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Rubber — Vocabulary

Caoutchouc — Vocabulaire

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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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 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*.

This seventh edition cancels and replaces the sixth edition (ISO 1382:2012), which has been technically revised.

The main changes compared to the previous edition are as follows:

- in [Clause 3](#), terms have been redefined and new terms have been added;
- separate entries for abbreviated terms and synonyms (admitted terms) have been removed and incorporated into the preferred terms as single entries following ISO 10241-1:2011, which is the reference document for the presentation of entries in a vocabulary; and
- an alphabetical index of terms has been added.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This International Standard is intended to be helpful to persons who are unfamiliar with the terminology of the rubber industry. However, it is also intended for use as a guide by the rubber industry itself in selecting appropriate recommended terms to minimize possible confusions and for use in other International Standards and other reports and publications on rubber.

The vocabulary is limited to those terms in general use in the industry. It does not define terms intended for particular products of rubber nor does it define terms that are generally understood or adequately defined in other readily available sources such as general dictionaries.

Many rubber product areas have also produced International Standards on vocabulary specific to their products and processes, and a list of some of these vocabulary standards is given in the Bibliography.

Attention is also drawn to ISO 472, *Plastics — Vocabulary*, and to ISO 18064, *Thermoplastic elastomers — Nomenclature and abbreviated terms*, because these contain many terms of common interest to the rubber and plastics industries.

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Rubber — Vocabulary

1 Scope

The vocabulary is limited to those terms in general use throughout the rubber industry.

It does not define terms intended for particular rubber products, some of which are given in the vocabulary standards listed in the Bibliography.

It does not define terms that are generally understood or adequately defined in other readily available sources such as general dictionaries.

The terms are listed in the alphabetical order of the English terms, with a French index to the corresponding English terms attached. Some terms have parenthetical information added to indicate a specific limitation of the term to a particular field, for example “(rubber latex)”. When a term has one or more synonyms, the synonymous terms follow the preferred term.

Deprecated terms are indicated by “DEPRECATED”.

Symbols are included under their full descriptions, but for convenience they are also listed separately at the end of the main text.

For convenience, standards and other relevant sources referred to in this vocabulary are listed in the first section of the Bibliography and vocabularies relating to finished rubber products are listed in the second section.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

abrasion

loss of material from a surface due to frictional forces

3.2

abrasion resistance

resistance to wear resulting from mechanical action upon a surface

Note 1 to entry: Abrasion resistance is often expressed by the *abrasion resistance index*.

3.3

abrasion resistance index

ratio of the loss in volume of a standard rubber due to frictional forces to the loss in volume of a test rubber measured under the same specified conditions and expressed as a percentage

Note 1 to entry: ISO 4649 contains a method for the determination of abrasion resistance using a rotating drum device.

3.4

accelerated ageing

change in physical properties in a test environment intended to produce the effect of slow natural changes at ambient temperature in a shorter period of time

Note 1 to entry: The rate of degradation is usually increased by raising the temperature, sometimes in combination with increased air or oxygen pressure, increased humidity and/or changes in other conditions.

3.5

accelerator

compounding ingredient used in small amounts with a vulcanizing agent to increase the speed of vulcanization and/or enhance the physical properties of the vulcanizate

3.6

acrylonitrile-butadiene rubber nitrile rubber

NBR

oil-resistant rubber made by the copolymerization of acrylonitrile and butadiene

Note 1 to entry: Oil resistance increases with the level of acrylonitrile, which in commercial nitrile rubber grades varies from 18 % to 49 %.

3.7

activator

compounding ingredient used in small proportions to increase the effectiveness of an accelerator

3.8

active zinc oxide

fine-particle form of zinc oxide chemical activator for accelerated sulfur vulcanization

Note 1 to entry: It is more effective than general-purpose zinc oxide at the low concentrations needed for the production of transparent or translucent vulcanizates or the production of vulcanizates containing reduced levels of zinc.

3.9

addition polymerization

monomers are linked together to form chains, without water or other simple molecules being split off

Note 1 to entry: See also *polyaddition* ([3.367](#)).

