

INTERNATIONAL
STANDARD

ISO
1629

Third edition
1995-11-15

Rubbers and latices — Nomenclature

Caoutchouc et latex — Nomenclature

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Reference number
ISO 1629:1995(E)

Foreword

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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.

International Standard ISO 1629 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*.

This third edition cancels and replaces the second edition (ISO 1629:1987), which has been technically revised.

Annex A of this International Standard is for information only.

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International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Rubbers and latices — Nomenclature

1 Scope

1.1 This International Standard establishes a system of symbols for the basic rubbers in both dry and latex forms, based on the chemical composition of the polymer chain.

1.2 The purpose of this International Standard is to standardize the terms used in industry, commerce and government, and it is not intended to conflict with, but rather to act as a supplement to, existing trade names and trade marks.

NOTE 1 In technical papers or presentations, the name of the rubber should be used if possible. The symbols should follow the chemical name for use in later references.

2 Rubbers

Rubbers, in both dry and latex forms, are grouped and symbolized on the basis of the chemical composition of the polymer chain in the following manner:

M Rubbers having a saturated carbon chain of the polymethylene type

N Rubbers having carbon and nitrogen in the polymer chain

NOTE 2 No rubber has so far been symbolized in the "N" group.

O Rubbers having carbon and oxygen in the polymer chain

Q Rubbers having silicon and oxygen in the polymer chain

R Rubbers having an unsaturated carbon chain, e.g. natural rubber and synthetic rubbers derived at least partly from conjugated dienes

T Rubbers having carbon, oxygen and sulfur in the polymer chain

U Rubbers having carbon, oxygen and nitrogen in the polymer chain

Z Rubbers having phosphorus and nitrogen in the polymer chain

3 Symbol groups

3.1 The "M" group

The "M" group comprises rubbers having a saturated chain of the polymethylene type. The following symbols are used:

ACM Copolymer of ethyl acrylate (or other acrylates) and a small amount of a monomer which facilitates vulcanization. (Usually known as acrylic rubber)

AEM Copolymer of ethyl acrylate (or other acrylates) and ethylene

ANM Copolymer of ethyl acrylate (or other acrylates) and acrylonitrile

CM Chloropolyethylene¹⁾

CSM Chlorosulfonyl polyethylene

1) In ISO 1043-1^[1], the abbreviation given for chloropolyethylene is PE-C.

EPDM	Terpolymer of ethylene, propylene and a diene with the residual unsaturated portion of the polymerized diene in the side chain
EPM	Ethylene-propylene copolymer
EVM	Ethylene-vinyl acetate copolymer ²⁾
FEPM	Copolymer of tetrafluoroethylene and propylene
FFKM	Perfluoro rubber in which all substituent groups on the polymer chain are fluoro, perfluoroalkyl or perfluoroalkoxy groups
FKM	Fluoro rubber having substituent fluoro, perfluoroalkyl or perfluoroalkoxy groups on the polymer chain
IM	Polyisobutene ³⁾
NBM	Fully hydrogenated acrylonitrile-butadiene copolymer (see 3.4.2)

3.2 The "O" group

The "O" group comprises rubbers having carbon and oxygen in the polymer chain. The following symbols are used:

CO	Polychloromethyloxirane (usually known as epichlorohydrin rubber)
ECO	Copolymer of ethylene oxide (oxirane) and chloromethyloxirane (also known as epichlorohydrin copolymer or rubber)
GECO	Terpolymer of epichlorohydrin-ethylene oxide-allyl glycidyl ether
GPO	Copolymer of propylene oxide and allyl glycidyl ether (also known as polypropylene oxide rubber)

3.3 The "Q" group

The "Q" group is defined by inserting the name of the substituent group on the polymer chain prior to the silicone designation. The following symbols are used:

FMQ	Silicone rubber having both methyl and fluorine substituent groups on the polymer chain
FVMQ	Silicone rubber having methyl, vinyl and fluorine substituent groups on the polymer chain
MQ	Silicone rubber having only methyl substituent groups on the polymer chain, such as dimethyl polysiloxane
PMQ	Silicone rubber having both methyl and phenyl substituent groups on the polymer chain
PVMQ	Silicone rubber having methyl, vinyl and phenyl substituent groups on the polymer chain
VMQ	Silicone rubber having both methyl and vinyl substituent groups on the polymer chain

The letter for substituent group(s) on the polymer chain is inserted to the left of the code letter for rubber with silicon and oxygen in the backbone (Q) in descending order of per cent present, i.e. largest nearest the Q.

