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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.

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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.

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:

<http://www.iso.org/obp>

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.

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.

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.

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)

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

2.6

acrylonitrile-methyl methacrylate plastic

AMMA plastic

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.

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

2.1548

adhesion promoter

coupling agent

substance used in small proportions to increase the adhesion to specific substrates

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.

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

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

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

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

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

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

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"

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.

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 :

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

viscosity-average molecular mass M_v :

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

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.

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.

2.20

bead polymerization

pearl polymerization

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

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

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

2.29**blister**

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

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

2.82

blowing agent

substance used to cause expansion in the manufacture of hollow or cellular articles

Note 1 to entry: Blowing agents can be compressed gases, volatile liquids or chemicals that decompose or react to form a gas.

2.83.1

blow-up ratio

<blow moulding> ratio of the diameter of the parison to the maximum diameter of the cavity in which it is to be blown

2.83.2

blow-up ratio

<tubular extrusion blowing of film> ratio of the extrusion die diameter to the diameter of the blown tube

2.88

bond strength

force necessary to bring an adhesive joint to the point of failure, with failure occurring in, or near, the plane of the bond line

2.85

bond, noun

<adhesives> joint between adherends achieved by means of an adhesive

2.1610

bondability

ability of a substrate to form a bond of specified properties with a specified adhesive under specified conditions

2.1606

bonding range

bonding life

period of time for which an adhesive coat is capable of forming a bond under specified conditions

Note 1 to entry: The bonding range characterizes the interval of time between the minimum and the maximum open assembly time of a particular adhesive.

2.1612

bonding surface

faying surface

portion of a surface that is prepared for bonding to another prepared surface or to a clean surface

2.89

boss

raised area on the surface of a moulding

2.91

branch

oligomeric or polymeric offshot from a macromolecular chain

2.92

branched polymer

polymer composed of molecules having a branched structure, which is chainlike either between branch junctions or between each chain end and a branch junction

Note 1 to entry: The branches are composed of mers.

2.1464

break

<puncture testing> any fissure through the full thickness of the material

2.94**breaker plate**

perforated plate in an extruder which can support a screen pack

2.1098**breaking force**

force necessary to bring an adhesive joint to the point of failure irrespective of the mode of failure

2.97**breathing**

operation of opening of a mould or press for a very short period of time at an early stage in the process of cure

Note 1 to entry: Breathing allows the escape of gas or vapour from the moulding material and reduces the tendency of thick mouldings to blister.

2.99**brittleness temperature**

temperature at which there is a 50 % probability of failure in a specimen when tested by the method specified in ISO 974

Note 1 to entry: It is expressed in degrees Celsius.

2.100**B-stage**

intermediate stage in the reaction of certain thermosetting resins in which the material swells when in contact with certain liquids and softens when heated, but might not dissolve or fuse entirely

2.101**bulk compression****isotropic compression**

volume compression

relative decrease in volume caused by hydrostatic pressure

$$\text{Bulk compression } \chi = \frac{\Delta V}{V}$$

Note 1 to entry: It is dimensionless.

2.102**bulk density**

apparent density of powders, pellets, granules, etc.

2.103**bulk factor**

ratio of the volume of a given mass of moulding material to its volume in the moulded form

Note 1 to entry: The bulk factor is also equal to the ratio of the density of the material in its moulded form to its apparent density in the unmoulded form.

2.104**bulk modulus**

quotient of hydrostatic pressure by bulk compression

$$\text{Bulk modulus } K = p / \chi$$

where

p is the hydrostatic pressure;

χ is the bulk compression.

Note 1 to entry: It is expressed in pascals.

2.1055

bulk moulding compound

BMC

product composed of thoroughly mixed resins and chopped reinforcing fibres, with or without particulate fillers, supplied in mass form and capable of being moulded under heat and pressure

Note 1 to entry: In bulk moulding compounds, high viscosity is achieved by chemical thickeners.

2.105

bulk polymerization

polymerization in which the monomer (gas, liquid or solid) is in a homogeneous phase without solvent or dispersing medium

2.1728

bulk wave

<dynamic mechanical testing> mode of propagation of an acoustic wave in a material whose boundaries normal to the direction of propagation are infinitely remote

2.107

burn, intransitive verb
undergo combustion

2.106

burn, noun

trace of local thermal decomposition resulting in a variation of colour which can go as far as blackening

Note 1 to entry: Such a defect can cause distortion or destruction of the surface of a moulded part or an extruded section.

2.108

burned area

that part of the damaged area of a material that has been destroyed by combustion or pyrolysis under specified conditions

Note 1 to entry: See also “damaged area”.

Note 2 to entry: It is expressed in square metres.

2.1273

burned length

maximum extent in a specified direction of the burned area

Note 1 to entry: See also “damaged length”.

Note 2 to entry: It is expressed in metres.

2.109

burning behaviour

all the physical and/or chemical changes that take place when an item is exposed to a specified ignition source

2.854**burning rate** (deprecated)**rate of burning** (deprecated)

see “area burning rate”, “linear burning rate”, “mass burning rate”, “flame spread rate”, “heat-release rate”, as appropriate

2.1274**bursting**

violent rupture of an object due to an overpressure within it or upon it

Note 1 to entry: In English, bursting due to stresses generated within a material is referred to as “shattering”.

2.111**cabled yarn**

<textile glass> two or more folded yarns (or, alternatively, one folded and one single yarn) twisted together in one or more folding operations

2.112**calender**

machine that has a series of heated rolls, arranged in pairs, the rolls in each pair turning in opposite directions

Note 1 to entry: A calender is used to produce film, sheeting, coated substrates or laminates, the thickness being determined by adjustment of the gap between the last pair of rolls.

2.1484**calibration**

set of operations that establish, under specified conditions, the relationship between values indicated by a measurement instrument or measurement system and values corresponding to appropriate standards or known values derived from such standards

2.1291**calorific value**

see “heat of combustion”

2.116**carbon fibre precursor**

organic fibres which can be converted to carbon fibres by pyrolysis

Note 1 to entry: Precursors are usually in the form of continuous yarn, but can be woven or knitted fabric, braid, mat or felt.

2.1043**carbonization**

heat treatment in an inert atmosphere to convert a carbon fibre precursor into carbon fibre

2.117**carboxymethyl cellulose****CMC**

glycolic acid ether of cellulose

2.1608**carrier**

<adhesive tape> flexible material to which an adhesive is applied

Note 1 to entry: A carrier can be, e.g. a film, a fabric, a foil or paper. For the carrier in single-sided tape, the term “backing” is used.

2.118**casein****CS**

protein material precipitated from skimmed milk by the action either of rennet or dilute acid

2.119

cast film

film made by depositing a layer of plastic, which is molten, in a solution or in a dispersion, on to a surface, allowing it to solidify and then removing the film from the surface

2.120

casting

process in which a liquid or viscous material is poured or otherwise introduced into a mould or on to a prepared surface to solidify without the use of external pressure

2.121

casting resin

resin in liquid form that can be poured or otherwise introduced into a mould and shaped without pressure into a solid article

2.122

catalyst

substance, used in small proportions, that augments the rate of a chemical reaction and remains unchanged chemically at the end of the reaction

2.1729

cavity

that part of the hollow space in a mould that produces one moulding

2.1730

cavity pressure at hold

pressure on the material in a mould cavity during the pressure hold period of the moulding process, measured centrally near the gate or the inner surface of the cavity

2.126

cellular plastic

expanded plastic

foamed plastic

plastic the density of which is reduced by the presence of numerous small cavities (cells), interconnecting or not, dispersed throughout the mass

Note 1 to entry: A cellular plastic (foamed plastic) is often simply called a foam.

