BS EN ISO 472:2013

BSI Standards Publication

# Plastics — Vocabulary

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**National foreword**

This British Standard is the UK implementation of EN ISO 472:2013. It supersedes BS EN ISO 472:2001, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/10, Terminology for rubbers and plastics.

A list of organizations represented on this committee can be obtained on request to its secretary.

BSI, as a member of CEN, is obliged to publish BS EN ISO 472 as a British Standard. However, attention is drawn to the fact that the UK committee voted against its approval as a standard in CEN and ISO. The UK committee submitted a negative vote because more than three hundred terms and definitions have been removed since the standard's enquiry stage, including many important terms that appear in the previous edition of the standard (BS EN ISO 472:2001). These terms and definitions are expected to eventually be reintroduced, after further deliberations in the ISO committee. In the meantime, readers may refer to BS EN ISO 472:2001, copies of which are available on application to the BSI Knowledge Centre, for terms that are not in this edition.

Only the English language text is reproduced in this British Standard adoption; however, this terminology is also available in French and German on the ISO Internet Browsing Platform (see ISO Introduction).

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EUROPEAN STANDARD

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English Version

## Plastics - Vocabulary (ISO 472:2013)

Plastiques - Vocabulaire (ISO 472:2013)

Kunststoffe - Fachwörterverzeichnis (ISO 472:2013)

This European Standard was approved by CEN on 19 July 2010.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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# Foreword

This document (EN ISO 472:2013) has been prepared by Technical Committee ISO/TC 61 "Plastics" in collaboration with Technical Committee CEN/TC 249 “Plastics” the secretariat of which is held by NBN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2013, and conflicting national standards shall be withdrawn at the latest by August 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 472:2001.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

**Endorsement notice**

The text of ISO 472:2013 has been approved by CEN as EN ISO 472:2013 without any modification.

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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.

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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

**INTERNATIONAL STANDARD** **ISO 472:2013(E/F)**

# 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 poymerization**
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;

$\chi$ 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 $M^* = M' + \mathrm{i}M''$

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 formadehyde

**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 vc and n is given by the equation $v_c = n 2\pi R$.

**2.1580**
**cyanoacrylate monomer**
special type of acrylic ester monomer having the general formula CH2 = C(CN) – 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**
$\beta$
<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 (tanδ)

**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 temperture 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**
symmetical 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**
**dwell**, 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 stoichoimetric 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 cause 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

**2.400**
**flatwise**
<laminates> perpendicular to the layers of the laminate

Note 1 to entry: See also “edgewise”.

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.

**2.1420**
**flatwise impact**
<Charpy and Izod impact testing> impact on the broad longitudinal surface of the test specimen, in the direction parallel to the width of the specimen

**2.1783**
**flatwise position**
<determination of temperature of deflection under load> test specimen position in which the test load is applied at right angles to the thickness direction on the narrow longitudinal surface of the specimen

**2.1407**
**flexural strain**
<flexural testing> nominal fractional change in length of an element of the outer surface of the test specimen at mid-span

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

**2.404**
**flexural strength**
<flexural testing> maximum flexural stress sustained by the test specimen during a test

Note 1 to entry: It is expressed in megapascals.

**2.1406**
**flexural stress**
<flexural testing and flexural-creep testing> nominal stress at the outer surface of the test specimen at mid-span

Note 1 to entry: It is expressed in megapascals.

**2.1461**
**flexural-creep modulus**
ratio of the flexural stress to the flexural-creep strain

Note 1 to entry: It is expressed in megapascals.

**2.1784**
**flexural-creep strain**
<flexural-creep testing> strain, at the surface of the test specimen, produced by a stress at any given time during a creep test

**2.1408**
**flexural-strain increase**
<determination of temperature of deflection under load> specified increase in flexural strain that takes place during heating

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

**2.406**
**floating platen**
platen located between the main head and the press table in a multiplaten press and capable of being moved independently

**2.408**
**flow line**
visible line in a moulding in the direction of, and caused by, flow

**2.1062**
**flowability**
ability of a thermosetting moulding compound to flow and fill the cavity of a mould under given conditions

**2.1692**
**fluff**
<recycling of plastics> filament-like regrind

Note 1 to entry: Common usage of the term "fluff" also includes shredder residue fractions produced in the commercial recycling of durable goods such as automobiles.

**2.409**
**fluidized-bed coating**
coating process in which either

a) a part to be coated is preheated, dipped into a bed of powdered plastic particles kept in a state of flotation by an upward air current, and usually subsequently heated to fuse the adhering particles, or

b) a part to be coated, which is at least slightly conductive electrically and earthed (grounded), is dipped cold into a bed of electrostatically charged powdered plastic particles which are kept in a state of floatation by an upward air current and which adhere to the part, and is subsequently heated to fuse the particles

**2.410**
**fluoroplastic**
plastic based on polymers made with monomers containing one or more atoms of fluorine, or copolymers of such monomers with other monomers, the fluoromonomer(s) being in the greatest amount by mass

**2.412**
**foam in situ**, verb
**foam in place**, verb
prepare, deposit and cure a cellular plastic mix at the site where it is used

**2.413**
**foaming adhesive**
adhesive designed to foam in situ, after application, in order to provide effective gap-filling properties

**2.415**
**folded yarn**
**plied yarn**
<textile glass> general term designating yarn formed by twisting two or more single yarns in one folding operation

**2.414**
**folded-chain crystal**
polymer crystal consisting predominantly of chains that traverse the crystal repeatedly by folding as they emerge at its external surfaces

**2.1470**
**force**
<instrumented Charpy impact and puncture testing> force exerted by the striker on the test specimen in the direction of impact

Note 1 to entry: It is expressed in newtons.

**2.411**
**force**
<fracture toughness testing> applied load at the initiation of crack growth

Note 1 to entry: It is expressed in newtons.

**2.1785**
**force-deflection diagram**
<instrumented Charpy impact and puncture testing> plot of impact force as ordinate against specimen deflection from the moment of impact as abscissa

**2.1786**
**force-time diagram**
<instrumented Charpy impact and puncture testing> plot of impact force as ordinate against time from the moment of impact as abscissa

**2.416**
**forming**
process in which the shape of plastic pieces such as sheets, rods or tubes is changed to a desired configuration

**2.417**
**fractionation**
process by means of which macromolecular species differing in some characteristic (such as chemical composition, relative molecular mass, branching or stereoregularity) are separated from each other

**2.1668**
**fracture pattern**
<adhesives> visual appearance of the fracture surfaces produced by the rupture of an adhesive bond

Note 1 to entry: The pattern can be classified with regard to the amount (or percentage) of adhesion or cohesion failure.

**2.140**
**frame**
<pendulum impact-testing machine> that part of the machine carrying the pendulum bearings, the supports, the vice and/or clamps, the measurement instrument and the mechanism for holding and releasing the pendulum

**2.421**
**friction welding**
**spin welding**
pressure-welding process in which the surfaces to be united are softened by heat generated by friction

**2.1339**
**full fire development**
evolution of a fire to a state of full flaming of the combustible materials

**2.1340**
**fully developed fire**
state of total involvement of combustible materials in a fire

**2.425**
**furan plastic**
plastic based on furan resins

**2.426**
**furan resin**
resin in which the furan ring is an integral part of the polymer chain, the furan monomer being in the greatest amount by mass

Note 1 to entry: Furan resins are thermosetting resins obtained by condensation of furfuryl alcohol or co-condensation of furfuryl alcohol or 2-furaldehyde with other compounds like formaldehyde, phenol, urea and/or acetone.

**2.427**
**furfural resin**
resin made by the polymerization or polycondensation of furfural alone or with other compounds, the furfural being in the greatest amount by mass

**2.429**
**gap**
opening between two adjacent rolls of a calender or other, similar, machine

**2.1523**
**gap-filling adhesive**
adhesive designed to fill gaps between uneven surfaces

Note 1 to entry: For high-strength load-bearing purposes, e.g. in the car industry, such an adhesive will provide satisfactory bond strength in bonds up to 1 mm in thickness. For the construction industry, high-solid adhesives designed for use between uneven surfaces and to bond satisfactorily in gaps up to 6 mm wide are used.

**2.430**
**gas transmission rate**
volume of gas which, under steady conditions, passes through unit area of a specimen in unit time under unit pressure difference and at constant temperature

Note 1 to entry: The rate depends on the thickness of the specimen.

**2.1341**
**gasification**
transformation of a solid and/or liquid material to a gaseous state

**2.1342**
**gasify**
transform a solid and/or liquid material into a gaseous state

**2.432**
**gauge length**
<tensile and compression testing> initial distance between the gauge marks on the central part of the test specimen

Note 1 to entry: It is expressed in millimetres.

**2.1514**
**gauge length**
<fatigue crack propagation testing> free distance between the upper and lower grips after the specimen has been mounted in the test machine

Note 1 to entry: It is expressed in metres.

**2.433**
**gauge marks**
<tensile and compression testing> marks made on the surface of the central part of the test specimen to indicate the points between which the change in separation is measured when determining the longitudinal strain (elongation) or compression

**2.435**
**gel coat**
outer layer of resin, sometimes containing a colorant, applied to a reinforced-plastic part to improve the surface properties

**2.436**
**gel point**
stage at which a liquid begins to exhibit pseudoelastic properties

Note 1 to entry: This stage can conveniently be determined as the point of inflection of a viscosity-time plot.

**2.437**
**gel strength**
measure, in arbitrary units, of the rigidity modulus of a gel prepared and matured under standard conditions

Note 1 to entry: "Bloom strength" is a quantitative assessment of "gel strength", determined under standard conditions using a Bloom gelometer or electronic gel tester.

**2.1050**
**gel temperature**
temperature at which a system no longer flows under shearing stress, but shows a tendency to tear

**2.1481**
**geometry calibration factor**
<fracture toughness testing> factor to correct the error due to the dimensions of the test specimen

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

**2.440**
**glass transition**
reversible change in an amorphous polymer or in amorphous regions of a partially crystalline polymer from (or to) a viscous or rubbery condition to (or from) a hard and relatively brittle one

**2.441**
**glass transition temperature**
approximate midpoint of the temperature range over which the glass transition takes place

Note 1 to entry: The glass transition temperature varies significantly, depending upon the specific property and the test method and conditions selected to measure it.

**2.1343**
**glowing**
made luminous by heat

Note 1 to entry: See also "incandescence".

**2.444**
**glowing combustion**
combustion of a material in the solid phase without flame but with emission of light from the combustion zone

Note 1 to entry: See also "incandescence".

**2.449**
**granulator**
machine for reducing large pieces of material or rejected moulded articles to a granular state

**2.450**
**granule**
relatively small particle produced in various sizes and shapes in operations such as cutting, grinding, crushing, precipitation and polymerization

Note 1 to entry: These operations also yield material in the form of powder; in some precipitation and polymerization processes material in the form of beads is produced.

**2.1488**
**gravity length**
<pendulum impact-testing machine> distance between the axis of rotation of the pendulum and the centre of gravity of the pendulum

Note 1 to entry: It is expressed in metres.

**2.1663**
**green strength**
<adhesives> strength of a bond determined immediately after assembly

**2.1346**
**gross heat of combustion**
heat of combustion of a substance when the combustion is complete and any water produced has been entirely condensed under specified conditions

**2.1563**
**gum**
water-soluble vegetable resin

Note 1 to entry: Gums are dried exudations of plants or modified vegetable products.

— "Gum arabic" is the dried exudation from the stem and the branches of Acacia senegal Willdenow and other species of acacia.

— "Gum tragacanth" is the dried mucilaginous exudation from Astragalus gummifer and other species of astragalus (leguminosae). It is partly soluble in water. Gum tragacanth is used as a modifier and stabilizer in water-borne (and occasionally alcohol-borne) adhesives.

— "Cellulose gum" is a water-soluble cellulose derivative used as a substitute for gum arabic.

— "British gum" is a special type of dextrin normally used in textile sizing.

— "Mucilage" is a solution of a gum in water.

**2.1489**
**gyration length**
<pendulum impact-testing machine> distance between the axis of rotation of the pendulum and the point at which the pendulum mass would have to be concentrated to give the same moment of inertia as the pendulum

Note 1 to entry: It is expressed in metres.

**2.1664**
**handling strength**
<adhesives> level of strength which allows the removal of a recently bonded joint from the clamping or pressing device without damaging it

**2.452**
**hardening agent**
**hardener**
agent that promotes or regulates the curing reaction of resins or adhesives by taking part in the reaction

**2.454**
**haze**
percentage of transmitted light, passing through a plastic, which deviates from the incident light by no more than 0,044 rad (2,5°) by forward scattering

Note 1 to entry: This phenomenon gives the plastic a cloudy appearance.

**2.1629**
**heat activation**
**heat reactivation**
use of heat to provide or restore the bonding properties of a dried adhesive coat

**2.1344**
**heat flux**
amount of thermal energy emitted, transmitted or received per unit area and unit time

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

**2.456**
**heat of combustion**
thermal energy produced by combustion of unit mass of a given substance

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

**2.1635**
**heat reactivator**
heating device for providing or restoring the bonding properties of a dried adhesive coat by heat

**2.1348**
**heat release**
thermal energy which is released by the combustion of an item under specified conditions

Note 1 to entry: It is expressed in joules.

**2.1349**
**heat release rate**
thermal energy released per unit time by an item during combustion under specified conditions

Note 1 to entry: It is expressed in watts.

**2.458**
**heat sealing**
process of bonding two or more thin layers of material, at least one of which is a thermoplastic film, by heating areas in contact with each other to the temperature at which fusion of the thermoplastic film(s) occurs, the bonding usually being completed by the application of pressure

**2.1662**
**heat strength**
bond strength at an elevated temperature measured under specified conditions of temperature, load and time

Note 1 to entry: Various test methods are used to measure the heat strength of an adhesive bond.

**2.1350**
**heat stress**
conditions caused by exposure to elevated/reduced temperature, radiant heat flux or a combination of these factors

Note 1 to entry: These conditions can apply to people or occur in a product either during normal use or due to external influence. They may or may not be adverse.

**2.455**
**heat-activated adhesive**
adhesive pre-applied to the adherends that is rendered tacky prior to use by the application of heat and forms a bond on cooling under pressure

**2.459**
**heater band**
**heater blanket**
**heater strip**
electrical heating device for barrels, dies and moulds of extruders

Note 1 to entry: Bands and strips are more or less flexible; blankets are rigid.

**2.460**
**heating-curve determination**
technique in which the temperature of a substance is measured as a function of the programmed temperature, while the substance is subjected to a controlled temperature programme in the heating mode

**2.1537**
**heat-sealing adhesive**
adhesive pre-applied to one or both adherends that is activated by the application of heat and forms a bond on cooling

Note 1 to entry: Heat-sealing adhesives are commonly used in the packaging industry.

**2.1370**
**high-density polyethylene**
**PE-HD**
polyethylene, containing very few short-chain branches (< 4 per 1 000 carbon atoms), having a density greater than 0,940 grams/cubic centimetre

**2.461**
**high-frequency welding**
pressure-welding process in which the surfaces to be united are softened by heat produced by a high-frequency field

**2.463**
**high-pressure decorative laminate**
**HPDL**
**high-pressure laminate**
**HPL**
sheet(s) consisting of layers of fibrous sheet material (for example, paper) impregnated with thermosetting resin and bonded together by means of heat and a pressure of at least 5 MPa, the outer layer or layers on one or both sides having decorative colours or designs

**2.464**
**high-pressure moulding**
method of moulding or laminating in which the pressure used is greater than 5 MPa

**2.1789**
**hinge break**
<Charpy and Izod impact testing> incomplete break such that both parts of the specimen are held together only by a thin peripheral layer in the form of a hinge having low residual stiffness

**2.1790**
**hold pressure**
<injection moulding> melt pressure during the hold time

**2.1791**
**hold time**
<injection moulding> time during which the pressure is maintained at the hold pressure

**2.1693**
**homogenizing**
processing to improve the degree to which a constituent and/or property is uniformly distributed throughout a quantity of material

**2.465**
**homopolymer**
polymer derived from a single species of monomer

**2.467**
**hopper**
funnel-like container placed on the feed opening of a moulding machine (e.g. an extruder)

**2.472**
**hot stamping**
process of decorating or marking plastics in which a pigmented or metallized film is pressed against the plastic by a hot die, thereby transferrring and firmly bonding the pigment or the metal to the plastic

**2.468**
**hot-gas welding**
pressure-welding process in which the surfaces to be united are softened by a jet of hot air or inert gas

**2.469**
**hot-melt adhesive**
adhesive that is applied in the molten state and forms a bond on cooling to a solid state

**2.470**
**hot-runner mould**
<injection moulding> mould in which the runners are kept at a temperature that is higher than the solidification temperature of the material

**2.471**
**hot-setting adhesive**
adhesive that sets only with the application of heat

**2.473**
**hybrid**
<composites> assembly manufactured with two or more different types of fibre material (for example, glass and carbon)

**2.1351**
**"I" criterion**
see thermal-insulation criterion "I"

**2.1352**
**ignitability**
measure of the ease with which an item can be ignited under specified conditions

**2.1353**
**ignitable**
capable of being ignited

**2.1354**
**ignite**, transitive verb
initiate combustion

Note 1 to entry: See also "light".

**2.1355**
**ignited**, adjective
state of an item undergoing combustion

**2.477**
**ignition**
initiation of combustion

Note 1 to entry: The term "ignition" in French has a different meaning (it indicates that a body is in a state of combustion).

**2.1356**
**ignition source**
source of energy that initiates combustion

**2.478**
**ignition temperature**
minimum temperature at which combustion can be initiated under specified test conditions

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

Note 2 to entry: The temperature measured is normally either that of the material or that of the ignition source. It is important to state clearly where and how the temperature is measured.

**2.1428**
**impact energy**
<Charpy and Izod impact testing> energy expended accelerating, deforming and breaking the test specimen during the deflection

Note 1 to entry: It is expressed in joules.

**2.1433**
**impact energy at break**
<Charpy and Izod impact testing> impact energy up to the deflection at break

Note 1 to entry: It is expressed in joules.

**2.1427**
**impact force**
<Charpy and Izod impact testing> force exerted by the striking edge on the test specimen in the direction of the impact

Note 1 to entry: It is expressed in newtons.

**2.1490**
**impact length**
<pendulum impact-testing machine> distance between the axis of rotation of the pendulum and the point of the striking edge at the centre of the specimen face

Note 1 to entry: It is expressed in metres.

**2.1661**
**impact strength**
<impact testing of adhesives> force necessary to bring an adhesive joint to the point of failure by means of a very high rate of shear stress development

Note 1 to entry: The force required is usually measured in units of energy.

**2.479**
**impact strength**
<Charpy and Izod impact testing> energy absorbed in breaking a specimen, under shock loading, referred to the cross-section of the specimen

Note 1 to entry: The specimen can be unnotched or notched; in the latter case, the specimen cross-section is that between the bottom of the notch and the side of the specimen remote from the notch.

**2.1425**
**impact velocity**
<impact testing> velocity of the striker relative to the test specimen supports at the moment of impact

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

**2.1467**
**impact-failure energy**
<puncture testing> impact energy that will cause 50 % of the test specimens to fail

Note 1 to entry: It is expressed in joules.

**2.1469**
**impact-failure height**
<puncture testing> pendulum drop height that will cause 50 % of the test specimens to fail, using a given falling mass

**2.1468**
**impact-failure mass**
<puncture testing> falling mass that will cause 50 % of the test specimens to fail, for a given pendulum drop height

**2.1357**
**imposed load**
force applied to an item other than that associated with its own mass

Note 1 to entry: See also load-bearing criterion "R".

