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Plastics — Vocabulary

Plastiques — Vocabulaire

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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.

ISO 472 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 1, *Terminology*.

This fourth edition cancels and replaces the third edition (ISO 472:1999), which has been technically revised.

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Introduction

In this fourth edition of ISO 472, the terms and definitions have been stored in the Online Browsing Platform (OBP) where they can be browsed free of charge by members of the public (but not downloaded). The following information is included for each term in each of the three languages currently available (English, French and German):

— term ID — unique for each term;

— term;

— definition;

— note (where applicable).

The complete product is available at the following URL. Please copy the link below in your browser:

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Plastics — Vocabulary

1 Scope

This International Standard defines terms used in the plastics industry, including terms and definitions appearing in plastics standards (of ISO/TC 61) and general terms and definitions of polymer science used in all aspects of plastics technology.

NOTE In addition to terms in English and French (two of the three official ISO languages), this vocabulary includes the equivalent terms in German; these have been included under the responsibility of the member body for Germany (DIN). However, only the terms and definitions in the official languages can be considered as ISO terms and definitions.

2 Terms and definitions

When a term has one or more synonyms, they follow the preferred term. The synonyms are listed in alphabetical order. Deprecated terms are indicated by "(deprecated)".

IUPAC rules for source-based names of polymers specify that, when "poly" is followed by more than one word, parentheses are used. The IUPAC practice is followed in this International Standard. In common use, the parentheses are often omitted.

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For terms involving olefins, the name used commonly in the plastics industry has been utilized rather than the (scientific) name approved by IUPAC; for example, polyethylene is used as opposed to polyethene.

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Some definitions in this International Standard begin with information in angled brackets. This has been added to indicate limitation of the definition to a particular field.

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In the English text, the word class (i.e. "noun", "verb" or "adjective") of terms is indicated where necessary to avoid ambiguity.

2.786
abrasive wear
<abrasion testing> progressive loss of material from the operating surface of a plastic material resulting from the cutting or scratching action of an abrasive wheel

2.785
abrasive wheel
<abrasion testing> small grinding wheel or a roller faced with abrasive paper

2.1666
accelerated-ageing test
short-term test designed to simulate the effects of longer-term service conditions

2.1
accelerator
promoter
substance used in small proportions to increase the reaction rate of a chemical system (reactants, plus other additives)

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2.2
accuracy of the mean
closeness of agreement between the true value and the mean result which would be obtained by applying an experimental procedure a very large number of times

Note 1 to entry: The smaller the systematic part of the experimental errors which affect the result, the more accurate is the procedure.

2.4
acrylic plastic
plastic based on polymers made with acrylic acid or a structural derivative of acrylic acid, or their copolymers with other monomers, the acrylic monomer(s) being in the greatest amount by mass

2.1581
acrylonitrile-butadiene rubber
nitrile rubber
nitrile-butadiene
NBR
range of synthetic rubbers made by the copolymerization of buta-1,3-diene and acrylonitrile

Note 1 to entry: Depending on their acrylonitrile content, these rubbers are oil- and solvent-resistant. Suitably compounded, they are used as a basis for solvent-borne adhesives. NBR is also available as latices, allowing the manufacture of dispersion adhesives. Acrylonitrile-butadiene rubber can be carboxylated.

2.5
acrylonitrile-butadiene-styrene plastic
ABS plastic
plastic, based on terpolymers and/or blends of polymers and copolymers, made with acrylonitrile, butadiene and styrene

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2.6
acrylonitrile-methyl methacrylate plastic
AMMA plastic
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plastic based on copolymers of acrylonitrile and methyl methacrylate

2.1712
activated sludge
biomass produced in the aerobic treatment of waste water by the growth of bacteria and other microorganisms in the presence of dissolved oxygen

Note 1 to entry: It is used in the composting of plastics waste.