Note 2 to entry: There are two major types of addition polymerization process, polymerization of unsaturated compounds, such as olefins and dienes, and polymerization of certain ring structures, such as lactams and alkylene oxides, by an opening of the ring to make large molecules.

3.10

additive

substance that is added into rubber compounds to improve mixing or to modify properties of cured rubber

3.11

adhesion

state in which two surfaces are held together by chemical or physical forces or both

3.12**adhesion promoter**

compounding ingredient added to unvulcanized rubber to improve bonding of rubber to another material in the compound

Note 1 to entry: See also *bonding agent* (3.63).

3.13**adhesion strength**

force required to cause separation at the interface of the bonded components of a test piece or product

3.14**aftercure**

continuation of process of vulcanization subsequent to removal of the energy source

3.15**ageing**

(the effect of, or act or) exposure to an environment for a period of time and the irreversible change of material properties during that time

3.16**agglomerate**

(carbon black and other dry filler particles) group of particle aggregates that are separated by normal rubber processing

3.17**agglomeration**

(rubber latex) reversible or irreversible joining together of latex particles

3.18**aggregate**

(carbon black and other dry filler particles) rigid group of coalesced particles which is the smallest entity that can be dispersed by normal rubber processing

3.19**air checks**

laking

surface markings or depressions that occur on a moulding due to air trapped between the rubber and the mould surface

3.20**air oven ageing**

exposure in an enclosure to circulating air at elevated temperature, at atmospheric pressure and in the absence of light

3.21**anisotropic**

not having the same physical properties in all directions

3.22**anti-blocking agent**

material used to prevent, or reduce the risk of, unwanted adherence between rubber surfaces

3.23**anticoagulant**

(natural rubber latex) substance added to field, or other, latex to retard bacterial action and acidification which would otherwise cause rapid coagulation of the latex

3.24

antidegradant

compounding ingredient used to retard deterioration during ageing

Note 1 to entry: Antidegradant is a generic term for certain additives such as antioxidants, antiozonants, waxes and other protective materials.

3.25

anti-flex-cracking agent

compounding ingredient used to retard cracking caused by cyclic deformation

3.26

anti-foaming agent

(rubber latex) compounding ingredient used to prevent the formation of air bubbles in a latex mix which might otherwise cause blisters or pinholes in the finished product

3.27

antioxidant

compounding ingredient used to retard deterioration caused by oxidation

3.28

antiozonant

compounding ingredient used to retard deterioration caused by ozone

3.29

antistatic agent

material which counteracts the tendency for an electrical charge to build up on the surface of a product

3.30

anti-webbing agent

(rubber latex) compounding ingredient used in a latex mix to prevent the formation of webbing between adjacent parts of a dipped product

Note 1 to entry: See also *webbing* ([3.548](#)).

3.31

apparent hardness

stiffness measured on a test piece of non-standard dimensions or on a curved surface

3.32

applied skin

(cellular material) thin surface layer of elastomeric material applied to a cellular product

3.33

aromatic oil

hydrocarbon process oil usually containing at least 35 % by mass of aromatic hydrocarbons

3.34

artificial weathering

exposure of material to laboratory conditions that accelerate the effect of natural climate-induced effects

3.35

ash

residue from incineration of a material under specified conditions

3.36

asphalt rubber

blend of polymeric cement, and any combination of recycled rubber, raw rubber, rubber compound and certain additives in which the rubber component is at least 5 % of the total blend and has reacted in the hot cement sufficiently to cause swelling of the rubber particles

Note 1 to entry: The term is widely used in the asphalt road surfacing industry, but the product is not an elastomer.

