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Rubber 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

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

This second edition cancels and replaces the first edition (ISO 1629 : 1976), clauses 2 and 3 of which have been technically revised and to which a clause concerning the designation of thermoplastic elastomers has been added.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Rubber and latices — Nomenclature

1 Scope and field of application

1.1 This International Standard establishes a system of general classification 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.

1.3 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 classified and coded on the basis of the chemical composition of the polymer chain in the following manner:

M Rubbers having a saturated chain of the polymethylene type.

N Rubbers having nitrogen in the polymer chain.

O Rubbers having oxygen in the polymer chain.

Q Rubbers having silicon and oxygen in the polymer chain.

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

T Rubbers having 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 Group designations

3.1 The "M" group includes rubbers having a saturated chain of the polymethylene type. The following classification is used:

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

ANM Copolymer of ethylacrylate (or other acrylates) and acrylonitrile.

CM Chloropolyethylene.

CFM Polychlorotrifluoroethylene.¹⁾

CSM Chlorosulfonyl polyethylene.

EAM Ethylene-vinyl acetate copolymer.²⁾

EPDM Terpolymer of ethylene, propylene and a diene with the residual unsaturated portion of the diene in the side chain.

EPM Ethylene-propylene copolymer.

FPM Rubber having fluoro and fluoroalkyl or fluoroalkoxy substituent groups on the polymer chain.

IM Polyisobutene.³⁾

3.2 The "O" group includes rubbers having oxygen in the polymer chain. The following classification is used:

CO Polychloromethyloxiran (usually known as epichlorohydrin rubber).

ECO Copolymer of ethylene oxide (oxiran) and chloromethyloxiran (also known as epichlorohydrin copolymer or rubber).

GPO Copolymer of propylene oxide and allyl glycidyl ether (also known as polypropylene oxide rubber).

3.3 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 immediately 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. The following classification is used:

1) In ISO 1043, *Symbols for terms relating to plastics*, prepared by ISO/TC 61, *Plastics*, the abbreviation given for polychlorotrifluoroethylene is PCTFE.

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

3) In ISO 1043, the abbreviation given for polyisobutene is PIB.

- ABR** Acrylate-butadiene rubber.
BR Butadiene rubber.
CR Chloroprene rubber.
IIR Isobutene-isoprene rubber (usually known as butyl rubber).
IR Isoprene rubber, synthetic.
NBR Acrylonitrile-butadiene rubber (usually known as nitrile rubber).
NCR Acrylonitrile-chloroprene rubber.
NR Isoprene rubber, natural; natural rubber.
PBR Vinylpyridine-butadiene rubber.
SBR Styrene-butadiene rubber.
SCR Styrene-chloroprene rubber.
SIR Styrene-isoprene rubber.
NIR Acrylonitrile-isoprene rubber.
PSBR Vinylpyridine-styrene-butadiene rubber.

NOTE — For latices, the word "rubber" should be replaced by "latex".

3.3.1 Rubbers having substitute carboxylic acid groups (COOH) on the polymer chain are classified as follows:

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

3.3.2 Rubbers containing halogen on the polymer chains are classified as follows:

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

3.4 The "Q" group is defined by inserting the name of the substituent group on the polymer chain prior to silicone designation. The following classification is 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.

NOTE — Insert initial for substituent group(s) on polymer chain 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.

3.5 The "U" group includes rubbers having carbon, oxygen and nitrogen in the polymer chain. The following classification is used:

- AFMU** Terpolymer of tetrafluoroethylene, trifluoronitrosomethane and nitroso-perfluorobutyric acid.
AU Polyester urethane.
EU Polyether urethane.

3.6 The "T" group includes rubbers having carbon, oxygen and sulfur in the polymer chain. The following classification is 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.

3.7 The "Z" group includes rubbers having phosphorus and nitrogen in the polymer chain. The following classification is 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.

4 Thermoplastic elastomers

Designations of materials in clause 3 shall be preceded by the letter Y if the material consists essentially of polymers having a block, graft, segmented or other structure that imparts rubber-like properties at room temperature whilst the material is in the unvulcanized state. For example,

- YSBR** A block copolymer of styrene and butadiene.
YXSBR A block copolymer of styrene and butadiene containing carboxylic acid groups on the polymer chain.

The designation Y shall not be assigned to materials whose rubber-like properties in the unvulcanized state rely on the blending of polymers or on any other compounding techniques. In such cases, each component of the material shall be included in the designation.

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