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Classification of wood adhesives for non-structural timber products for exterior use

Klassifizierung von Holzklebstoffen für nicht tragende Holzprodukte zur Verwendung im Außenbereich

Classification des colles à bois pour les produits en bois non structuraux utilisés à l'extérieur

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Klassifizierung von Holzklebstoffen für nicht tragende Holzprodukte zur Verwendung im Außenbereich

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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 17619:2020) 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.

Introduction

European Standards giving a common classification with respect to durability classes for wood adhesives for exterior uses will allow considerable improvement in consumer protection in any future product liability system with regard to properties guaranteed by the adhesive manufacturer.

1 Scope

This document establishes a classification of wood adhesives for non-structural applications for exterior use without protection by an adequate surface coating.

This document specifies performance requirements and durability classes of such adhesives for use in an environment corresponding to the defined conditions.

The performance requirements of this document apply to the adhesive only, not to wooden products.

This document is primarily intended to assess the performance of adhesives. The requirements apply to the type testing of the adhesives. Production control activities are outside the scope of this document.

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 204:2016, *Classification of thermoplastic wood adhesives for non-structural applications*

EN 205, *Adhesives - Wood adhesives for non-structural applications - Determination of tensile shear strength of lap joints*

EN 923, *Adhesives - Terms and definitions*

EN 12765:2016, *Classification of thermosetting wood adhesives for non-structural applications*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 923, EN 205 apply.

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

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

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

4 Classification

The adhesive classified for non-structural applications for exterior use according to this document shall have a minimum durability class of D4 as specified in EN 204:2016 or C4 as specified in EN 12765:2016.

An adhesive shall be classified in accordance with Table 1, which gives examples of climatic conditions and fields of application in which the bonded member is to be used. The classification shall be based on tests on thin bond-lines as defined in EN 205.

Table 1 — Description of durability classes

Durability class	Examples of climatic conditions and fields of application
XT5	Exterior application with rare exposure to direct weathering, in which the glued wooden product is covered by constructive protection from the weather. (e.g.: wooden products behind cladding and products completely protected by roofs, coverings, canopy or open sheds, etc).
XT6	Exterior application with occasional but not persistent exposure to direct weathering, in which the glued wooden product is partially covered by constructive protection.
XT7	Exterior application with frequent exposure to direct weathering, in which the glued wooden product is not covered by constructive protection and not in contact with the ground (e.g.: decking, outdoor playground equipment and urban furniture, etc)

5 Test method

The adhesive shall be tested in accordance with EN 205 and as follows:

a) the tests shall be performed using the conditioning sequences given in Table 2;

b) for all the adhesive types the tensile shear test shall be carried out at a rate of traverse of approximately 6 mm/min;

c) the individual strength values τ in N/mm² rounded to 0,1 N/mm² and the mean value of the 20 test pieces for each conditioning sequence shall be recorded.

Test pieces that are twisted, bent or showing other irregularities in form are valid if they reach the requirements; otherwise, or if visual examination shows that the adhesive was not correctly applied, the results are invalid.

Results from tests in which failure occurred in the wood only at values below the specified minimum requirement are invalid. In case of more than 10 invalid results, the test shall be repeated.

All results valid or invalid with explanation of the invalid values, shall be reported.

6 Requirements

The adhesives shall fulfil the values shown in Table 2.

Table 2 — Minimum values of adhesives strength for thin bond-lines

Conditioning sequences		Adhesive strength in N/mm^2 Durability classes		
Sequence number	**Duration and condition**	XT5[c]	XT6[c]	XT7[c]
1	7 days[a] in standard atmosphere[b] 24 h in boiling water 1 h in water at (20 ± 5) °C	≥ 3	≥ 5	≥ 6
2	7 days in standard atmosphere 1 h in oven at (110 ± 2) °C	≥ 4	≥ 8	≥ 10
In each conditioning sequence, specimens shall change from one step to another immediately (not gradually). - For the conditioning sequence 1 the specimens shall be tested in wet state after removing them from cold water. - For the conditioning sequence 2 the time between removal of the test piece from the ventilated oven and the start of the test (beginning of the application of the load) shall be (9 ± 1) s. NOTE 1 The 7 days in standard atmosphere (see "Duration and condition") correspond to the conditioning time in EN 205 NOTE 2 A longer conditioning time between gluing and testing might be necessary as advised by the adhesive manufacturer.				
a 1 day = 24 h. b (20 ± 2) °C and (65 ± 5) % relative humidity or (23 ± 2) °C and (50 ± 5) % relative humidity. c All minimum values for both sequence numbers indicated in the columns of durability classes XT5 to XT7 shall be reached as mean values for the classification of an adhesive.				

7 Test report

The following items shall be reported:

a) Data about the adhesive:

1) type and origin of the adhesive;

2) batch number or other marking of uniquely identifying the adhesive used;

3) number of components and working methods (procedure of preparing and applying of adhesive);

4) indication of durability class D4 according to EN 204:2016 or C4 according to EN 12765:2016 (for information only)

b) Preparation of the test pieces and testing

1) Species of wood with botanical name;

2) Moisture content of wood relative to oven-dry mass;

3) Characteristics data relating to the bonding procedure (for instance information about the amount of adhesive applied, the open and closed assembly time, pressing pressure, pressing temperature, pressing time);

4) Special treatment of the surface of the boards to be bonded;

5) Time between the termination of pressing and the cutting of the test pieces;

6) Number of bonded test pieces;

7) Rate of traverse;

c) Test results and data about the durability class:

1) Strength τ in N/mm^2 of 20 test pieces rounded to 0,1 N/mm^2.

2) Indication of the estimated portion of wood failure as a percentage graded as follows: 0 %, 25 %, 50 %, 75 %, 100 % breakage of wood (mean value of all test pieces);

3) Description of further peculiarities of the appearance of the break;

4) If necessary, deviations from this document;

5) Indication of durability class: XT5, XT6 or XT7;

6) Date of issue of the report.

Results from tests in which failure occurred in the wood at values below the specified minimum are invalid. Test pieces that are twisted, bent or showing other irregularities in form are valid if they reach the requirements; otherwise, or if visual examination shows that the adhesive was not correctly applied, the results are invalid. All results valid or invalid with explanation of the invalid values, shall be reported.