**2.481**
**impregnation**
process of incorporating polymers or monomers, in the form of liquids, melts, dispersions or solutions, into a substrate by way of pores or voids

**2.483**
**impulse sealing**
**thermal-impulse sealing**
bonding process in which the surfaces to be united are subjected to non-continuous rapid heating under pressure, pressure being maintained after heating

**2.484**
**incandescence**
emission of light by a material when intensely heated

Note 1 to entry: It can be produced by materials in the liquid or solid state, with or without combustion.

**2.1286**
**indicative data**
<exposure testing> ratios of the mean values of indicative properties measured before and after exposure

Note 1 to entry: They give a measure of the severity of the influence of an environment on a material for specific exposure conditions.

**2.790**
**indicative property**
<exposure testing> property that has been selected to reveal the influence of an environment on a material through a comparison of measurements of the property before and after exposure

**2.1426**
**inertial peak**
<instrumented Charpy impact and puncture testing> first peak in a force-time or force-deflection diagram, which arises from the inertia of the part of the test specimen accelerated after the first contact with the striker

**2.487**
**inherent viscosity**
logarithmic viscosity number
ratio of the natural logarithm of the relative viscosity to the mass concentration of the polymer

$$\text{Inherent viscosity } \eta_{\text{inh}} = \text{Logarithmic viscosity number } \eta_{\ln} = \frac{\ln \eta_{\text{r}}}{c}$$

where

$\eta_r$ is the natural logarithm of the relative viscosity;

$c$ is the mass concentration of the polymer.

Note 1 to entry: See notes to reduced viscosity.

**2.488**
**inhibitor**
substance used in small proportions to suppress a chemical reaction

**2.1510**
**initial crack length**
<fatigue crack propagation testing> length of the notch made in the test specimen

Note 1 to entry: It is expressed in metres.

**2.1452**
**initial stress**
<tensile creep testing> tensile force per unit area of the initial cross-section within the gauge length

Note 1 to entry: It is expressed in megapascals.

**2.490**
**initiator**
substance, used in small proportions, that starts a chemical reaction, for example by providing free radicals

**2.491**
**injection blow moulding**
blow-moulding process in which a parison is formed over a mandrel by injection moulding and then blown to its final form and dimensions in a second mould

**2.492**
**injection moulding**
process of moulding a material by injection under pressure from a heated cylinder through a sprue into the cavity of a closed mould

**2.1794**
**injection time**
<injection moulding> time from the instant the screw starts to move forward until the switchover point between the injection period and the hold period

**2.1795**
**injection velocity**
<injection moulding> average velocity of a melt as it passes through the critical cross-sectional area of a specimen

**2.494**
**inorganic polymer**
polymer without carbon atoms in the main chain

Note 1 to entry: Examples are polydichlorophosphazene and polydimethylsiloxane. Organic-group side chains can be present in inorganic polymers; in this case, the polymers are sometimes referred to as “semi-organic”.

**2.496**
**insert**
part, made of metal or other material, which can be moulded into position in a moulding or can be pressed into the moulding after completion of the moulding operation

**2.497**
**insert pin**
pin used to place an insert in position and maintain it in position during moulding

**2.499**
**insulation resistance**
<two electrodes in contact with a specimen> ratio of the direct voltage applied to the electrodes to the total current between them at a given time after the application of that voltage

Note 1 to entry: It is dependent upon both the volume and the surface resistance of the specimen.

**2.1358**
**integrity**
<fire testing> ability of a separating element, when exposed to fire on one side, to prevent, for a stated period of time, the passage of flames and hot gases or the occurrence of flames on the unexposed side

Note 1 to entry: This can be assessed as integrity criterion "E" in a standard fire resistance test.

**2.1359**
**integrity criterion "E"**
<fire testing> criterion by which the ability of a separating element to prevent the passage of flames and hot gases is assessed

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

**2.1360**
**intermediate-scale test**
<fire testing> test performed on an item of medium dimensions

Note 1 to entry: A test performed on an item whose largest dimension is between 1 m and 3 m is usually called an intermediate-scale test.

**2.503**
**intrinsic viscosity**
limiting viscosity number
limiting value of the reduced viscosity or the inherent viscosity at infinite dilution of the polymer

$$\text{Intrinsic viscosity } [\eta] = \lim_{c \to 0} \left( \frac{\eta_i}{c} \right) = \lim_{c \to 0} \eta_{\text{inh}}$$

where

$\eta_i$ is the reduced viscosity;

$\eta_{\text{inh}}$ is the inherent viscosity;

$c$ is the concentration of the polymer in the solution.

Note 1 to entry: See notes to reduced viscosity.

Note 2 to entry: This term is also known in the polymer literature as the Staudinger index.

**2.1361**
**irritant**, noun
<burning behaviour of plastics> toxicant causing pulmonary irritancy and/or sensory irritancy

**2.1800**
**ISO mould**
any one of several standard moulds (designated type A, B, C, D1 and D2) having a fixed plate with a central sprue, plus a multicavity plate and intended for the reproducible preparation of test specimens for measurement of comparable properties

Note 1 to entry: See ISO 294-1, ISO 294-2 and ISO 294-3.

**2.1456**
**isochronous stress-strain curve**
<creep testing> Cartesian plot of stress versus creep strain at specific times after application of the test load

**2.509**
**isocyanate polymer**
<isocyanate resins> prepolymer, of relatively low molecular mass, used for the production of (mostly thermoset) polyurethane polymers, e.g. cellular plastics and casting-resin articles

Note 1 to entry: In some countries, the term "isocyanate plastic" designates polymers made by reaction of polyfunctional isocyanates with other compounds.

Note 2 to entry: In other countries, these products are called polyurethanes and polyureas.

Note 3 to entry: Reaction of isocyanates with hydroxyl-containing compounds produces polyurethanes having the urethane group -NH-CO-O-. Reaction of isocyanates with amino-containing compounds produces polyureas having the urea group -NH-CO-NH-.

**2.511**
**isothermal mass-change determination**
technique which gives a record of the dependence of the mass of a substance on time at constant temperature

Note 1 to entry: The record is the isothermal mass-change curve. It is normal to plot mass as the ordinate, with mass decreasing downwards, and time as the abscissa, increasing from left to right.

**2.1424**
**Izod notched impact strength**
<Izod impact testing> impact energy absorbed in breaking a notched specimen, supported as a vertical cantilever beam, by a single impact of a striker, referred to the original cross-sectional area of the specimen

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

**2.1423**
**Izod unnotched impact strength**
<Izod impact testing> impact energy absorbed in breaking an unnotched specimen, supported as a vertical cantilever beam, by a single impact of a striker, referred to the original cross-sectional area of the specimen

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

**2.512**
**joint**
<adhesive bonding> junction of two adjacent adherends

**2.1593**
**kinematic viscosity**
dynamic viscosity divided by the density of the material, both measured at the same temperature

**2.513**
**kiss roll**
<coating processes> rotating cylinder of a coating machine, used for the deposition of a coating material, transferred to the cylinder's surface from another cylinder immersed in the coating fluid, on to a substrate to be coated

**2.514**
**kneader**
machine for mixing materials intensively by severe shear action

**2.515**
**knitted fabric**
<textile glass> planar or tubular structure made by the intermeshing of loops of glass yarn

**2.1801**
**lag phase**
<composting of plastics waste> time, measured in days, from the start of a composting test until adaptation and/or selection of the degrading microorganisms is achieved and the degree of biodegradation of a chemical compound or organic matter has increased to about 10 % of the maximum level of biodegradation

**2.517**
**lamellar crystal**
type of crystal with a large extension in two dimensions and a uniform thickness

**2.518**
**laminate**, verb
bond layers of material(s) together

**2.524**
**laminating**
**lamination**
process of bonding two or more layers of one or more materials

**2.525**
**lamination**
layer of a laminate

**2.1645**
**lamination**
process of preparing a laminate

**2.527**
**land**
<extruder die> surface parallel to the direction of flow of material in the die

**2.526**
**land**
**land area**
**mating surface**
<compression or injection mould> surface of contact, perpendicular to the direction of application of the pressure, of the seating faces of the mould, i.e. those faces that come into contact with one another when the mould is closed

**2.1694**
**landfill**
waste disposal site for the deposit of waste on to or into land under controlled or regulated conditions

**2.528**
**lap joint**
joint made by placing one adherend partly over another and bonding together the overlapping portions

**2.1363**
**large-scale test**
<fire testing> test, which cannot be carried out in a typical laboratory test chamber, performed on an item of large dimensions

Note 1 to entry: A test performed on an item whose largest dimension is greater than 3 m is usually called a large-scale test.

**2.529**
**latex**
colloidal aqueous dispersion of a polymeric material

**2.531**
**lay up**, verb
<reinforced plastics> assemble layers of resin-impregnated material for processing

**2.530**
**lay-up**, noun
<reinforced plastics> assembly of layers of resin-impregnated material ready for processing

**2.533**
**let-go area**
<laminated safety glass> area over which the initial adhesion between interlayer and glass has been lost

**2.1362**
**lethal concentration 50**
<fire testing> concentration of toxic gas or fire effluent statistically calculated from concentration-response data to cause the death of 50 % of test animals of a given species under specified conditions

Note 1 to entry: It is expressed in grams per cubic metre.

**2.1364**
**lethal exposure dose 50**
<fire testing> result of multiplying the concentration of toxic gas or fire effluent by the exposure time which will cause the death of 50 % of test animals of a given species under specified conditions

Note 1 to entry: It is expressed in gram minutes per cubic metre.

**2.762**
**lethal exposure time 50**
<fire testing> duration of exposure to a fixed concentration of toxic gas or fire effluent that causes the death of 50 % of test animals of a given species under specified conditions

**2.534**
**let-off device**
**pay-off device**
device used to suspend a coil or reel from which the material to be processed is fed under controlled tension to a machine, such as for extrusion or for a coating operation by calendering

**2.1802**
**life cycle**
consecutive and interlinked stages of a product system, from raw-material acquisition or generation of natural resources to final disposal

**2.1803**
**life cycle assessment**
**LCA**
compilation and evaluation of the inputs, outputs and potential environmental impacts of a product system throughout its life cycle

**2.1365**
**light**, transitive verb
initiate combustion

Note 1 to entry: See also “ignite”.

**2.1367**
**lighted**, adjective
**lit**, adjective
**alight**, adjective
state of an item after the appearance and during persistence of flame

**2.1368**
**lighting**, noun
<fire testing>

a) first appearance of flame

b) act of initiating combustion

**2.537**
**lignin resin**
resin made by heating lignin or by reaction of lignin with chemicals or resins, lignin being in the greatest amount by mass

**2.539**
**linear burning rate**
length of material burned per unit time under specified conditions

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

**2.540**
**linear chain**
polymer chain that contains no short-chain or long-chain branches

**2.1014**
**linear density**
<yarn> mass per unit length of a yarn, with or without size, expressed in the tex system

**2.545**
**linear expansion**
increase in a dimension of a test specimen under specified test conditions

**2.1372**
**linear low-density polyethylene**
**PE-LLD**
polyethylene containing insignificant amounts of long-chain branching (when compared to low-density polyethylene) but which can, by design, contain significant amounts of short-chain branching and normally has a density of 0,910 grams/cubic centimetre to 0,926 grams/cubic centimetre

**2.1411**
**load**
<determination of temperature of deflection under load> force, applied to the test specimen at mid-span, that results in a defined flexural stress

**2.1501**
**load range**
<fatigue crack propagation testing> difference between the maximum and the minimum loads in one test cycle

**2.1502**
**load ratio**
**stress ratio**
<fatigue crack propagation testing> ratio of the minimum to the maximum load in one cycle

**2.1369**
**load-bearing criterion "R"**
<fire testing> criterion by which the ability of an element or structure to sustain specified actions during a fire resistance test is assessed

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

**2.549**
**loading chamber**
space in a mould, additional to that occupied by the mould cavity, provided to accommodate excess unpressed moulding material and where the moulding material remains for an appropriate time to reach the melt flow temperature

**2.1806**
**locking force**
<moulding> force holding the plates of the mould closed

**2.551**
**logarithmic decrement**
$\Lambda$
<dynamic mechanical testing> natural logarithm of the ratio of two successive amplitudes, in the same direction, of damped free oscillations of a viscoelastic system

$$\Lambda = \frac{1}{k} \ln \frac{A_n}{A_{n+k}}$$

where

$A_n$ and $A_{n+k}$ are the amplitudes (in radians of rotation) of two oscillations;

$k$ is the number of oscillations separating the two amplitude measurements.

Note 1 to entry: Damped freely decaying vibrations are especially suitable for analysing the type of damping in a material under test (i.e. whether the viscoelastic behaviour is linear or non-linear) and the friction between moving and fixed components of the apparatus.

Note 2 to entry: The logarithmic decrement is dimensionless.

**2.1805**
**longitudinal acoustic wave**
<dynamic mechanical testing> sound wave in which the particle displacement is in the direction of wave propagation

**2.1099**
**longitudinal shear strength**
**lap joint strength**
force per unit surface area necessary to rupture an adhesive joint by means of stress applied parallel to the plane of the bond

**2.555**
**longitudinal wave modulus**
<dynamic mechanical testing> ratio of a uniaxial tensile or compressive stress applied to a specimen to the resulting uniaxial strain when the strain in a plane transverse to the axis of the applied stress is zero

Longitudinal wave modulus $L = \sigma / \varepsilon$

where

$\sigma$ is the stress;

$\varepsilon$ is the strain.

Note 1 to entry: A longitudinal wave is normally a compressional wave. With lateral extension or dilatation, the strain in the x-direction ε(x) = the strain in the y-direction ε(y) = 0.

Note 2 to entry: Longitudinal wave modulus is expressed in pascals.

**2.557**
**loss factor**
tan delta
<dynamic mechanical testing> ratio between the loss modulus and the storage modulus

Measured in tension, the loss factor is given by: $\tan\delta_E = E'' / E'$

Measured in shear, the loss factor is given by: $\tan\delta_G = G'' / G'$

Measured in compression, the loss factor is given by: $\tan\delta_K = K'' / K'$

Measured in longitudinal compression, the loss factor is given by: $\tan\delta_L = L'' / L'$

where $E'$ and $E''$, $G'$ and $G''$, $K'$ and $K''$ and $L'$ and $L''$ are the storage modulus and loss modulus in tension, shear, compression and longitudinal compression, respectively.

Note 1 to entry: It is dimensionless.

**2.559**
**loss modulus**
<dynamic mechanical testing> imaginary part of the complex modulus

Note 1 to entry: It is expressed in pascals.

**2.560**
**lot**
definite quantity of some commodity manufactured or produced under conditions that are presumed uniform

**2.1064**
**low shrink**
qualifies products that, upon curing, shrink between 0,05 % and 0,2 % in the length direction

**2.1371**
**low-density polyethylene**
**PE-LD**
polyethylene which is highly branched (short and long chains) and has a density of 0,910 grams/cubic centimetre to 0,925 grams/cubic centimetre

**2.561**
**low-pressure moulding**
method of moulding or laminating in which the pressure used is 5 MPa or less

**2.562**
**lubricant**
substance added in small proportions to a formulation of a plastic to facilitate processing or to prevent sticking

**2.563**
**lubricant bloom**
cloudy, greasy exudate of a lubricant on the surface of a plastic

**2.565**
**macrocycle**
cyclic macromolecule of high relative molecular mass or a cyclic portion of a macromolecule of high relative molecular mass

**2.566**
**macromer**
monomer that itself can be described as a polymer, or at least as an oligomer

**2.567**
**macromolecule**
very large molecule (organic or inorganic)

**2.1807**
**major load**
<Rockwell hardness testing> main load applied to the indenter following the minor (preliminary) load

Note 1 to entry: It is expressed in newtons.

**2.569**
**mandrel**
<extrusion> centre member of an extrusion die that determines the internal shape and dimensions of a hollow product

**2.570**
**Mark-Houwink equation**
**Mark-Houwink-Sakurada equation**
**MHS equation**
equation describing the dependence of the intrinsic viscosity of a polymer on its viscosity-average molecular mass, as shown in the equation below

$$[\eta] = K \times (\overline{M_V})^a$$

where

$K$ and $a$ are constants, the values of which depend on the nature of the polymer and the solvent as well as on the temperature;

$(\overline{M_V})$ is the viscosity-average molecular mass.

**2.572**
**mass burning rate**
mass of material burned per unit time under specified conditions

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

**2.1383**
**mass loss rate**
mass of material lost per unit time under specified conditions

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

**2.1015**
**mass per unit area**
ratio of the mass of a piece of a flat material of specified dimensions to its area

Note 1 to entry: Examples of such materials are glass mats and fabrics.

**2.571**
**mass-distribution function**
distribution function in which the relative amount of a portion of a substance with a specific value, or a range of values, of the random variable(s) is expressed as a mass fraction

**2.574**
**masterbatch**
well-dispersed mixture of a polymer and high percentages of one or more components (colorants and/or other additives) in known proportions for use in blending in appropriate amounts with the basic polymer in the preparation of a compound

**2.1696**
**material recovery**
material-processing operations including mechanical recycling, feedstock (chemical) recycling and organic recyclying, but excluding energy recovery

**2.1551**
**matrix**
<adhesives> that part of an adhesive that surrounds or engulfs embedded filler or reinforcing particles or filaments

**2.576**
**matt spot**
local reduction in gloss on the surface of a part

**2.1811**
**maturity of compost**
<composting of plastics waste> assignment of the maturity of a compost based on the measurement of the maximum temperature in a self-heating test using Dewar vessels

Note 1 to entry: It is expressed in terms of the so-called “Rottegrad”.

**2.1506**
**maximum energy release rate**
<fatigue crack propagation testing> highest value of the energy release rate in one cycle

**2.1812**
**maximum force**
<instrumented Charpy impact and puncture testing> maximum force occurring during the test

Note 1 to entry: It is expressed in newtons.

**2.1429**
**maximum impact force**
<instrumented Charpy impact and puncture testing> maximum value of the impact force in a force-time or force-deflection diagram

Note 1 to entry: It is expressed in newtons.

**2.1813**
**maximum level of biodegradation**
degree of biodegradation, measured in per cent, of a chemical compound or organic matter in a test, above which no further biodegradation takes place during the test

**2.1499**
**maximum load**
<fatigue crack propagation testing> highest value of the load during a cycle

Note 1 to entry: It is expressed in newtons.

**2.1650**
**maximum open time**
<adhesives> maximum length of time after which an adhesive coat which has been applied to an adherend loses its bonding ability

**2.1503**
**maximum stress intensity factor**
<fatigue crack propagation testing> lowest value of the stress intensity factor in one cycle

**2.1622**
**mechanical adhesion**
adhesion between surfaces produced by an adhesive after setting due to interlocking with the asperities of the surfaces and to absorption of the adhesive by porous substrates during application

**2.1697**
**mechanical recycling**
processing of plastics waste into secondary raw material or products without significantly changing the chemical structure of the material

Note 1 to entry: The terms "recycled plastics" and "regenerate" are sometimes used synonymously with "secondary raw material".