2.128

cellulose acetate

CA

acetic acid ester of cellulose

2.129

cellulose acetate butyrate

CAB

mixed acetic and butyric acid ester of cellulose

2.130

cellulose acetate propionate

CAP

mixed acetic and propionic acid ester of cellulose

2.131

cellulose nitrate

CN

nitric acid ester of cellulose

2.132**cellulose propionate****CP**

propionic acid ester of cellulose

2.133**cellulosic plastic**

plastic based on derivatives of cellulose

2.1486**centre of percussion**

<pendulum impact-testing machine> point on a pendulum at which a perpendicular impact in the plane of swing does not cause reaction forces at the axis of rotation of the pendulum

2.134**centrifugal casting**

process of forming hollow cylindrical products by rotating about one axis at high speed a mould containing a fluid monomer, prepolymer or polymer dispersion and maintaining the rotation while solidifying the polymeric material by suitable means, such as heating

2.135**centrifugal moulding**

process of forming hollow cylindrical products by rotating about one axis at high speed a mould containing a dry fusible powder and maintaining the rotation while fusing the polymer by the application of heat

2.137**chain transfer**

chemical reaction usually occurring during chain polymerization, in which an active macromolecule transfers the reactive functional species to another molecule and becomes itself inactive

2.138**chain-transfer polymerization**

chain polymerization in which the chain-growth reaction frequently proceeds through a chain-transfer process

2.139**chalking**

appearance of a powdery residue on a surface

2.1294**char length**

length of carbonaceous residue along a burning-behaviour test specimen

Note 1 to entry: See also "burned length".

Note 2 to entry: In some standards, char length is defined by a specific test method.

2.1292**char, noun**

carbonaceous residue resulting from pyrolysis or incomplete combustion

2.1293**char, verb**

form a carbonaceous residue during pyrolysis or combustion

2.1482**characteristic length**

<fracture toughness testing> size of the plastic deformation zone around the crack tip, required for checking fulfilment of the size criteria

2.1418

Charpy notched impact strength

<Charpy impact testing> impact energy absorbed in breaking a notched specimen, referred to the original cross-sectional area of the specimen at the notch

Note 1 to entry: It is expressed in kilojoules per square metre.

2.1417

Charpy unnotched impact strength

<Charpy impact testing> impact energy absorbed in breaking an unnotched specimen, referred to the original cross-sectional area of the specimen

Note 1 to entry: It is expressed in kilojoules per square metre.

2.141

chemically foamed plastic

cellular plastic in which the cells are formed by gases generated from thermal decomposition or chemical reaction of the constituents

2.142

chill-roll extrusion

process of extruding film and sheeting in which a molten extrudate is cast on to a cooled roll

2.1295

chimney effect

upward movement of hot fire effluent caused by convection currents confined within an essentially vertical enclosure

Note 1 to entry: This usually draws more air into the fire.

2.145

chlorinated polyethylene

PE-C

polyethylene modified by chlorination of the polymer

2.1571

chlorinated rubber

white powder or fibrous product obtained by the controlled chlorination of natural rubber

Note 1 to entry: Chlorinated rubber is used as a compounding ingredient in solvent adhesives.

2.1585

chloroprene rubber

CR

polychloroprene

range of synthetic rubbers based on polymerized 2-chlorobuta-1,3-diene

Note 1 to entry: Polychloroprene, particularly the strong and medium crystallizing grades, is widely used as a basis for solvent and contact adhesives used both by industry (e.g. the footwear, furniture, construction and car industries) and by other users. Polychloroprene is also available in the form of a latex for dispersion adhesives.

2.1577

chlorosulfonated polyethylene

CSM

elastomeric material prepared by simultaneous chlorination and chlorosulfonation of polyethylene in solution using gaseous chlorine and sulfur dioxide

2.146

chopped fibre

short fibre cut from yarn, not held together by any means

Note 1 to entry: The chopped fibre can be sized for incorporation in injection-moulding powders.

2.148**chopped strands**

<textile glass> short strands cut from continuous-filament strands, not held together by any means

2.147**chopped-strand mat**

mat formed of strands cut to a short length, randomly distributed, without intentional orientation, and held together by a binder

2.1630**clamp, verb**

<adhesives> hold an adhesive joint under pressure with clamps during setting of the adhesive

Note 1 to entry: A “cramp” is a particular type of clamp used to exert higher pressure.

2.1652**clamping time**

<adhesives> length of time for which an adhesive joint is clamped

2.1655**cleavage**

<testing of adhesives> mode of application of a force to a joint between rigid adherends which is not uniform over the whole area but results in a stress concentrated at one edge

2.1660**cleavage strength**

force necessary to bring an adhesive assembly to the point of failure by the application of force in a cleavage mode

2.1296**clinker**

solid agglomerate of residues formed by either complete or incomplete combustion and which may result from complete or partial melting

2.150**closed cell**

cell enclosed totally by its walls and hence non-interconnecting with other cells

2.149**closed-assembly time**

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

2.151**closed-cell cellular plastic**

cellular plastic in which almost all the cells are non-interconnecting

2.152**coated fabric**

fabric with an adherent layer of polymeric material on one or both sides, the coated product remaining flexible

2.153**coating**

<product> thin layer of a material applied by a coating process

2.154**coating process**

process of applying a thin layer of a material in the form of a fluid or powder to a substrate

2.156

coefficient of linear thermal expansion

reversible change in length of a material per unit length per degree change in temperature

Note 1 to entry: The value may vary for different temperature ranges.

2.157

coefficient of twist contraction

<glass fibres> change in length of a yarn attributable to the twist, expressed as a percentage of the length of the untwisted yarn

2.158

cohesion

state in which the particles of a single substance are held together by intermolecular forces

2.159

cohesion failure

cohesive failure

failure of an adhesive bond within the body of the adhesive, i.e. not at the interface

2.161

cold drawing

process of stretching unheated thermoplastics

2.1673

cold flow

deformation of an adhesive layer (or film) at room temperature without an externally applied load

2.162

cold moulding

compression-moulding process in which the moulding is formed at room temperature and subsequently baked at an elevated temperature

2.163

cold pressing

<adhesives> bonding operation in which an assembly is subjected to pressure without the application of heat

2.164

cold setting

curing a thermosetting material at room temperature

2.1539

cold-curing adhesive

adhesive that cures without the application of heat

2.165

cold-setting adhesive

cold glue (deprecated)

adhesive that sets without the application of heat

2.166

cold-slug well

slug well

space provided directly opposite the sprue opening in an injection mould to trap the material injected initially (cold slug) that has cooled below the effective moulding temperature

2.167

collapse, noun

<cellular plastics> inadvertent densification of cellular plastics during manufacture, resulting from breakdown of cell structure

2.1682**collection**

<plastics waste> logistical process of moving plastics waste from its source to a place where it can be recovered

2.168**colour bleeding**

movement of colorants or coloured constituents to the surface as a result of exudation or migration

2.174**combination reinforcement**

combination of several forms of one reinforcement that are bonded mechanically or chemically

Note 1 to entry: Generally, such reinforcements include a reinforcement with chopped strands and another with unchopped strands.

