



SLOVENSKI STANDARD

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SIST EN 2243-2:1998
SIST EN 923:1999

Lepila – Izrazi in definicije

Adhesives - Terms and definitions

Klebstoffe - Benennungen und Definitionen

Adhésifs - Termes et définitions

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EUROPEAN STANDARD
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October 2005

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Supersedes EN 923:1998

English Version

Adhesives - Terms and definitions

Adhésifs - Termes et définitions

Klebstoffe - Benennungen und Definitionen

This European Standard was approved by CEN on 12 September 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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Contents	Page
Foreword	3
Introduction	4
1 Scope	5
2 Terms and definitions	5
2.1 Adhesives	5
2.2 Functional adhesive components.....	9
2.3 Chemical base products.....	12
2.4 Adhesive properties.....	20
2.5 Material and material treatment	24
2.6 Bonding	26
2.7 Bond properties	32
Annex A (informative) Adhesives	36
Annex B (informative) Adhesives joints	38

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Foreword

This European Standard (EN 923:2005) has been prepared by Technical Committee CEN/TC 193 “Adhesives”, the secretariat of which is held by AENOR.

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of an identical text or by endorsement, at the latest by April 2006, and conflicting national standards shall be withdrawn at the latest by April 2006.

This European Standard supersedes EN 923:1998.

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

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Introduction

This European Standard comprises terms peculiar to, or in general use in, the adhesive and adhesive processing industry.

The terms defined have been classified so that, as far as possible, related concepts (adhesives, functional adhesive components, chemical base products, adherents, adhesives properties, bonding, and bond properties) are grouped together. All definitions are numbered and an alphabetical index which includes all terms is provided at the end of this European Standard.

The numbering of the individual definitions is the same in all three versions (English, French and German) of this European Standard. Consequently this European Standard can be used as a dictionary, combined with one or both of the other versions as an aid for translation of terms into French or German, as a source of information about related concepts in the adhesive industry or to provide a term for a concept.

In order to find:

- a) the definition of a term; look up the term in the alphabetical index at the end of this European Standard. The index will refer to the number in this European Standard. The definition, the term and any synonyms appear by the number;
- b) information about related terms; look up the term in the alphabetical index to find its number in this European Standard. When the term has been located in this European Standard, the related concepts can be found in the same subdivision;
- c) the translation of a term into the French or German language; look up the number of this term in this European Standard and locate the translation of the term and the definition under the same number in the standard of the foreign version.

1 Scope

This European Standard defines terms used in the adhesive industry and terms relating to adhesives in those industries that use adhesives.

2 Terms and definitions

2.1 Adhesives

2.1.1

adhesive

non-metallic substance capable of joining materials by surface bonding (adhesion), and the bond possessing adequate internal strength (cohesion)

NOTE Many adhesives names refer to their main functional components;

— the physical nature of the adhesive.

Table A.1 lists main binders, temperature and mode of setting of these adhesives and the number of parts that have to be mixed before use. Some other names refer to

— the method of application, or

— mode of setting.

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Furthermore adhesives are named according to points of less significance:

— field of application (e.g. footwear adhesive, construction adhesive, packaging adhesive),

— material to bond (e.g. paper adhesive, wood adhesive, wall paper adhesive, rubber adhesive),

— place of application (e.g. in situ adhesive),

— speed of setting (e.g. instant adhesive),

— bond properties (e.g. structural adhesive),

— shape (e.g. powder adhesive, pearl glue, table glue for solid glue, adhesive film for shaped adhesive, or stick adhesive for stick shaped adhesives), or

— aspect (e.g. white glue).

2.1.2

water-borne adhesive; aqueous adhesive

adhesive in which the solvent, or the continuous phase is water

2.1.3

glue

aqueous adhesive specifically designed for bonding of wood and other porous substrates

NOTE A glue can be based on a natural product like protein or synthetic resins (UF, PF or PVAC, see 2.3.51, 2.3.52 and 2.3.30 respectively)

2.1.4

paste adhesive

adhesive of a non-stringy, highly viscous nature

EN 923:2005 (E)

NOTE Paste adhesives based on starch or cellulose ethers are usually applied for paper bonding (e.g. paper bags or wall paper), based on synthetic polymers for bonding floor coverings.