2.1627
activation
reactivation
<adhesives> provision or restoration of the bonding properties of a dried adhesive coat

2.7
activator
substance used in small proportions to increase the effectiveness of an accelerator

2.8
addition polymer
polymer made by addition polymerization

2.9
addition polymerization
polymerization by a repeated addition process

Note 1 to entry: The repeated addition process takes place without the splitting off of water or other simple molecules.

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2.11
adhere
be in a state of adherence

2.12
adherence
state in which two surfaces are held together by interfacial forces

Note 1 to entry: Adherence can be achieved with or without the use of an adhesive.

2.13
adherend
body that is, or is intended to be, held to another body

Note 1 to entry: "Adherend" is a narrower term than "substrate".

2.1669
adherend failure
failure of an adhesive bond in the body of an adherend

2.1654
adhesion
state in which two surfaces are held together by interfacial adhesive bonds

2.30
adhesion failure
adhesive failure
failure of an adhesive bond in such a way that the separation appears to be at the adhesive/adherend interface

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2.1548
adhesion promoter
coupling agent
substance used in small proportions to increase the adhesion to specific substrates

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2.1623
adhesive coat
adhesive layer applied to an adherend

2.1624
adhesive film
adhesive coat separated from the substrate after setting

Note 1 to entry: Adhesive films are used for test purposes.

2.32
adhesive line
glue line (deprecated)
space filled with adhesive between two parts to be bonded or in a bonded product

2.1527
adhesive tape
flexible backing or carrier coated with a pressure-sensitive, moistenable or heat-activatable adhesive

2.33
afterflame
flame which persists after the ignition source has been removed

2.34
afterflame time
length of time for which an afterflame persists under specified conditions

Note 1 to entry: It is expressed in seconds.

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2.35
afterglow
persistence of glowing combustion after both removal of the ignition source and the cessation of any flaming

2.1269
afterglow time
length of time for which an afterglow persists under specified conditions

Note 1 to entry: It is expressed in seconds.

2.1677
agglomerate
shredded and/or granulated plastics material in the form of particles which cling together

2.1632
air pressing
<adhesives> application of pressure to an assembly by means of a flexible cover or bag inflated by compressed air

2.37
air-assist vacuum thermoforming
vacuum thermoforming process in which partial preforming of a heated sheet is accomplished by air pressure before vacuum pulldown

2.38
air-slip vacuum thermoforming
vacuum thermoforming process in which a male mould is enclosed in a box, providing an air cushion to keep the advancing mould from contacting a heated sheet until the end of its travel, at which point vacuum is applied to destroy the air cushion and pull the sheet against the mould

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2.41
allyl polymer
polymer or resin made by polymerization of chemical compounds containing the allyl group

2.43
alternating copolymer
copolymer in the molecules of which two species of monomeric unit are distributed in alternating sequence

2.47
amino resin
resin made by polycondensation of a compound containing amino groups, such as urea or melamine, with an aldehyde, such as formaldehyde, or an aldehyde-yielding material

Note 1 to entry: Urea-formaldehyde and melamine-formaldehyde resins are mainly of significance in the adhesive field.

2.49
amorphous
non-crystalline, or devoid of crystalline structure

2.50
amorphous regions
regions within a polymeric material that, on the basis of X-ray diffraction or other suitable techniques, do not show any evidence of crystalline structure

2.51
anaerobic adhesive
adhesive that cures in the absence of oxygen, curing being inhibited by the presence of oxygen and catalysed by metallic ions

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2.52
angle-head
extruder head fixed at an angle to the axis of the extruder barrel

2.54
aniline-formaldehyde resin
amino resin made by polycondensation of aniline with formaldehyde

2.1051
annealing
<processed plastic materials> heat treatment to reduce stress concentrations

2.1923
annealing
<determination of temperature of deflection under load> heat treatment of the test specimen to reduce residual stress in the specimen and thus obtain reproducible test results

2.55
antiblocking agent
<for films> substance incorporated in or applied to films to prevent them sticking together during manufacture, storage or use

2.56
antioxidant
substance used to retard deterioration caused by oxidation

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2.58
apparent density
mass divided by the volume of a sample of material, including both permeable and impermeable voids normally present in the material

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2.1648
application time
period of time required for spreading an adhesive on the surfaces specified to be coated

2.1092
applicator roller
roller that transfers a controlled amount of adhesive to a surface

2.1716
apprentice installer
<polyurethane foam spraying> individual who applies polyurethane spray foam on the job site, under direct supervision of a polyurethane spray installer

2.1270
arc resistance
ability of an electrically insulating material to resist, under specified conditions, the influence of an electric arc along its surface

Note 1 to entry: The arc resistance is identified by the length of the arc, the absence or presence of a conducting path, and the burning or damage of the specimen under test.

