Austrian Institute of Construction Engineering
Schenkenstrasse 4 | T +43 1 533 65 50
1010 Vienna | Austria | F +43 1 533 64 23
www.oib.or.at | mail@oib.or.at

Designated according to Article 29 of Regulation (EU) No 305/2011

Member of EOTA
www.eota.eu

European Technical Assessment

ETA-14/0349 of 13.04.2026

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	CLT – Cross Laminated Timber
Product family to which the construction product belongs	Solid wood slab elements to be used as structural elements in buildings
Manufacturer	Stora Enso Oyj P.O. Box 309 00101 Helsinki FINLAND
Manufacturing plants	See Annex 1
This European Technical Assessment contains	37 pages including 5 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-14/0349 of 15.12.2022.

Specific parts

1 Technical description of the product

1.1 General

This European Technical Assessment (ETA) [1] applies to the cross laminated timber

CLT – Cross Laminated Timber

CLT – Cross Laminated Timber 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 2, Figure 1.

The principle structure of the cross laminated timber is shown in Annex 2, Figure 2 and Figure 3. Surfaces of the cross laminated timber are planed or sanded. Surfaces of the boards are planed.

The solid wood slab elements consist of at least three and up to twenty 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. In case of serious deviations from symmetry potential effects should be investigated.

The individual boards of the layers may be side-glued.

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. When the cover layer is substituted by two adjacent layers oriented in direction of the mechanical action with approximately the same overall thickness a symmetric assembly may be considered.

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

The cover layers may be substituted by lamellae type “Super VI”. Lamellae type “Super VI” may be side-glued.

The transverse layers may be substituted by lamellae type “REX”. Lamellae type “REX” may be side-glued.

The surfaces of the solid wood slabs may be covered with additional layers. This panels are not part of this European Technical Assessment. Strength and stiffness characteristics for mechanical actions perpendicular to and in plane of the cross laminated timber are only assigned to the cross laminated timber without covering.

CLT – Cross Laminated Timber and the boards for its manufacturing correspond to the specifications given in the Annexes 2 and 3. The material characteristics, dimensions and tolerances of CLT – Cross Laminated Timber, 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 3, Table 2. Boards are visually or machine strength graded. Only technically dried wood shall be used.

Wood species is Norway spruce (Picea abies) or equivalent softwood.

---

[1] In 2014 ETA-14/0349 was firstly issued as European Technical Assessment ETA-14/0349 of 02.10.2014, amended to ETA-14/0349 of 19.10.2018, amended to ETA-14/0349 of 07.01.2019, amended to ETA-14/0349 of 03.06.2019, amended to ETA-14/0349 of 06.04.2020, amended to ETA-14/0349 of 15.12.2022 and amended to ETA-14/0349 of 13.04.2026.

[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.

1.2.2 Lamellae type “Super VI”

The specification of the lamellae type “Super VI” is given in Annex 3, Table 2. Lamellae type “Super VI” consist of one or two base lamellas of strength class C24 or T14 according to EN 338[3] and a (visual) cover lamellae of initial strength class ≥ C24 or T14. Only technically dried wood shall be used.

Wood species is European spruce, pine, fir or larch or equivalent softwood.

1.2.3 Lamellae type “REX”

The specification of the lamellae type “REX” is given in Annex 3, Table 2. Lamellae type “REX” are extracted from symmetrical cross laminated timber of European spruce, fir or pine of boards with min. strength class ≥ 90 % T14 and ≤ 10 % T11 according to EN 338. Lamellae type “REX” show a predefined percentage of end grain on the face of the lamellae, see Figure 4. Only technically dried wood shall be used.

1.2.4 Layers type “Yield_99”

The specification of the layers type “Yield_99” is given in Annex 3, Table 2. Layers type “Yield_99” are made of boards with stress reliefs and possibly a non-prismatic shape due to the existence of a wane (on one side) graded S10+ following DIN 4074-1[4]. Only technically dried wood shall be used.

1.2.5 Lamellae type “LCB”

The specification of the lamellae type “LCB” is given in Annex 3, Table 2. Lamellae type “LCB” are extracted from single-layer panels of laminated conical boards graded S10 following DIN 4074-1. Only technically dried wood shall be used.

1.2.6 Wood-based panels

The specification of the wood-based panels is given in Annex 3, Table 2. Wood-based panels are in accordance with EN 13986[5] or a European Technical Assessment.

1.2.7 Adhesive

The adhesive for bonding of the cross laminated timber and the finger joints of the individual boards shall conform to EN 301[6] or EN 15425[7].

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[8]. Members which are directly exposed to the weather shall be provided with an effective protection for the solid wood slab element in service.