2.1.5**dispersion adhesive**

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

NOTE Dispersion adhesives containing an elastomer as polymer conventionally are often termed "latex".

2.1.6**emulsion adhesive**

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

2.1.7**solvent-borne adhesive; solution adhesive, solvent-based adhesive**

adhesive in which the binder is dissolved in a volatile organic solvent

NOTE In practice solvents used for solvent-borne adhesives have boiling points below 170 °C at 101,3 kPa and a vapour pressure greater than 50 Pa at 20 °C and, if flammable, a flash point below 55 °C.

2.1.8**solvent free adhesive**

adhesive that is substantially free from organic solvents (see 2.1.7)

NOTE "Substantially free" means that organic solvents have neither been added in the basic elements of an adhesive nor during its process of manufacture out of these basic elements. "Low solvent adhesives" contain at most 5 % of solvents based on total weight of the adhesive.

2.1.9**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

2.1.10**toughened adhesive**

adhesive which by virtue of its physical structure discourages propagation of cracks

NOTE The toughening can be achieved, for example, by the creation of a discrete elastomeric phase within the adhesive matrix.

2.1.11**spray adhesive**

adhesive that is projected in small particles by means of a pressure medium

2.1.12**gap-filling adhesive**

adhesive designed for filling wider gaps between uneven surfaces

NOTE For high strength load-bearing purposes, e.g. in the car industry, the adhesive will provide satisfactory bond strength in bond-lines 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 are used.

2.1.13**sealant**

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

NOTE The term "sealant" is also used for a material filling a void against the ingress or egress of a fluid under pressure.

2.1.14**film adhesive**

adhesive in film form, with or without a carrier

NOTE Film adhesives set usually by means of heat under pressure.

2.1.15**foaming adhesive**

adhesive designed to foam in situ, after application, in order to provide extensive gap-filling properties

2.1.16**unsupported film adhesive**

adhesive supplied in sheet, film or web, without an incorporated carrier

2.1.17**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 The carrier can be woven or non-woven material consisting of organic or inorganic fibres.

2.1.18**adhesive tape**

flexible backing or carrier coated with a pressure-sensitive, remoistable, or heat activatable adhesive

2.1.19**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

2.1.20

double coated adhesive tape; double sided adhesive tape
 tape where the adhesive is applied on both sides of the carrier

2.1.21**multiple-layer adhesive**

film adhesive, usually supported with a different adhesive composition on each side

NOTE Multiple-layer adhesives are designed to bond dissimilar materials.

2.1.22**encapsulated adhesive**

adhesive in which particles or droplets of the adhesive or an adhesive component are enclosed in a protective film (microcapsules) usually to prevent cross-linking until the film is destroyed by suitable means

2.1.23**one-way stick adhesive**

adhesive that is applied to only one of the adherends

2.1.24**separate application adhesive**

adhesive consisting of different components which are applied separately to adherends

NOTE Pressing together the components initiates a chemical reaction curing the bond-line.

2.1.25**two way stick adhesive, double spread adhesive**

adhesive that is applied to both adherends

EN 923:2005 (E)**2.1.26**

one part adhesive
adhesive ready for use

NOTE A one-part adhesive can require the addition of water or the presence of ambient moisture for setting.

2.1.27

two part adhesive
adhesive that consist of two separate reactive components that are mixed before use

2.1.28

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

2.1.29

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 "apparently dry" means that the adhesive coats are "dry to touch" at some stage in the evaporation of volatile constituents.

2.1.30

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

2.1.31

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

2.1.32

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 Heat-sealing adhesives are commonly used in the packaging industry.

2.1.33

solvent activated adhesive
adhesive pre-applied to an adherend that is rendered tacky immediately prior to use by the application of solvent

2.1.34

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 Pressure-sensitive adhesives are used among other things for the manufacture of pressure sensitive tapes.