2.60
area burning rate
area burned per unit time under specified conditions

Note 1 to entry: It is expressed in square metres per second.

2.1271
ash, **ashes**
mineral residue resulting from complete combustion

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2.63
assembling
fabricating operations involved in fastening parts together by mechanical devices, adhesives, heat sealing, welding or other means

2.1272
assembly
unit or structure composed of a combination of materials or products, or both

2.64
assembly
<adhesives> group of parts which has been placed together for bonding or has been bonded

2.65
assembly time
<adhesives> interval between the application of adhesive to the adherends and the application of heat and/or pressure to initiate the setting process in the assembled joint

2.66
A-stage
early stage in the preparation of certain thermosetting resins, in which the material is still soluble in certain liquids and still fusible

2.68
atactic polymer
regular polymer, the molecules of which have equal numbers of the possible configurational base units in a random sequence distribution

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2.1379
atactic polypropylene
type of amorphous polypropylene characterized by a head-to-tail succession of monomer units having a randomly equal and opposite configuration along the polymer "backbone"

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Note 1 to entry: The definitions of isotactic, syndiotactic and atactic polypropylene are "ideal" definitions. In practice, commercial polypropylene always contains a certain amount of atactic material and low-molecular-mass oligomers.

2.70
autothermal extrusion
adiabatic extrusion
method of extrusion in which the sole source of heat is the conversion of the drive energy through viscous resistance of the plastic mass in the extruder

2.1719
average cooling rate (non-linear)
<moulding> rate of cooling by a constant flow of the cooling fluid, calculated by dividing the difference between the moulding and demoulding temperatures by the time required to cool the mould to the demoulding temperature

2.598
average molar mass
average relative molecular mass
average of the molar mass or relative molecular mass of a polydisperse polymer

Note 1 to entry: The unit gram per mole is recommended in polymer science for molar mass since then the numerical values of the molar mass and the relative molar mass of a substance are equal.

Note 2 to entry: Three types of average commonly used are number-average, mass-average and viscosity-average.

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2.1720
average molecular mass
four types of average molecular mass are defined by the following equations:

number-average molecular mass M_n:

$$M_n = \frac{\sum_{i=1}^{\infty}(N_i \times M_i)}{\sum_{i=1}^{\infty} N_i}$$

mass-average molecular mass M_w:

$$M_w = \frac{\sum_{i=1}^{\infty}(N_i \times M_i^2)}{\sum_{i=1}^{\infty}(N_i \times M_i)}$$

z-average molecular mass M_z:

$$M_z = \frac{\sum_{i=1}^{\infty}(N_i \times M_i^3)}{\sum_{i=1}^{\infty}(N_i \times M_i^2)}$$

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viscosity-average molecular mass M_v:

$$M_v = \left[\frac{\sum_{i=1}^{\infty}(N_i \times M_i^{a+1})}{\sum_{i=1}^{\infty}(N_i \times M_i)}\right]^{1/a}$$

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where N_i is the number of molecules of species i of molecular mass M_i and a is the exponent of the Mark-Houwink-Sakurada equation.

2.14
back draft
back taper
counterdraft
reverse taper
slight taper in a mould wall tending to impede removal of a moulding

2.15
backing plate
support plate
<mould> plate that supports the cavity block, guide pins, etc.