[3] EN 338:2016
[4] DIN 4074-1:2012:2016
[5] EN 13986+A1:2015
[6] EN 301:2017
[7] EN 15425:2017
[8] EN 1995-1-1:2004 + AC:2006 + A1:2008 + A2:2014

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[9], 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[10], taking into account of Annex 3 of the European Technical Assessment.

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

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 CLT – Cross Laminated Timber 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[11].

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.

[9] EN 14080:2013

[10] EN 1995-1-2:2004 + AC:2006 + AC:2009

[11] 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.

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

3.1 Essential characteristics of the product

Table 1: Essential characteristics of the product and assessment methods

Essential characteristic	Method of assessment	Performance
Basic requirement for construction works 1: Mechanical resistance and stability [1)]		
Bending [2)]	EAD 130005-00-0304, Clause 2.2.1.1	Annex 3
Tension and compression [2)]	EAD 130005-00-0304, Clause 2.2.1.2	Annex 3
Shear [2)]	EAD 130005-00-0304, Clause 2.2.1.3	Annex 3
Embedment strength	EAD 130005-00-0304, Clause 2.2.1.4	Annex 3
Creep and duration of the load	EAD 130005-00-0304, Clause 2.2.1.5	Annex 3
Dimensional stability	EAD 130005-00-0304, Clause 2.2.1.6	Annex 3
In-service environment	EAD 130005-00-0304, Clause 2.2.1.7	Annex 3
Bond integrity	EAD 130005-00-0304, Clause 2.2.1.8	Annex 3
Basic requirement for construction works 2: Safety in case of fire		
Reaction to fire	EAD 130005-00-0304, Clause 2.2.2.1	Annex 3
Resistance to fire	EAD 130005-00-0304, Clause 2.2.2.2	Annex 3
Basic requirement for construction works 3: Hygiene, health and the environment		
Content, emission and/or release of dangerous substances	EAD 130005-00-0304, Clause 2.2.3.1	3.1.1
Water vapour permeability – Water vapour transmission	EAD 130005-00-0304, Clause 2.2.3.2	Annex 3
Basic requirement for construction works 4: Safety and accessibility in use		
Impact resistance	EAD 130005-00-0304, Clause 2.2.4.1	Annex 3
Basic requirement for construction works 5: Protection against noise		
Airborne sound insulation	EAD 130005-00-0304, Clause 2.2.5.1	Annex 3
Impact sound insulation	EAD 130005-00-0304, Clause 2.2.5.2	Annex 3
Sound absorption	EAD 130005-00-0304, Clause 2.2.5.3	Annex 3

Essential characteristic	Method of assessment	Performance
Basic requirement for construction works 6: Energy economy and heat retention		
Thermal conductivity	EAD 130005-00-0304, Clause 2.2.6.1	Annex 3
Air permeability	EAD 130005-00-0304, Clause 2.2.6.2	Annex 3
Thermal inertia	EAD 130005-00-0304, Clause 2.2.6.3	Annex 3
[1)] These characteristics also relate to basic requirement for construction works 4. [2)] Load bearing capacity and stiffness regarding mechanical actions perpendicular to and in plane of the solid wood slab element.		

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 CLT – Cross Laminated Timber 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.

3.2 Assessment methods

3.2.1 General

The assessment of the essential characteristics in Clause 3.1 of CLT – Cross Laminated Timber 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 use 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 CLT – Cross Laminated Timber 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[12] the system of assessment and verification of constancy of performance to be applied to CLT – Cross Laminated Timber is System 1. System 1 is detailed in Commission Delegated Regulation (EU) № 568/2014[13] 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[14];

(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 AVCP for 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).

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 CLT – Cross Laminated Timber 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.

---

12 Official Journal of the European Union OJ L 73, 14.3.1997, p. 19
13 Official Journal of the European Union OJ L 157, 27.5.2014, p. 76
14 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.

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 CLT – Cross Laminated Timber 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

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 13.04.2026
by Österreichisches Institut für Bautechnik

The original document is signed by:

Thomas Rockenschaub

Managing Director

Manufacturing plants in Austria

Stora Enso Wood Products Bad St.
Leonhard GmbH
Wisperndorf 4
9462 Bad St. Leonhard
Austria

