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Member of EOTA
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European Technical Assessment

ETA-20/0023 of 16.09.2026

General part

Technical Assessment Body issuing the European Technical Assessment	Österreichisches Institut für Bautechnik (OIB) Austrian Institute of Construction Engineering
Trade name of the construction product	Pfeifer CLT Brettsperrholz
Product family to which the construction product belongs	Solid wood slab elements to be used as structural elements in buildings
Manufacturer	Pfeifer Timber GmbH Mühlenstraße 7 86556 Unterbernbach GERMANY
Manufacturing plant	Pfeifer Holz Schlitz GmbH & Co KG Bahnhofstraße 63 36110 Schlitz GERMANY
This European Technical Assessment contains	18 pages including 4 annexes which form an integral part of this assessment.
This European Technical Assessment is issued in accordance with Article 95(4) of Regulation (EU) 2024/3110, on the basis of	European Assessment Document (EAD) 130005-00-0304 “Solid wood slab element to be used as a structural element in buildings”.
This European Technical Assessment replaces	European Technical Assessment ETA-20/0023 of 16.10.2025.

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

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Specific parts

1 Technical description of the product

1.1 General

This European Technical Assessment (ETA)[1] applies to the cross laminated timber "Pfeifer CLT Brettsperrholz". Pfeifer CLT Brettsperrholz is made of softwood boards which are bonded together in order to form cross laminated timber (solid wood slab elements). Generally, adjacent layers of the softwood boards are arranged perpendicular (angle of 90°) to each other, see Annex 1, Figure 1.

The principle structure of the cross laminated timber is shown in Annex 1, Figure 1 and Figure 2. Surfaces of the boards are planed.

The solid wood slab elements consist of at least three and up to fifteen adjacent layers which are arranged perpendicular to each other. With regard to the thickness of the solid wood slab element, thickness and orientation of individual layers are symmetrically assembled.

A maximum of three adjacent layers may be arranged in the same direction as long as a symmetric cross-section with cross-layering remains and their all over thickness does not exceed 90 mm.

Single board layers (maximum 50 % of the cross section) may be replaced by one- and multilayer wood-based panels. The solid wood panels shall be suitable for structural use.

The surfaces of the solid wood slabs may be covered with additional layers without load bearing function. This panels are not part of this European Technical Assessment.

Pfeifer CLT Brettsperrholz and the boards for its manufacturing correspond to the specifications given in the Annexes 1 and 2. The material characteristics, dimensions and tolerances of Pfeifer CLT Brettsperrholz, not indicated in these Annexes, are given in the technical file[2] of the European Technical Assessment.

The application of wood preservatives and flame retardants is not subject of the European Technical Assessment.

1.2 Components

1.2.1 Boards

The specification of the boards is given in Annex 2, Table 2. Boards are visually or machine strength graded. Only technically dried wood shall be used.

Wood species is Norway spruce (*Picea abies (L.) Karst.*), Scots pine (*Pinus sylvestris L.*) or equivalent softwood. Wood species may be mixed.

1.2.2 Wood-based panels

Wood-based panels are in accordance with EN 13986[3] or a European Technical Assessment.

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1 In 2020 ETA-20/0023 was firstly issued as European Technical Assessment ETA-20/0023 of 27.01.2020, 2023 amended to ETA-20/0023 of 04.08.2023, 2025 amended to ETA-20/0023 of 16.10.2025 and 2026 amended to ETA-20/0023 of 16.09.2026.

2 The technical file of the European Technical Assessment is deposited at Österreichisches Institut für Bautechnik and, in so far as is relevant to the tasks of the notified product certification body involved in the assessment and verification of constancy of performance procedure, is handed over to the notified product certification body.

3 EN 13986:2004+A1:2015

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1.2.3 Adhesive

The adhesive for bonding of the cross laminated timber and the finger joints of the individual boards shall conform to EN 301[4] or EN 15425[5].

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (thereafter EAD)

2.1 Intended use

The solid wood slab is intended to be used as a structural or non-structural element in buildings and timber structures.