**2.1615**
**mechanical surface preparation**
production of surfaces suitable or more suitable for adhesive bonding by mechanical means

Note 1 to entry: Depending on the materials to be bonded, different mechanical treatments are used

— metals can be scarified, i.e. many scars or scratches are made in the adherend surface;

— metals can also be grit-blasted with natural or artificial grit or shot which is projected onto the surface by compressed air or other means for controlled cleaning and roughening;

— metals, plastics and leather can be roughened with a wire brush;

— metals can be scoured with an abrasive and a liquid (water), rubber vulcanizates by abrasive paper or cloth without the use of a liquid.

**2.579**
**mechanically foamed plastic**
cellular plastic in which the cells are formed by the physical incorporation of gases

**2.1373**
**medium-density polyethylene**
**PE-MD**
polyethylene having some short-chain branching (four to six branches per 1 000 carbon atoms) and a density of from 0,926 grams/cubic centimetre to 0,940 grams/cubic centimetre

**2.581**
**melamine plastic**
plastic based on amino resins, melamine being the amine present in the greatest amount by mass of the amines or amides involved in the polymerization

**2.580**
**melamine-formaldehyde resin**
**MF resin**
amino resin made by the polycondensation of melamine with formaldehyde or a compound that is capable of providing methylene bridges

**2.582**
**melt flow rate**
quantity of thermoplastic material extruded in a given time under specified test conditions

**2.583**
**melting behaviour**
phenomena accompanying the phase transition from solid to liquid

**2.584**
**melting temperature**
temperature at which crystallinity in a semi-crystalline polymer disappears on heating

**2.1814**
**mesophilic incubation period**
incubation at 25 °C to allow the development of microorganisms growing at room temperature

**2.585**
**metallized plastic**
plastic part or film on which a metal has been deposited, generally by vacuum sublimation, but also by chemical reaction

Note 1 to entry: Metallizing by vacuum sublimation and chemical reaction generally gives deposits about 0,1 mm thick. The metal thickness is then commonly increased by electroplating.

**2.586**
**metering device**
device, normally forming part of a machine, which allows a material or component to be measured out in predetermined quantities

**2.587**
**metering zone**
final zone of a screw where the melt is advanced at a uniform rate to the breaker plate or die

**2.588**
**micro-encapsulation**
process of coating individual minute particles of matter as a means of separating and storing them for later release under controlled conditions

**2.589**
**microgel**
polymer network of microscopic dimensions

**2.1698**
**micronization**
**micronizing**
process by which a material is ground into a fine powder

**2.590**
**migration**
transfer, usually undesirable, of a constituent of a plastic material to another contacting material

**2.591**
**milled fibres**
fibres broken into very short lengths by processing through a size-reduction mill

**2.1507**
**minimum energy release rate**
<fatigue crack propagation testing> lowest value of the energy release rate in one cycle

**2.592**
**minimum film-forming temperature**
<dispersions> limiting temperature above which a continuous, homogeneous film without cracks is formed

**2.593**
**minimum ignition time**
duration of exposure of a material to a defined ignition source for the length of time required for the initiation of combustion under specified conditions

Note 1 to entry: See also "exposure time".

Note 2 to entry: It is expressed in seconds.

**2.1500**
**minimum load**
<fatigue crack propagation testing> lowest value of the load during a cycle

Note 1 to entry: It is expressed in newtons.

**2.1649**
**minimum open time**
minimum length of time after which an adhesive coat which has been applied to an adherend is capable of bonding an assembly

Note 1 to entry: During the minimum open time, solvents and/or other volatile constituents of the adhesive are usually allowed to evaporate.

**2.1504**
**minimum stress intensity factor**
<fatigue crack propagation testing> lowest value of the stress intensity factor during a cycle

**2.1815**
**minor load**
<Rockwell hardness testing> preliminary load applied to the indenter prior to the major load

Note 1 to entry: It is expressed in newtons.

**2.1552**
**modifier**
ingredient which, when added to an adhesive, changes its properties

Note 1 to entry: The term "modifier" includes fillers, diluents, plasticizers and tackifiers.

**2.1451**
**modulus of elasticity in compression**
**compressive modulus**
<compression testing> ratio of the compressive stress to the corresponding compressive strain below the proportionality limit, i.e. when the relation is linear

Note 1 to entry: The compressive modulus is calculated on the basis of the compressive strain only.

Note 2 to entry: With computer-assisted equipment, the determination of the modulus using two distinct stress-strain points can be replaced by a linear regression procedure applied to the part of the curve between the two points.

Note 3 to entry: In compression tests, the stresses and strains are negative. The negative sign is generally omitted, however. If this generates confusion, for example in comparing tensile and compressive properties, the negative sign may be added for the latter. This is unnecessary for nominal compressive strains.

Note 4 to entry: It is expressed in megapascals.

**2.1416**
**modulus of elasticity in flexure**
**flexural modulus**
<flexural testing> ratio of the flexural stress to the corresponding flexural strain below the proportionality limit, i.e. when the relation is linear

Note 1 to entry: It is expressed in megapascals.

**2.1443**
**modulus of elasticity in tension**
**tensile modulus**
<tensile testing> ratio of the tensile stress to the corresponding tensile strain below the proportionality limit, i.e. when the relation is linear

Note 1 to entry: It is expressed in megapascals.

Note 2 to entry: With computer-assisted equipment, the determination of the modulus using two distinct stress-strain points can be replaced by a linear regression procedure applied to the part of the curve between the two points.

**2.1817**
**moist state**
**moist**
state of a test specimen which has been conditioned at (23 ± 2) °C and (50 ± 5) % relative humidity until equilibrium has been reached

**2.1542**
**moisture curing adhesive**
adhesive that cures by reaction with water from the air or from an adherend

**2.597**
**molar mass**
mass of one mole of a substance

**2.1818**
**molecular mass**
sum of the masses of the atoms making up a molecule

Note 1 to entry: "Molecular weight" is also used for "molecular mass", but is deprecated.

**2.599**
**molecular-mass distribution**
relative amounts of molecules of different molecular mass that are present in a polymer

Note 1 to entry: The molecules of commercial polymers do not have a single molecular mass; the molecular-mass distribution follows statistical considerations. The distribution observed is dependent on the method of analysis used, and it is therefore essential that it be stated. The ratio of the mass-average molecular mass to the number-average molecular mass often is used as an indication of the distribution. The molecular-mass distribution can influence processing behaviour considerably.

**2.1384**
**molten drips**, noun
<fire testing> falling droplets of material which have been softened or liquefied by heat

Note 1 to entry: The droplets can be flaming or not flaming.

**2.623**
**monofilament**
single filament that is strong enough to function as a yarn in commercial textile operations or as an entity in other applications

**2.624**
**monomer**
chemical compound, usually of low molecular mass, that can be converted into a polymer by combining it with itself or with other chemical compounds

**2.625**
**monomeric unit**
**mer**
largest constitutional unit contributed by a single monomer molecule in a polymerization process

**2.627**
**mould clamping force**
**mould locking force**
**mould locking pressure**
force which is applied to a mould to keep it closed during the moulding process

**2.628**
**mould mark**
blemish on the surface of a moulding, derived from the mould

**2.629**
**mould seam**
line on a moulded or laminated article, caused by the parting line of the mould, differing in colour or appearance from the general surface

**2.626**
**mould**
**die**
assembly of parts enclosing the space (cavity) from which the moulding takes its form

**2.1018**
**mouldability**
<of a mat or fabric> ease with which a mat or fabric, when wetted out with resin, can be made to conform permanently to a mould of a specified configuration

**2.630**
**moulding**
<process> act of shaping a material with a mould by applying pressure and usually heat

**2.631**
**moulding**
<product> object produced in a closed mould (for example by compression moulding, transfer moulding, injection moulding)

**2.632**
**moulding compound**
compound that can be shaped by a moulding process

**2.633**
**moulding cycle**
complete sequence of operations in a moulding process required for the production of one set of mouldings

**2.634**
**moulding pressure**
pressure acting on the moulding material during a moulding process

**2.635**
**moulding shrinkage**
difference in dimensions between a moulding and the mould cavity in which it was moulded, both the mould and the moulding being at normal room temperature when measured

**2.636**
**moving plate**
**moving table**
plate that holds a part of the mould and moves to a fixed plate to close the mould

**2.637**
**multicavity mould**
**multi-impression mould**
**gang mould**
mould permitting the production of several parts in a single cycle

**2.638**
**multifilament**
class of textile materials consisting of assembled filaments

**2.639**
**multi-gated cavity**
mould cavity to which entry is provided by more than one gate

**2.1536**
**multi-part adhesive**
adhesive that consists of two or more separate reactive components that are mixed before use

**2.640**
**multiplaten press**
**multidaylight press**
press with floating platens between the upper and lower platens, thus providing more than one space for mould or laminate assemblies

**2.641**
**multiple wound yarn**
<textile glass> yarn formed from two or more yarns wound together but not twisted together

Note 1 to entry: Single, folded or cabled yarns are used to make multiple wound yarn.

**2.789**
**multipoint data**
<acquisition and presentation of data> data characterizing the behaviour of a plastics material by means of a number of test results for a property measured over a range of test conditions

**2.1385**
**narcosis**
<burning behaviour of plastics> depression of the central nervous system causing reduced awareness and/or impaired physical capability, for example reducing the ability to escape

Note 1 to entry: In extreme cases, unconsciousness and finally death may occur.

**2.1386**
**narcotic**
<burning behaviour of plastics> toxicant that causes narcosis

**2.643**
**narrow fabric**
<textile glass> fabric, with or without selvedge, between 100 mm and 300 mm in width

Note 1 to entry: See also “tape”.

Note 2 to entry: Both “selvage” and “selvedge” are used, “selvedge” being the preferred spelling in the United Kingdom.

**2.645**
**necking**
**striction**
localized reduction in cross-section that can occur in a material under tensile stress

**2.646**
**needled mat**
mat formed of strands cut to a short length and felted together in a needle loom, with or without a carrier

**2.1347**
**net heat of combustion**
heat of combustion of a substance when combustion is complete, with any water produced still in the vapour state under specified conditions

Note 1 to entry: The net heat of combustion can be calculated from the gross heat of combustion.

**2.647**
**network**
interlacing structure produced by crosslinking of polymer chains

**2.648**
**network polymer**
polymer in which a three-dimensional structure is formed by interchain covalent bonds

**2.650**
**nip**
line of tangency between two rolls in contact with one another, or between either of the rolls and the surface of an object passing between them

**2.1447**
**nominal compressive strain**
<compression testing> decrease in length per unit original length of the test specimen

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

**2.651**
**nominal diameter**
<filaments and staple fibres> filament or fibre diameter used in the designation of a fibre-glass product and corresponding approximately to the mean real diameter of the filaments or staple fibres, expressed in micrometres and rounded to a whole number

**2.1454**
**nominal extension**
<tensile-creep testing> increase in the distance between the grips

Note 1 to entry: It is expressed in millimetres.

**2.1441**
**nominal tensile strain**
<tensile testing> change in distance between the grips, relative to the initial distance, produced by the applied load at any given time during the test

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

**2.1820**
**nominal tensile-creep modulus**
<tensile-creep testing> ratio of the initial stress to the nominal tensile-creep strain

Note 1 to entry: It is expressed in megapascals.

**2.1821**
**nominal tensile-creep strain**
<tensile-creep testing> change in distance between the grips, relative to the initial distance, produced by the applied load at any given time during the test

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

**2.1822**
**non-break**
<Charpy and Izod impact testing> there is no break and the specimen is only distorted, possibly combined with stress whitening

**2.1387**
**non-combustible**
not capable of undergoing combustion under the specified conditions

**2.1388**
**non-flammable**
not capable of burning with a flame under the specified conditions

**2.1592**
**non-Newtonian liquid**
**non-ideal liquid**
liquid characterized by an inconstant value for the shear stress divided by the rate of shear in simple shear flow and with normal stress differences

**2.652**
**non-resonant forced-vibration technique**
<dynamic mechanical testing> method for performing dynamic mechanical measurements in which the test specimen is oscillated mechanically at a fixed frequency

Note 1 to entry: The storage modulus and the damping are calculated from the applied stress, the resultant strain and the phase angle shift.

**2.653**
**non-rigid plastic**
plastic that has a modulus of elasticity in flexure, or, if that is not applicable, then in tension, not greater than 70 MPa

Note 1 to entry: Materials are usually classified at standard temperature and relative humidity in accordance with ISO 291.

**2.654**
**non-uniform polymer**
**polydisperse polymer**
polymer comprising molecules which are non-uniform with respect to their relative molecular mass, constitution or both

**2.655**
**non-woven scrim**
non-woven open-mesh fabric in which two or more layers of parallel yarns are bonded to each other by chemical or mechanical means, the yarns in successive layers lying at an angle to the yarns in preceding layers

**2.1421**
**normal impact**
<Charpy and Izod impact testing of laminar-reinforced plastics> impact with the direction of blow normal to the plane of reinforcement

**2.1509**
**notch**
<fatigue crack propagation testing> sharp indentation made in the specimen, generally using a razor blade or a similar sharp tool, before a test and intended as the starting point of a fatigue-induced crack

**2.658**
**no-twist roving** (for over-end unwinding)
roving in which intentional twist is placed during assembly so that, when the roving is pulled from a designated end of the package, the twist is removed

**2.659**
**novolak**
phenolic resin containing less than a 1:1 ratio of formaldehyde to phenol so that normally it remains thermoplastic until heated with an appropriate amount of a compound (for example formaldehyde or hexamethylenetetramine) capable of giving additional linkages, thereby producing an infusible material

**2.660**
**nozzle**
device at the end of an injection or extruder barrel, through which the moulding material flows to the mould or die

Note 1 to entry: A nozzle can have a valve for controlling the flow of the moulding material.

**2.661**
**nucleation**
formation of the smallest crystalline entity whose further growth is favoured thermodynamically

**2.1326**
**numerical fire model**
mathematical representation of one or more different but interconnected phenomena governing the development of a fire

**2.664**
**oligomer**
substance composed of molecules containing only a few groups of atoms (constitutional units) repetitively linked to each other

Note 1 to entry: The physical properties of an oligomer vary with the addition or removal of one or a few of the constitutional units from its molecules.

**2.667**
**on torque**
<testing of adhesives> maximum torque required to screw a nut onto a bolt precoated with adhesive

**2.1531**
**one-way-stick adhesive**
adhesive that is applied to only one of the adherends

**2.1389**
**opacity**
<of smoke> measure of the attenuation of a light beam passing through the smoke, expressed as the ratio of the incident luminous flux to the transmitted luminous flux under specified conditions

Note 1 to entry: It is dimensionless.

**2.668**
**open assembly time**
**open time**
<adhesives> time interval between application of the adhesive to the adherends and assembly of the adhesive joint

**2.669**
**open cell**
cell not enclosed totally by its walls and hence interconnecting with other cells or with the exterior

**2.670**
**open-cell cellular plastic**
cellular plastic in which almost all the cells are interconnecting

**2.671**
**optical density**
<of smoke> measure of the attenuation of a light beam passing through the smoke, expressed as the common logarithm (i.e. the logarithm to the base 10) of the opacity of the smoke

**2.672**
**optical distortion**
any apparent alteration of the geometric pattern of an object when seen either through a material or as a reflection from a surface of a material

**2.673**
**orange peel**
irregular surface of pock-marked appearance exhibited in the form of an accumulation of pimples, pinholes and craters, somewhat resembling the surface of orange peel

**2.1699**
**organic recycling**
<composting of plastics waste> controlled microbiological treatment of biodegradable plastics waste under aerobic or anaerobic conditions

Note 1 to entry: The term “biological recycling” is used synonymously.

**2.674**
**organosol**
suspension of a finely divided polymer in a mixture of plasticizer and a volatile organic liquid

**2.782**
**out-of-phase component of the complex shear viscosity**
<parallel oscillatory rheometry> imaginary part of the complex shear viscosity

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

**2.1068**
**overall volume shrinkage**
sum of the shrinkage during curing and the shrinkage after curing of a moulding when cooled to ambient temperature

**2.677**
**overcure**
state of cure of a polymeric system when the curing conditions (e.g. time, temperature, radiation, amounts of curing additives) have exceeded those that would produce a satisfactory cure

**2.678**
**oxidatively degradable plastic**
degradable plastic in which the degradation results from oxidation

**2.1266**
**oxygen index**
**OI**
minimum concentration of oxygen in a mixture of oxygen and nitrogen that will just support flaming combustion of a material under specified test conditions

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

**2.1422**
**parallel impact**
<Charpy and Izod impact testing of laminar-reinforced plastics> impact with the direction of blow parallel to the plane of reinforcement

Note 1 to entry: The direction of the blow in the Izod test is usually "edgewise parallel".

**2.1646**
**parallel laminate**
laminate in which all the layers of material are orientated approximately parallel with respect to the grain or to the direction of an anisotropic property

**2.681**
**parallel-laminated**
pertaining to a laminate in which all the layers of material are oriented approximately parallel with respect to the grain or strongest direction in tension

**2.682**
**parison**
shaped plastic mass, generally in the form of a tube, used in blow moulding

**2.1825**
**partial break**
<Charpy and Izod impact testing> incomplete break that does not meet the definition for hinge break

**2.1515**
**paste adhesive**
adhesive of a non-stringy, highly viscous nature

Note 1 to entry: Paste adhesives based on starch or cellulose ethers are usually used for bonding paper (e.g. paper bags or wallpaper). Paste adhesives based on synthetic polymers are usually used for bonding floorcoverings.

**2.1656**
**peel mode**
**peeling mode**
<testing of adhesives> mode of application of a force to a joint in which one or both of the adherends are flexible and in which the stress is concentrated at a boundary line

**2.683**
**peel strength**
**peel adhesion**
**peel resistance**
force per unit width necessary to bring an adhesive joint to the point of failure or to maintain a rate of failure by means of a stress applied in the peeling mode

Note 1 to entry: The peel strength can be expressed as force per unit peel width.

**2.684**
**pellet**
small mass of preformed moulding material, having relatively uniform dimensions in a given lot, often used as feedstock in moulding and extrusion operations

**2.685**
**pelletizer**
machine in which extruded rods or other shapes are cut into pellets of relatively uniform dimensions for use as feedstock in moulding and extrusion operations

**2.1487**
**pendulum length**
<pendulum impact-testing machine> distance between the axis of rotation of the pendulum and the centre of percussion

Note 1 to entry: It is the length of the equivalent theoretical pendulum whose mass is concentrated at the point which gives the same period of oscillation as the actual pendulum.

Note 2 to entry: It is expressed in metres.

**2.1465**
**penetration**
<puncture test> failure in which the striker penetrates through the whole thickness of the test specimen

**2.686**
**perfluoro**(ethylene/propylene) **plastic**
**FEP plastic**
plastic based on copolymers of tetrafluoroethylene and hexafluoropropylene

**2.1485**
**period of oscillation of pendulum**
<pendulum impact-testing machine> period of a single complete (to and fro) oscillation of the pendulum oscillating with an angle of oscillation of less than 5° on each side of the vertical

Note 1 to entry: It is expressed in seconds.

**2.687**
**periodic copolymer**
copolymer consisting of macromolecules comprising more than two species of monomeric unit distributed in ordered sequence

**2.690**
**permeability**
ability of a material to transmit gases and liquids by passage through one surface and out at another surface by diffusion and sorption processes

Note 1 to entry: Not to be confused with porosity.

**2.774**
**phase angle**
<dynamic mechanical testing> phase difference between the dynamic stress and the dynamic strain in a viscoelastic material subjected to a sinusoidal oscillation

Note 1 to entry: It is expressed in radians.

