BS EN 16254:2023

BSI Standards Publication

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

Documents
Document Sharing Hub

Full document details: BS EN 16254:2023

National foreword

This British Standard is the UK implementation of EN 16254:2023. It supersedes BS EN 16254:2013+A1:2016, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/52, Adhesives.

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

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

© The British Standards Institution 2023
Published by BSI Standards Limited 2023

ISBN 978 0 539 19411 1

ICS 83.180

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 28 February 2023.

Amendments/corrigenda issued since publication

Date	Text affected

AVA Documents
Document Sharing Hub

Full document details: BS EN 16254:2023

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16254

February 2023

ICS 83.180

Supersedes EN 16254:2013+A1:2016

English Version

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

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

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

This European Standard was approved by CEN on 18 December 2022.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

© 2023 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN 16254:2023 E

Documents
Document Sharing Hub

Full document details: BS EN 16254:2023

Contents

Page

European foreword 4
Introduction 5
1 Scope 6
2 Normative references 6
3 Terms and definitions 7
4 Classification 8
5 Requirements 10
5.1 General 10
5.2 Bond strength in longitudinal tensile shear test 10
5.3 Resistance to delamination 11
5.4 Tensile strength perpendicular to the bond line after climatic treatment (acid damage test) 12
5.5 Effect of wood shrinkage on the shear strength 12
5.6 Static load test of multiple bond line specimens in compression shear 12
5.7 Creep deformation test at cyclic climate conditions with specimens loaded in bending shear 13
5.8 Long term sustained load test at cyclic climate conditions with specimens loaded perpendicular to the bond line ("Glass house test") 13
5.9 Delamination test on finger-jointed test pieces 13
6 Test methods 13
6.1 General 13
6.2 Determination of bond strength in longitudinal tensile shear test 13
6.3 Determination of resistance to delamination 13
6.4 Determination of tensile strength perpendicular to the bond line after climatic treatment (acid damage test) 13
6.5 Determination of the effect of wood shrinkage on the shear strength 13
6.6 Static load test of multiple bond line specimens in compression shear 14
6.7 Creep deformation test with specimens loaded in bending shear 14
6.8 Long term sustained load test at cyclic climate conditions with specimens loaded perpendicular to the bond line ("Glass house test") 14
6.9 Delamination test on finger-jointed test pieces 14
7 Working properties of the adhesive 14
7.1 General 14
7.2 Determination of working life under reference conditions 14
7.3 Determination of open assembly time under reference conditions 15
7.4 Determination of pressing time under reference conditions 15
8 Marking and labelling 15
Annex A (normative) Delamination test for bonding of finger-joints 16
A.1 Production of the specimens 16
A.2 Testing 17
A.3 Expression of results 17
A.4 Test report 18

Documents
Document Sharing Hub
Full document details: BS EN 16254:2023

A.4.1 Adhesive **18**
A.4.2 Preparation of test pieces and testing procedure **18**
A.4.3 Test results **18**
Annex B (informative) **Product limitations and glulam production control for beams produced with Small dimension adhesives** **19**
B.1 Product limitations **19**
B.2 Control of the glue line thickness **19**
Bibliography **20**

Documents
Document Sharing Hub
Full document details: BS EN 16254:2023

European foreword

This document (EN 16254:2023) has been prepared by Technical Committee CEN/TC 193 “Adhesives”, the secretariat of which is held by UNE.

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 2023, and conflicting national standards shall be withdrawn at the latest by August 2023.

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

This document supersedes EN 16254:2013+A1:2016.

EN 16254:2023 includes the following significant technical changes with respect to EN 16254:2013+A1:2016:

a) the title has been changed;

b) the designation of adhesive types has been modified and aligned with EN 301 and EN 15425;

c) the reference to EN 15416-2 has been replaced by reference to EN 302-8;

d) 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.);

e) 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;

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

g) 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.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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

Documents
Document Sharing Hub
Full document details: BS EN 16254:2023

Introduction

This document is one of a series dealing with emulsion polymer isocyanate (EPI) adhesives for use with timber structures, and is published in support of product standards for bonded load-bearing timber structures in connection with EN 1995-1-1, *Eurocode 5: Design of timber structures — Part 1-1: General — Common rules and rules for buildings*.

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.

Safety statement

Persons using this document should be familiar with the normal laboratory practice, if applicable. This document cannot address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any regulatory conditions.

Environmental statement

It is understood that some of the material permitted in this document may have negative environmental impact. As technological advantages lead to better alternatives for these materials, they will be eliminated from this European Standard to the extent possible.

At the end of the test, it is recommended that the users of this document take care to carry out an appropriate disposal of the wastes, according to local regulations.

Documents
Document Sharing Hub
Full document details: BS EN 16254:2023

1 Scope

This document establishes a classification for emulsion polymer 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 are applicable 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) or the production of wood-based panels, except solid wood panels, or modified and stabilized wood with considerably reduced swelling and shrinkage properties, e.g. acetylated wood, heat treated wood and polymer impregnated wood.

This document is primarily intended for use by adhesive manufacturers and for 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, *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*

Documents
Document Sharing Hub
Full document details: BS EN 16254:2023