The solid wood slab shall be subjected to static and quasi-static actions only.

The solid wood slab is intended to be used in service classes 1 and 2 according to EN 1995-1-1[6]. Members which are directly exposed to the weather shall be provided with an effective protection for the solid wood slab element in service.

2.2 General assumptions

The solid wood slab elements are manufactured in accordance with the provisions of the European Technical Assessment using the manufacturing process as identified in the inspection of the manufacturing plant by Österreichisches Institut für Bautechnik and laid down in the technical file.

The manufacturer shall ensure that the requirements in accordance with the Clauses 1, 2 and 3 as well as with the Annexes of the European Technical Assessment are made known to those who are concerned with design and execution of the works.

Layers of planed boards shall be bonded together to the required thickness of the cross laminated timber. The individual boards shall be jointed in longitudinal direction by means of finger joints according to EN 14080[7], there shall be no butt joints.

Adhesive shall be applied on one face of each board. The edges of the boards need not to be bonded.

Design

The European Technical Assessment only applies to the manufacture and use of cross laminated timber. Verification of stability of the works including application of loads on the cross laminated timber is not subject to the European Technical Assessment.

The following conditions shall be observed:

- Design of cross laminated timber members is carried out under the responsibility of an engineer experienced in such products.
- Design of the works shall account for the protection of the cross laminated timber.
- The cross laminated timber members are installed correctly.

Design of cross laminated timber members elements may be according to EN 1995-1-1 and EN 1995-1-2[8], taking into account of Annexes 2 to 4 of the European Technical Assessment.

Standards and regulations in force at the place of use shall be considered.

[4] EN 301:2023
[5] EN 15425:2023
[6] EN 1995-1-1:2004 +AC:2006 +A1:2008 +A2:2014
[7] EN 14080:2013
[8] EN 1995-1-2:2004 + AC:2006 + AC:2009 resp. EN 1995-1-2:2025

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Packaging, transport, storage, maintenance, replacement and repair

Concerning product packaging, transport, storage, maintenance, replacement and repair it is the responsibility of the manufacturer to undertake the appropriate measures and to advise his clients on the transport, storage, maintenance, replacement and repair of the product as he considers necessary.

Installation

It is assumed that the product will be installed according to the manufacturer's instructions or (in absence of such instructions) according to the usual practice of the building professionals.

2.3 Assumed working life

The provisions made in the European Technical Assessment (ETA) are based on an assumed intended working life of Pfeifer CLT Brettsperrholz of 50 years, when installed in the works, provided that the cross laminated timber elements are subject to appropriate installation, use and maintenance (see Clause 2.2). These provisions are based upon the current state of the art and the available knowledge and experience[9].

The indications given as to the working life of the construction product cannot be interpreted as a guarantee neither given by the product manufacturer or his representative nor by EOTA nor by the Technical Assessment Body, but are regarded only as a means for choosing the appropriate products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and reference to the methods used for its assessment

3.1 Essential characteristics of the product

Table 1: Performance of the product in relation to the essential characteristics

Essential characteristic	Method of assessment	Performance
Basic requirement for construction works 1: Mechanical resistance and stability		
Bending	EAD 130005-00-0304, Clause 2.2.1.1	Annex 2
Tension and compression	EN 338[10]	Annex 2
Shear	EAD 130005-00-0304, Clause 2.2.1.3	Annex 2
Embedment strength	EAD 130005-00-0304, Clause 2.2.1.4	Annex 2
Creep and duration of the load	EAD 130005-00-0304, Clause 2.2.1.5	Annex 2
Dimensional stability	EAD 130005-00-0304, Clause 2.2.1.6	Annex 2
In-service environment	EAD 130005-00-0304, Clause 2.2.1.7	Annex 2

[9] The real working life of a product incorporated in a specific works depends on the environmental conditions to which that works is subject, as well as on the particular conditions of the design, execution, use and maintenance of that works. Therefore, it cannot be excluded that in certain cases the real working life of the product can also be shorter than the assumed working life.

