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Rubbers and latices — Nomenclature

Caoutchouc et latex — Nomenclature

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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.

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.

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

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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 Chloropolyethylene[1)]

CSM Chlorosulfonylpolyethylene

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

$$—CH_2—CH_2—O—CH_2—O—CH_2—CH_2—$$

group or occasionally an R group, where R is an aliphatic hydrocarbon, not usually $—CH_2—CH_2—$, between the polysulfide linkages in the polymer chain.

EOT A rubber having a

$$—CH_2—CH_2—O—CH_2—O—CH_2—CH_2—$$

group and R groups which are usually $—CH_2—CH_2—$ 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.*