2.1.35

cold setting adhesive (cold glue deprecated)
adhesive that sets without the application of heat

2.1.36

hot setting adhesive
adhesive that sets only with the application of heat

2.1.37**reaction adhesive, reactive adhesive**

adhesive that sets by a chemical reaction of its components and/or the action of external agents

2.1.38**cold curing adhesive**

adhesive that cures without the application of heat

2.1.39**hot curing adhesive**

adhesive that cures only with the application of heat

2.1.40**self curing adhesive**

adhesive that cures, after application, under specified conditions

2.1.41**anaerobic adhesive**

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

2.1.42**moisture curing adhesive**

adhesive that cures by reaction of water from the air or from an adherend

2.1.43**conductive adhesive**

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

2.1.44**adhesive batch**

quantity of a particular adhesive (or component of an adhesive) manufactured in a single location at a defined, limited time and under uniform conditions

NOTE "Lot" is a commonly used commercial term. A lot can consist of less or more than one batch.

2.2 Functional adhesive components**2.2.1****binder**

component of an adhesive that is primarily responsible for the adhesion and cohesion

2.2.2**monomer**

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

2.2.3**polymer**

substance composed of molecules characterized by the multiple repetition of one or more species of atoms or groups of atoms (constitutional units) linked to each other in amounts sufficient to provide a set of properties that do not markedly vary with the addition or removal of one or a few of the constitutional units

NOTE The nature of these constitutional units, their order and the average number per molecule influence the physical and mechanical properties of the polymer.

2.2.4**copolymer**

polymer derived from more than one species of monomer

EN 923:2005 (E)**2.2.5****elastomer**

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

2.2.6**resin**

solid, semi solid 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 In a broader sense, the term is used to designate any polymer that is basic material for plastics. Bitumen, pitches and waxes are excluded by convention.

NOTE 2 Some resins may be part of a reaction adhesive (see 2.1.37).

2.2.7**synthetic resin**

resin derived from a synthetic monomer

2.2.8**thermoplastic resin, thermoplast**

polymer or copolymer capable of being softened by heating and hardened by cooling

NOTE Softening and hardening are repeatable. 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.

2.2.9**thermosetting resin, thermoset**

monomer, polymer or copolymer, which when cured, changes into a substantially infusible and insoluble product

NOTE The setting of a thermosetting resin undergoes 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. The "B-stage" is converted to the final crosslinked, insoluble and infusible "C-stage" by application of heat and, usually, pressure.

2.2.10**crosslinking agent**

substance that causes, promotes or regulates the formation of intermolecular, covalent or ionic bonds between polymer chains resulting in a three dimensional molecular network

NOTE Crosslinking can occur either between polymer chains or by reaction of simple functional molecules (e.g. two part polyurethane or epoxy adhesives). Crosslinking can also be produced by radiation or oxidation. The terms "hardener" and "curing agent" are often used synonymously with crosslinking agent.

2.2.11**adhesion promotor; coupling agent**

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

2.2.12**accelerator**

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

2.2.13**catalyst**

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

2.2.14**inhibitor**

substance used in small proportions to suppress a chemical reaction

2.2.15**retarder**

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

2.2.16**antioxidant**

substance used to retard deterioration caused by oxidation

2.2.17**flexibilizer; internal plasticizer**

co-reactant which, when incorporated into a polymer confers improved flexibility and resilience to the polymer

NOTE A flexibilizer provides to the adhesive film a greater extension at break, a lower modulus and a lower temperature at which it becomes brittle. A flexibilizer is not extractable and will not migrate from the adhesive film.

2.2.18**plasticizer; external plasticizer**

non-reactive substance incorporated into an adhesive to improve flexibility and resilience of its bond.

NOTE A plasticizer provides to the adhesive film a greater extension at break, a lower modulus and a lower temperature at which it becomes brittle. A plasticizer can be soluble and can migrate from the adhesive film.

2.2.19**solvent**

liquid or mixture of liquids that are used in the manufacture of adhesives to dissolve or to dilute the binder without chemical change

NOTE Solvents are used to control the consistency and character of the adhesive and can regulate application properties.

2.2.20**diluent (thinner, deprecated)**

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

2.2.21**reactive diluent**

low-viscosity liquid added to a high-viscosity solvent-free adhesive which reacts chemically with the adhesive during setting

NOTE A reactive diluent is usually mono-functional and reduces the viscosity of the adhesive with acceptable changes in other properties.

2.2.22**filler**

relatively inert solid material added to a plastic or an adhesive to modify strength, permanence, working properties or other quality

NOTE 1 Two classes of fillers 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 A filler only used to reduce cost is termed "extender". An extender can be a liquid.