**2.691**
**phase inversion**
<in polymerization> phenomenon of the continuous and dispersed phases replacing one another when a given stage of conversion is reached in some types of heterogeneous phase polymerization, for example in the preparation of rubber-modified polystyrene

**2.692**
**phenol-formaldehyde resin**
**PF resin**
resin of the phenolic type, made by the polycondensation of phenol with formaldehyde

**2.693**
**phenol-furfural resin**
resin made by the polycondensation of phenol with furfural

**2.1325**
**physical fire model**
laboratory process, including the apparatus, the environment and the test procedure, intended to represent a certain phase of a fire

**2.1091**
**pick-up roller**
roller in a roller coater that runs in the bath or reservoir of coating material

**2.541**
**pilot(ed) ignition**
ignition of combustible gases or vapours by a secondary source of energy, for example a flame, spark, electric arc or glowing wire

**2.698**
**pinhole**
hole of very small diameter in the surface of a material

Note 1 to entry: In the case of films, the hole usually penetrates through the entire thickness.

**2.1641**
**pinking**
<adhesives> incomplete recovery of flexible adherends when compressed towards the adhesive layer

Note 1 to entry: Term commonly used when describing foam bonds.

**2.699**
**pin-point gate**
<moulding> injection channel or orifice of very small circular cross-sectional area, leaving almost no sprue on the moulded part

**2.700**
**pipe**
rigid or semi-rigid tube

**2.701**
**pitch-based carbon fibre**
carbon fibre produced from anisotropic or isotropic pitch precursors

Note 1 to entry: The carbon fibres produced from isotropic pitch precursors have a lower modulus of elasticity than those obtained from anisotropic pitch precursors, which can be processed to give a high modulus of elasticity.

**2.1826**
**pit**
<surface wear> localized surface cavity of small dimensions

**2.702**
**plastic**, noun
material which contains as an essential ingredient a high polymer and which, at some stage in its processing into finished products, can be shaped by flow

Note 1 to entry: Elastomeric materials, which are also shaped by flow, are not considered to be plastics.

Note 2 to entry: In some countries, particularly the United Kingdom, the term “plastics” is used as the singular form as well as the plural form.

**2.705**
**plasticating capacity**
<of an extruder> maximum amount of material of a given type that an extruder can plasticate per unit time

**2.706**
**plasticity**
tendency of a material to remain deformed after reduction of the deforming stress to or below the yield stress

**2.707**
**plasticize**
render a polymeric material softer, more flexible and/or more workable by the addition of a plasticizer or by chemical modification of the polymer

**2.708**
**plasticizer**
<plastics> substance of low or negligible volatility incorporated in a plastic to lower its softening range and to increase its workability, flexibility or extensibility

**2.709**
**plasticizer limit**
maximum amount of plasticizer that is compatible with a given material under specified conditions

**2.1549**
**plasticizer**
**external plasticizer**
<adhesives> non-reactive substance incorporated in an adhesive to improve the flexibility and resilience of the bond

Note 1 to entry: A plasticizer gives the adhesive film a greater extension at break, a lower modulus and a lower brittleness temperature. A plasticizer can be soluble in liquids and can migrate from the adhesive film.

**2.1908**
**plastics product**
any material or combination of materials, semi-finished or finished product that is within the scope of ISO/TC 61, Plastics

**2.710**
**plastigel**
gel-like suspension of a finely divided polymer in a plasticizer

**2.711**
**plastisol**
suspension of a finely divided polymer in a plasticizer

Note 1 to entry: The polymer does not dissolve appreciably in the plasticizer at room temperature, but does so at elevated temperatures to form a homogeneous plastic mass (i.e. an externally plasticized polymer).

**2.1520**
**plastisol adhesive**
adhesive material formed by the dispersion of a polymer in a plasticizer such that, when the dispersion is heated, the polymer dissolves irreversibly in the plasticizer to form a solution that solidifies on cooling

**2.712**
**plastisol fusion**
process in which, in the course of heating, the polymer particles in a plastisol are dissolved in the plasticizer(s), so that, upon cooling, a homogeneous solid results

Note 1 to entry: Plastisol gel refers to the state attained when, in the course of heating or aging, the plasticizer(s) in plastisols as (have) been absorbed by the polymer particles to an extent that a weak gel mass is formed.

**2.713**
**plate**
smooth, flat piece of material of uniform and limited thickness and area

**2.714**
**plate mark**
<defect> imperfection in a pressed plastic sheet resulting from the surface of the pressing plate

**2.1827**
**plateau phase**
<composting of plastics waste> time, measured in days, from the end of the biodegradation phase until the end of a test

**2.1828**
**ploughing**
<scratch testing> scratch behaviour in which the scratch force and scratch-tip displacement are constant over the scratch distance during the test

Note 1 to entry: The surface of the scratch is smooth along its whole length rather than rough.

**2.715**
**plug-assist vacuum thermoforming**
vacuum thermoforming process in which a male mould or plug is used to preform partially the heated sheet before forming, which is completed by means of a vacuum

**2.1830**
**poly**(butylene naphthalate)
**PBN**
polyester based on 1,4-butanediol and 2,6-naphthalenedicarboxylic acid (or one of its esters)

**2.729**
**poly**(butylene terephthalate)
**PBT**
polymer made by the polycondensation of butylene glycol and terephthalic acid or dimethyl terephthalate

**2.1829**
**poly**(cyclohexylenedimethylene terephthalate)
**PCT**
polyester based on cyclohexanedimethanol and terephthalic acid (or one of its esters)

**2.600**
**poly**(diallyl phthalate)
**PDAP**
polymer of diallyl phthalate

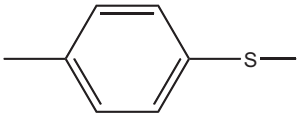
**2.1831**
**poly**(ethylene naphthalate)
**PEN**
polyester based on ethylene glycol and 2,6-naphthalenedicarboxylic acid (or one of its esters)

**2.608**
**poly**(ethylene oxide)
**PEOX**
polymer of ethylene oxide

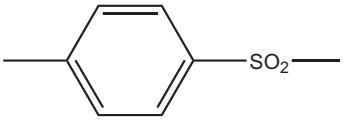
**2.610**
**poly**(ethylene terephthalate)
**PET**
polymer made by the polycondensation of ethylene glycol and terephthalic acid or dimethyl terephthalate

**2.747**
**poly**(methyl methacrylate)
**PMMA**
polymer of methyl methacrylate

**2.756**
**poly**(phenylene sulfide)
**PPS**
polymer in which the constitutional repeating unit is phenylene sulfide




**2.757**
**poly**(phenylene sulfone)
**PPSU**
polymer in which the constitutional repeating unit is phenylene sulfone




**2.792**
**poly**(propylene oxide)
**PPOX**
polymer of propylene oxide

**2.1832**
**poly**(trimethylene terephthalate)
**PTT**
polymer made by the polycondensation of trimethylene glycol and terephthalic acid or dimethyl terephthalate

**2.809**
**poly**(vinyl chloride-vinyl acetate)
**PVC/PVAC**
copolymer of vinyl chloride and vinyl acetate

**2.810**
**poly**(vinyl fluoride)
**PVF**
polymer of vinyl fluoride

**2.815**
**poly**(vinyl pyrrolidone)
**PVP**
polymer of N-vinyl-2-pyrrolidone

**2.813**
**poly**(vinylidene chloride) **plastic**
**PVDC plastic**
plastic based on polymers of vinylidene chloride or copolymers of vinylidene chloride with other monomers, the vinylidene chloride being in the greatest amount by mass

**2.814**
**poly**(vinylidene fluoride)
**PVDF**
polymer of vinylidene fluoride

**2.717**
**polyacetal**
polymer in which the repeated structural unit in the chain is of the acetal type

**2.721**
**polyacrylonitrile**
**PAN**
polymer of acrylonitrile

**2.723**
**polyallyl plastic**
**allyl plastic**
**allyl resin**
plastic based on allyl polymers

**2.726**
**polyaryletherketone**
**PAEK**
polymer in which aryl groups are connected by one or more ether linkages as well as by one or more ketone linkages

**2.727**
**polybutylene**
**PB**
polymer of butene

**2.730**
**polycarbonate**
**PC**
polymer in which the repeated structural unit in the chain is of the carbonate type

**2.732**
**polychlorofluorocarbon plastic**
**chlorofluorocarbon plastic**
plastic based on polymers made with monomers composed of chlorine, fluorine and carbon only

**2.733**
**polychlorofluorohydrocarbon plastic**
**chlorofluorohydrocarbon plastic**
plastic based on polymers made with monomers composed of chlorine, fluorine, hydrogen and carbon only

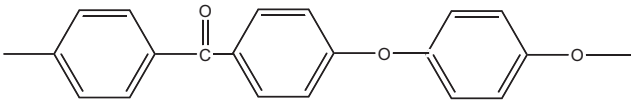
**2.734**
**polychlorotrifluoroethylene**
**PCTFE**
polymer of chlorotrifluoroethylene

**2.1834**
**polycycloolefin**
polymer of a cycloolefin (or cycloolefins) or a polymer which has an alicylic group

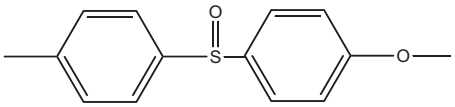
**2.601**
**polyelectrolyte**
macromolecule with a large number of ionic groups

**2.604**
**polyether**
polymer in which the repeated structural unit in the chain is of the ether type

**2.605**
**polyetheretherketone**
**PEEK**
polymer in which the repeated structural unit in the chain is as shown in the diagram



**2.606**
**polyethersulfone**
**PESU**
polymer in which the repeated structural unit in the chain is as shown in the diagram



**2.735**
**polyfluorocarbon plastic**
**fluorocarbon plastic**
plastic based on polymers made with monomers composed of fluorine and carbon only

**2.736**
**polyfluorohydrocarbon plastic**
**fluorohydrocarbon plastic**
plastic based on polymers made with monomers composed of fluorine, hydrogen and carbon only

**2.737**
**polyhalocarbon plastic**
**halocarbon plastic**
plastic based on polymers from monomers composed only of carbon and a halogen or halogens

**2.738**
**polyhydrocarbon plastic**
**hydrocarbon plastic**
plastic based on polymers made with monomers composed of carbon and hydrogen only

**2.740**
**polyisocyanurate plastic**
**isocyanurate plastic**
plastic based on polymers in which trimerization of isocyanates incorporates six-membered isocyanurate ring groups in a chain

Note 1 to entry: In commercial cellular polyisocyanurate plastics, 10 % to 30 % of the available isocyanate groups are reacted with polyols to introduce urethane groups into the chain.

**2.744**
**polymerization**
process of converting a monomer or a mixture of monomers into a polymer

**2.745**
**polymer-poor phase**
**dilute phase**
that phase of a two-phase equilibrium system, consisting of a polymer and low-molecular-mass material, in which the polymer concentration is lower

Note 1 to entry: The use of the name “sol phase” is discouraged.

**2.746**
**polymer-rich phase**
**concentrated phase**
that phase of a two-phase equilibrium system, consisting of a polymer and low-molecular-mass material, in which the polymer concentration is higher

Note 1 to entry: The use of the name “gel phase” is discouraged.

**2.1579**
**polymethacrylate**
polymer or copolymer in which at least one constitutional unit is derived from methacrylic acid, CH2 = C(CH3)–COOH, or one of its esters, CH2 = C(CH3)–COOR

**2.1380**
**polypropylene copolymer**
thermoplastic polymer in which the CH2–CH– repeating units are partially replaced by ethylene and/or another α-olefin

Note 1 to entry: Although terms such as "block copolymers", "polypropylene alloys", "impact copolymers", "in situ blends", "reactor grade blends" and "chemical blends" are encountered in common usage, they are technically incorrect, inappropriate and misleading.

**2.1381**
**polypropylene random copolymer**
semi-crystalline polypropylene in which the repeating structural unit –CH2–CH– in the macromolecular chain is partially replaced randomly by ethylene and/or another α-olefin (e.g. but-1-ene or hex-1-ene)

Note 1 to entry: Although this is a statistical copolymer, the probability of finding a given monomeric unit at any given site in the chain is independent of the nature of neighbouring units at that position (i.e. the distribution is a Bernoullian one).

**2.1588**
**polysulfide**
polymer containing disulfide, –(S–S)–, linkages together with repeating polyether units and usually terminated by thiol or hydroxyl groups

**2.1837**
**polysulfone**
**PSU**
polymer in which the constitutional repeating unit is oxy-1,4-phenylenesulfonyl-1,4-phenyleneoxy-1,4-phenylene(dimethylmethylene)-1,4-phenylene

**2.796**
**polytetrafluoroethylene**
**PTFE**
polymer of tetrafluoroethylene

**2.799**
**polyurea**
polymer produced by the reaction of a polyfunctional isocyanate with primary or secondary diamines

Note 1 to entry: Polyureas are mostly used for producing fibres.

**2.806**
**polyvinylcarbazole**
**PVK**
polymer of vinylcarbazole

**2.817**
**porosity**
property of a material that contains very fine continuous holes which allow the passage of gases, liquids and solids in through one surface and out at another surface

Note 1 to entry: Not to be confused with permeability.

**2.818**
**positive mould**
mould in which the total applied pressure rests only, and continuously, on the moulding and in which there is no provision for escape of excess moulding material

**2.1700**
**post-consumer**
descriptive term covering material, generated by the end-users of products, that has fulfilled its intended purpose or can no longer be used (including material returned from within the distribution chain)

Note 1 to entry: The term “post-use” is sometimes used synonymously.

**2.820**
**postforming**
forming cured or partially cured thermosetting plastics

**2.821**
**post-shrinkage**
shrinkage of a plastic product after moulding, during post-treatment, storage or use

**2.1492**
**potential energy of pendulum**
<pendulum impact-testing machine> potential energy of the pendulum in its starting position, relative to its position at impact

Note 1 to entry: It is expressed in joules.

**2.823**
**potting**
embedding process in which the mould remains attached to the resin-encased article

**2.824**
**powder moulding**
pressureless moulding process in which a dry, fusible powder is caused to fuse into a uniform layer against a mould wall

**2.827**
**precision**
closeness of agreement between the results obtained by applying an experimental procedure several times under prescribed conditions

Note 1 to entry: The smaller the random part of the experimental errors which affect the results, the more precise is the procedure. Repeatability and reproducibility are special cases of precision.

**2.1838**
**pre-conditioning**
<composting of plastics waste> pre-incubation of an inoculum under the conditions of the subsequent test, in the absence of the chemical compound or organic matter under test, with the aim of improving the test by acclimatization of the microorganisms to the test conditions

**2.1701**
**pre-consumer**
descriptive term covering material diverted during a manufacturing process

Note 1 to entry: This term excludes re-utilized material, such as rework, regrind or scrap that has been generated in a given process and is capable or being reclaimed within that same process.

Note 2 to entry: The term “post-industrial material” is sometimes used synonymously.

**2.1839**
**pre-exposure**
<composting of plastics waste> pre-incubation of an inoculum in the presence of the chemical compound or organic matter under test, with the aim of enhancing the ability of the inoculum to biodegrade the test material by adaption and/or selection of the microorganisms

**2.828**
**preform**, noun
coherent, shaped mass of powdered, granular or fibrous plastics moulding compound, or of a fibrous filler material with or without resin

**2.1073**
**pre-impregnated fabric**
woven fabric that has been impregnated with a thermosetting or thermoplastic resin system

**2.1069**
**pre-impregnated roving**
continuous roving that has been impregnated with a thermosetting resin system in which thickening has been obtained by curing to the B-stage and/or evaporation of solvent

Note 1 to entry: Pre-impregnated rovings are supplied on spools and are capable of being moulded or laminated under heat and pressure.

**2.829**
**premix**
admixture of resin, reinforcement, fillers, etc., not in web or filamentous form, usually prepared by the moulder shortly before use

**2.831**
**prepolymer**
polymer of degree of polymerization intermediate between that of the monomer or monomers and that of the final polymer

**2.830**
**prepreg**
admixture of resins (with or without fillers) and additives, plus reinforcements in woven or filamentous form, ready for moulding

**2.1631**
**press**, verb
<adhesives> hold an adhesive joint under pressure in a press during setting of the adhesive

**2.1075**
**pressing time**
<moulding> period during a press cycle in which the mould is closed and the required pressure is reached

**2.1651**
**pressing time**
<adhesives> time for which an adhesive joint is pressed

**2.832**
**pressure break**
<defects in laminates> apparent break in one or more outer sheets of the paper, fabric or other base of a laminated plastic, visible through the surface layer of resin which covers it

**2.833**
**pressure pad**
device designed to reduce the pressure on the land areas of a mould when the mould is closed

Note 1 to entry: Normally, it consists of hardened steel blocks suitably located to bear a proportion of the pressure applied by the press.

**2.835**
**pressure thermoforming**
thermoforming process in which air pressure is used to form a heated sheet against the mould surface

**2.836**
**pressure welding**
welding method depending essentially on using pressure and also applying heat, e.g. to produce thick plates or blocks from thermoplastic sheets

Note 1 to entry: Unlike laminates, such plates show only low anisotropy.

**2.834**
**pressure-sensitive adhesive**
adhesive which, in a dry state, is permanently tacky at room temperature and adheres readily to surfaces under light and brief pressure

Note 1 to entry: Pressure-sensitive adhesives are used, for instance, for the manufacture of pressure-sensitive tape.

**2.1840**
**prestress**
<tensile testing> stress generated during centring of a test specimen, or caused by the clamping pressure, especially with less rigid materials

Note 1 to entry: It is expressed in megapascals.

**2.1841**
**primary anaerobic biodegradation**
structural change (transformation) of a chemical compound by microorganisms, resulting in the loss of a specific property

**2.838**
**primer**
<adhesives> coating applied to the surface of an adherend, prior to the application of adhesive, to improve adhesion and/or durability of the bond

**2.1617**
**priming**
<adhesives> application of a coating of primer to an adherend surface, prior to the application of an adhesive, to improve adhesion and/or durability of the bond

**2.1842**
**product standard**
standard that specifies requirements to be fulfilled by a product or group of products

**2.839**
**profile**
extruded plastic product, excluding film and sheet, having a characteristic constant cross-section along the axis of the product

Note 1 to entry: Profiles include only sections other than rectilinear or circular, such as U-shaped, T-shaped or L-shaped.

**2.1556**
**protein**
natural product having the repeating linkage –NH–CO–

Note 1 to entry: Some examples are:

— Soya bean protein, which is obtained from soya beans. Compounded with other reactants, it is used as an adhesive, mostly in plywood.

— “Casein” is protein precipitated from skimmed milk by the action of rennet or acid. Compounded with other reactants, it is used as an adhesive in wood and packaging applications.

— “Collagen” is produced from collagenous animal materials like skin, bone and connective tissue.

— “Gelatine” is a soluble protein derived from collagen.

— "Animal glue" is an impure protein obtained by hydrolysis of collagenous materials by various methods and used mainly in bonding wood and other porous substrates.

**2.1843**
**protuberances**
<surface wear> localized surface elevations which can be rounded or sharp-angled, adhering or loose

Note 1 to entry: See Figure 2 in ISO 6601:2002.

**2.1599**
**pseudoplasticity**
time-independent shear thinning with no yield stress

**2.841**
**pull-back ram**
hydraulically operated ram that returns the main ram of a hydraulic press to the open position, or returns ejector gear to its normal position

**2.1391**
**pulmonary irritancy**
<burning behaviour of plastics> action of toxicants on the lower respiratory tract which can result in breathing discomfort (e.g. dyspnoea or an increase in respiratory rate)

Note 1 to entry: In severe cases, pneumonitis or pulmonary oedema (which can be fatal) can occur some hours after exposure.

