SLOVENSKI STANDARD
oSIST prEN 16254:2022

01-marec-2022

Lepila - Emulzijsko polimerizirani izocianat (EPI) za nosilne lesene konstrukcije - Razvrstitev in zahtevane lastnosti

Adhesives - Emulsion polymerized isocyanate (EPI) for load-bearing timber structures - Classification and performance requirements

Klebstoffe - Emulsionspolymerisiertes Isocyanat (EPI) für tragende Holzbauteile - Klassifizierung und Leistungsanforderungen

Adhésifs - Isocyanate polymérisé en émulsion (EPI) pour structures portantes en bois - Classification et exigences de performance

Ta slovenski standard je istoveten z: **prEN 16254**

ICS:

83.180	Lepila	Adhesives
91.080.20	Lesene konstrukcije	Timber structures

oSIST prEN 16254:2022 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 16254

December 2021

ICS 83.180

Will supersede EN 16254:2013+A1:2016

English Version

Adhesives - Emulsion polymerized isocyanate (EPI) for load-bearing timber structures - Classification and performance requirements

Adhésifs - Isocyanate polymérisé en émulsion (EPI) pour structures portantes en bois - Classification et exigences de performance

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 193.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 16254:2021) has been prepared by Technical Committee CEN/TC 193 “Adhesives”, the secretariat of which is held by UNE.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 16254:2013+A1:2016.

Compared to EN 16254:2013+A1:2016, the following main changes have been made:

a) designation of adhesive types modified and aligned with EN 301 and EN 15425;

b) reference to EN 15426-2 replaced by reference to EN 302-8;

c) for the delamination test according to EN 302-2 with preservative treated wood a test with Scots pine (*Pinus sylvestris*) and Silver fir (*Abieas alba*) covers also Norway spruce (*Picea abies* L.);

d) for adhesive type FJ the test according to EN 302-2 is required only with short closed assembly time, and the test according to EN 15416-5 is only required with thin glue line;

e) Annex A on storage treatments for tests according to EN 302-1 deleted and replaced by reference to EN 302-1, the storage time for the temperature treatment (A6, A7, A8) are therefore reduced from 72 h to 24 h;

f) for bonding of finger joints in additional wood species the test according to EN 302-2 may be replaced by the delamination test on finger-joints from EN 301 which is specified as new Annex A.

Introduction

This document is one of a series dealing with emulsion polymerized isocyanate (EPI) adhesives for use with timber structures, and is published in support of product standards for bonded load-bearing timber structures.

The series consists of:

— one standard for classification and performance requirements (EN 16254);

— eight test methods (EN 302-1, EN 302-2, EN 302-3, EN 302-4, EN 302-8, EN 15416-1, EN 15416-3 and the test method given in Annex A of this document ("finger-joint delamination test") used to assess the performance of adhesives after specified heat and humidity treatments; and

— three test methods (EN 302-7, EN 15416-4 and EN 15416-5) to characterize the working properties of the adhesive.

1 Scope

This document establishes a classification for emulsion polymerized isocyanate (EPI) adhesives according to their suitability for use in load-bearing timber products in defined climatic exposure conditions, and specifies performance requirements for such adhesives for the industrial manufacture of load-bearing timber products only.

The performance requirements of this document apply to the adhesives only, not to the timber products. This document does not cover the performance of adhesives for on-site gluing (except for factory-like conditions) nor the production of wood-based panels, except solid wood panels, or modified and stabilized wood with considerably reduced swelling and shrinkage properties, e.g. such as acetylated wood, heat treated wood and polymer impregnated wood.

This document is primarily intended for the use of adhesive manufacturers and for the use in timber products bonded with adhesives, to assess or control the quality of adhesives. This document only specifies the performance of an adhesive for use in an environment corresponding to the defined conditions.

Such an adhesive meeting the requirements of this document for its type is adequate for use in load-bearing timber products, provided that the bonding process has been carried out according to an appropriate product standard.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 302-1, *Adhesives for load-bearing timber structures - Test methods - Part 1: Determination of longitudinal tensile shear strength*

EN 302-2, *Adhesives for load-bearing timber structures - Test methods - Part 2: Determination of resistance to delamination*

EN 302-3, *Adhesives for load-bearing timber structures - Test methods - Part 3: Determination of the effect of acid damage to wood fibres by temperature and humidity cycling on the transverse tensile strength*

EN 302-4, *Adhesives for load-bearing timber structures - Test methods - Part 4: Determination of the effects of wood shrinkage on the shear strength*

EN 302-7, *Adhesives for load-bearing timber structures - Test methods - Part 7: Determination of the working life under referenced conditions*

EN 302-8, *Adhesives for load-bearing timber structures - Test methods - Part 8: Static load test of multiple bond line specimens in compression shear*

EN 923:2015, *Adhesives - Terms and definitions*

EN 13183-2, *Moisture content of a piece of sawn timber - Part 2: Estimation by electrical resistance method*

EN 13183-3, *Moisture content of a piece of sawn timber - Part 3: Estimation by capacitance method*

EN 14080, *Timber structures - Glued laminated timber and glued solid timber - Requirements*

EN 15416-1, *Adhesives for load bearing timber structures other than phenolic and aminoplastic - Test methods - Part 1: Long-term tension load test perpendicular to the bond line at varying climate conditions with specimens perpendicular to the glue line (Glass house test)*

EN 15416-3, *Adhesives for load bearing timber structures other than phenolic and aminoplastic - Test methods - Part 3: Creep deformation test at cyclic climate conditions with specimens loaded in bending shear*

EN 15416-4, *Adhesives for load bearing timber structures other than phenolic and aminoplastic - Test methods - Part 4: Determination of open assembly time under referenced conditions*

EN 15416-5, *Adhesives for load bearing timber structures other than phenolic and aminoplastic - Test methods - Part 5: Determination of minimum pressing time under referenced conditions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 923:2015 and the following apply.