EN 923:2005 (E)**2.2.23****matrix**

part of an adhesive that surrounds or engulfs embedded filler or reinforcing particles and filaments

2.2.24**modifier**

ingredient which, when added to an adhesive, changes its properties

NOTE The term modifier includes fillers, diluents, plasticizers and tackifiers.

2.2.25**stabilizer**

substance used in the formulation of some plastics or adhesives to assist in maintaining the properties of the material or of the adhesive and its bonds at or near their initial values during storage and processing and under service conditions

NOTE Special stabilizers are used to prevent or slow down undesirable effects such as coagulation, excessive reactivity, absorption by adherends or destruction of adherends.

2.2.26**emulsifier; emulsifying agent; dispersant**

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

2.2.27**tackifier**

substance intended to enhance the tack or the tack range of an adhesive coat

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2.3 Chemical base products**2.3.1****soluble silicate**

silicate obtained by melting a purified silica with an alkali salt

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2.3.2**hydraulic cement**

inorganic adhesive material that sets and hardens by chemical interaction with water and that is capable of doing so under water

NOTE 1 Hydraulic cements set chemically by "hydration" thus forming compounds with strength-producing properties. There are several types of hydraulic cements:

- "Portland cement", produced by pulverizing partially fused "clinker" consisting primarily of hydrated calcium silicates, and usually containing calcium sulfate in any hydration state (anhydrite, gypsum, hemihydrate);
- "natural cement", produced by calcining a naturally occurring argillaceous limestone at a temperature below the sintering point and then grinding to a fine powder;
- "slag cement", consisting mostly of an intimate and uniform blend of granulated blast-furnace slag and hydrated lime in which the slag constituent is more than a specified minimum percentage. Blast-furnace slag is the non-metallic product consisting essentially of silicates and aluminosilicates of calcium and other bases that is developed in a molten condition simultaneously with iron in a blast furnace;
- "Portland-Pozzolan cement", consisting of an intimate and uniform blend of Portland cement or Portland blast-furnace slag cement and fine pozzolan, in which the amount of the pozzolan constituent is within specified limits. Pozzolan is a siliceous and aluminous material which in itself possesses little or no cementitious value but which will, in finely divided form and in the presence of moisture, chemically react with calcium hydroxide at ordinary temperatures to form compounds possessing cementitious properties.

NOTE 2 "Concrete" is composite material that consists essentially of a binder (e.g. hydrated cement and water) within which are embedded particles of fragments or aggregates.

NOTE 3 The term "cement" is also used as a synonym for organic adhesives but its use is strongly deprecated.

2.3.3

protein

natural product having the repeating linkage -NH-CO-

NOTE Some examples are:

- Soya bean protein is obtained from soya bean seeds. When 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. When compounded with other reactants it is used as an adhesive for 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 is predominantly used for bonding of wood and other porous substrates.

2.3.4

starch

vegetable carbohydrate occurring in the granular form in certain plants and corresponding to a polymer composed almost exclusively of anhydroalpha-D-glucose groups

2.3.5

starch ether

modified starch in which the hydroxyl groups of the starch have been totally or partially etherified

2.3.6

starch ester

modified starch in which the hydroxyl groups of the starch have been totally or partially esterified

2.3.7

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 Dextrin is used in certain water-borne adhesives.

2.3.8

cellulose esters

products of esterification of certain of the hydroxyl groups of the cellulose macromolecule with organic or mineral acids

NOTE Examples of cellulose esters are cellulose acetate, cellulose acetobutyrate, cellulose acetopropionate, cellulose nitrate. Cellulose esters are soluble in organic solvents such as esters or ketones, and thus form the basis of some solvent-borne adhesives.

2.3.9

cellulose ethers

products of etherification of certain of the hydroxyl groups of the cellulose macromolecule

NOTE Examples of cellulose ethers are carboxymethyl cellulose, methyl cellulose, hydroxyethyl- and hydroxypropyl cellulose. Cellulose ethers are soluble in, or solubilized by water and simple alcohols and find use as the basis of water soluble adhesives for paper and as thickening agents in water-borne adhesives.