**2.1076**
**pultruded sections**
linear composite products produced continuously by the pultrusion process and usually of constant cross-section and characteristics

**2.844.1**
**punch**
<moulding> male part of a mould

**2.844.2**
**punch**
<punching> tool used in punching

**2.1471**
**puncture deflection**
<instrumented puncture testing> specimen deflection at which the impact force has dropped to half its maximum value

Note 1 to entry: It is expressed in millimetres.

**2.771**
**puncture energy**
<puncture testing> energy expended up to puncture deflection

Note 1 to entry: It is expressed in joules.

**2.1702**
**purge material**
<processing of plastics> material resulting from the passing of polymer through plastics processing equipment for the purpose of cleaning the equipment, or when changing from one polymer to another, or when changing from one colour or grade of polymer to another

**2.845**
**purging**
removal of one colour, type or grade of material from an injection or extrusion machine by forcing it out with the compound to be used in production subsequently, or with another suitable material

**2.1392**
**pyrolysis**
irreversible chemical decomposition caused solely by a rise in temperature

Note 1 to entry: Pyrolysis can be accompanied by decomposition due to other influences, such as the action of oxygen (i.e. combustion) and chemical attack.

**2.850**
**radical polymerization**
chain polymerization in which the reactive functional species is a radical

**2.851**
**ram**
**piston**
<press> device that transforms hydraulic pressure into a mechanical force

**2.852**
**random copolymer**
copolymer in which two or more species of monomeric unit are distributed in random sequence along the polymeric chains

**2.1394**
**"R" criterion**
see load-bearing criterion "R"

**2.1538**
**reaction adhesive**
**reactive adhesive**
adhesive that sets by chemical reaction between its components and/or by the action of external agents

**2.855**
**reaction injection moulding**
**RIM**
injection-moulding process in which reactive multicomponents, with or without fillers, are mixed by high-pressure impingement in a mixing chamber immediately prior to being injected into a closed mould

**2.1396**
**reaction to fire**
response of a material in contributing by its own decomposition to a fire to which it is exposed, measured under specified conditions

**2.856**
**reactive diluent**
<adhesives> low-viscosity liquid added to a high-viscosity solvent-free thermosetting adhesive which reacts chemically with the adhesive during curing

Note 1 to entry: A reactive diluent is usually monofunctional and reduces the viscosity of the adhesive with acceptable changes in other properties.

**2.1077**
**reactivity**
<thermosetting plastics> maximum gradient, in degrees Celsius per second, of a plot of the temperature of a thermosetting compound as a function of time during curing

**2.1397**
**real-scale test**
test which simulates a given application, taking into account the real scale, the real ways of working or installation and the environment

Note 1 to entry: Such a test normally assumes that the products will be used in accordance with the conditions laid down by the specifier and/or in accordance with normal practice.

**2.1703**
**recovered material**
<recycling of plastics waste> plastics material that has been separated, diverted or removed from the solid-waste stream in order to be recycled or used to substitue virgin raw materials

Note 1 to entry: See also ISO 14021.

**2.1704**
**recovery**
processing waste material for the original purpose or for other purposes, including energy recovery

**2.1460**
**recovery from creep**
**creep recovery**
<creep testing> decrease in strain at any given time after completely unloading the specimen

**2.611**
**recrystallization**
process following melting by which 1) amorphous or poorly ordered regions of a polymeric material become incorporated into crystals; 2) change to a more stable crystal structure takes place; 3) defects within the crystals decrease; 4) any of the above-mentioned occur in combination

**2.1705**
**recyclate**
<plastics> plastics material resulting from the recycling of plastics waste

Note 1 to entry: The terms “secondary raw material”, “recycled plastics” and “regenerate” are sometimes used synonymously with “recyclate”.

Note 2 to entry: As soon as the used plastics material is treated in such a way that it is ready to replace virgin product, material or substance in a production process, it loses its characteristics as waste.

**2.612**
**recycled plastic**
plastic prepared by processing in a production process from plastics waste materials for the original purpose or for other purposes, but excluding energy recovery

Note 1 to entry: In a broad sense, the recycling of plastics covers any re-use of scrap material or discarded articles, including pyrolysis to recover useful organic chemicals.

Note 2 to entry: Recycled plastics may or may not be reformulated by the addition of fillers, plasticizers, stabilizers, pigments, etc.

**2.1706**
**recycling**
processing of waste materials for the original purpose or for other purposes, excluding energy recovery

**2.613**
**reduced viscosity**
**viscosity number**
ratio of the relative viscosity increment to the mass concentration of a polymer

Note 1 to entry: It is essential that the unit be specified; the unit cubic centimetres per gram is recommended.

Note 2 to entry: Reduced viscosity, inherent viscosity and intrinsic viscosity are not viscosities or pure numbers. The terms are to be looked on as traditional names. Any replacement by consistent terminology would produce unnecessary confusion in the polymer literature.

**2.615**
**regenerated cellulose**
cellulose regenerated from a solution of cellulose or from a cellulose derivative

**2.1707**
**regrind**
shredded and/or granulated recovered plastics material in the form of a free-flowing material

Note 1 to entry: The term "regrind" is frequently used to describe plastics material in the form of scrap generated in a plastics processing operation and re-used in-house. The term is also used to describe fine plastics powder used as a filler in the recovery of plastics.

**2.616**
**regular block**
block that can be described by only one species of constitutional repeating unit in a single sequential arrangement

**2.617**
**regular polymer**
polymer, the molecules of which can be described by only one species of constitutional unit in a single sequential arrangement

**2.618**
**regulator**
substance used in small proportions to control relative molecular mass during polymerization

**2.620**
**reinforced-reaction injection moulding**
**RRIM**
process of using solid reinforcements, such as glass fibre, mica or talc, in the reaction injection-moulding process

**2.1008**
**reinforcement**
fibrous material (such as yarn, fabric or mat) added to a resin matrix in order essentially to improve its mechanical properties

**2.1078**
**reinforcement layer**
discrete layer of reinforcement consisting of only one type of fibre format, such as unidirectional rovings, mat or fabric

**2.859**
**relative permittivity**
**dielectric constant** (relative)
ratio of the capacitance of a capacitor in which the space between and around the electrodes is filled entirely and exclusively with the insulating material to the capacitance of the same configuration of electrodes in vacuum

Note 1 to entry: The relative permittivity of air at normal atmospheric pressure is equal to 1,000 53, so that, in practice, the capacitance of the configuration of electrodes in air normally can be used to determine the relative permittivity with sufficient accuracy.

**2.861**
**relative viscosity**
**viscosity ratio**
**solution/solvent viscosity ratio**
ratio of the viscosity of the solution to the viscosity of the solvent

$$\text{Relative viscosity } \eta_\tau = \frac{\eta}{\eta_s}$$

where

$\eta$ is the viscosity of the solution;

$\eta_s$ is the viscosity of the solvent.

**2.862**
**relative viscosity increment**
viscosity ratio increment
ratio of the difference between the viscosities of the solution and the solvent to the viscosity of the solvent

$$\text{Relative viscosity increment } \eta_i = \frac{\eta - \eta_s}{\eta_s}$$

where

$\eta$ is the viscosity of the solution;

$\eta_s$ is the viscosity of the solvent.

Note 1 to entry: The use of the term specific viscosity for this quantity is discouraged, because the relative viscosity increment does not have the attributes of a specific quantity.

**2.864**
**release agent**
<moulding> substance put on a mould or added to a moulding material to facilitate removal of the moulded product from the mould

**2.1619**
**release agent**
coating material intended to prevent or reduce adhesion

Note 1 to entry: Waxy materials or silicones are frequently used as release agents.

**2.1609**
**release paper**
<adhesives> sheet, serving as a protectant and/or carrier for an adhesive film or mass, which is easily removed from the film or mass prior to use

**2.865**
**relieve**
<moulding> reduce the contact area between the sealing faces of a mould to provide escape for gas or excess moulding material

**2.866**
**repeatability**
closeness of agreement between successive results obtained with the same method on identical test material, under the same conditions (same operator, same apparatus, same laboratory and at short intervals of time)

**2.868**
**reprocessed plastic**
thermoplastic prepared from, usually, melt-processed scrap or rejected parts by a plastics processor, or from non-standard or non-uniform virgin material

Note 1 to entry: Reprocessed plastics may or may not be reformulated by the addition of fillers, plasticizers, stabilizers, pigments, etc.

**2.867**
**reproducibility**
closeness of agreement between individual results obtained with the same method on identical test material but under different conditions (different operators, different apparatus, different laboratories and/or at different times)

**2.870**
**resin**
solid, semisolid or pseudosolid organic material that has an indefinite and often high relative molecular mass, exhibits a tendency to flow when subjected to stress, usually has a softening or melting range, and usually fractures conchoidally

Note 1 to entry: In some countries, the term is used in a broad sense to designate any polymer that is a basic material for plastics.

**2.871**
**resin pocket**
accumulation of resin, localized in the interior of a reinforced plastic

**2.872**
**resin streak**
streak of excess resin in the surface of a reinforced plastic

**2.873**
**resistance to chemicals**
**chemical resistance**
resistance of a material to change in mass, changes in dimensions or changes in other properties after immersion in chemicals

**2.874**
**resite**
phenol-formaldehyde resin in the final state of the curing process

Note 1 to entry: See also “C-stage”.

Note 2 to entry: In this state, it is insoluble in alcohol and acetone and is infusible.

**2.875**
**resitol**
phenol-formaldehyde resin in the transition state of the curing process

Note 1 to entry: See also “B-stage”.

Note 2 to entry: On heating, it softens to a rubberlike consistency, but without melting. It swells when immersed in alcohol or acetone, but does not dissolve.

**2.876**
**resol**
fusible, soluble phenolic resin containing sufficient reactive methylol groups to enable the resin to become infusible on further reaction

Note 1 to entry: See also “A-stage”.

**2.881**
**retarder**
substance used in small proportions to reduce the rate of reaction of a chemical system

**2.1602**
**retrogradation**
gradual and irreversible insolubilization of an aqueous dispersion of starch or its derivatives with the formation of either a precipitate or a gel, depending on the concentration

**2.1708**
**re-use**, noun
use of a product more than once in its original form

Note 1 to entry: In view of the fact that a re-used product has not been discarded, re-use does not constitute a recovery option.

**2.882**
**reverse roll**
<coating machine> rotating cylinder used for the deposition of a coating material, premetered to the surface of the cylinder, on to a substrate to be coated, the surface of the cylinder moving in the opposite direction to the substrate

**2.883**
**reworked plastic**
thermoplastic prepared from trimmings or rejected mouldings that has been reprocessed in a fabricator's plant after having been processed previously in that plant by, e.g. moulding or extrusion

Note 1 to entry: In many specifications, the use of reworked material is limited to clean plastic that meets the requirements specified for the virgin material and yields a product essentially equal in quality to one made from only virgin material.

**2.884**
**rigid plastic**
plastic that has a modulus of elasticity in flexure or, if that is not applicable, then in tension, greater than 700 MPa

Note 1 to entry: Materials are usually classified at standard temperature and relative humidity in accordance with ISO 291.

**2.886**
**ring gate**
injection channel that extends around the whole periphery of a moulding

**2.887**
**ring-opening polymerization**
polymerization in which a cyclic monomer molecule is incorporated into the macromolecule, yielding a monomeric unit which is acyclic

**2.888**
**rise time**
time required for a free-rise cellular plastic to achieve its ultimate expansion under controlled conditions

**2.1845**
**Rockwell hardness**
measure of a material's resistance to permanent indentation when a test force is applied through a hardmetal or steel ball indenter or, for certain scales, a spheroconical diamond indenter

**2.889**
**roll coating**
coating process in which a coating material is transferred to a substrate from a roll on which the fluid material is spread

**2.1568**
**rosin**
**colophony**
resin, consisting essentially of abietic acid and its isomers, obtained as a residue in the distillation of crude turpentine from the sap of the pine tree ("gum rosin") or from an extract of the stumps and other parts of the tree ("wood rosin")

Note 1 to entry: Resinous esters of rosin with polyhydric alcohols such as glycerol or pentaerythritrol (ester gum) are sometimes used as tackifiers. Both hydrogenated and polymerized rosin grades are available.

**2.893**
**rotary moulding**
process of moulding by injection, transfer, compression or blowing, in which multiple moulds mounted on a rotating table are cycled automatically through the moulding operations

**2.894**
**rotational casting**
process of forming hollow articles from fluid materials by rotating a mould containing a charge of the material about one or more axes at relatively low speed until the charge is distributed on the inner mould walls by gravitational force and then solidifying the material by suitable means

**2.895**
**rotational moulding**
process analogous to rotational casting in which dry, fusible, finely divided powders are distributed against the mould walls and fused

**2.1036**
**roving**
collection of parallel strands (assembled roving) or parallel continuous filaments (direct roving) assembled without intentional twist

**2.898**
**runner**
secondary feed channel in an injection or transfer mould that runs from the inner end of the sprue or pot to the cavity gate

**2.1637**
**sagging**
<adhesives> downward movement of an adhesive coat between application and setting

Note 1 to entry: "Sagging" is usually restricted to a local area of a vertical surface and results in a coating having a thick lower end. It can be caused by an unsuitable viscosity or too thick a coat.

**2.899**
**sample**
small portion of a material or small group of units taken from a larger quantity of material or collection of units and intended to be representative of the whole

**2.1647**
**sandwich panel**
assembly made of a lightweight core to which sheet material has been bonded on both surfaces

**2.900**
**scarf joint**
<adhesives> joint made by cutting identical angular (wedge-shaped) segments from the ends of two adherends, at an angle normally less than 45° to the major axis of the adherends, and bonding the adherends with the cut areas fitted together so that they are coplanar

**2.1398**
**scorch**, verb
modify the surface of material by limited carbonization due to heat

**2.1846**
**scoring**
<surface wear> wear marks in the form of grooves in the direction of sliding

**2.1848**
**scratch distance**
<scratch testing> horizontal distance travelled by the scratch tip relative to the test specimen at any given moment during the test

Note 1 to entry: It is expressed in millimetres.

**2.1849**
**scratch force**
<scratch testing> horizontal force between the scratch tip and the test specimen at any given moment during the test

Note 1 to entry: It is expressed in newtons.

**2.1850**
**scratch map**
<scratch testing> schematic plot of the type of scratch behaviour observed for a particular material at various test loads and test speeds

Note 1 to entry: A scratch map indicates in a simple, pictorial way how the scratch behaviour of a material changes as the test load or test speed is changed.

**2.1847**
**scratch**, noun
<scratch testing> damage made by the tip of a hard instrument when moved across the test specimen surface under specified conditions of tip geometry, test load and test speed

**2.901**
**screen pack**
**filter pack**
wire gauze at the entrance to the extrusion head, used for filtering molten plastics and/or building up back-pressure

**2.1399**
**screening test**
preliminary test used, before carrying out a standard test method, to ascertain whether an item is likely to exhibit (or not exhibit) certain characteristics

**2.1524**
**sealant**
adhesive material used to fill gaps where movement can occur in service and which, when set, has elastic properties

Note 1 to entry: The term “sealant” is also used for a material filling a void against the ingress or egress of a fluid under pressure.

**2.1618**
**sealing**
**sizing**
<adhesives> application of a material (sealer, size) to the surface of an adherend, prior to application of the adhesive, in order to reduce the absorbency of the adherend

**2.902**
**seam welding**
pressure-welding process in which overlapping portions of the surfaces to be united are softened by heat or solvent

**2.903**
**seizing**
<mould> unwanted binding of two parts of a mould, preventing their separation

Note 1 to entry: The binding can be caused by cohesion between metal parts or adhesion of one or more metal parts to the moulding material.

**2.904**
**selective solvent**
medium that is a solvent for at least one component of a mixture of polymers, or for at least one block of a block or graft polymer, but a non-solvent for the other component(s) or block(s)

**2.1541**
**self-curing adhesive**
adhesive that cures, after application, under specified conditions

**2.1400**
**self-extinguishability**
deprecated term

**2.905**
**self-extinguishing**
deprecated term

**2.1402**
**self-ignition**
spontaneous ignition resulting from self-heating

**2.1403**
**self-ignition temperature** (deprecated)
See "spontaneous-ignition temperature"

**2.1401**
**self-propagation of flame**
propagation of a fire front after the removal of any applied energy source

**2.907**
**semi-crystalline polymer**
polymer containing crystalline and amorphous phases

**2.908**
**semi-positive mould**
mould designed to allow a small amount of excess moulding material to escape when it is closed

**2.909**
**semi-rigid plastic**
plastic that has a modulus of elasticity in flexure, or, if that is not applicable, then in tension, between 70 MPa and 700 MPa

Note 1 to entry: Materials are usually classified at standard temperature and relative humidity in accordance with ISO 291.

**2.1275**
**sensory irritancy**
<burning behaviour of plastics> action of toxicants on the eyes and/or upper respiratory tract causing a painful sensation, either by a direct stimulus of specialized receptors or as a result of tissue damage

**2.1532**
**separate-application adhesive**
adhesive consisting of different components which are applied separately to the adherends

Note 1 to entry: Pressing together the components initiates a chemical reaction, curing the adhesive in the bond.

**2.912**
**set**, noun
strain remaining after complete release of the load producing a deformation

Note 1 to entry: Because of practical considerations, such as distortion in the specimen and slack in the strain-indicating system, measurements of strain at a small load rather than zero load are often taken. Set is often referred to as permanent set if it shows no further change with time. The time elapsing between removal of the load and final reading of the set should be stated.

**2.913**
**setting**
<adhesives> process by which an adhesive develops its cohesive strength and thus the physical and chemical properties of its bond

Note 1 to entry: The development of this strength can be produced by physical changes (gelation, hydration, cooling, evaporation of volatile constituents) and/or by chemical reactions (polymerization, crosslinking, oxidation, curing).

**2.914**
**setting temperature**
<adhesives> temperature specified for the setting of an adhesive

Note 1 to entry: The temperature attained by the adhesive during setting can differ from the temperature of the atmosphere surrounding the assembly.

**2.916**
**setting time**
<plastics> time taken for a plastic material to harden sufficiently for handling

**2.915**
**setting time**
<adhesives> period of time necessary for an adhesive to set under specified conditions

**2.917**
**sewing thread**
<textile glass> strong, smooth glass yarn made from filament and usually having a high twist

**2.1466**
**shattering**
<puncture testing> breaking of the test specimen into two or more pieces

**2.1657**
**shear mode**
<testing of adhesives> mode of application of a force to a joint that acts in the plane of the bondline

Note 1 to entry: The force can be applied in longitudinal compression, tension or torsion.

**2.918**
**shear modulus**
**modulus of elasticity in shear**
quotient of shear stress by shear strain

$$\text{Shear modulus } G = \sigma_{ij} / \gamma$$

where

$\sigma_{ij}$ is the shear stress;

$\gamma$ is the shear strain.

Note 1 to entry: It is expressed in pascals.

**2.921.1**
**shear strength**
<general testing> maximum shear stress sustained by a specimen during a shear test

**2.921.2**
**shear strength**
<testing of adhesives> force per unit surface area necessary to bring an adhesive joint to the point of failure by means of forces applied in a shear mode

**2.1088**
**shear stress**
<testing of adhesives> force applied parallel to a flat adhesive joint, divided by the bond area of the joint

Note 1 to entry: It is expressed in megapascals.