[10] EN 338:2016

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Essential characteristic	Method of assessment	Performance
Bond integrity	EAD 130005-00-0304, Clause 2.2.1.8	Annex 2
Basic requirement for construction works 2: Safety in case of fire		
Reaction to fire	Commission Decision 2005/610/EC[11], as amended	Annex 2
Resistance to fire	EAD 130005-00-0304, Clause 2.2.2.2	Annex 2
Basic requirement for construction works 3: Hygiene, health and environment		
Content, emission and/or release of dangerous substances	EAD 130005-00-0304, Clause 2.2.3.1	Clause 3.1.1
Water vapour permeability – Water vapour transmission	EN ISO 10456[12]	Annex 2
Basic requirement for construction works 4: Safety and accessibility in use		
Impact resistance	EAD 130005-00-0304, Clause 2.2.4.1	Annex 2
Basic requirement for construction works 5: Protection against noise		
Airborne sound insulation	No performance assessed.	
Impact sound insulation	No performance assessed.	
Sound absorption	No performance assessed.	
Basic requirement for construction works 6: Energy economy and heat retention		
Thermal conductivity	EN ISO 10456	Annex 2
Air permeability	EN 12114[13] and EN 12207[14]	Annex 2
Thermal inertia	EN ISO 10456	Annex 2

3.1.1 Hygiene, health and the environment

The release of dangerous substances is determined according to EAD 130005-00-0304, “Solid wood slab element to be used as a structural element in buildings”. No dangerous substances is the performance of the Pfeifer CLT Brettsperrholz in this respect.

NOTE In addition to the specific clauses relating to dangerous substances contained in the European Technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

11 Official Journal of the European Communities OJ L 208, 11.8.2005, p. 21
12 EN ISO 10456:2007 + AC:2009
13 EN 12114:2000
14 EN 12207:2016

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3.2 Assessment methods

3.2.1 General

The assessment of the essential characteristics in Clause 3.1 of Pfeifer CLT Brettsperrholz for the intended use, and in relation to the requirements for mechanical resistance and stability, for safety in case of fire, for hygiene, health and the environment, for safety and accessibility in use, for protection against noise and for energy economy and heat retention in the sense of the basic requirements for construction works № 1 to 6 of Regulation (EU) № 305/2011 has been made in accordance with the European Assessment Document EAD 130005-00-0304, Solid wood slab element to be used as a structural element in buildings.

3.2.2 Identification

The European Technical Assessment for Pfeifer CLT Brettsperrholz is issued on the basis of agreed data that identify the assessed product. Changes to materials, to composition, to characteristics of the product, or to the production process could result in these deposited data being incorrect. Österreichisches Institut für Bautechnik should be notified before the changes are implemented, as an amendment of the European Technical Assessment is possibly necessary.

4 Assessment and verification of constancy of performance (thereafter AVCP) system applied, with reference to its legal base

4.1 System of assessment and verification of constancy of performance

According to Commission Decision 97/176/EC[15], as amended, the system of assessment and verification of constancy of performance to be applied to Pfeifer CLT Brettsperrholz is System 1. System 1 is detailed in Commission Delegated Regulation (EU) № 568/2014[16] of 18 February 2014, Annex, 1.2., and provides for the following items

(a) The manufacturer shall carry out

  (i) factory production control;

  (ii) further testing of samples taken at the manufacturing plant by the manufacturer in accordance with a prescribed test plan[17];

(b) The notified product certification body shall decide on the issuing, restriction, suspension or withdrawal of the certificate of constancy of performance of the construction product on the basis of the outcome of the following assessments and verifications carried out by that body:

  (i) an assessment of the performance of the construction product carried out on the basis of testing (including sampling), calculation, tabulated values or descriptive documentation of the product;

  (ii) initial inspection of the manufacturing plant and of factory production control;

  (iii) continuous surveillance, assessment and evaluation of factory production control.