3.37**autoclave**

pressurized vessel used for vulcanizing rubber in a vapour or gas

3.38**average particle diameter**

(carbon black and other particulate filler) arithmetic mean of the diameters of several individual particles measured by an electron microscope

3.39**back-rind****retracted spew**

defect in which the rubber adjacent to the flash line shrinks below the level of the moulded product

3.40**bagging**

tendency of a band of rubber on a mixing mill to sag and rotate beneath the mill roll due to lack of grip to the roll

3.41**balata**

tough flexible thermoplastic substance containing approximately equal proportions of *trans*-polyisoprene and resin, obtained from the sap of various trees of the *Sapotaceae* family, especially *Mimusops globosa*

3.42**bale coating**

film applied to surfaces of natural rubber bales which inhibits adhesion to other surfaces and facilitates marking

3.43**ball mill**

rotating drum, usually mounted horizontally, containing hard, loose balls which serve to pulverize coarse material

3.44**bank**

accumulation of material at the opening between the rolls of a mill or calender or at a spreader bar or knife

3.45**bareness**

defect resulting from the failure of the rubber to fill out all the pattern detail of a mould

3.46**batch**

(compounding) product of one mixing operation

3.47**bay region hydrogen**

hydrogen in a characteristic three-sided concave area of a non-linear polyaromatic hydrocarbon (PAH) with three or more fused rings

Note 1 to entry: For more information, see ISO 21461

3.48**bench marks****reference marks**

marks of known separation applied to a test piece and used to measure strain

3.49

biobased content

amount of biologically-derived component(s) in a product expressed by carbon % to total carbon or mass % to total product mass

3.50

biomass

material of biological origin excluding material embedded in geological formations and/or fossilized

3.51

black scorch

severe stiffening of a rubber compound during processing, due to interactions between the polymer and carbon black

Note 1 to entry: The effect is similar to that of scorch and can be a particular problem in extrusion processes. The effect is most common in EPDM compounds.

3.52

blank

piece of rubber compound of suitable shape and volume to fill the mould

3.53

bleeding

exudation of a liquid compounding ingredient or material to the surface of a rubber

Note 1 to entry: See also *blooming* (3.60).

Note 2 to entry: The term is also used for the migration of liquid and solid colourants.

3.54

blister

defect in a rubber product evidenced by a crater or sac that deforms the surface

3.55

block

portion of a polymer molecule, comprising many constitutional units, that has at least one constitutional or configurational feature not present in adjacent portions

Note 1 to entry: The term is sometimes preceded by the word “soft” for an elastomeric phase and by the word “hard” for a glassy or crystalline phase.

[SOURCE: IUPAC]

3.56

block copolymer

polymer containing sections of more than one constitutional monomer type

3.57

block polymer

polymer whose disparate monomers in sequence are connected linearly

[SOURCE: IUPAC]

3.58

blocking

unintentional adherence between materials

3.59

bloom

liquid or solid material which has migrated to the surface of a rubber

Note 1 to entry: Bloom changes the surface appearance of the rubber.

3.60**blooming**

migration of liquid or solid material to the surface of a rubber

Note 1 to entry: See also *bleeding* (3.53).

3.61**blowing agent**

compounding ingredient used to produce gas by chemical and/or thermal action in the manufacture of hollow or cellular products

3.62**blowing down**

(rubber latex) removal of excess ammonia from latex by stirring the latex while passing a stream of air across the surface

3.63**bonding agent**

substance, usually in liquid form, coated onto another material and used to produce a good bond between the material and rubber

Note 1 to entry: See also *chemical bonding* (3.85) and *adhesion promoter* (3.12).

3.64**bound monomer**

individual molecule that is combined or reacted with itself or other types of molecules in a polymerization reaction to form a polymer

Note 1 to entry: This term is used with reference to synthetic rubber, and the bound monomer is usually expressed as a percentage of the total polymer.

3.65**bound rubber**

that portion of the elastomer in a mix which is so closely associated with the filler as to be unextractable by the usual rubber solvents

3.66**bowl**

two or more cylinders forming the rotating members of a calender

3.67**branched polymer**

molecules connected together having a branched structure, chainlike between branch junctions and between each chain end and a branch junction

3.68**bridge**

two-spoked member supporting the centre of the head of an extruder

Note 1 to entry: See also *spider* (3.466).

3.69**brittleness temperature**

lowest temperature below which all of a set of test pieces fractures due to low-temperature embrittlement when tested under specified conditions

Note 1 to entry: ISO 812 contains a method for the determination of brittleness temperature.

3.70**buffings**

(recycling) particulate vulcanized rubber obtained from abrading rubber articles, especially during tyre retreading operations