**2.1596**
**shear thickening**
increase of apparent viscosity with increasing rate of shear

**2.1598**
**shear thinning**
reduction in apparent viscosity with increasing rate of shear

**2.923**
**sheet**
**sheeting**
thin, generally plane product in which the thickness is small compared to the length and width

Note 1 to entry: It is made in continuous lengths and generally supplied in roll form.

**2.924**
**sheeter line**
**knife line**
parallel scratches or projecting ridges distributed over a considerable area of a sheet of plastic, such as might be produced during a slicing operation

**2.1082**
**shelf life**
<thermosetting plastics> period after production of a thermosetting compound during which the flowability remains at a level at which the compound can be moulded without the need to make significant changes in the moulding conditions from those normally used

**2.926**
**shelf life**
**storage life**
time of storage under stated conditions during which a material can be expected to retain its working properties

**2.927**
**shell moulding resin**
resin used in admixture with sand or a ceramic powder in the foundry industry to make thin-walled moulds in which to cast metals

**2.929**
**short**
<moulding> incompletely filled-out condition of a moulding

**2.1094**
**shortness**
**short-breaking**
quality of an adhesive that does not string, cotton or otherwise form filaments or threads during application

**2.932**
**shot**
amount of material delivered to a mould assembly in one moulding cycle

**2.933**
**shot capacity**
maximum quantity of material that an injection-moulding machine can inject per cycle into a mould

**2.1709**
**shredding**
<recycling of plastics waste> any mechanical process by which plastics waste is fragmented into irregular pieces of any dimension or shape

Note 1 to entry: Shredding usually signifies the tearing or cutting of materials that cannot be crushed by fragmentation methods applicable to brittle materials, as typically carried out in a hammer mill.

**2.934**
**shrink packaging**
**shrink wrapping**
process of enclosing an article in a protective envelope by heat sealing it within prestretched film and then heating to cause the film to shrink tightly around the article

**2.935**
**shrinkage**
<cellular plastics> inadvertent decrease in the dimensions of a cellular plastic without breakdown of the cell structure

**2.937**
**sieve retention**
<sieve analysis> percentage of the mass of material remaining on the sieve after a test

**2.938**
**silicone plastic**
**Si plastic**
plastic based on polymers in which the main polymer chain consists of alternating silicon and oxygen atoms

**2.1911**
**single filament yarn**
given number of continuous filaments (one or several strands), held together by twists

**2.940**
**single spun yarn**
<fibreglass> simplest continuous strand of glass material composed of one of the following:

a) a number of discontinuous fibres, held together by twist (such yarns are described as spun yarn or staple-fibre yarn);

b) a given number of continuous filaments (one or several strands), held together by twist (such yarns are described as continuous-filament yarn or filament yarn)

Note 1 to entry: The definition of single yarn in ISO 1139 states that twist can be absent or present. In the glass industry, however, twist is always present in a single yarn.

**2.1855**
**single-edge-notched tensile**
**SENT specimen**
<fracture toughness and fatigue crack propagation testing> one of the types of test specimen used in fracture toughness and fatigue crack propagation testing

Note 1 to entry: See Figure 3 in ISO 13586:2000 or Figure 4 in ISO 15850:2002.

**2.787**
**single-point data**
<acquisition and presentation of data> data characterizing a plastics material by means of those property tests in which important aspects of performance can be described with single-value results

**2.939**
**single-strand chain**
linear chain that can be described by constitutional units which are always joined to each other through a single common atom

**2.941**
**sink mark**
**shrink mark**
depression in the surface of a moulding

Note 1 to entry: This defect occurs where the material has retracted from the mould, often in a region where there is a considerable change in thickness.

**2.1856**
**site quality assurance programme**
<polyurethane foam spraying> quality assurance programme which ties the chemical system components manufacturer (supplier), the contractor and the installer together for the installation of polyurethane spray foam

Note 1 to entry: The quality assurance programme outlines the responsibilities and obligations of each of the three parties as well as the training and certification requirements.

**2.1021**
**size**
mixture of chemical products (or ingredients) applied to continuous filaments during their manufacture

Note 1 to entry: Plastic size is a product designed to obtain a good bond between the surface of the fibre and the matrix resin; it generally contains ingredients that facilitate certain operations of conversion or application (e.g. winding, chopping).

Note 2 to entry: Textile size is a product designed to facilitate subsequent textile operations (e.g. twisting, folding or weaving).

Note 3 to entry: Textile plastic size is a product designed either to facilitate subsequent textile operations or to promote the bond between the surface of the fibre and the matrix resin.

**2.1858**
**size-exclusion chromatography**
**SEC**
**gel-permeation chromatography**
**GPC**
liquid-chromatographic technique in which the separation is based on the hydrodynamic volume of the molecules eluting in a column packed with porous non-adsorbing material having pore dimensions that are similar in size to the molecules being separated

Note 1 to entry: The term “gel-permeation chromatography” should be used only when the porous non-absorbing packing material is a gel. The term “size-exclusion chromatography” is preferred.

**2.1859**
**skin**, noun
<cellular plastics> relatively dense layer at the surface of a cellular plastic

**2.948**
**slip thermoforming**
thermoforming process in which a sheet clamping frame, provided with tensioned pressure pads, permits the heated sheet to slip inwards as the part is being formed

**2.949**
**slippage**
<adhesives> movement of adherends with respect to each other during the bonding process

**2.1634**
**slip-sheet**
**interliner**
<adhesives> treated sheet to cover an adhesive temporarily to facilitate handling or unrolling

**2.951**
**slit-die extrusion**
**slot-die extrusion**
process of extruding film or sheet in which a heated thermoplastic compound is forced through a straight die orifice

**2.950**
**slitting**
conversion of a given width of plastic film or sheeting to several smaller widths by means of knives

**2.1037**
**sliver**
continuous assembly of slightly bonded discontinuous filaments in a practically parallel arrangement

Note 1 to entry: The definition of this term is not the same as that of "narrow fabric".

**2.952**
**slush casting**
**slush moulding**
process of forming articles from fluid materials, such as vinyl plastisols, in which a layer of the material of desired thickness is gelled against the inner surface of a heated mould, after which the excess fluid material is poured out and, if necessary, additional heat is applied to fuse or cure the plastic

**2.1276**
**small-scale test**
<fire testing> test performed on an item of small dimensions

Note 1 to entry: A test performed on a specimen whose largest dimension is less than 1 m is usually called a small-scale test.

**2.953**
**smoke**
visible part of fire effluent

**2.1277**
**smoke obscuration**
reduction in the intensity of light due to its passage through smoke

Note 1 to entry: In practice, smoke obscuration is usually expressed as a percentage.

Note 2 to entry: This phenomenon induces a reduction in visibility.

**2.954**
**smouldering**
combustion of a material without flame and without light being visible

Note 1 to entry: Smouldering is generally evidenced by an increase in temperature and/or by effluent.

**2.1601**
**softening point**
temperature at which a non-crystalline polymeric material attains a degree of softness under specified conditions

**2.1554**
**soluble silicate**
silicate obtained by melting a purified silica with an alkali salt

**2.960**
**solution polymerization**
polymerization in which the monomer, dissolved in a solvent, reacts to form a polymer which can be soluble or insoluble in the solvent

**2.1550**
**solvent**
liquid or mixture of liquids that is used to dissolve a substance or to dilute a solution without causing any chemical change

Note 1 to entry: In the adhesives field, solvents are used to control the consistency and character of the adhesive and to regulate the application properties.

**2.1628**
**solvent activation**
**solvent reactivation**
use of solvent to provide or restore the bonding properties of a dried adhesive coat

**2.962**
**solvent bonding**
**solvent welding**
process of bonding thermoplastic products by applying a solvent capable of softening the surfaces to be united, pressing the softened surfaces together, and removing the solvent by evaporation, absorption or polymerization

**2.963**
**solvent polishing**
process for improving the gloss of thermoplastic articles by immersion in or spraying with a solvent to dissolve surface irregularities, followed by evaporation of the solvent

**2.961**
**solvent-activated adhesive**
adhesive pre-applied to an adherend that is rendered tacky immediately prior to use by the application of solvent

**2.1518**
**solvent-borne adhesive**
**solution adhesive**
**solvent-based adhesive**
adhesive in which the binder is dissolved in a volatile organic solvent

Note 1 to entry: In practice, solvents used for solvent-borne adhesives have boiling points below 170 °C at 101,3 kPa, a vapour pressure greater than 50 Pa at 20 °C and, if flammable, a flash point below 55 °C.

**2.1519**
**solvent-free adhesive**
adhesive that is substantially free from organic solvents

Note 1 to entry: "Substantially free" means that no organic solvents have been added to the basic elements of the adhesive, nor have they been added during the process of manufacturing the adhesive from these basic elements. "Low-solvent adhesives" contain, at the most, 5 % of solvent, based on the total mass of the adhesive.

**2.1860**
**sonic-pulse propagation method**
technique used to measure the elastic modulus of a material using sonic pulses

**2.1278**
**soot**
particulate matter produced and deposited during or after combustion

Note 1 to entry: Soot usually consists of finely divided particles, consisting mainly of carbon, produced by the incomplete combustion of organic materials.

**2.1621**
**specific adhesion**
adhesion between surfaces due to intermolecular forces

**2.1279**
**specific optical density of smoke**
<fire testing> measure of the opacity of the smoke produced by a specimen, taking into account the optical density and factors characteristic of the specified test method

Note 1 to entry: See also "optical density of smoke".

Note 2 to entry: It is dimensionless.

**2.788**
**specimen coordinate axes**
<fibre-reinforced materials> coordinate axes for a material in which the fibres are preferentially aligned in one direction

Note 1 to entry: Where the material contains a known axis of preferred fibre orientation, then this is defined as the "1"-axis (or "1"-direction). For materials prepared as a test plate, the in-plane direction transverse to the "1"-axis is defined as the "2"-axis.

Note 2 to entry: Where the direction of preferred orientation is not known, the "1"-axis is taken as the production direction of the composite or the reinforcement (for woven fabrics, this will be the warp direction).

**2.966**
**spherulite**
polycrystalline, roughly spherical region in a polymer, consisting of crystals emanating from a common centre

**2.967**
**split mould**
mould in which the cavity is formed of two or more components (called splits) held together by an outer chase during moulding, but separable for ejection

**2.968**
**spontaneous combustion**
deprecated term

**2.1280**
**spontaneous ignition**
ignition resulting from a rise in temperature as opposed to the use of an ignition source

**2.969**
**spontaneous-ignition temperature**
minimum temperature at which ignition is obtained under specified test conditions without any source of pilot ignition

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

Note 2 to entry: This temperature can be reached either by self-heating or by induced heating.

**2.971**
**spray**
<injection moulding> complete set of mouldings, with the associated solidified sprues and runners, from a multi-impression injection mould

**2.1522**
**spray adhesive**
adhesive that is projected in small particles by means of a pressure medium

**2.972**
**spray gun**
device used for spray application of single or multicomponent liquids to substrates or the walls of enclosed spaces

Note 1 to entry: The components, with or without fillers, are conveyed separately to an impingement-type mixing chamber and dispensed in a fan-shaped or conical pattern. Reinforcing fibres can also be incorporated in the spray.

**2.973.1**
**spray-up**
<processing of reinforced plastics> simultaneous spraying of prepolymer, catalyst and chopped fibres on to a mould or mandrel

**2.973.2**
**spray-up**
<processing of cellular plastics, such as epoxy and polyurethane types> spraying of fast-reacting resin-catalyst systems on to a surface where they react to foam and cure

Note 1 to entry: In both processes, the resin and catalyst usually are sprayed through separate nozzles so that they are mixed during the spray-up operation.

**2.1625**
**spread of adhesive**
**coverage**
mass of adhesive applied per unit area of a surface

Note 1 to entry: An insufficient adhesive spread can result in unsatisfactory bond properties (“starved joint”).

**2.1052**
**spreader**
device for the controlled application of an adhesive

**2.975.1**
**sprue**
primary feed channel that runs from the outer face of an injection or transfer mould to the mould gate in a single-cavity mould or to the runners in a multicavity mould

**2.975.2**
**sprue**
moulding material in this primary feed channel

**2.976**
**sprue bush**
**sprue bushing**
hardened steel insert in an injection mould that contains the tapered sprue hole and has a suitable seat for the nozzle of the injection cylinder

**2.977**
**sprue lock**
undercut in a cold-slug well that allows the sprue to be pulled out of the bushing as the mould is opened

**2.978**
**sprue-puller**
**anchor**
device in a mould provided with a recess for withdrawing the sprue positively from the sprue bush

**2.979**
**spun roving**
fibre strand repeatedly doubled back on itself to form a roving, sometimes reinforced by one or more straight strands

**2.980**
**stabilizer**
substance used in the formulation of some plastics to assist in maintaining the properties of the material at or near their initial values during processing and subsequent service life

Note 1 to entry: In adhesives, special stabilizers are used to prevent or slow down undesirable effects such as coagulation, excessive reactivity, absorption by adherends or destruction of adherends.

**2.1639**
**staining**
local exudation, by gels, of small amounts of liquid on standing

**2.1410**
**standard deflection**
<determination of temperature of deflection under load> increase in deflection corresponding to the increase in flexural strain at the surface of the test specimen

Note 1 to entry: The standard deflection depends on the dimensions and position of the test specimen and the span between the specimen supports.

Note 2 to entry: It is specified in the relevant part of ISO 75.

Note 3 to entry: It is expressed in millimetres.

**2.982**
**staple fibre**
**discontinuous fibre**
single textile element of small diameter and short length

Note 1 to entry: This forms the basis for staple-fibre products.

**2.983**
**staple-fibre woven fabric**
fabric woven from staple-fibre yarns in warp and weft

**2.986**
**star polymer**
polymer, the molecules of which are star chains

**2.1491**
**starting angle**
<pendulum impact-testing machine> angle, relative to the vertical, from which the pendulum is released

Note 1 to entry: Usually, the test specimen is impacted at the lowest point of the pendulum swing (i.e. at an angle of 0°). In this case, the starting angle will also be the angle of fall.

Note 2 to entry: It is expressed in degrees.

**2.987**
**starved joint**
joint that has an insufficient amount of adhesive to produce a satisfactory bond

**2.1106**
**static shear strength**
average static shear stress at rupture

Note 1 to entry: In the testing of adhesives, it is determined in accordance with ISO 4587 and expressed in megapascals.

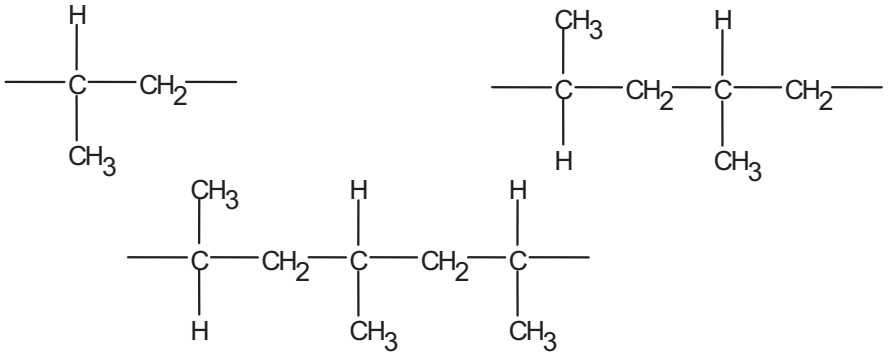
**2.990**
**statistical copolymer**
copolymer consisting of molecules in which the sequential distribution of the monomeric units obeys known statistical laws

**2.992**
**stereoblock**
regular block that can be described by one species of stereorepeating unit in a single sequential arrangement

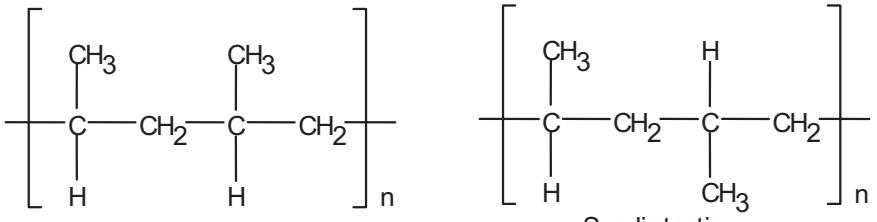
**2.993**
**stereoblock polymer**
polymer, the molecules of which consist of stereoblocks connected linearly

**2.994**
**stereoregular polymer**
regular polymer, the molecules of which can be described in terms of only one species of stereorepeating unit in a single sequential arrangement

In a stereoregular polypropylene, the three simplest possible repeating units are:

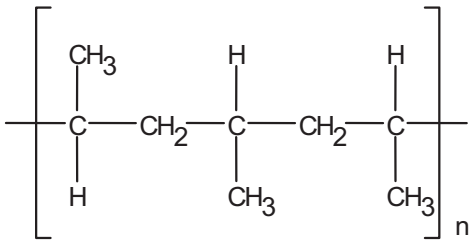


The corresponding stereoregular polymers are:



Isotactic

Syndiotactic



Atactic

Note 1 to entry: A stereoregular polymer is always a tactic polymer, but a tactic polymer is not always stereoregular since a tactic polymer need not have every site of stereoisomerism defined.

**2.996**
**stereoselective polymerization**
polymerization in which a polymer molecule is formed from a mixture of stereoisomeric monomer molecules by incorporation of only one stereoisomeric species

**2.997**
**stereospecific polymerization**
polymerization in which a tactic polymer is formed

**2.1477**
**stiffness**
<fracture toughness testing> initial slope of the force-displacement diagram

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

**2.998**
**storage modulus**
<dynamic mechanical testing> real part of the complex modulus

Note 1 to entry: It is expressed in pascals.

**2.1659**
**strain**
change, due to the application of a force, in the size of a body, referred to its original size

**2.1001**
**strain rate**
rate of change of strain with time

$$\text{Strain rate } \dot{\varepsilon} = \mathrm{d}\varepsilon / dt$$

where

$\varepsilon$ is the strain;

$t$ is time.

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

**2.1002**
**strand**
assembly of parallel filaments produced simultaneously, slightly bonded and without intentional twist

**2.1003**
**streaming birefringence**
**flow birefringence**
birefringence introduced by flow in liquids, solutions and dispersions of optically anisotropic, anisometric or deformable molecules or particles, attributable to a non-random orientation of the molecules or particles

**2.1005**
**stress amplitude**
alternating stress equal to half the algebraic difference between the maximum and minimum stresses

$$\sigma_a = \frac{\sigma_{max} - \sigma_{min}}{2}$$

Note 1 to entry: It is expressed in megapascals.

**2.1006**
**stress crack**
external or internal crack in a plastic caused by stresses which are less than the short-time mechanical strength of the plastic

Note 1 to entry: Frequently, the development of such a crack is accelerated by the environment to which the plastic is exposed. The stresses which cause cracking can be present internally or externally or can be combinations of these two kinds of stress.

**2.1290**
**stress intensity factor**
<fracture toughness testing> limiting value of the product of the stress perpendicular to the crack area at a distance, r, from the crack tip and of the square root of 2πr, as r tends to zero

Note 1 to entry: It is expressed in pascal square root metres ($Pa \bullet m^{1/2}$).

**2.1505**
**stress intensity factor range**
<fatigue crack propagation testing> difference between the maximum and the minimum stress intensity factors in one test cycle

**2.1114**
**stress ratio**
algebraic ratio of the minimum stress to the maximum stress in one cycle

**2.775**
**stress-strain hysteresis loop**
<dynamic mechanical testing> stress expressed as a function of the strain in a viscoelastic material subjected to sinusoidal vibrations

Note 1 to entry: Provided the viscoelasticity is linear in nature, this curve is an ellipse.