4.2 Construction products for which a European Technical Assessment has been issued

Notified bodies undertaking tasks under System 1 shall consider the European Technical Assessment issued for the construction product in question as the assessment of the performance of that product. Notified bodies shall therefore not undertake the tasks referred to in point 4.1 (b)(i).

15 Official Journal of the European Communities OJ L 073, 14.3.1997, p. 19
16 Official Journal of the European Communities OJ L 157, 27.5.2014, p.76

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5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document

5.1 Tasks for the manufacturer

5.1.1 Factory production control

In the manufacturing plant the manufacturer shall establish and continuously maintain a factory production control. All procedures and specification adopted by the manufacturer shall be documented in a systematic manner. The factory production control shall ensure the constancy of performances of Pfeifer CLT Brettsperrholz with regard to the essential characteristics.

The manufacturer shall only use raw materials supplied with the relevant inspection documents as laid down in the control plan. The incoming raw materials shall be subject to controls by the manufacturer before acceptance. Check of incoming materials shall include control of inspection documents presented by the manufacturer of the raw materials.

The frequencies of controls conducted during manufacturing and on the assembled product are defined by taking account of the manufacturing process of the product and are laid down in the control plan.

The results of factory production control are recorded and evaluated. The records include at least the following data:

- Designation of the product, basic materials and components
- Type of control or test
- Date of manufacture of the product and date of testing of the product or basic materials or components
- Results of controls and tests and, if appropriate, comparison with requirements
- Name and signature of person responsible for factory production control

The records shall be kept at least for ten years time after the construction product has been placed on the market and shall be presented to the notified product certification body involved in continuous surveillance. On request they shall be presented to Österreichisches Institut für Bautechnik.

5.1.2 Declaration of performance

The manufacturer is responsible for preparing the declaration of performance. When all the criteria of the assessment and verification of constancy of performance are met, including the certificate of conformity issued by the notified product certification body, the manufacturer shall draw up a declaration of performance.

5.2 Tasks for the notified product certification body

5.2.1 Initial inspection of the manufacturing plant and of factory production control

The notified product certification body shall verify the ability of the manufacturer for a continuous and orderly manufacturing of Pfeifer CLT Brettsperrholz according to the European Technical Assessment. In particular the following items shall be appropriately considered

- Personnel and equipment
- The suitability of the factory production control established by the manufacturer
- Full implementation of the control plan

[17] The prescribed test plan has been deposited with Österreichisches Institut für Bautechnik and is handed over only to the notified product certification body involved in the procedure for the assessment and verification of constancy of performance. The prescribed test plan is also referred to as control plan.

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5.2.2 Continuous surveillance, assessment and evaluation of factory production control

The notified product certification body shall visit the factory at least once a year for routine inspection. In particular the following items shall be appropriately considered

- The manufacturing process including personnel and equipment
- The factory production control
- The implementation of the control plan

The results of continuous surveillance are made available on demand by the notified product certification body to Österreichisches Institut für Bautechnik. When the provisions of the European Technical Assessment and the control plan are no longer fulfilled, the certificate of constancy of performance is withdrawn by the notified product certification body.

Issued in Vienna on 16.09.2026
by Österreichisches Institut für Bautechnik

The original document is signed by:

Thomas Rockenschaub
Managing Director

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Figure 1: Principle structure of the solid wood slab