2.16
baffle
<mould> plug or other device fitted in a steam or water channel to divert the melt flow and direct it to a required path

2.17
bag moulding
process of moulding reinforced plastics in which the consolidation of a material placed over or in a rigid mould is accomplished by the application of uniform pressure through a flexible membrane, for example a rubber bag

Note 1 to entry: Also called autoclave moulding, pressure-bag moulding and vacuum-bag moulding, depending on the means used to force the bag against the material.

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2.1678
baling
process in which plastics waste is compacted and secured as a bundle to facilitate handling, storage and transportation

2.486
ball indentation hardness
quotient of the load on a ball indenter and the surface area of the impression caused by the ball indenter after a specified time of load application

Note 1 to entry: It is expressed in newtons per square millimetre.

2.18
bar mould
multi-impression mould in which the impressions are arranged in rows on separate bars which can be removed individually

2.19
barrel
cylinder
tube of steel that forms the housing around extruder screws, injection screws or injection plungers

2.1679
batch
quantity of material regarded as a single unit, and having a unique reference

Note 1 to entry: "Batch" is primarily a processing term.

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2.20
bead polymerization
pearl poymerization
polymerization in which the monomer is dispersed as relatively large droplets in water or another suitable inert diluent, resulting in a beadlike product

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2.24
binder
<adhesives> component of an adhesive that is primarily responsible for the adhesion and cohesion

2.25
binder
binding agent
<textile glass> material(s), or a mixture of chemical products (ingredients), applied to strands or filaments (including staple fibres) in order to hold them in a desired arrangement, for example in chopped-strand mats, continuous-strand mats, surfacing mats and veils or other non-woven fabrics

2.1723
biochemical oxygen demand
BOD
mass concentration of the dissolved oxygen consumed under specified conditions by the aerobic biological oxidation of a chemical compound or organic matter in water, expressed as milligrams of oxygen uptake per milligram or gram of test compound

2.1680
biodegradation
<composting of plastics waste> degradation caused by biological activity, especially by enzymatic action, leading to a significant change in the chemical structure of a material

2.1726
biodegradation phase
<composting of plastics waste> time, measured in days, from the end of the lag phase of a test until about 90 % of the maximum level of biodegradation has been reached

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2.1681
biological recycling
<composting of plastics waste> aerobic (composting) or anaerobic (digestion) treatment of biodegradable plastics waste under controlled conditions using microorganisms to produce, in the presence of oxygen, stabilized organic residues, carbon dioxide and water or, in the absence of oxygen, stabilized organic residues, methane, carbon dioxide and water

2.1727
biological treatability
potential of a material to be aerobically composted or anaerobically biogasified

2.1573
bitumen
asphalt
very viscous liquid or solid consisting essentially of hydrocarbons and their derivatives

Note 1 to entry: Bitumen is soluble in carbon disulfide. It is substantially non-volatile and softens gradually when heated. It is black or brown in colour and possesses waterproofing and adhesive properties. It is one of the products of refining petroleum and is also found as a natural deposit and as a component of naturally occurring asphalt.

2.28
blast finishing
process of removing flash from mouldings and/or dulling their surfaces by directing a stream of material, such as steel balls, walnut shells or plastic pellets, at the mouldings with sufficient force to fracture the flash or to dull the surface

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2.29
blister
elevation of the surface of varied contours and dimensions, with a cavity beneath it

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2.72
block
portion of a polymer molecule, comprising many constitutional units, that has at least one constitutional or configurational feature not present in the adjacent portions

Note 1 to entry: The definitions that relate to “polymer” can also be applied to “block”.

2.73
block copolymer
polymer containing blocks of more than one constitutional type

2.78
blocked curing agent
curing or hardening agent temporarily rendered unreactive, which can be reactivated as desired by physical or chemical means

2.79
blocking
unintentional adherence between sheet materials

2.80
bloom
visible exudation or efflorescence on a surface

Note 1 to entry: Bloom can be caused by, e.g. lubricants or plasticizers.

Note 2 to entry: In some cases, it will adversely affect coalescence.

2.81
blow moulding
method of forming hollow objects by inflating a parison into a mould with compressed gas

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