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Rubber and latices — 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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The committee responsible for this document is ISO/TC 45, *Rubber and rubber products*.

This fourth edition cancels and replaces the third edition (ISO 1629:1995), of which it constitutes a minor revision. The main change is the addition of two new rubbers, BIMSM (terpolymer of isobutene, para-methylstyrene, and para-bromomethylstyrene) and DPNR (deproteinized natural rubber). It also incorporates the Amendment ISO 1629:1995/Amd.1:2007.

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Rubber and latices — Nomenclature

1 Scope

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.

The purpose of this International Standard is to standardize the abbreviated 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 trademarks.

NOTE 1 It is intended that in technical papers or presentations, the name of the rubber be used, if possible. It is intended that the symbols follow the chemical name for use in later references.

NOTE 2 The nomenclature of thermoplastic elastomers is described in ISO 18064.^[1]

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 At the time of publication, 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

- BIMSM** terpolymer of isobutene, para-methylstyrene, and para-bromomethylstyrene
- CM** chloropolyethylene¹⁾
- CSM** chlorosulfonylpolyethylene
- EBM** ethylene-butene copolymer
- EOM** ethylene-octene copolymer
- 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 copolymer²⁾
- 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** polyisobutene³⁾
- NBM** fully hydrogenated acrylonitrile-butadiene copolymer (see [3.4.2](#))
- SEBM** styrene-ethylene-butene terpolymer
- SEPM** styrene-ethylene-propylene terpolymer

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)
- GCO** copolymer of epichlorohydrin and allyl glycidyl ether
- GECO** terpolymer of epichlorohydrin-ethylene oxide-allyl glycidyl ether
- GPO** copolymer of propylene oxide and allyl glycidyl ether (also known as polypropylene oxide rubber)

1) In ISO 1043-1, the abbreviated term given for chloropolyethylene is PE-C.

2) In ISO 1043-1, the abbreviated term given for ethylene-vinyl acetate copolymer is EVAC.

3) In ISO 1043-1, the abbreviated term given for polyisobutene is PIB.

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 percent present, i.e. largest nearest the “Q”.

NOTE In ISO 1043-1,^[2] 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.

3.4.2 General

ABR	acrylate-butadiene rubber
BR	butadiene rubber
CR	chloroprene rubber
DPNR	deproteinized natural 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
NBIR	acrylonitrile-butadiene-isoprene rubber
NBR	acrylonitrile-butadiene rubber (usually known as nitrile rubber)
NIR	acrylonitrile-isoprene rubber
NOR	norbornene 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 $-\text{CH}_2-\text{CH}_2-\text{O}-\text{CH}_2-\text{O}-\text{CH}_2-\text{CH}_2-$ group or occasionally an "R" group, where "R" is an aliphatic hydrocarbon, not usually $-\text{CH}_2-\text{CH}_2-$, between the polysulfide linkages in the polymer chain
- EOT** a rubber having a $-\text{CH}_2-\text{CH}_2-\text{O}-\text{CH}_2-\text{O}-\text{CH}_2-\text{CH}_2-$ group and "R" groups which are usually $-\text{CH}_2-\text{CH}_2-$ 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, trifluoro-nitrosomethane, 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 $-\text{P}=\text{N}-$ chain and having fluoroalkoxy groups attached to the phosphorus atoms in the chain
- PZ** a rubber having a $-\text{P}=\text{N}-$ chain and having aryloxy (phenoxy and substituted phenoxy) groups attached to the phosphorus atoms in the chain