NOTE 3 In ISO 1043-1^[1], the symbol for silicone polymers is SI.

3.4 The "R" group

3.4.1 Description

The "R" group, in both dry and latex forms, is defined by inserting, before the word "rubber", the name of the monomer or monomers from which the rubber was prepared (except for natural rubber). The letter preceding the letter "R" signifies the conjugated diene from which the rubber was prepared (except for natural rubber). Any letter or letters preceding the diene letter signifies the comonomer or comonomers, substituent groups or chemical modifications. The designation may be prefixed by the letter E and a hyphen to signify an emulsion-polymerized rubber or the letter S and a hyphen to signify a solution-polymerized rubber.

For latices, the designated symbol is followed by the word latex, e.g. "SBR latex".

The symbols given in 3.4.2 to 3.4.4 are used.

2) In ISO 1043-1^[1], the abbreviation given for ethylene-vinyl acetate copolymer is E/VAC.

3) In ISO 1043-1^[1], the abbreviation given for polyisobutene is PIB.

3.4.2 General

ABR	Acrylate-butadiene rubber
BR	Butadiene rubber
CR	Chloroprene rubber
ENR	Epoxidized natural rubber
HNBR	Hydrogenated NBR (some unsaturation remains, see 3.1)
IIR	Isobutene-isoprene rubber (usually known as butyl rubber)
IR	Isoprene rubber, synthetic
MSBR	α -methylstyrene-butadiene rubber
NBR	Acrylonitrile-butadiene rubber (usually known as nitrile rubber)
NIR	Acrylonitrile-isoprene rubber
NR	Natural rubber
PBR	Vinylpyridine-butadiene rubber
PSBR	Vinylpyridine-styrene-butadiene rubber
SBR	Styrene-butadiene rubber
E-SBR	Emulsion-polymerized SBR
S-SBR	Solution-polymerized SBR
SIBR	Styrene-isoprene-butadiene rubber

3.4.3 Rubbers having substituent carboxylic acid groups (COOH) on the polymer chain

XBR	Carboxylic-butadiene rubber
XCR	Carboxylic-chloroprene rubber
XNBR	Carboxylic-acrylonitrile-butadiene rubber
XSBR	Carboxylic-styrene-butadiene rubber

3.4.4 Rubbers containing halogen on the polymer chain

BIIR	Bromo-isobutene-isoprene rubber (usually known as bromobutyl rubber)
CIIR	Chloro-isobutene-isoprene rubber (usually known as chlorobutyl rubber)

3.5 The "T" group

The "T" group comprises rubbers having carbon, oxygen and sulfur in the polymer chain. They are usually known as polysulfide rubbers. The following symbols are used:

OT	A rubber having either a $\text{—CH}_2\text{—CH}_2\text{—O—CH}_2\text{—O—CH}_2\text{—CH}_2\text{—}$ group or occasionally an R group, where R is an aliphatic hydrocarbon, not usually $\text{—CH}_2\text{—CH}_2\text{—}$, between the polysulfide linkages in the polymer chain.
EOT	A rubber having a $\text{—CH}_2\text{—CH}_2\text{—O—CH}_2\text{—O—CH}_2\text{—CH}_2\text{—}$ group and R groups which are usually $\text{—CH}_2\text{—CH}_2\text{—}$ but occasionally other aliphatic groups between the polysulfide linkages in the polymer chain.

3.6 The "U" group

The "U" group comprises rubbers having carbon, oxygen and nitrogen in the polymer chain. The following symbols are used:

AFMU	Terpolymer of tetrafluoroethylene, trifluoronitrosomethane and nitrosoperfluorobutyric acid
AU	Polyester urethane
EU	Polyether urethane

3.7 The "Z" group

The "Z" group comprises rubbers having phosphorus and nitrogen in the polymer chain. The following symbols are used:

FZ	A rubber having a —P=N— chain and having fluoroalkoxy groups attached to the phosphorus atoms in the chain
PZ	A rubber having a —P=N— chain and having aryloxy (phenoxy and substituted phenoxy) groups attached to the phosphorus atoms in the chain

Annex A
(informative)

Bibliography

- [1] ISO 1043-1:1987, *Plastics — Symbols — Part 1: Basic polymers and their special characteristics.*

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