2.175**combustible**, adjective

capable of being combusted

2.1297**combustible**, noun

item capable of combustion

2.1031**combustible-matter content**

ratio of the mass of material removed on calcination from a dried textile glass product to the mass of the dried product

2.176**combustion**

exothermic reaction of a substance with an oxidizer, generally accompanied by flames and/or visible light and the emission of effluent

2.542**combustion products**

solid, liquid and gaseous materials resulting from combustion

Note 1 to entry: See also "fire effluent".

Note 2 to entry: Combustion products can include fire effluent, ash, char, clinker and soot.

2.1683**commingled plastics**

mixture of materials or products consisting of different types of plastic

Note 1 to entry: The term "mixed plastics" is used synonymously.

2.1733**compact tensile specimen**

one of the test specimens used in fatigue crack propagation testing

Note 1 to entry: See Figure 2 in ISO 15850:2002.

2.177**compatibility**

property of the components of a mixture such that the components will not exude, bloom or otherwise separate from the mixture

2.1734**complete break**

<Charpy and Izod impact testing> break in which the specimen separates into two or more pieces

2.178

complex compliance

<dynamic mechanical testing> reciprocal of the complex modulus for linear-viscoelastic behaviour

Symbol C^*

Note 1 to entry: It is expressed in reciprocal pascals (1/Pa).

2.179

complex modulus

<dynamic mechanical testing> ratio of the dynamic stress to the dynamic strain in a viscoelastic material that is subjected to a sinusoidal vibration

Complex modulus $M^* = M' + iM''$

where

M' is the real part of the complex modulus;

M'' is the imaginary part of the complex modulus;

i is equal to $\sqrt{-1}$

Note 1 to entry: It is expressed in pascals.

2.780

complex shear viscosity

<parallel oscillatory rheometry> ratio of dynamic shear stress and dynamic rate of shear strain

Note 1 to entry: It is expressed in pascal seconds (Pa•s).

2.182.1

composite

<fibre reinforcement> solid product consisting of two or more distinct phases, including a binding material (matrix) and a particulate or fibrous material

EXAMPLE Moulding material containing reinforcing fibres, particulate fillers or hollow spheres.

2.182.2

composite

solid product consisting of two or more layers (often in a symmetrical assembly) of, for instance, plastic film or sheet, normal or syntactic cellular plastic, metal, wood or a composite in accordance with definition in 2.182.1, with or without adhesive interlayers

EXAMPLE Film composite for packaging; cellular sandwich composite for structural applications; laminates made with paper or fabric.

2.183

composite mould

multicavity mould containing dissimilar cavities with a common baseplate

2.1735

compost

organic soil conditioner obtained by biodegradation of a mixture consisting principally of various vegetable residues, occasionally with other organic material, and having a limited mineral content

2.1736

compostability

property of a material to be biodegraded in a composting process

2.1737**composting**

aerobic process designed to produce compost

Note 1 to entry: Compost is an organic soil conditioner obtained by biodegradation of a mixture consisting principally of vegetable residues, occasionally with other organic material, and having a limited mineral content.

2.184**compound**

intimate mixture of a polymer or polymers with other ingredients such as fillers, plasticizers, catalysts and colorants

2.185**compression moulding**

process of moulding a material in a confined cavity by applying pressure and usually heat

2.186**compression-moulding pressure**

<compression moulding> fluid pressure applied to the material in the mould

2.187**compressive strain**

<compression testing> decrease in length per unit original distance between the gauge marks on the test specimen

Note 1 to entry: It is expressed as a dimensionless ratio or as a percentage.

2.192**condensation polymer****polycondensate**

polymer made by condensation polymerization

2.193**condensation polymerization****polycondensation**

polymerization by a repeated condensation process (i.e. with the elimination of simple molecules such as water)

2.195**conditioning atmosphere**

atmosphere in which a sample or test specimen is kept before being subjected to a test

2.1653**conditioning time**

interval between the end of application of heat and/or pressure to a bond and attaining the desired bond properties

2.1543**conductive adhesive**

adhesive especially designed either to avoid the accumulation of electrical charge or to conduct an electrical current

2.197**configurational repeating unit**

smallest set of successive configurational base units that describes configurational repetition at one or more sites of stereoisomerism in the main chain of a polymer molecule

2.198**configurational sequence**

defined portion of a macromolecule comprising configurational units with relative or absolute configuration of one or more types at the sites of stereoisomerism in the constitutional units

2.1746

constant cooling rate

<moulding> specified constant rate of cooling over a defined temperature range, obtained by controlling the flow of the cooling fluid in such a way that, over each 10 mm interval measured in the direction of flow of the cooling fluid, the deviation from this rate of cooling does not exceed a specified tolerance

Note 1 to entry: The cooling rate is usually expressed in degrees Celsius per hour.

2.201

constitutional sequence

defined portion of a macromolecule comprising constitutional units of one or more types

2.203

contact adhesive

adhesive that is applied to both adherends and, when allowed to become apparently dry, will instantly develop a firm bond when a firm but not sustained pressure is applied

Note 1 to entry: "Apparently dry" means that the adhesive coat is dry to the touch due to the evaporation of sufficient amounts of the volatile constituents.

2.1743

contact force

<stamping> force applied to a stamping tool in the direction perpendicular to the plane of a sheet

2.204

contact moulding

contact pressure moulding

process of making reinforced-plastic mouldings in which minimal pressure is applied during the forming and curing operations

2.1684

contaminant

unwanted substance or material

Note 1 to entry: The term "impurity" is a deprecated synonym of "contaminant".

2.206

continuous-filament woven fabric

fabric woven from glass filament yarns in warp and weft

2.205

continuous-filament/staple-fibre woven fabric

glass fabric woven from filament yarns in one direction, usually the warp, and staple-fibre yarns in the other

2.207

continuous-strand mat

<textile glass> mat formed of uncut strands, without intentional orientation, and held together by a binder

2.1413

conventional deflection

<flexural testing> deflection equal to 1,5 times the thickness of the test specimen

Note 1 to entry: It is expressed in millimetres.

2.1685

converter

<recycling of plastics waste> specialized operator capable of shaping plastics raw material to make a usable semi-finished or finished product

2.210

cooling jig
cooling fixture
shrinkage block
shrinkage jig

form on which mouldings are cooled for the purpose of obtaining controlled dimensions of specific parts

2.1747

cooling time

<injection moulding> length of time from the end of the injection period until the moment when the mould starts to open

Note 1 to entry: It is expressed in seconds.