**2.1117.1**
**stretch ratio**
<blow moulding> ratio of the length of the parison to the length of the cavity in which it is to be blown

**2.1117.2**
**stretch ratio**
<filament and film stretching> ratio of the length of the stretched to the unstretched filament or film

**2.1675**
**strike-through**
**bleed-through**
presence of adhesive on the surface of a porous adherend, the adhesive having penetrated through the adherend from the bond line

**2.1095**
**stringiness**
**legging**
property of an adhesive that results in stringing or the formation of filaments or threads when adhesively bonded surfaces are separated

**2.1119**
**stripper plate**
part of a mould that makes possible a special kind of ejection, e.g. the removal of bottle caps with internal threads from the mould

**2.1121**
**stroke**, noun
travel of the ram of a press

**2.1122**
**structural adhesive**
adhesive of proven reliability in structural engineering applications in which the bond can be stressed to a high proportion of its maximum failing load for long periods without failure

**2.1672**
**structural bond**
bond which is capable of sustaining in a structure a specified strength level under a combination of stresses for a specified period of time

Note 1 to entry: The combination of stresses can, for example, include peel and shear forces, fluctuating loads, environmental exposure and steady load. An adhesive that is capable of forming a structural bond is commonly referred to as a "structural adhesive".

**2.1123**
**structural foam moulding**
process of moulding articles with a cellular core and an integral solid (non-cellular) skin

**2.1124**
**structure with twist**
general term designating a very long and relatively thin assembly of filaments (called continuous-filament yarn or filament yarn) or staple fibres (called staple-fibre yarn or spun yarn) to which twist has been applied intentionally

Note 1 to entry: The yarn may be produced in one twisting operation (single yarn) or in several succeeding operations (folded yarn, cabled yarn). The twist in single yarns is capable of being removed by a single untwisting operation.

**2.1125**
**styrene/α-methylstyrene plastic**
**S/MS plastic**
plastic based on copolymers of styrene and α-methylstyrene

**2.795**
**styrene-acrylonitrile plastic**
plastic based on copolymers of styrene and acrylonitrile

**2.1126**
**styrene-rubber plastic**
plastic based on styrene polymers and rubbers, the styrene polymers being in the greatest amount by mass

**2.1128**
**substrate**
object or semi-manufactured product (e.g. wire, extruded metallic section or plastic profile, sheet, film, paper, textile product) on which a coating or layer of another material is applied from the gas, liquid or solid phase by coating, by laminating or generated by a chemical process

Note 1 to entry: In adhesion, the term “substrate” often is a synonym of adherend.

Note 2 to entry: The substrate or the applied layer, or both, can be of polymeric material.

**2.1526**
**supported-film adhesive**
adhesive, supplied in sheet or film form, with an incorporated carrier that remains in the bond when the adhesive is applied and used

Note 1 to entry: The carrier can be woven or non-woven material consisting of organic or inorganic fibres.

**2.1129**
**surface burn**
combustion limited to the surface of a material

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

**2.1614**
**surface cleaning**
<adhesives> surface treatment to remove substances impairing adhesion from the surfaces to be bonded

Note 1 to entry: Suitable organic solvents or aqueous detergents can be used for degreasing surfaces. Contaminants, weak surface layers and other substances impairing adhesion can be removed by a solvent wipe.

**2.1281**
**surface flash**
<burning behaviour> movement of transient flame over the surface of a material without ignition of its basic structure

Note 1 to entry: See also “surface burn”.

Note 2 to entry: If surface burn occurs simultaneously or sequentially with surface flash, it is not considered part of the surface flash.

Note 3 to entry: Each flash is usually shorter than 1 s.

**2.1613**
**surface preparation**
**surface pretreatment**
<adhesives> physical and/or chemical treatments applied to adherends to render them suitable (or more suitable) for bonding

**2.1130**
**surface resistance**
quotient of the direct voltage applied between two electrodes in contact with the surface of a material by that part of the current flowing through a thin layer on the surface of the specimen (for instance, moisture or another poorly conducting material)

**2.1131**
**surface resistivity**
quotient of the d.c. electric field strength by the linear current density in the surface layer of a material

Note 1 to entry: The surface resistivity of a material is equal to the surface resistance between two electrodes forming opposite sides of a square. The size of the square is immaterial.

**2.1282**
**surface spread of flame**
propagation of flame away from the source of ignition across the surface of a liquid or a solid

**2.1132**
**surface tack**
stickiness of a surface

**2.1089**
**surface tension**
property of liquids arising from unbalanced molecular cohesive forces at or near the surface, as a result of which the surface tends to contract and has properties resembling those of a stretched elastic membrane

Note 1 to entry: Surface tension is a thermodynamic property affecting the wettability of a solid surface. To assure spreading and wetting, a liquid should have a surface tension not higher than the "critical" surface tension of the solid adherend.

Note 2 to entry: It is expressed in millimetres per metre.

**2.1133**
**surface treatment**
**prebond treatment** (deprecated)
<fibre-based composites> treatment applied to the fibres to improve the adhesive bond between them and the resin component of the composite

Note 1 to entry: Oxidation of the fibre surface carried out under controlled conditions is an example of such a surface treatment.

**2.1134**
**surfacing mat**
thin compact sheet of bonded staple fibres or continuous filaments, used as the surface layer of composites

Note 1 to entry: The fibres can be of glass or organic material.

**2.1135**
**suspension**
heterogeneous sytem in which a solid is distributed as fine particles in a liquid

**2.1136**
**suspension polymerization**
polymerization in which the monomer is dispersed as fine droplets in water or another suitable inert non-solvent

**2.1283**
**sustained flaming**
persistence of flame on or over a surface for a minimum period of time

Note 1 to entry: The period of time required varies in different standards, but it is usually of the order of 10 s.

**2.1138**
**swelling**
increase in volume of a body when immersed in a liquid or exposed to a vapour

**2.1137**
**syneresis**
contraction of a gel accompanied by the separation of a liquid

**2.1140**
**syntactic cellular plastic**
cellular plastic in which hollow microspherical fillers are used as the low-density element

**2.1545**
**synthetic resin**
resin based on a synthetic monomer

**2.1603**
**tack**
property of a material that enables it to form a bond immediately on contact with another surface, which can be an adherend or another layer of adhesive

Note 1 to entry: Tack describes the ability of the adhesive surface to deform and flow, wetting the second surface immediately on contact, thereby forming a bond. "Grab" is a subjective estimate of tack.

**2.1604**
**tack force**
force necessary to separate an adhesive coat from a second surface shortly after they have been brought into contact under a load equal only to the weight of the adhesively coated article (for example, tape)

Note 1 to entry: The tack force can increase with time as the coat flows.

**2.1605**
**tack range**
**tack time**
**tack life**
period of time for which an adhesive coat will be in the tack dry condition (i.e. capable of adhering on contact with another surface, although it seems dry to the touch) after application to a specified adherend under specified conditions of temperature and humidity

Note 1 to entry: The tack range depends on pressure effected when the adhesive coats are brought into contact.

**2.1553**
**tackifier**
substance intended to enhance the tack or the tack range of an adhesive coat

**2.1142**
**tactic block**
regular block that can be described by only one species of configurational repeating unit in a single sequential arrangement

**2.1143**
**tactic block polymer**
polymer, the molecules of which consist of tactic blocks connected linearly

**2.1144**
**tactic polymer**
regular polymer, the molecules of which can be described in terms of only one species of configurational repeating unit in a single sequential arrangement

**2.1145**
**tacticity**
orderliness of the succession of configurational repeating units in the main chain of a polymer molecule

**2.1146**
**take-off**
device for conveying extruded or calendered material away from the machine

**2.1147**
**take-up**
device for winding extruded or calendered material

**2.1567**
**tall resin**
resin consisting essentially of abietic acid and its isomers and obtained from pine trees by the sulfate-cellulose process

**2.1148**
**tape**
<textile glass> fabric, with or without selvage, not exceeding 100 mm in width

Note 1 to entry: See also "narrow fabric".

Note 2 to entry: Both "selvage" and "selvedge" are used, "selvedge" being the preferred spelling in the United Kingdom.

**2.1151**
**tear propagation force**
force required to continue the growth of a tear initiated in a plastic film

**2.1152**
**tear propagation resistance**
tear propagation force divided by the thickness of the specimen

**2.1153**
**tear strength**
**tear resistance**
force required to tear a test specimen of a thin material

**2.1150**
**tear**, verb
divide or disrupt by the pulling effect of opposing forces

**2.1154**
**telomer**
polymer composed of molecules having terminal groups incapable, under the conditions of the synthesis, of reacting with additional monomers to form larger polymer molecules of the same chemical type

**2.258**
**temperature of deflection under load**
temperature at which a test specimen will deflect a given distance under a given load in flexure under specified conditions of test

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

**2.1284**
**temperature-time curve**
<fire testing> time-related variation of temperature prescribed in a specified way during a standard fire resistance test

**2.1440**
**tensile strain**
<tensile testing> increase in length of a test specimen relative to the original length

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

**2.1156**
**tensile strength**
<tensile testing> maximum tensile stress sustained by a test specimen during a tensile test

Note 1 to entry: It is expressed in megapascals.

**2.1436**
**tensile stress**
<tensile testing> tensile force per unit area of the original cross-section of a test specimen within the specimen gauge length at any given moment

Note 1 to entry: It is expressed in megapascals.

**2.1287**
**tensile work to break**
<tensile testing> area under a plot of the applied stress against the grip displacement, the applied stress being determined from the ratio of the tensile force to the minimum initial cross-sectional area of the specimen

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

**2.1457**
**tensile-creep modulus**
<tensile-creep testing> ratio of the initial stress to the tensile-creep strain

Note 1 to entry: It is expressed in megapascals.

**2.1455**
**tensile-creep strain**
<tensile-creep testing> change, produced by the applied load, in the distance between the gauge marks on the specimen, relative to the initial distance between them

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

**2.784**
**tensile-impact strength**
energy absorbed in breaking a specimen by a single blow of the pendulum of a tensile-impact testing machine under specified conditions, referred to the original cross-sectional area of the specimen

Note 1 to entry: The specimen can be notched or unnotched.

Note 2 to entry: Tensile-impact strength is expressed in kilojoules per square metre.

**2.1658**
**tension mode**
<testing of adhesives> mode of application of a tensile force normal to the plane of a joint between rigid adherends and uniformly distributed over the whole area of the bond line

**2.1565**
**terpene resin**
pale thermoplastic polyterpene hydrocarbon mixture obtained by the acid-catalysed polymerization of bicyclic monoterpene β-pinene (or occasionally α-pinene) products of the distillation of sulfate-cellulose turpentine

Note 1 to entry: Terpene resin is principally used in adhesives as a tackifier. Both hydrogenated and polymerized grades are available.

**2.1157**
**terpolymer**
polymer derived from three species of monomer

**2.1865**
**test load**
<scratch testing> load applied by the scratch tip perpendicularly to the test specimen during the test

Note 1 to entry: It is expressed in newtons.

**2.964**
**test specimen**
piece of material of appropriate shape and size, prepared so that it is ready for use in a test

**2.1435**
**test speed**
**speed of testing**
<tensile testing> rate of separation of the grips of the test machine during the test

Note 1 to entry: It is expressed in millimetres per minute.

**2.1039**
**textile glass**
generic term designating all reinforcement products made of glass and based on continuous and/or discontinuous filaments

**2.1040**
**textile glass multifilament products**
class of textile glass products consisting of filaments (multifilaments)

**2.1041**
**textile glass staple-fibre products**
class of textile glass products consisting of staple, i.e. discontinuous, filaments

**2.1042**
**texturized yarn**
<textile glass> continuous-filament yarn in which the filaments have been deliberately and permanently separated to increase the bulk of the yarn

**2.1866**
**theoretical amount of evolved biogas**
Thbiogas
<composting of plastics waste> maximum theoretical amount of biogas ($CH_4$ + $CO_2$) which will evolve after complete biodegradation of an organic compound under anaerobic conditions, calculated from the molecular formula and expressed as millilitres of biogas evolved per milligram of the compound under standard conditions

**2.1867**
**theoretical amount of evolved carbon dioxide**
$ThCO_2$
<composting of plastics waste> maximum theoretical amount of carbon dioxide which will evolve after completely oxidizing an organic compound, calculated from the molecular formula and expressed as milligrams of carbon dioxide evolved per milligram or gram of the compound

**2.1868**
**theoretical amount of evolved methane**
$ThCH_4$
<composting of plastics waste> maximum theoretical amount of methane which will evolve after complete reduction of an organic compound, calculated from the molecular formula and expressed as milligrams of methane evolved per milligram of the compound

**2.1869**
**theoretical oxygen demand**
ThOD
<composting of plastics waste> maximum theoretical amount of oxygen required to oxidize an organic compound completely, calculated from the molecular formula and expressed as milligrams of oxygen uptake per milligram or gram of the compound

**2.1160**
**thermal analysis**
group of techniques in which a physical property of a substance is measured as a function of temperature or time while the substance is subjected to a controlled temperature programme

Note 1 to entry: The adjective corresponding to "thermal analysis" is "thermo-analytical" (as in, for example, thermo-analytical techniques).

Note 2 to entry: When two or more techniques are applied to the same test sample at the same time, they should be identified as "simultaneous multiple techniques", for example simultaneous thermogravimetry and differential thermal analysis. The term "combined multiple techniques" would indicate the use of separate test samples for each technique.

**2.1285**
**thermal decomposition**
process whereby the action of heat or elevated temperature on an item causes changes in the chemical composition

Note 1 to entry: "Thermal decomposition" is not the same as "thermal degradation".

**2.1164**
**thermal diffusivity**
ratio of the thermal conductivity of a substance to the product of its density and specific heat

Note 1 to entry: The Sl unit for this property is the square metre per second.

Note 2 to entry: The IUPAP symbol is $\alpha$.

**2.1165**
**thermal expansion**
increase in the dimensions or volume of a specimen attributable to a change in its temperature

**2.761**
**thermal radiation**
transfer of thermal energy by electromagnetic waves

**2.1166**
**thermal stability**
ability of a material to resist degradation under the action of heat

**2.760**
**thermal-insulation criterion "I"**
criterion, determined from the results of a fire resistance test, by which the ability of a separating element to prevent the passage of heat is assessed

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

**2.1167**
**thermally foamed plastic**
cellular plastic produced by applying heat to effect gaseous decomposition or volatilization of a constituent

**2.1169**
**thermodilatometry**
technique in which a dimension of a substance under negligible load is measured as a function of temperature or time while the substance is subjected to a controlled temperature programme

Note 1 to entry: Recorded is the thermodilatometric curve. The dimension should be plotted as the ordinate, increasing upwards, and temperature or time as the abscissa, increasing from left to right.

Note 2 to entry: A distinction is made between linear thermodilatometry and volume thermodilatometry, depending on the parameter measured.

**2.1170**
**thermoelasticity**
rubberlike elasticity resulting from an increase in temperature

**2.1172**
**thermoforming**
process of shaping heated thermoplastic sheets or other articles, generally on a mould, followed by cooling

**2.1173**
**thermogravimetry**
**TG**
technique in which the mass of a substance is measured as a function of temperature or time while the substance is subjected to a controlled temperature programme

Note 1 to entry: Recorded is the thermogravimetric, or TG, curve. The mass should be plotted as the ordinate, decreasing downwards, and temperature or time as the abscissa, increasing from left to right.

**2.1175**
**thermomechanical measurement**
technique in which the deformation of a substance under non-oscillatory load is measured as a function of temperature while the substance is subjected to a controlled temperature programme

Note 1 to entry: It is essential that the mode, as determined by the type of stress applied (compression, tension, flexure or torsion), always be stated.

**2.1870**
**thermophilic incubation period**
<composting of plastics waste> incubation at 58 °C to allow the development of microorganisms growing at high temperature

**2.1179**
**thermoplastic elastomer**
polymer or blend of polymers that has properties at its service temperature similar to those of vulcanized rubber but which can be processed and reprocessed at elevated temperatures like thermoplastics

Note 1 to entry: The term thermoplastic rubber is commonly used for thermoplastic elastomer.

**2.1177**
**thermoplastic**, adjective
capable of being softened repeatedly by heating and hardened by cooling through a temperature range characteristic of the plastic and, in the softened state, of being shaped by flow repeatedly into articles by moulding, extrusion or forming

Note 1 to entry: Many thermoplastic materials can become thermoset by appropriate treatment to induce crosslinking, e.g. by the addition of a suitable chemical crosslinking agent or by irradiation.

**2.1178**
**thermoplastic**, noun
plastic that has thermoplastic properties

**2.1181**
**thermoset**, noun
plastic which, when cured by heat or other means, changes into a substantially infusible and insoluble product

Note 1 to entry: This term includes both thermosetting plastics and thermoset plastics.

**2.1184**
**thermosetting plastic**
plastic that has thermosetting properties

**2.1183**
**thermosetting**, adjective
capable of being changed into a substantially infusible and insoluble product when cured by heat or by other means such as radiation or catalysts

Note 1 to entry: The setting of a thermosetting resin goes through three different stages: the “A-stage” at which the material is still fusible and still soluble, the intermediate pseudo-stable “B-stage” at which it is fusible and partially soluble and the “B-stage” at which it is converted to the final crosslinked, insoluble and infusible “C-stage” by application of heat and, usually, pressure.

**2.1084**
**thick moulding compound**
**TMC**
sheet moulding compound with a thickness greater than 25 mm

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

**2.1186**
**thickener**
substance that increases the viscosity of a liquid polymeric system

**2.1871**
**thickness**
<test specimen> the shorter dimension of the rectangular cross-section perpendicular to the longitudinal direction of a bar (beam) test specimen

Note 1 to entry: It is expressed in millimetres.

**2.1187**
**thiourea-formaldehyde resin**
amino resin made by the polycondensation of thiourea (thiocarbamide) with formaldehyde

**2.1600**
**thixotropy**
decrease of apparent viscosity under shear stress, followed by a gradual recovery when the stress is removed

Note 1 to entry: This effect is time-dependent. In practical use, an adhesive is termed thixotropic if, once applied to a substrate, it shows an acceptable, limited flow.

**2.1638**
**throwing**
<adhesives> undesirable behaviour of adhesives that occurs when they are transferred from a roller or rotary stencil mechanism wherein, due to peripheral speed, droplets of adhesive are sometimes thrown from the roller or stencil

**2.1458**
**time to rupture**
<creep testing> period of time during which a specimen is under full load until it ruptures

**2.1189**
**torpedo**
streamlined metal device placed in the path of flow of the plastic material in the heating cylinders of injection-moulding machines and extruders, or in extrusion dies, to spread the melt into thin layers and force it into contact with the heating areas

**2.1872**
**total dry solids content**
amount of solids obtained by taking a known volume of test material and drying at about 105 °C to constant mass

**2.1873**
**total luminous transmittance**
ratio of the transmitted luminous flux to the incident luminous flux when a parallel beam of light passes through a specimen

**2.1875**
**total organic carbon**
**TOC**
<composting of plastics waste> all the carbon present in the organic matter in the material being composted

**2.1877**
**total spectral transmittance**
ratio of the transmitted radiant flux (regular and diffuse) to the incident radiant flux when a parallel beam of monochromatic radiation of a given wavelength passes through a specimen

**2.1192**
**total volume shrinkage**
<resin casting> sum of the shrinkage during curing of a resin compound and the shrinkage of the cured casting during cooling from the curing temperature to room temperature

**2.1521**
**toughened adhesive**
adhesive which, by virtue of its physical structure, discourages propagation of cracks

Note 1 to entry: The toughening can be achieved, for example, by the creation of a discrete elastomeric phase within the adhesive matrix.