Stora Enso Wood Products GmbH
Bahnhofstraße 31
3370 Ybbs
Austria

Manufacturing plant in Sweden

Stora Enso Timber AB
Timmervägen 2
664 33 Grums
Sweden

Manufacturing plant in Czech Republic

Stora Enso WP HV s.r.o.
Nádražní 66
58263 Ždírec nad Doubravou
Czech Republic

Figure 1: Principle structure of the solid wood slab – Example

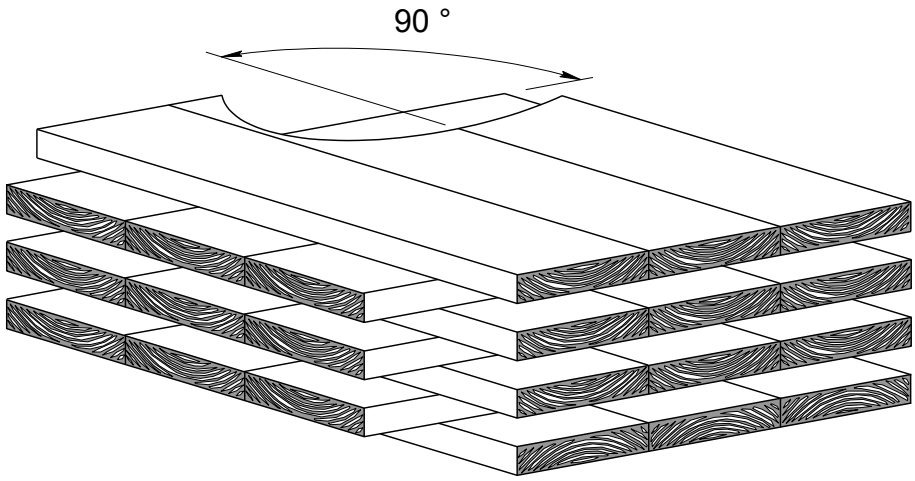


Figure 2: Principle structure of cross laminated timber with 3 layers – Example

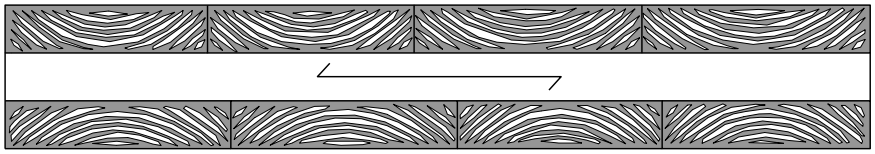


Figure 3: Principle structure of cross laminated timber with 5 layers – Example

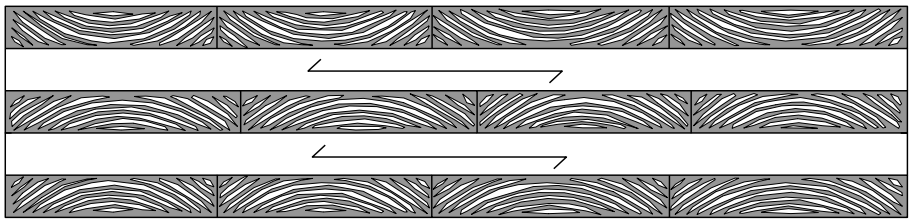
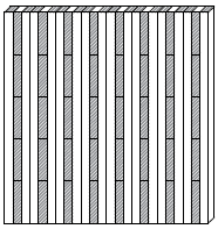
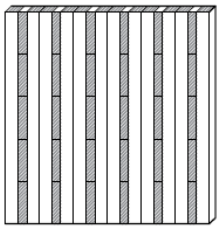
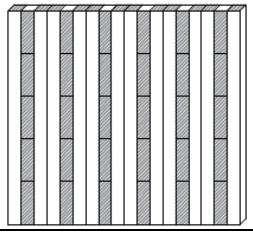
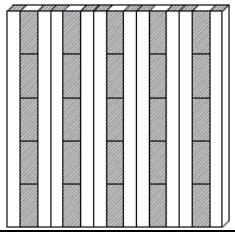
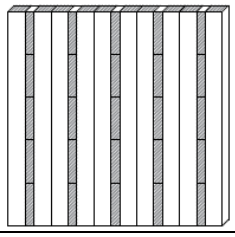
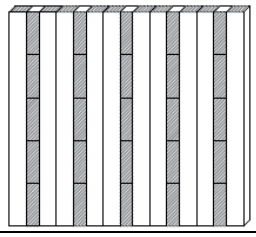
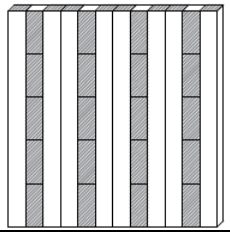
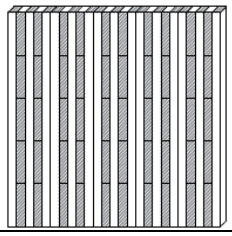
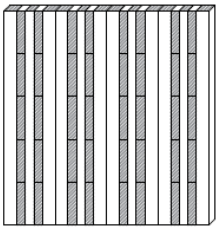
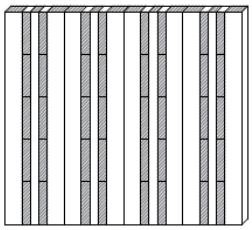
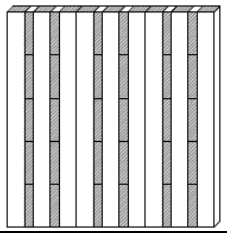
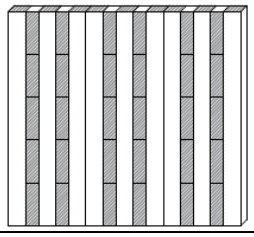