2.212

copolymer

polymer derived from more than one species of monomer

2.216

cored screw

extruder screw incorporating lengthwise passages for circulating a heating or cooling fluid

2.1299

corrosion damage

physical and/or chemical damage or impaired function caused by chemical action

2.1300

corrosion target

sensor used to determine, under specified conditions, the degree of corrosion damage

Note 1 to entry: This sensor may be a product, a component or a reference material used to simulate them.

2.217

co-solvency

dissolution of a polymer in a solvent comprising more than one component, each component of which by itself is a non-solvent for the polymer

2.1576

coumarone-indene resin

type of thermoplastic resin obtained by the acid-catalysed polymerization of coal tar petroleum fractions rich in coumarone, indene, their homologues and their derivatives

Note 1 to entry: Coumarone-indene resin is often used as a tackifier.

2.219

coupling agent

<reinforced plastics> substance that promotes or establishes a stronger bond at the interface between the resin matrix and the reinforcement

Note 1 to entry: The coupling agent can be applied to the reinforcement, added to the resin or both.

2.1928

crack

<puncture testing> any fissure that can be observed with the naked eye and that does not penetrate the full thickness of the material

2.221

crack

<surface wear> localized feature, in the surface of a material, of small width but often of significant length and depth

2.1927

crack length

<fatigue crack propagation testing> total crack length at any time during a test, given by the initial crack length plus the crack length increment due to fatigue loading

Note 1 to entry: It is expressed in metres.

2.1511

crack length

<fracture toughness testing> length of crack up to the tip of the initial crack prepared

Note 1 to entry: It is expressed in metres.

2.222

crater

pit

small, shallow surface cavity

Note 1 to entry: In general, such cavities are larger in dimensions than a pinhole and have a less regular shape.

2.223

craze

crazing

defect, at or under the surface of a plastic, which has the appearance of a network of fine cracks

2.225

creaming

<PUR cellular plastics> initiation of expansion in the reaction of a polyol/isocyanate mixture

Note 1 to entry: This stage is marked by a change in the reaction mixture from a clear to a cloudy (creamy) appearance.

2.224

creaming

<dispersions> increasing the concentration of at least one dispersed phase at the top of a dispersion by a partial and reversible separation

2.227

creep

<mechanical properties of materials> slow increase in strain with time when a constant force is applied

2.1674

creep

<adhesives> slow elastic deformation of an adhesive layer under load following the initial instantaneous elastic deformation

2.1459

creep-strength limit

initial stress which will just cause rupture or will produce a specified strain at a specified time at a given temperature and relative humidity

2.229

cresol resin

resin of the phenolic type made by the polycondensation of cresol with aldehydes or ketones

2.230

cresol-formaldehyde resin

CF resin

resin of the phenolic type, made by the polycondensation of cresol with formaldehyde

2.1748**critical cross-sectional area**

<moulding of test specimens> cross-sectional area of the mould cavity at the position where the critical portion of a test specimen, i.e. that part on which the measurement will be made, is moulded

2.231**crosshead**

extruder head fixed perpendicular to the axis of the extruder barrel

2.1053**cross-laminating****cross-banding**

process in which some layers of material are orientated at angles to the remaining layers with respect to the grain or to the direction of an anisotropic property

Note 1 to entry: This term is wrongly used in relation to plywood and blackboard. Balanced construction of the laminations about the centreline of the thickness of the laminate is usually assumed.

2.233**crosslink, noun**

constitutional unit connecting two parts of a macromolecule that were earlier separate molecules

2.232**crosslink, verb**

form multiple intermolecular (covalent or ionic) bonds between polymer chains

2.234**crosslinking**

formation of chemical bonds resulting in a three-dimensional molecular network

2.236**crosswise**

direction at 90° to the lengthwise direction

2.237**crosswise laminate**

laminate in which anisotropic layers are arranged at right angles to one another

2.238**crown**

<calender> increased diameter at the centre of a calender roll to compensate for the deflection of the roll under pressure

2.239**crystalline polymer**

polymer showing crystallinity

2.240**crystallinity**

presence of three-dimensional order at the level of molecular dimensions

2.241**crystallite**

<polymer> small crystalline domain

Note 1 to entry: A (polymer) crystal is a crystalline domain usually limited by well-defined boundaries.

Note 2 to entry: The definition is not identical with that used in classical crystallography.

2.242

C-stage

final stage in the reaction of certain thermosetting resins, in which the material is practically insoluble and infusible

Note 1 to entry: The resin in a fully cured thermoset moulding is at this stage.

2.245

cure temperature

temperature at which an adhesive, an assembly or a polymeric composition achieves its cure

2.246

cure time

period of time necessary for an adhesive in an assembly or for a polymer composition to cure under specified conditions of temperature or pressure or both

2.243

cure, noun

curing

<polymer or adhesive> process of converting a prepolymeric or polymeric composition into a more stable, usable condition by polymerization and/or crosslinking

Note 1 to entry: Curing of a bifunctional urethane system takes place by polyaddition, that of a rubber system by crosslinking and that of a phenol-formaldehyde system by both polycondensation and crosslinking.

Note 2 to entry: With adhesives, curing results in the development of the strength properties.

2.244

cure, verb

<polymer or adhesive> convert a prepolymeric or polymeric composition into a more stable, usable condition by polymerization and/or crosslinking; for adhesives this finds expression in developing strength properties

Note 1 to entry: Curing of a bifunctional urethane system takes place by polyaddition, that of a rubber system by crosslinking and that of a phenol-formaldehyde system by both polycondensation and crosslinking.

Note 2 to entry: With adhesives, curing results in the development of the strength properties.

2.247

curing agent

substance that promotes or regulates a curing reaction

2.248

cut layers

<laminated plastics> condition of the surface of machined or ground rods and tubes and of sanded sheets in which cut edges of the surface layer or lower laminations are revealed

2.1749

cutting depth

<machining of workpieces> (mean) difference between the thicknesses of the workpiece before and after one complete milling run

2.1750

cutting speed

<machining of workpieces> instantaneous velocity of the cutting tip of a saw tooth, or of a point on the cutting edge of an abrasive disc, relative to the workpiece

Note 1 to entry: For a circular saw or an abrasive disc, the relationship between v_c and n is given by the equation $v_c = n \pi R$.

2.1580**cyanoacrylate monomer**

special type of acrylic ester monomer having the general formula $\text{CH}_2 = \text{C}(\text{CN}) - \text{COOR}$

Note 1 to entry: Cyanoacrylate monomers are capable of polymerizing rapidly in the form of thin films and are used for certain fast-setting polymerizing adhesives.

2.1497**cycle**

<fatigue testing> smallest segment of a load-time or stress-time function which is repeated periodically

2.249**cycle ratio**

<fatigue testing> ratio of the number of applied cycles to the service life

Note 1 to entry: This ratio is used in tests with load bearings, together with an SN curve (Woehler's curve).

2.1751**cycle time**

<moulding> time required to carry out a complete moulding cycle

2.1752**cycloolefin copolymer**

polymer of a cycloolefin (or cycloolefins) and other monomers

2.1301**damaged area**

<fire testing> total of those surface areas which have been affected permanently by fire under specified conditions

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

Note 2 to entry: Users of this term should specify the types of damage to be considered. This could include, for example, loss of material, deformation, softening, melting, charring, combustion, pyrolysis or chemical attack.