**2.1194**
**tow**, noun
large number of filaments collected into a loose strand or assemblage substantially without twist

**2.763**
**toxic hazard**
potential for injury or loss of life by exposure to toxicants with respect to their potency, quantity, concentration and duration of exposure

Note 1 to entry: See also “fire hazard”, “fire risk” and “toxic risk”.

**2.764**
**toxic potency**
measure of the amount of toxicant required to elicit a specific toxic effect

Note 1 to entry: The smaller the amount of toxicant required, the greater the toxic potency.

**2.765**
**toxic risk**
result of multiplying the probability of occurrence of a toxic hazard to be expected in a given technical operation or state by the consequence or extent of injury to be expected on the occurrence of the toxic hazard

Note 1 to entry: In the case of fires, the toxic risk is part of the fire risk.

**2.766**
**toxicant**
substance which has an adverse effect upon a living organism

**2.767**
**toxicity**
ability of a substance to produce an adverse effect upon a living organism

**2.768**
**tracking resistance**
ability of a material to withstand a test voltage, under specified conditions, without creating conducting paths on the surface of the material and without the occurrence of flame

Note 1 to entry: See also “electrical tracking resistance”.

**2.1196**
**transfer chamber**
**transfer pot**
heating chamber used in transfer moulding

**2.1197**
**transfer moulding**
process of moulding a thermosetting material by passing it from a heated pot into the cavity of a closed, heated mould

**2.1528**
**transfer tape**
carrier coated with a pressure-sensitive adhesive which, when detached from the substrate, permits the carrier to be removed, leaving only the adhesive

**2.1198**
**transfer-moulding pressure**
pressure applied to the cross-sectional area of the transfer chamber used in transfer moulding

**2.769**
**transitory flaming**
existence of flame on or over the surface of a material for a period of time longer than that of surface flash but shorter than that of sustained flaming

Note 1 to entry: The period of time is usually greater than 1 s and shorter than 10 s.

**2.1199**
**translucency**
property of a material by which a large portion of the transmitted light undergoes scattering, making it difficult or impossible to distinguish objects beyond the material

**2.770**
**transmittance**
<through smoke> ratio of the transmitted luminous flux to the incident luminous flux under specified conditions

Note 1 to entry: Transmittance is the reciprocal of the opacity of smoke.

Note 2 to entry: It is dimensionless.

**2.1200**
**transparency**
property of a material by which a negligible portion of the transmitted light undergoes scattering, thereby enabling objects to be distinguished clearly through the material

**2.1879**
**transparent plastic**
plastic in which the transmission of light is essentially regular and which has a high transmittance in the visible region of the spectrum

Note 1 to entry: Provided their geometrical shape is suitable, objects will be seen distinctly through plastic which is transparent in the visible region.

**2.1201**
**trimer**
oligomer composed of three units of a single species of monomer

Note 1 to entry: A trimer can be the product of oligomerization or of scission of a larger molecule.

**2.1202**
**triple-skin sheet**
**TSS**
sheet having three skins, two of which are external and one internal

Note 1 to entry: The internal skin is parallel to, and properly spaced by ribs from, the external ones.

**2.1880**
**true strain**
<tensile testing at high strain rates> incremental increase in the specimen gauge length divided by the gauge length at the time the increase is measured

**2.1203**
**true stress**
<tensile testing at high strain rates> applied force divided by the cross-sectional area of the specimen within the specimen gauge length at the time the force is measured

**2.1206**
**tubing**
<textile glass> tubular structure of glass yarns with a collapsed width greater than 100 mm

**2.1205**
**tubing**
<general> flexible tube

EXAMPLE Laboratory tubing to convey water and gases to equipment; tubing for medical applications.

**2.1207**
**tumble polishing**
**barrel polishing**
removal of flash and sharp edges from mouldings and improvement of finish by allowing the mouldings to tumble in a loosely packed condition in a rotating or vibrating container

**2.1208**
**turbidity**
apparent absorbance of incident radiation, attributable to scattering

**2.1535**
**two-part adhesive**
adhesive that consists of two separate reactive components that are mixed before use

**2.1533**
**two-way-stick adhesive**
**double-spread adhesive**
adhesive that is applied to both adherends

**2.772**
**type of failure**
<puncture testing> type of deformation behaviour of the material under test

Note 1 to entry: The type of failure can be any one of the following: yielding followed by deep drawing, YD, yielding followed by (at least partially) stable cracking, YS, yielding followed by unstable cracking, YU, or no yielding, NY.

**2.1434**
**type of failure**
<Charpy and Izod impact testing> type of deformation behaviour of the material under test

Note 1 to entry: The type of failure can be any one of the following: no break, N, partial break, P, hinge break, H, or complete break, C.

Note 2 to entry: In instrumented Charpy impact testing, the hinge break, H, and complete break, C, can be further subdivided into tough (t), brittle (b) and splintering (s) breaks. The deflection and the impact energy at maximum force are identical to the deflection and impact energy at break in the case of splintering failure and brittle failure, where unstable cracking takes place at the maximum impact force.

**2.1881**
**type of scratch behaviour**
<scratch testing> type of deformation behaviour of the material under test

Note 1 to entry: The type of failure can be any one of the following: ploughing, p, wedge formation, w, or cutting, c.

**2.1883**
**ultimate aerobic biodegradation**
<composting of plastics waste> breakdown of an organic compound by microorganisms in the presence of oxygen into carbon dioxide, water and mineral salts of any other elements present (mineralization) plus new biomass

**2.1404**
**ultimate stability failure**
<fire testing> change in a test element which is of sufficient magnitude to result in the rupture or collapse of the element after a very short period of time

**2.1374**
**ultra-high-molecular-weight polyethylene**
**PE-UHMW**
polyethylene with no measurable melt flow rate due to its very high molecular weight

**2.1209**
**ultrasonic welding**
pressure welding process in which the surfaces to be united are softened by heat produced by intramolecular vibratory motion at ultrasonic frequencies

**2.1210**
**undercure**
state of cure of a polymeric system when the curing conditions (e.g. time, temperature, radiation, amounts of curing additives) have been insufficient to produce a satisfactory cure

**2.1211**
**undercut**, noun
depression in the side wall of a mould cavity that necessitates deformation of the moulding or the use of special mould construction for ejection

**2.1212**
**unidirectional fabric**
fabric with a great number of yarns or rovings in one direction (usually the warp) and fewer and generally finer yarns in the other direction, resulting in a fabric much stronger in the first direction than in the other

Note 1 to entry: Examples are unidirectional woven fabric and unidirectional woven roving fabric.

**2.1085**
**unidirectional prepreg**
unidirectional structure, that has been impregnated with a thermosetting or thermoplastic resin system

**2.1213**
**uniform polymer**
**monodisperse polymer**
polymer composed of molecules which are uniform with respect to their relative molecular mass and constitution

**2.1216**
**unsaturated polyester**
**UP**
polyester characterized by carbon-carbon unsaturation in the polymer chain, which permits subsequent crosslinking with an unsaturated monomer or prepolymer

**2.1525**
**unsupported-film adhesive**
adhesive supplied in sheet, film or web form, without an incorporated carrier

**2.1047**
**untreated fibre**
fibre that has not been subjected to the process of surface treatment

**2.1217**
**upstroke press**
press in which the pressing device is situated below the moving table, pressure being applied by an upward movement of this device

**2.1219**
**urea plastic**
plastic based on amino resins, urea being present in the greatest amount by mass of the amines or amides involved in the polymerization

**2.1220**
**urethane plastic**
plastic based on polymers in which the repeated structural units in the chains are of the urethane type, or on copolymers in which urethane and other types of repeated structural unit are present in the chains

**2.1633**
**vacuum pressing**
<adhesives> application of pressure to an assembly by inserting the assembly into a flexible cover or bag from which the air is then evacuated

Note 1 to entry: This process enables uniform pressure to be applied to irregular surfaces.

**2.1222**
**vacuum snap-back thermoforming**
**snap-back thermoforming**
vacuum thermoforming process, particularly useful for very deep draws, in which a heated sheet is drawn into a concave shape by means of a vacuum, a male plug is lowered into the concavity, and the sheet is pulled rapidly upwards against the surface of the plug by means of a vacuum drawn through the plug

**2.1223**
**vacuum thermoforming**
thermoforming process in which a vacuum is used to form a heated sheet against the mould surface

**2.442**
**veil**
<textile glass> thin layer made from (continuous or chopped) glass filaments held together with a binder

Note 1 to entry: See also "surfacing mat".

Note 2 to entry: A veil is generally stiffer and often has a higher mass per unit area than a surfacing mat.

**2.1224**
**veneer**
thin wood sheeting used to make plywood or to serve as a decorative surface layer on a laminate

**2.1225**
**vent**
hole, slot or groove provided in a mould or machine to allow air and gas to escape during moulding, extrusion or forming

**2.1926**
**verification of an instrument**
<durometer hardness> all of the operations carried out in order to ensure compliance of a durometer with the requirements of the test method standard

**2.1483**
**verification of an instrument**
<general> proof, with the use of calibrated standards or standard reference materials, that the calibration of an instrument is acceptable

**2.1375**
**very-low-density polyethylene**
**PE-VLD**
polyethylene which has many short-chain branches, an insignificant number of long-chain branches and a density typically of 0,910 grams/cubic centimetre or less

**2.957**
**Vicat softening temperature**
temperature at which a specified indenting tip with a flat point penetrates 1 mm into a plastic test specimen, when the temperature of the specimen is raised in a specified rate from room temperature

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

**2.1227**
**vinyl acetate plastic**
plastic based on polymers of vinyl acetate or copolymers of vinyl acetate with other monomers, the vinyl acetate being in the greatest amount by mass

**2.1228**
**vinyl chloride plastic**
plastic based on polymers of vinyl chloride or copolymers of vinyl chloride with other monomers, the vinyl chloride being in the greatest amount by mass

**2.1229**
**vinyl resin**
resin made by polymerization of monomers containing the vinyl group

Note 1 to entry: In some countries, vinyl resin also is used for non-resinous vinyl polymers.

Note 2 to entry: The term "vinyl resin" is normally used for polymers based on vinyl chloride, vinyl acetate and the theoretical vinyl alcohol. Strict polymer science nomenclature would also include polymers, e.g. polystyrene, derived from other vinyl compounds.

**2.1230**
**vinylidene chloride plastic**
plastic based on polymers of vinylidene chloride or copolymers of vinylidene chloride with other monomers, the vinylidene chloride being in the greatest amount by mass

**2.1231**
**virgin plastic**
plastic material in the form of pellets, granules, powder, floc, etc., that has not been subjected to use or processing other than that required for its initial manufacture

**2.1232**
**viscoelasticity**
stress response of a material acting as though it were a combination of an elastic solid and a viscous fluid with flow dependent on time, temperature, load and rate of loading

**2.1237**
**visible fibre**
**fibre show**
fibre wetted incompletely with resin and hence appearing at the surface of a reinforced plastic

**2.1238**
**void**
<non-cellular plastics> enclosed cavity of an undefined shape, containing air or some other gas

Note 1 to entry: The term bubble refers to a more or less spherical void.

Note 2 to entry: In cable insulation, voids may contain water.

**2.1239**
**void**
<cellular plastics> cavity formed unintentionally in cellular plastics and substantially larger than the characteristic individual cells

**2.1889**
**volatile-solids content**
<composting of plastics waste> amount of solids obtained by subtracting the residue of a known volume of test material or compost after incineration at about 550 °C from the total dry solids of the same test sample

Note 1 to entry: The volatile-solids content is an indication of the amount of organic matter present.

**2.1240**
**volume expansion**
increase in the volume of a specimen under specified test conditions

**2.1241**
**volume resistance**
quotient of the direct voltage applied between two electrodes which are in contact with, or embedded in, two opposite sides of a specimen by that portion of the current flowing through the volume of the specimen, excluding current flowing along the surface

**2.1243**
**volumetric feeding**
<moulding> way of feeding in which the material being fed is controlled volumetrically

**2.1244**
**vulcanized fibre**
nearly homogeneous material consisting of hydrated cellulose and made by subjecting cellulose to a parchmentizing process

**2.1245**
**warp**, noun
**warping**
dimensional distortion of a plastic object after moulding or other fabrication, caused by non-uniform change of internal stress

**2.1710**
**waste**
any material or object which the holder discards, or intends to discard, or is required to discard

**2.1246**
**water absorption**
**moisture absorption**
amount of water absorbed by a material under specified test conditions

Note 1 to entry: The conditions may be immersion in water or exposure to a humid atmosphere. In the latter case, the process is also referred to as water vapour absorption.

**2.1473**
**water-borne adhesive**
**aqueous adhesive**
adhesive in which the solvent, or the continuous phase, is water

**2.1892**
**water-holding capacity**
mass of water which evaporates from a known mass of material saturated with water when the material is dried to constant mass at 105 °C, divided by the dry mass of the material

**2.1671**
**water-resistant**
**waterproof** (deprecated)
<adhesives> property of an adhesive bond enabling it to withstand prolonged contact with water whilst retaining adequate bond strength and other properties necessary for its intended purpose

Note 1 to entry: The term “waterproof” applied to an adhesive means that a continuous void-free film in the joint is impervious to the passage of water during a normal service life. Such adhesives are rare, and the use of the term “waterproof” is therefore deprecated.

**2.1893**
**waves**
<surface wear> regularly repeated form of surface change in the form of depressions or bulges

**2.1574**
**wax** (synthetic)
range of low-temperature-melting, low-molecular-mass solid aliphatic hydrocarbons

Note 1 to entry: Waxes are commonly used in hot-melt adhesives, mainly to lower cost and reduce viscosity. Properties affected by the waxes are blocking characteristics, softening point, bonding range and cohesive strength. Waxes are obtained as a by-product of either oil refining or polyethylene production. The waxes mainly used are paraffin wax and microcrystalline wax.

**2.1247**
**wear**, noun
<friction and wear> cumulative action all the deleterious mechanical influences encountered in use that tend to impair the serviceability of a material

**2.1026**
**web**
flat structure made with fibres laid with or without orientation and held together by appropriate means

**2.1895**
**wedge formation**
<scratch testing> scratch behaviour in which the scratch force and/or scratch-tip displacement oscillate, resulting in a corresponding increase in the actual distance travelled by the scratch tip during the test

Note 1 to entry: The surface of the scratch exhibits a continuous serrated or wedge-like pattern, and stick-slip occurs.

**2.1250**
**weight feeding**
<moulding> way of feeding in which the material being fed is controlled gravimetrically

**2.1251**
**weld line**
**knit line**
**weld mark**
mark on a moulded plastic formed by the union of two or more streams of plastic flowing together

**2.1252**
**welding**
process of uniting softened surfaces of materials, generally with the aid of heat

Note 1 to entry: In some countries, particularly Canada, the UK and the USA, the term “sealing” is used rather than “welding” for processes in which the surfaces of films are united by the application of heat and pressure as, for example, in the following terms: dielectric sealing, high-frequency sealing, RF sealing and ultrasonic sealing.

**2.1626**
**wet bonding**
formation of an adhesive bond where the adhesive coats applied still contain substantial amounts of volatile adhesive constituents when the coats are brought together

Note 1 to entry: The adhesives used are called “wet-bonding” or “wet-stick” adhesives.

**2.1253**
**wet strength**
<adhesives> strength of an adhesive joint determined immediately after removal from a liquid in which it has been immersed under specified conditions of time, temperature and pressure

Note 1 to entry: The term “wet strength” is commonly used alone to designate strength after immersion in water. In the case of some water-borne and latex adhesives, the term is also used to describe the bond strength when the adherends are brought together with the adhesive still in the wet state.

**2.1607**
**wettability**
ability of a liquid (such as an adhesive) to spread on a specific solid surface

Note 1 to entry: The extent to which a liquid wets a solid can be measured by the contact angle. When a liquid comes into contact with a solid surface, the liquid shows a typical edge shape. The contact angle is the angle between the tangent to the liquid at the solid-liquid-air contact point and the solid surface under the liquid. A low contact angle indicates a good potential for wetting of the solid.

**2.1254**
**whisker**
short, fibrous, single-crystal, inorganic reinforcing material

**2.1255**
**"white point" temperature**
<dispersions> limiting temperature below which an opaque mass, and above which a transparent film, is formed

**2.1405**
**wicking**
transmission of a fluid through or over a particulate or fibrous material by capillary action

**2.1257**
**window**
tiny, colourless, transparent area or speck in a sheet of coloured or opaque plastic, which looks like a hole when the sheet is held up to the light

**2.1259**
**woven roving**
fabric formed by weaving rovings

**2.1260**
**woven scrim**
woven open-mesh glass fabric in which both warp and weft yarns are spaced widely

**2.1261**
**xylenol resin**
resin of the phenolic type made by the polycondensation of a xylenol with an aldehyde or a ketone

**2.1027**
**yarn**
general term covering all specific types of textile structure, with or without twist, made of continuous or discontinuous filaments

Note 1 to entry: The term "yarn" is sometimes used as a synonym of the term "single yarn".

**2.1263**
**yield point**
<tensile and compression testing> first stress in a material, which can be less than the maximum attainable stress, at which an increase in strain occurs without an increase in stress

**2.1097**
**yield stress**
<adhesives> stress applied to an adhesively bonded joint at which permanent deformation occurs

**2.1264**
**Young's modulus**
**modulus of elasticity in tension**
<tensile testing> quotient of stress and strain (secant modulus) or the tangent to the stress-strain curve (tangent modulus)

**2.1899**
**Z twist or S twist**
twist in a product if, when it is held in a vertical position, the spirals or helices formed by the fibres or filaments around its axis incline in the same direction as the central portion of the letter Z or S, respectively

**2.1265**
**zone**
<of an extruder screw> that part of an extruder screw where the pitch is designed in such a way as to perform a specific function, e.g. feeding, compressing, venting, mixing, metering

# Bibliography

[1] ISO 75 (all parts), *Plastics — Determination of temperature of deflection under load*

[2] ISO 291, *Plastics — Standard atmospheres for conditioning and testing*

[3] ISO 294-1, *Plastics — Injection moulding of test specimens of thermoplastic materials — Part 1: General principles, and moulding of multipurpose and bar test specimens*

[4] ISO 294-2, *Plastics — Injection moulding of test specimens of thermoplastic materials — Part 2: Small tensile bars*

[5] ISO 294-3, *Plastics — Injection moulding of test specimens of thermoplastic materials — Part 3: Small plates*

[6] ISO 974, *Plastics — Determination of the brittleness temperature by impact*

[7] ISO 1139, *Textiles — Designation of yarns*

[8] ISO 4587, *Adhesives — Determination of tensile lap-shear strength of rigid-to-rigid bonded assemblies*

[9] ISO 6601:2002, *Plastics — Friction and wear by sliding — Identification of test parameters*

[10] ISO 13586:2000, *Plastics — Determination of fracture toughness (GIC and KIC) — Linear elastic fracture mechanics (LEFM) approach*

[11] ISO 14021, *Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling)*

[12] ISO 15850:2002, *Plastics — Determination of tension-tension fatigue crack propagation — Linear elastic fracture mechanics (LEFM) approach*

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