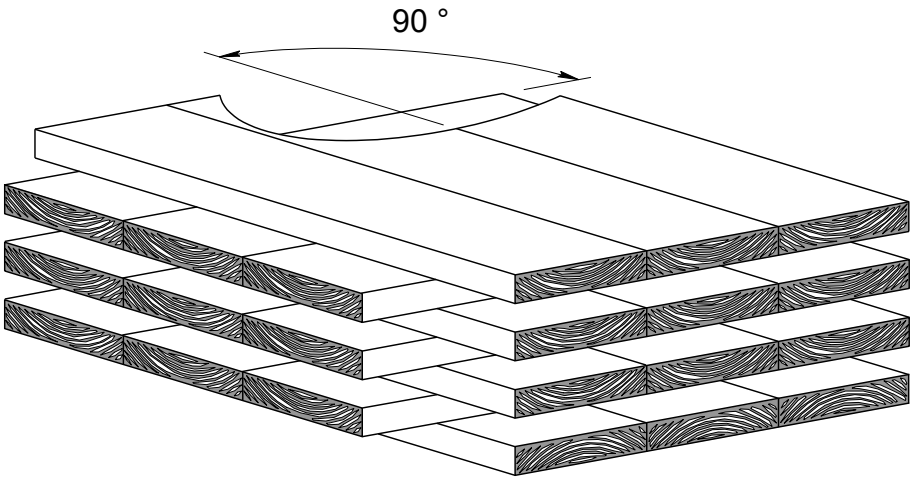
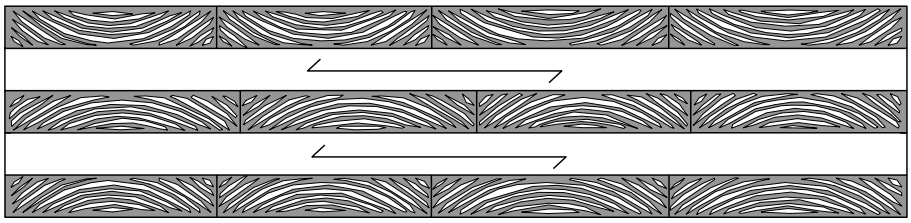


Figure 2: Principle structure of cross laminated timber with 5 layers



Pfeifer CLT Brettsperrholz	Annex 1
Structure of cross laminated timber	of European Technical Assessment ETA-20/0023 of 16.09.2026

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Table 1: Dimensions and specifications

Item		Dimension / Specification
Cross laminated timber		
Thickness	mm	57 to 360
Width	m	≤ 3.20
Length	m	≤ 14.7
Number of layers	—	3 to 15 symmetric assembly
Maximum number of adjacent layers arranged in the same direction	—	2 for n = 5 3 for n > 5
Maximum width of joints between boards within one layer	mm	≤ 5 mm Mean value 2 mm
Boards		
Surface	—	planed
Thickness (planed dimension)	mm	18 to 45
Width	mm	72 to 300
Ratio width to thickness	—	≥ 4 : 1
Boards shall be graded with suitable visual and/or machine procedures to be able to assign them to a strength class according to EN 338. Cover layer Inner layer	—	 C24 ≤ 10 % C16 ≥ 90 % C24
Moisture of wood according to EN 13183-2	%	6 to 15 % Within one member of cross laminated timber the moisture content shall not differ by more than 5 %.
Finger joints	—	EN 14080

Pfeifer CLT Brettsperrholz	Annex 2
Characteristic data of cross laminated timber	of European Technical Assessment ETA-20/0023 of 16.09.2026

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Table 2: Product characteristics of the solid wood slab

BWR	Essential characteristic	Assessment method	Level / Class / Description
1	**Mechanical resistance and stability**		
	1. Mechanical actions perpendicular to cross laminated timber		
	Strength class of boards	EN 338	Cover layer: C24 Inner layer: ≤ 10 % C16 ≥ 90 % C24
	Modulus of elasticity		
	– parallel to the grain of the boards $E_{0,\,mean}$	I_{eff}, Annex 3 EAD 130005-00-0304, 2.2.1.1	11 000 N/mm²
	– perpendicular to the grain of the boards $E_{90,\,mean}$	EN 338	370 N/mm²
	Shear modulus		
	– parallel to the grain of the boards $G_{090,\,mean}$	EN 338	690 N/mm²
	– perpendicular to the grain of the boards (rolling shear modulus) $G_{9090,\,mean}$	EAD 130005-00-0304, 2.2.1.1 and 2.2.1.3	50 N/mm²
	Bending strength		
	– parallel to the grain of the boards $f_{m,\,k}$	W_{eff}, Annex 3 EAD 130005-00-0304, 2.2.1.1	24 N/mm²
	Tensile strength		
	– perpendicular to the grain of the boards $f_{t,\,90,\,k}$	EN 338, reduced	0.12 N/mm²
	Compressive strength		
	– perpendicular to the grain of the boards $f_{c,\,90,\,k}$	EN 338	2.5 N/mm²
	Shear strength		
	– parallel to the grain of the boards $f_{v,\,090,\,k}$	A_{gross}, Annex 3 EAD 130005-00-0304, 2.2.1.3	3.7 N/mm²
	– perpendicular to the grain of the boards (rolling shear strength) $f_{v,\,9090,\,k}$	A_{gross}, Annex 3 EAD 130005-00-0304, 2.2.1.3	1.3 N/mm²