2.1302**damaged length**

<fire testing> maximum extent in a specified direction of a damaged area

Note 1 to entry: See also "burned length".

Note 2 to entry: It is expressed in metres.

2.253**daylight**

distance between the moving and fixed platens of a press in the open position

Note 1 to entry: In the case of a multiplaten press, daylight is the distance between adjacent platens.

2.254**decay constant**

β

<dynamic mechanical testing> coefficient that determines the time-dependent decay of damped free vibrations

Note 1 to entry: It is expressed in reciprocal seconds (1/s).

2.255**decorative laminate**

laminate consisting of bonded layers of sheet material (for example paper, film, foil or fabric), the outer layer or layers on one or both sides having decorative plain or variegated colours or designs

2.1303

deflagration

combustion wave, accompanied by an explosion, propagating at subsonic velocity

2.257

deflashing

process of removing flash mechanically or manually from a moulding

2.1924

deflection

<instrumented Charpy impact and puncture testing> relative displacement between the striker and the specimen support, starting from the first contact between the striker and the test specimen

Note 1 to entry: It is expressed in millimetres.

2.1409

deflection

<flexural testing and flexural-creep testing> distance over which the top or bottom surface of the test specimen at mid-span deviates from its original position during flexure

Note 1 to entry: It is expressed in millimetres.

2.1432

deflection at break

<Charpy impact testing> deflection at which the impact force is reduced to less than or equal to 5 % of the maximum impact force

Note 1 to entry: It is expressed in millimetres.

Note 2 to entry: It is necessary to differentiate between the deflection at break and the deflection limit at the beginning of pull-through which is determined by the length and width of the test specimen and the distance between the specimen supports. For type 1 specimens in the edgewise position, the deflection limit is in the range 32 mm to 34 mm.

2.1430

deflection at maximum impact force

<instrumented Charpy impact and puncture testing> deflection at which the maximum impact force occurs

Note 1 to entry: It is expressed in millimetres.

2.259

deflocculation agent

substance that breaks down agglomerates into primary particles or prevents the latter from combining into agglomerates

2.261

degradable plastic

plastic designed to undergo a significant change in its chemical structure under specific environmental conditions, resulting in the loss in some properties, as measured by standard test methods appropriate to the plastic and the application, in a given period of time that determines whether the plastic can be classified as biodegradable or not

2.262

degradation

irreversible process leading to a significant change in the structure of a material, typically characterized by a change of properties (e.g. integrity, molecular mass or structure, mechanical strength) and/or by fragmentation, affected by environmental conditions, proceeding over a period of time and comprising one or more steps

2.263

degree of polymerization

number of monomer units per molecule

2.266**delamination**

separation of layers in a laminate as the result of failure of the adhesive, either in the adhesive itself or at the interface with the adherend

2.1753**demoulding temperature**

temperature of the mould or the press plates at the end of the cooling time, measured in close vicinity to the moulded material

2.268**depolymerization**

reversion of a polymer to its monomer(s) or to a polymer of lower relative molecular mass

2.1754**design**

creative activity that, based on expressed or implied needs, existing means and technological possibilities, results in the definition of technical solutions for a product that can be commercially manufactured or fabricated into prototypes

2.270**desized fibre**

fibre from which the size has been removed by extraction with suitable solvents or by pyrolysis

2.1011**desized product**

product (e.g. yarn, fabric) from which the size has been removed, for example by extraction with a suitable solvent or by thermal treatment

2.271**deterioration**

irreversible change in the physical properties of a plastic, evidenced by impairment of these properties

2.1304**detonation**

combustion wave, accompanied by an explosion, propagating at supersonic velocity and characterized by a shock wave

2.1560**dextrin(e)**

modified starch prepared from starch by heat treatment in the dry state with or without the addition of small quantities of chemical agents

Note 1 to entry: Dextrin is used in certain water-borne adhesives.

2.273**die**

<punching> tool designed to cut a shaped item such as a test specimen from sheet or film material

2.272**die**

<extrusion> metal block with a shaped orifice through which plastic material is extruded

2.274**die cutting**

process of cutting shapes from film and sheets by pressing a knife-edge die through one or several layers

2.275**die plate**

main support plate for the punch or the cavity of a mould

2.276

dielectric dissipation factor

dissipation factor

loss tangent; tangent of loss angle

tangent of the phase angle ($\tan\delta$)

2.278

differential scanning calorimetry

DSC

technique in which the the difference between the heat flow rate into a test specimen and that into a reference specimen is measured as a function of temperature and/or time while the test specimen and the reference specimen are being subjected to the same controlled temperature programme under a specified atmosphere

Note 1 to entry: A distinction is made between two modes, power-compensation differential scanning calorimetry (power-compensation DSC) and heat-flux differential scanning calorimetry (heat-flux DSC), depending on the principle of measurement used.

2.280

diffusion of light

<light scattering> process by which the spatial distribution of a beam of radiation is changed when it is deviated in many directions by a surface or by a medium, without change of frequency of its monochromatic components

Note 1 to entry: The frequency is unchanged only if there is no Doppler effect attributable to the motion of the materials from which the radiation is returned.

2.1755

digested sludge

<composting of plastics waste> mixture of settled sewage and activated sludge which has been incubated in an anaerobic digester at about 35 °C to reduce the biomass and odour and to improve the dewaterability of the sludge

Note 1 to entry: Digested sludge contains an association of anaerobic fermentative and methanogenic bacteria producing carbon dioxide and methane.

2.1597

dilatancy

increase in volume due to shear

Note 1 to entry: "Dilatancy" is sometimes wrongly used to describe shear thickening.

2.281

diluent

thinner (deprecated)

<adhesives> liquid whose sole function is to reduce the concentration of solids and viscosity of an adhesive

2.282

dimensional stability

constancy of dimensions of a plastic part or specimen under environmental conditions

Note 1 to entry: The dimensional stability of plastics is influenced by creep, cure, shrinkage, evaporation or migration of additives, and water sorption.

2.283

dimer

compound composed of two units of a single species of monomer

Note 1 to entry: A dimer can be the product of the combination of two monomers or of scission of a larger molecule.

2.284**dip coating**

coating process in which a substrate is dipped into a fluid polymer, solution or dispersion, then withdrawn and subjected to heating and drying to solidify the deposited film

2.1034**direct roving**

roving obtained by winding directly from a bushing a large and predetermined number of filaments

2.287**dished**

symmetrical distortion of a flat or curved section of a plastic object such that, as normally viewed, it appears concave or more concave

2.1757**disintegration**

physical breakdown of a material into small fragments

2.288**dispersion**

heterogeneous system in which a finely divided material is distributed in another material

2.1516**dispersion adhesive**

adhesive consisting of a stable dispersion of a polymer in a liquid continuous phase, usually water

Note 1 to entry: Dispersion adhesives containing an elastomer as the polymer are often termed a "latex".

2.1476**displacement**

<fracture toughness testing> distance through which the loading device moves, corrected for the indentation of the loading pins, the compression of the test specimen and the machine compliance

Note 1 to entry: It is expressed in metres.