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

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
emulsion polymerised isocyanate (EPI) adhesive
water based emulsion polymer or a mixture of water based emulsion polymers cross-linked with an isocyanate as hardener

3.2
service class 1
climatic conditions characterised by a moisture content in the materials corresponding to a temperature of 20 °C and the relative humidity of the surrounding air only exceeding 65 % for a few weeks per year

[SOURCE: EN 1995-1-1:2004, 2.3.1.3 modified – Indoor conditions added in Note 1 to entry]

Note 1 to entry: In service class 1, which comprises typical indoor conditions, the average moisture content in most soft-woods will not exceed 12 %.

3.3
service class 2
climatic conditions characterized by a moisture content in the materials corresponding to a temperature of 20 °C and the relative humidity of the surrounding air only exceeding 85 % for a few weeks per year

Note 1 to entry: In service class 2, to which most covered exterior conditions belong, the average moisture content in most softwoods will not exceed 20 %.

[SOURCE: EN 1995-1-1:2004, 2.3.1.3, modified – Covered exterior conditions added in Note 1 to entry]

3.4
service class 3
climatic conditions leading to higher moisture contents than in service class 2

Note 1 to entry: Exterior conditions typically belong to service class 3.

[SOURCE: EN 1995-1-1:2004, 2.3.1.3, modified – Note 1 to entry has been added]

3.5
glue line
adhesive layer between the wood members

3.6
close contact glue line (cc)
glue line of thickness maximum 0,1 mm

Note 1 to entry: Close contact glue line can be achieved by pressing together two plane wood members with a clamping pressure of (0,8 ± 0,1) N/mm² without groves, spacers or similar device.

3.7
thick glue line
glue line of nominal thickness in the range of 0,2 mm to 0,5 mm in the test

Note 1 to entry: Thick glue lines can be achieved by using spacers, grooves or similar devices with a thickness of 0,2 mm to 0,5 mm when two plain members are glued together.

4 Classification

Adhesives for structural purpose shall produce joints of such strength and durability that the integrity of the bond is maintained in the assigned service class throughout the expected life of the structure.

EPI-adhesives according to prEN 16254 are classified by Type (climate condition in use), Maximum test temperature and Maximum glue line thickness in use. These three subclasses are subdivided as follows:

Type I: to be used in service class 1 and 2.

Type II: to be used in service class 1 only.

Maximum test temperature: 50 °C, 70 °C or 90 °C.

Maximum glue line thickness in use: 0,1 mm, 0,2 mm and 0,3 mm.

Depending on the maximum glue line thickness in use, the adhesives are assigned to different application areas as described below and shown in Table 1.

— General purpose adhesives (GP): to be used for bond lines between laminations (maximum glue line thickness 0,3 mm) and for finger-joints in laminations.

— Small dimension adhesives (SD): to be used in beams with a maximum cross section 45 000 mm² (maximum glue line thickness 0,2 mm) and for finger-joints in laminations. The beam width shall not exceed 180 mm and the beam height shall not exceed 300 mm.

— Finger-jointing adhesives (FJ): to be used for finger-jointing of laminations and structural timber only (maximum glue line thickness 0,1 mm).

The application of EPI shall always be in mixed state. These adhesives shall be applied according to the manufacturer's instructions.

NOTE The definition of "General purpose" and "Type" could be different in other standards.

Each area of application and use shall be given in the designation code of the adhesive.

Adhesives tested for working properties according to Clause 7 are specified by the letter “w” at the end of the designation code (example: EN 16254 I 90 GP 0,3 w).

Table 1 — Adhesive classes

Adhesive type designation	Application area	Max. test temperature [a] °C	Max. glue line thickness mm		Service classes
EN 16254 I 70 GP 0,3	**Normal use General purpose**	**70**	**Test 0,5**	**Use 0,3**	**1, 2**
	Special use				
EN 16254 I 90 GP 0,3	General purpose	90	0,5	0,3	1, 2
EN 16254 I 90 SD 0,2	Small dimension	90	0,3	0,2	1, 2
EN 16254 I 90 FJ 0,1	Finger-jointing	90	0,3	0,1	1, 2
EN 16254 I 70 SD 0,2	Small dimension	70	0,3	0,2	1, 2
EN 16254 I 70 FJ 0,1	Finger-jointing	70	0,3	0,1	1, 2
EN 16254 II 50 GP 0,3	General purpose	50	0,5	0,3	1
EN 16254 II 50 SD 0,2	Small dimension	50	0,3	0,2	1
EN 16254 II 50 JF 0,1	Finger-jointing	50	0,3	0,1	1

[a] Tested according to EN 302-8 and EN 302-1 in this standard, designation A6, A7 and A8.

A classification to a certain "maximum test temperature" will automatically be valid for lower temperatures.

Table 2 specifies the tests which shall be performed for each application area. References are given to the actual subclause in this standard and to which standard the tests are based on.