(octyl acrylate) plastic; preferred term for <b>VCOA</b>
<b>VCVAC</b>	(vinyl chloride)-(vinyl acetate) plastic
<b>VCVDC</b>	(vinyl chloride)-(vinylidene chloride) plastic
<b>VE</b>	vinyl ester resin

## 6 Symbols for indication of special characteristics

The abbreviated terms for the basic polymers may be supplemented by up to four symbols (see the list below) to differentiate between or among modifications of the polymer, if desired. The supplementary symbol(s) shall be placed after the abbreviated term of the basic polymer, separated by a hyphen, with no spacing before or after the hyphen.

No symbol shall be placed in front of the abbreviated term for the basic polymer.

### Symbol

### Meaning

<b>A</b>	acid (modified)
<b>A</b>	adipate
<b>A</b>	amorphous; atactic
<b>B</b>	biaxial
<b>B</b>	block
<b>B</b>	brominated
<b>C</b>	chlorinated
<b>C</b>	crystalline; isotactic
<b>D</b>	density
<b>E</b>	epoxidized
<b>E</b>	expanded; expandable
<b>F</b>	flexible
<b>F</b>	fluid
<b>F</b>	fluorinated
<b>G</b>	glycol (modified)
<b>H</b>	high
<b>I</b>	impact
<b>L</b>	linear
<b>L</b>	low
<b>M</b>	medium

4) In ISO 1629, the generic abbreviated term for silicone polymers is Q.

M	molecular
N	normal
N	novolak
O	orientated
P	plasticized
P	thermoplastic
R	raised
R	random
R	resol
R	rigid
S	saturated
S	sulfonated
S	syndiotactic
S	thermosetting
T	temperature (resistance)
T	toughened
U	ultra
U	unplasticized
U	unsaturated
V	very
W	weight
X	crosslinked; crosslinkable

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## 7 Symbol for plastics recyclate (standards.iteh.ai)

The symbol “(REC)” (made up of the capital letters REC enclosed in parentheses) is an option (according to ISO 14021:1999) that may be used in addition to the abbreviated term for the basic polymer and the symbols for the indication of special characteristics. The symbol “(REC)” for plastics recyclate shall always be at the last position of the abbreviated term and symbols used for the plastic.

If the percentage recycled content is available and a specific claim of recycling content has to be declared, the capital letters REC may be followed by a number indicating the minimum percentage by mass of the recycling content and the whole enclosed in parentheses, e.g. “(REC50)”.

## 8 Examples of the use of symbols

EXAMPLE 1 Plasticized poly(vinyl chloride) = PVC-P  
 Basic polymer PVC  
 Plasticized P

EXAMPLE 2 High-impact polystyrene = PS-HI  
 Basic polymer PS  
 High impact HI

EXAMPLE 3 Linear low-density polyethylene = PE-LLD  
 Basic polymer PE  
 Linear low density LLD

EXAMPLE 4 Poly(ethylene terephthalate) material resulting from the recycling of PET = PET(REC)

EXAMPLE 5 High-density polyethylene material resulting from the recycling of PE-HD = PE-HD(REC)

NOTE It should be understood that a plastics recyclate might contain constituents apart from the polymer type concerned.

## Annex A (informative)

### Guide for preparing new abbreviated terms for basic polymers, mixtures of polymers and related terms

**A.1** Use the letter P for “poly” to designate a homopolymer.

The letter P may also be used to designate a copolymer or other polymer when its omission would be confusing.

**A.2** Use only capital letters.

EXAMPLE Poly(vinyl chloride) is designated PVC.

**A.3** When duplication otherwise occurs or where confusion might otherwise result, use two or more capital letters for a given component, not necessarily in the order in which they occur in the component being designated.

EXAMPLE 1 Polyacrylate is designated PAK.

EXAMPLE 2 Polyarylate is designated PAR.

EXAMPLE 3 Poly(vinyl formal) is designated PVFM.

**A.4** For copolymers, use the symbols for the monomeric components in the order in which they occur in the term being designated. The symbols for the components generally appear from left to right in the order of decreasing mass ratio (mass percent) of the monomeric components in the copolymer.

EXAMPLE 1 Acrylonitrile-(methyl methacrylate) plastic is designated AMMA.

EXAMPLE 2 (Vinyl chloride)-ethylene-(methyl acrylate) plastic is designated VCEMAK.

A stroke “/” may be used to designate a copolymer when its omission would be confusing.

EXAMPLE 3 E/P for ethylene-propylene plastic.

**A.5** For polymer blends or alloys, use the abbreviated terms for the basic polymers, with the main component in first place followed by the other components in descending order of their mass fractions, separated by a plus sign.

EXAMPLE A blend of polycarbonate and acrylonitrile-butadiene-styrene plastics is designated PC+ABS.

There should be no space before or after the “+” sign.

**A.6** Use figures and letters after the symbols for the components (but before the symbols indicating special characteristics) to designate polymers prepared from various condensation units in a homologous series.

EXAMPLE 1 A polymer of  $\epsilon$ -caprolactam is designated PA6.

EXAMPLE 2 A polymer of hexamethylenediamine, adipic acid and sebacic acid is designated PA66/610.

EXAMPLE 3 A polymer of *m*-xylylenediamine and adipic acid is designated PAMXD6.