2.1758**dissolved inorganic carbon****DIC**

<composting of plastics waste> that part of the inorganic carbon in water which cannot be removed by specified phase separation, for example by centrifugation at 40 000 metres per second squared for 15 min or by membrane filtration using membranes with pores of diameter 0,2 µm to 0,45 µm

2.1759**dissolved organic carbon****DOC**

<composting of plastics waste> that part of the organic carbon in water which cannot be removed by specified phase separation, for example by centrifugation at 40 000 metres per second squared for 15 min or by membrane filtration using membranes with pores of diameter 0,2 µm to 0,45 µm

2.293**domed**

symmetrical distortion of a flat or curved section of a plastic object such that, as normally viewed, it appears convex or more convex

2.1529**double-coated adhesive tape****double-sided adhesive tape**

tape in which the adhesive is applied on both sides of the carrier

2.1643

double-lap joint

joint made by placing two adherends one each side of a third adherend, partly overlapping the third adherend, and bonding together the overlapping portions

2.298

dowel bush

dowel bushing

hardened steel insert in the portion of a mould that receives the dowel pin

2.299

downstroke press

press in which the pressing device is situated above the moving platen, pressure being applied by a downward movement of this device

2.300

draft

taper in a mould for the purpose of facilitating the removal of a moulding from the mould

2.301

drape vacuum thermoforming

vacuum thermoforming process in which a sheet is clamped in a movable frame, heated, lowered to contact and hang over the high points of a male mould, and then pulled against the mould by vacuum

2.1305

draught-free environment

environment in which the results of experiments are not significantly affected by the local air speed

Note 1 to entry: For example, for small-scale burning-behaviour tests, a maximum air speed of 0,2 m/s is sometimes specified.

2.302

draw ratio

measure of the degree of stretching during a drawing operation, expressed as the ratio of the cross-sectional area of the undrawn plastic to that of the drawn plastic

2.303

draw-down ratio

<extrusion> the ratio of the thickness of the die opening to the final thickness of the product

2.304

drawing

process of stretching a thermoplastic sheet, rod or filament to reduce its cross-sectional area and/or improve some of its physical properties by orientation

2.305

dry blend

free-flowing mixture prepared without fluxing or addition of solvent

2.1761

dry mass

mass of a sample or specimen measured after drying

Note 1 to entry: Dry mass is expressed as a percentage of the mass of the wet sample.

2.306

dry patch

dry spot

<reinforced plastics> area where the reinforcement has not been wetted sufficiently with resin

2.307**dry strength**

strength of an adhesive bond dried under specified conditions

2.308**dry tack****aggressive tack**

property of certain adhesives to adhere to themselves when apparently dry

Note 1 to entry: "Apparently dry" means that the adhesive coat is dry to the touch due to the evaporation of sufficient amounts of the volatile constituents.

2.1763**dry-as-moulded (DAM) state**

state of a moulding, such as a test specimen, which has been placed in a moisture-proof container immediately after moulding

2.309**drying temperature**

<adhesives> temperature to which an adhesive or an assembly is subjected in order to dry the adhesive

2.310**drying time**

<adhesives> period of time during which an adhesive or an assembly is allowed to dry, with or without the application of heat or pressure or both

2.1306**duration of flaming**

length of time for which flaming combustion persists under specified conditions, including flaming combustion due to the presence of an ignition source

Note 1 to entry: It is expressed in seconds.

2.1764**durometer hardness**

hardness determined by means of durometer

2.311

dwel, noun

dwelling

pause in the application of pressure to a mould to allow the escape of gas

2.314**dynamic mechanical analysis****DMA**

technique in which either the modulus or damping, or both, of a substance is measured as a function of temperature, frequency and/or time, while either load or displacement is varied with time

2.781**dynamic shear viscosity**

<parallel oscillatory rheometry> the real part of the complex shear viscosity

Note 1 to entry: It is expressed in pascal seconds (Pa•s).

2.317**dynamic thermomechanical measurement**

<dynamic mechanical testing> technique in which the dynamic modulus and/or damping of a substance under oscillatory load is measured as a function of temperature while the substance is subjected to a controlled temperature programme

Note 1 to entry: Torsional braid measurement is a particular case of dynamic thermomechanical measurement in which the material is supported on a braid.

2.1767

eco-profile

<plastics products> partial life cycle inventory analysis beginning at the raw-material extraction phase and ending at the point where the plastics product is ready for transfer to the next operator in the supply chain (so called cradle-to-gate analysis)

2.1307

“E” criterion

see integrity criterion “E”

2.1644

edge joint

butt joint formed by bonding two sheet adherends edge to edge

2.321

edgewise

<laminates> parallel to the layers of the laminate

Note 1 to entry: See also “flatwise”.

Note 2 to entry: The term is usually used to indicate one of the directions in which a load or electric stress can be applied when testing laminated plastic sheets.

2.1419

edgewise impact

<Charpy and Izod impact testing> impact on the narrow longitudinal surface of the test specimen, in the direction parallel to the width of the specimen

2.1769

edgewise position

<determination of temperature of deflection under load> test specimen position in which the test load is applied at right angles to the width direction on the broad longitudinal surface of the specimen

2.1345

effective heat of combustion

heat of combustion of a substance under specified conditions

2.322

ejection

process of removing a moulding from a mould cavity

2.323

ejector

mechanical or pneumatic device designed to remove a moulding from a mould

2.327

elastomer

macromolecular material which returns rapidly to its initial dimensions and shape after substantial deformation by a weak stress and release of the stress

Note 1 to entry: The definition applies under room temperature test conditions.

2.328

electric strength

dielectric strength

property of a dielectric which opposes a disruptive discharge

Note 1 to entry: It is measured by determining the intensity of the electric field which will break down the dielectric.

2.1308

electrical tracking resistance

See “tracking resistance”

2.331**embedding** (in a polymer)

process of encasing completely an article in a polymer by pouring a monomer, prepolymer or polymer dispersion over it in a mould, curing or solidifying the polymer, and removing the encased article from the mould

Note 1 to entry: In the case of electrical components, lead wires or terminals can protrude from the embedment.

2.332**embossed sheet**

sheet with a textured pattern on one or both sides

2.333**embossing**

process of producing a relief pattern on a surface

2.334**emulsifying agent****emulsifier****dispersant**

surface-active substance that promotes and maintains the dispersion of two incompletely miscible liquids or of a solid in a liquid by reducing the interfacial tension between the two phases

2.335**emulsion**

heterogeneous system in which a liquid is distributed as fine drops within another liquid

Note 1 to entry: In industry, there are systems called emulsions which are really suspensions, for example PVAC emulsion.

2.1517**emulsion adhesive**

adhesive consisting of a stable emulsion of a hydrophobic liquid resin in water

2.336**emulsion polymerization**

polymerization in which emulsifying agents are used to disperse and stabilize the monomer as very fine droplets in another liquid, resulting in the production of a latex

2.338**encapsulated adhesive**

adhesive in which particles or droplets of the adhesive or an adhesive component are enclosed in a protective film (giving what are referred to as microcapsules), usually to prevent crosslinking until the film is destroyed by suitable means

2.339**encapsulation**

process of applying a thermoplastic or thermosetting protective or insulating coating to enclose an article by suitable means, such as brushing, dipping, spraying, thermoforming or moulding

2.340**end group**

constitutional unit with only one attachment to a portion of a polymer chain

2.1309**end-use conditions**

intended conditions to which an item will be subjected during its normal working life, when used in accordance with the manufacturer's instructions

2.1478

energy

<instrumented Charpy impact and puncture testing> energy expended in deforming and penetrating the test specimen up to a given deflection

Note 1 to entry: It is expressed in joules.