Pfeifer CLT Brettsperrholz	Annex 2
Characteristic data of cross laminated timber	of European Technical Assessment ETA-20/0023 of 16.09.2026

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BWR	Essential characteristic	Assessment method	Level / Class / Description
1	**Mechanical resistance and stability**		
	2. Mechanical actions in plane of cross laminated timber		
	Strength class of boards	EN 338	Cover layer: C24 Inner layer: ≤ 10 % C16 ≥ 90 % C24
	Modulus of elasticity – parallel to the grain of the boards $E_{0,\,mean}$	A_{net}, I_{net}, Annex 3 EAD 130005-00-0304, 2.2.1.1	11 000 N/mm²
	Shear modulus – parallel to the grain of the boards $G_{090,\,mean}$	A_{net}, Annex 3 EAD 130005-00-0304, 2.2.1.3	450 N/mm²
	Bending strength – parallel to the grain of the boards $f_{m,\,k}$	W_{net}, Annex 3 EAD 130005-00-0304, 2.2.1.1	24 N/mm²
	Tensile strength – parallel to the grain of the boards $f_{t,\,0,\,k}$	EN 338	14.5 N/mm²
	Compressive strength – parallel to the grain of the boards $f_{c,\,0,\,k}$	EN 338	21 N/mm²
	Shear strength – parallel to the grain of the boards $f_{v,\,090,\,k}$	A_{net}, Annex 3 EAD 130005-00-0304, 2.2.1.3	3.5 N/mm²
	3. Other mechanical actions		
	Creep and duration of load	k_{mod} and k_{def} according to EN 1995-1-1 for glued laminated timber	
	Dimensional stability Moisture content during service shall not change to such an extend that adverse deformation will occur.		

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BWR	Essential characteristic	Assessment method	Level / Class / Description	
	Embedment strength	Embedment strength of fasteners may be calculated according to EN 1995-1-1. The direction of grain of the cover layer shall be taken as reference.		
	In-service environment			
	Durability of timber Service classes	EN 1995-1-1	1 and 2	
	Bond integrity	EAD 130005-00-0304	Pass	
2	**Safety in case of fire**			
	Reaction to fire			
	Glued laminated timber products	Commission Decision 2005/610/EC	Mean density of wood ≥ 380 kg/m³ Euroclass D-s2, d0	
	Resistance to fire			
	Charring rate (tested adhesive: Jowapur 681.10) - Charring of the cover layer β_0 - Charring of more layers than the cover layer β_n [1)] - Basic design charring rate β_0 [2)] - Post-protection factor k_3 for Phase 3 [2)]	EAD 130005-00-0304	Floor/Roof 0.67 mm/min 1.34 mm/min [1)] 0.68 mm/min 1.74	Wall 0.7 mm/min 1.1 mm/min 0.72 mm/min 1.57
	Glue line integrity maintained (tested adhesive: LOCTITE HB XE) [2)] - Basic design charring rate β_0		0.65 mm	
	Performances E and I		Annex 3	
3	**Hygiene, health and environment**			
	Vapour permeability, μ, including joints within the layers	EN ISO 10456	50 (dry) to 20 (wet)	

NOTE [1)] until 25 mm of charring. Afterwards the charring rate 0.67 mm/min applies up to the next glue line.
[2)] model in accordance with EN 1995-1-2:2025