2.1925

energy

<fracture toughness testing> input energy when crack initiates, which is based upon the corrected load-displacement curve

Note 1 to entry: It is expressed in joules.

2.1480

energy calibration factor

<fracture toughness testing> factor to correct the error due to the stiffness and the normalized crack length of the test specimen

Note 1 to entry: See Tables A.1 and A.2 in ISO 13586:2000.

2.1687

energy recovery

<recycling of plastics> production of useful energy through direct and controlled combustion

Note 1 to entry: Solid-waste incinerators producing hot water, steam and/or electricity are a common form of energy recovery.

2.1508

energy release rate

<fatigue crack propagation testing> difference between the external work done on a body to enlarge a cracked area by a given amount and the corresponding change in strain energy

Note 1 to entry: It is expressed in joules per square metre.

2.1288

energy release rate

<fracture toughness testing> change in the external work and the strain energy of a deformed body due to enlargement of the cracked area

Note 1 to entry: It is expressed in joules per square metre.

2.1431

energy to maximum impact force

<Charpy impact and puncture testing> energy expended up to the deflection at maximum impact force

Note 1 to entry: It is expressed in joules.

2.1310

environment

<fire testing> conditions and surroundings that might influence the behaviour of an item or persons when exposed to fire

2.1688

environmental aspect

element of an organization's activities or products or services that can interact with the environment

2.1689

environmental impact

any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects

2.1772**environmental provision**

normative element of a standard that specifies measures for minimizing adverse environmental impact of a test method, material or product

2.1667**environmental test**

test designed to assess the performance of an assembly under service conditions

2.1587**epoxy resin**

synthetic resin containing epoxide groups

Note 1 to entry: This is a class of thermosetting resin that can be used in adhesives for structural purposes.

Note 2 to entry: Epoxy resins can be crosslinked with stoichiometric amounts of co-reactants, such as primary or secondary polyamines or anhydrides, or by the use of catalysts, such as tertiary amines or boron trifluoride.

2.1611**equilibrium moisture content**

moisture content at which an item or a material neither gains nor loses moisture when subjected to given constant conditions of humidity and temperature

2.345**evolved-gas analysis****EGA**

technique in which the nature and/or amount of volatile product(s) released by a substance is (are) measured as a function of temperature while the substance is subjected to a controlled temperature or time programme

Note 1 to entry: The method of analysis should always be stated clearly.

2.346**evolved-gas detection****EGD**

technique in which the evolution of gas from a substance is detected as a function of temperature or time while the substance is subjected to a controlled temperature programme

2.1311**explosion**

abrupt expansion of gas which may result from a rapid oxidation or decomposition reaction, with or without an increase in temperature

2.1312**exposure time**

length of time for which people, animals or items are exposed under specified conditions

2.349**extender**

inert substance, which may be liquid or solid, added to a resin, plastic or adhesive primarily to reduce cost

2.1775**extensometer**

<tensile and compression testing> component of a tensile- or compression-testing machine which measures the change in the distance between the gauge marks on the test specimen

2.353**external plasticizer**

plasticizer incorporated as an additive in a plastic compound

2.354

extruder head

part of an extruder situated between the barrel and the die

Note 1 to entry: In some cases the head may be part of the die.

2.355

extruder screw

shaft with one or more helical ribs, often divided into different zones, with different depths of the channel between the ribs and sometimes different pitch, usually having a cylindrical part at one end and a curved or pointed surface at the other, designed to drive the plastic mass along the surrounding barrel

2.356

extrusion

process whereby heated or unheated plastic forced through a shaping orifice becomes one continuously formed piece

2.357

extrusion coating

coating process in which a molten plastic is extruded continuously on to a moving substrate

2.358

exudation

bleed-out (deprecated)

sweat-out (deprecated)

migration of liquid constituents to the surface

2.1463

failure

<puncture testing> any break in the surface of the specimen which is visible to the naked eye

2.360

fancy yarn

novelty yarn

<textile glass> yarn that has been manufactured specially so that its appearance differs significantly from that of conventional yarn in order to give it a decorative effect

2.1512

fatigue crack growth rate

<fatigue crack propagation testing> rate of crack extension caused by fatigue bending and expressed in terms of average crack extension per cycle

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

2.362

fatigue life

fatigue strength

<fatigue testing> number of cycles to which a test specimen is subjected until failure occurs or the test is terminated

Note 1 to entry: Fatigue life depends on the frequency and waveform of the applied stress, the magnitude of the applied stress and whether or not both compressive and tensile stresses occur within each cycle.

2.366

feeding

supplying of plastic material to a processing machine

2.1690**feedstock recycling**

<recycling of plastics waste> conversion to monomer or production of new raw materials by changing the chemical structure of plastics waste through cracking, gasification or depolymerization, excluding energy recovery and incineration

Note 1 to entry: "Feedstock recycling" and "chemical recycling" are synonyms.

2.1044**felt**

structure characterized by the densely matted condition of most or all of the fibres of which it is composed

2.367**fibre streak****fibre whitening**

accumulation of internal fibres incompletely wetted by resin in translucent reinforced plastics, appearing as a whitish defect

2.1061**fibre volume content**

<fibre-based composites> ratio of fibre volume to total volume of composite

2.1013**filament**

single textile element of small diameter compared to its length

Note 1 to entry: It can be continuous or discontinuous.

2.368**filament winding**

method of forming reinforced plastic products by winding resin-coated continuous strands of reinforcing material on to a mandrel or mould under controlled tension and in a predetermined pattern

2.369**filler**

relatively inert solid material added to a plastic or to an adhesive to modify its strength, permanence, working properties or other qualities, or to lower costs

Note 1 to entry: Two classes of filler are used

- chemically inert fillers, e.g. china clay or woodflour;
- reinforcing fillers like silicates, carbon black, fibrous materials or aluminium powder that markedly enhance the performance of a polymer.

Note 2 to entry: A filler only used to reduce cost is termed an "extender". An extender can also be a liquid.

2.370**filler rod**

rod of thermoplastic material used in hot-gas welding to provide a source of softened material to fill a welded joint

2.371**filler sheet**

<adhesives> sheet of deformable or resilient material which, when placed between an assembly to be bonded and the pressure applicator or when distributed between a stack of assemblies, aids in providing uniform application of pressure over the area to be bonded

2.372

fillet

portion of an adhesive that fills the corner or angle formed where two adherends are joined

Note 1 to entry: A fillet is usually formed by “squeeze-out” or by capillary action.

2.373

film

thin planar product of arbitrarily limited maximum thickness, the thickness being very small compared to the length and width

Note 1 to entry: The arbitrary thickness limit differs from country to country and often from material to material, but in some cases is 0,25 mm.