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BWR	Essential characteristic	Assessment method	Level / Class / Description
4	**Safety and accessibility in use**		
	Impact resistance	Soft body resistance is assumed to be fulfilled for walls with a minimum of 3 layers and minimum thickness of 60 mm.	
6	**Energy economy and heat retention**		
	Thermal conductivity λ of wood	EN ISO 10456	0.12 W/(m·K)
	Air permeability	EN 12114	Class 4 according to EN 12207
	Thermal inertia, specific heat capacity c_p of wood	EN ISO 10456	1 600 J/(kg·K)

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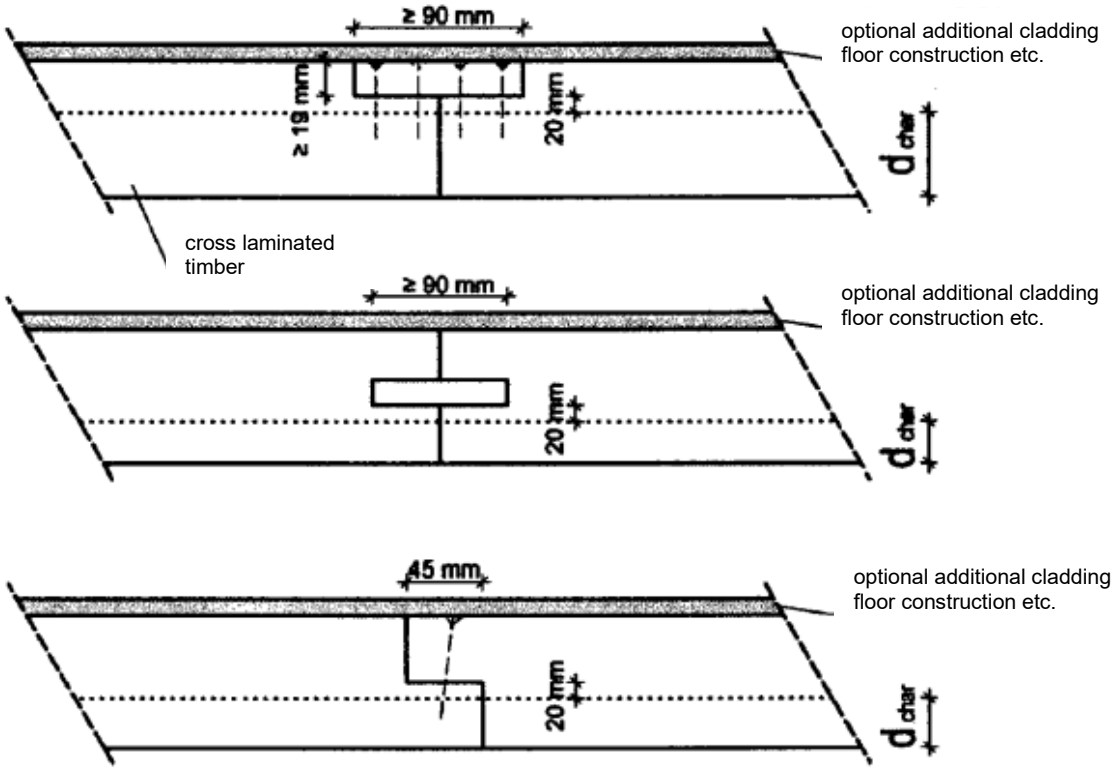
Performances E and I – integrity and insulation (informative)

The criteria E (integrity) and I (insulation) are considered to be fulfilled if

- the load-bearing capacity under fire was verified for the respective cross-laminated timber element using the charring rates according to Annex 2
- the element connections are at least 20 mm inside the designed, remaining cross-section
- the element joints in ceiling components are performed according to the following Figure



Pfeifer CLT Brettsperrholz	Annex 3
Resistance to fire	of European Technical Assessment ETA-20/0023 of 16.09.2026

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Mechanical actions perpendicular to plane and in plane of cross laminated timber

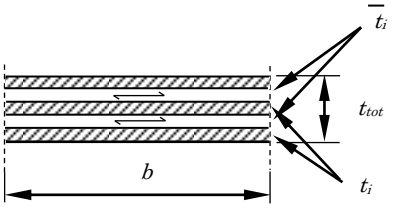
General

Due to the perpendicular orientation of the boards, cross laminated timber is able to transfer loads in all directions according to its condition of support. For cross laminated timber multi-axle stressed in both principal directions, different stiffness for the two principal directions shall be considered.