2.374

film adhesive

adhesive in film form, with or without a carrier

Note 1 to entry: Film adhesives are usually caused to set by means of heat under pressure.

2.375

film blowing

process of making film by extruding a thermoplastic tube kept inflated continuously by internal gas pressure during stretching and cooling

2.376

film casting

process of making film by distributing a fluid polymer, polymer dispersion or solution on a suitable substrate and then solidifying the polymeric material by suitable means

2.377

film extrusion

process of making film by extruding a molten thermoplastic through a die

2.379

finishing

<textile glass> application of a coupling agent to glass textile products in order to improve the bond between the glass fibre surface and the matrix

2.1313

fire

<controlled> self-supporting combustion which has been deliberately arranged to provide useful effects and which is controlled in its extent in time and space

Note 1 to entry: In the English language, the word “fire” can have two meanings which translate into two different words in both French and German.

2.1314

fire

<uncontrolled> self-supporting combustion which spreads uncontrolled in time and space

2.1315

fire barrier

separating element which resists the passage of flame and/or heat and/or effluents for a period of time under specified conditions

2.1316

fire behaviour

change in the physical and/or chemical properties of an item and/or structure exposed to fire

Note 1 to entry: This concept covers both reaction to fire and fire resistance.

Note 2 to entry: In English, this term can also be used to describe the behaviour of a fire.

2.1317

fire compartment

<in a building> enclosed space, which can be subdivided, separated from adjoining spaces within the building by elements of construction having a specified fire resistance

2.1318

fire effluent

totality of gases and/or aerosols (including suspended particles) created by combustion or pyrolysis

2.1319

fire exposure

extent to which persons, animals or items are subjected to the conditions created by fire

2.1320

fire gases

gaseous part of the products of combustion

Note 1 to entry: See also “fire effluent”.

Note 2 to entry: In French, the term “gaz de combustion” also applies to engine exhaust gas and might then include particles.

2.1321

fire hazard

potential for injury and/or damage from fire

2.1322

fire load

quantity of heat which could be released by the complete combustion of all the combustible materials in a given volume, including the facings of all bounding surfaces

Note 1 to entry: It is expressed in joules.

Note 2 to entry: Fire load can be based on effective, gross or net heat of combustion as required by the specifier.

2.1323

fire load density

fire load per unit floor area

Note 1 to entry: It is expressed in joules per square metre.

2.1324

fire model

procedure or process intended to represent, predict or reproduce one or more phases of a fire, or the transition between phases

2.1327

fire performance

response of an item when exposed to a specific fire

Note 1 to entry: See also “fire behaviour”.

2.1328

fire point

minimum temperature at which a material ignites and continues to burn for a specified time after a standardized small flame has been applied to its surface under specified conditions

Note 1 to entry: See also “flash point”.

Note 2 to entry: It is expressed in degrees Celsius.

Note 3 to entry: In some countries, the term “firepoint” has an additional meaning: a location where fire-fighting equipment is located. This location might also include a fire alarm call point and fire instruction notices.

2.380

fire resistance

ability of an item to fulfil for a stated period of time the required stability and/or integrity and/or thermal insulation and/or other expected duty specified in a standard fire-resistance test

Note 1 to entry: “Fire resistant” (adjective) refers only to this ability.

2.1329

fire retardant, noun

substance added, or treatment applied, to a material in order to delay ignition or to reduce the rate of combustion

Note 1 to entry: The use of fire retardants does not necessarily suppress fire.

2.1330

fire risk

product of

- the probability of occurrence of a fire to be expected in a given technical operation or state and
- the consequence or extent of damage to be expected on the occurrence of a fire

2.1331

fire scenario

detailed description of the conditions, including the environmental conditions, of one or more stages, from before ignition to after completion of combustion, in an actual fire at a specific location or in a real-scale simulation

2.1332

fire simulation

See “fire model”

2.382

fish-eye

<general> small globular mass that has not blended completely into the surrounding material

Note 1 to entry: This defect is apparent particularly in a transparent or translucent material.

2.1071

fish-eye

<adhesives> round, eye-shaped deformation in an adhesive layer

2.1691

flake

<recycling of plastics> plate-like regrind

Note 1 to entry: The shape of the regrind depends on both the plastic being processed and the manner of processing.

2.1781

flakes

spalling

<surface wear> superimposed surface layers

2.384

flaking

local breakage and detachment of the surface layer

2.1267**flame front**

boundary of flaming combustion at the surface of a material or propagating through a gaseous mixture

2.387**flame retardance**

property of a substance or treatment applied to a material of retarding markedly the propagation of a flame

2.388**flame retardant**, noun

substance added, or a treatment applied, to a material in order to suppress or delay the appearance of a flame and/or reduce its propagation (spread) rate

Note 1 to entry: The use of flame retardants does not necessarily suppress fire.

2.389**flame spray coating**

coating process in which a powdered polymer is heated to fusing temperature in a cone of flame placed between the spray gun orifice and the substrate

2.390**flame spread**

propagation of a fire front

2.391**flame spread rate**

distance travelled by a fire front during its propagation divided by the time of travel, measured under specified conditions

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

2.392**flame spread time**

time taken by a fire front on a burning material to travel a specified distance on the surface, or to cover a specified surface area, under specified conditions

Note 1 to entry: It is expressed in seconds.

2.385**flame**, noun

zone of combustion in the gaseous phase, usually with emission of light

2.386**flame**, verb

undergo combustion in the gaseous phase with emission of light

2.1390**flameproof**

deprecated term, except in the context of electrical equipment for explosive atmospheres

2.1333**flame-retardant treatment**

process whereby improved flame retardance is imparted to a material or product

2.1334**flame-retarded**

treated with a flame retardant

2.1335**flaming combustion**

combustion in the gaseous phase, usually with emission of light

2.1336

flaming debris

flaming droplets

material separating from a burning item during a fire test and continuing to flame

2.393

flammability

ability of a material or product to burn with a flame under specified conditions

2.394

flammable

capable of flaming under specified conditions

2.395

flash

that portion of the charge which escapes from the moulding cavity during moulding

2.396

flash groove

spew groove

groove in a mould designed to allow surplus material to escape during the moulding operation

2.397

flash line

spew line

raised line appearing on the surface of a moulding and formed at the junction of mould parts

2.398

flash mould

mould that is designed to allow excess charge to escape in the form of flash

Note 1 to entry: The flash sustains part of the total applied pressure.

2.1268

flash point

minimum temperature to which a material or a product must be heated for the vapours emitted to ignite momentarily in the presence of flame under specified conditions

Note 1 to entry: It is expressed in degrees Celsius.

Note 2 to entry: Various standards, using different methods and equipment, exist for the determination of the flash point.

2.399

flash ridge

flash area

spew area

spew ridge

that part of a flash mould where clearance is provided between the mating surfaces through which excess material can escape, thus facilitating closing of the mould

2.1338

flashing

repeated appearance of flame for very short periods of time (e.g. between 0 s and 1 s) on or over the surface of the specimen

2.1337

flash-over

transition to a state of total surface involvement in a fire of combustible materials within an enclosure