For calculation of characteristic values of cross-section, only boards which are oriented in direction of the mechanical action may be employed.

For design of cross laminated timber according to EN 1995-1-1, characteristic strength and stiffness of solid wood according to Annex 2 shall be taken.

Mechanical actions perpendicular to cross laminated timber



Where

t_i..... Thickness of board layers in direction of mechanical actions

$\bar{t}_i$..... Thickness of board layers perpendicular to direction of mechanical actions

The bending stiffness is specified in relation to the effective moment of inertia I_{eff}.
The calculation of the effective moment of inertia and therewith of the effective bending stiffness is according to EN 1995-1-1.

For I_{eff} see clause 9.1.3 and Annex B of EN 1995-1-1.

The term $\frac{s_i}{K_i}$ of EN 1995-1-1 should be substituted by $\frac{\bar{t}_i}{G_{9090} \cdot b}$.

$$I_i = \frac{b \cdot t_i^3}{12} \qquad W_{eff} = \frac{2 \cdot I_{eff}}{t_{tot}}$$

$$A_i = b \cdot t_i \qquad h_{tot} = \sum_i (t_i + \bar{t}_i)$$

$$\tau_{v,d} = \frac{1.5 \cdot V_d}{A_{gross}} \qquad A_{gross} = b \cdot t_{tot}$$

Where

I ..... moment of inertia
I_{eff}..... effective moment of inertia
s ..... spacing of fasteners according to EN 1995-1-1 *(not relevant for solid wood slab)*
K ..... slip modulus according to EN 1995-1-1 *(not relevant for solid wood slab)*
G_{9090}..... shear modulus of the board perp. to grain *(rolling shear modulus)*; G_{9090} = 50 N/mm²
b ..... width of the member of cross laminated timber

Pfeifer CLT Brettsperrholz	Annex 4
Design considerations for cross laminated timber	of European Technical Assessment ETA-20/0023 of 16.09.2026

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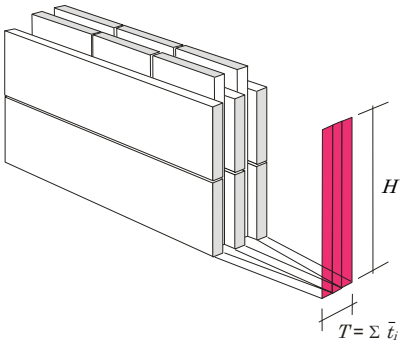
Mechanical actions in plane of the solid wood slab



Where
$H \leq 400$ mm
t_i.....Thickness of board layers in direction of mechanical actions
$\bar{t}_i$.....Thickness of board layers perpendicular to direction of mechanical actions
V.....Shear force

Under the terms of the technical beam theory the following equations may be used.

Moment of inertia

$$I_{net} = \frac{T \cdot H^3}{12}$$

Section modulus

$$W_{net} = \frac{T \cdot H^2}{6}$$

Shear strength

$$\tau_{v,\,d} = \text{Maximum} \begin{cases} \frac{3}{2} \cdot \frac{V_d}{A_{x,\,net}} \\ \frac{3}{2} \cdot \frac{V_d}{A_{z,\,net}} \end{cases}$$

$$A_{x,\,net} = H \cdot \sum_i \bar{t}_i$$

$$A_{z,\,net} = H \cdot \sum_i t_i$$

Pfeifer CLT Brettsperrholz	Annex 4
Design considerations for cross laminated timber	of European Technical Assessment ETA-20/0023 of 16.09.2026