Figure 4: Pattern of lamellae type "REX" to be used as transverse layers

Type	Illustration	Lamellae type "REX"	Type	Illustration	Lamellae type "REX"
REX 60L3s		20-20-20 33 % end grain in the face	REX 80 L3s		30-20-30 25 % end grain in the face
REX 90 L3s		30-30-30 33 % end grain in the face	REX 100 L3s		30-40-30 40 % end grain in the face
REX 100 L3s-B		40-20-40 20 % end grain in the face	REX 110 L3s		40-30-40 27 % end grain in the face
REX 120 L3s		40-40-40 33 % end grain in the face	REX 100 L5s		20-20-20-20-20 40 % end grain in the face
REX 120 L5s		30-20-20-20-30 33 % end grain in the face	REX 140 L5s		40-20-20-20-40 29 % end grain in the face
REX 160 L5s		40-20-40-20-40 25 % end grain in the face	REX 180 L5s		40-30-40-30-40 33 % end grain in the face

CLT – Cross Laminated Timber	Annex 2
Structure of cross laminated timber	of European Technical Assessment ETA-14/0349 of 13.04.2026

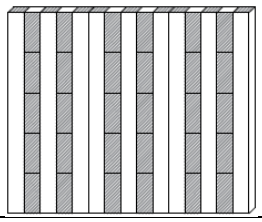
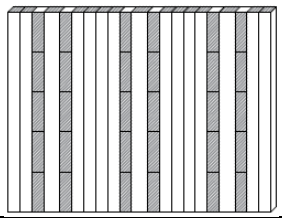
Type	Illustration	Lamellae type "REX"	Type	Drawing	Lamellae type "REX"
REX 200 L5s		40-40-40-40-40 40 % end grain in the face	REX 220 L7s-2		60-30-40-30-60 27 % end grain in the face

Table 2: Dimensions and specifications

Item		Dimension / Specification
Cross laminated timber		
Thickness	mm	42 to 360
Width	m	≤ 3.5
Length	m	≤ 16.5
Number of layers	—	3 to 20 symmetric assembly
Maximum number of adjacent layers arranged in the same direction	—	2 for n = 4 or n = 5 3 for n > 5
Maximum width of joints between boards within one layer	mm	3
Density ρ_k	kg/m³	1.1 x $\rho_{l,k}$ = 385
Boards		
Surface	—	planed
Thickness (planed dimension)	mm	14 to 45
Width	mm	40 to 300
Ratio width to thickness [1)]	—	≥ 2.2 : 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.	—	Within one member of cross laminated timber only one of the specified combinations of strength classes shall be applied. 100 % C16 or T11 [2)] ≥ 90 % C24 or T14 [2)] / ≤ 10 % C16 or T11 [2) 3)] ≥ 90 % C30 or T21 [2)] / ≤ 10 % C24 or T14 [2)]

1) Except lamellae type “REX” and type “LCB”.
2) According to EN 338.
3) Also for final processed lamellae type “Super VI”.

Item		Dimension / Specification	
Moisture of wood according to EN 13183-2[15]	%	6 to 15 % Within one member of cross laminated timber the moisture content shall not differ by more than 5 %.	
Finger joints [4)]	—	EN 14080 [5)]	
Lamellae type “Super VI”	—	base lamellae(s) 26 - 34 mm 20 – 24 mm 15-17 / 17-19 mm	cover lamellae 6 - 14 mm 6 – 10 mm 6 mm
Lamellae type “REX”	—	See Annex 2, Figure 4 percentage of end grain in the face: 20 % to 40 %	
Lamellae type “LCB”	—	extracted from single-layer panels of laminated conical boards: - graded S10 following EN 1912 / DIN 4074-1 - max. 1/3 wane - top diameter 170 – 450 mm - edge gluing	
Layers type “Yield 99”		made of boards with stress reliefs and possibly a non-prismatic shape due to the existence of a wane (on one side): - graded S10+ following EN 1912 / DIN 4074-1 - max. 15 % gaps of total surface area	
Wood-based panels	—	EN 13986	

4) Finger joints with acceptable wane are acceptable.
5) Cold finger jointing (minimum core temperature 5°C) is permitted in accordance with the relevant work instruction.

[15] EN 13183-2:2002

CLT – Cross Laminated Timber	Annex 3
Characteristic data of cross laminated timber	of European Technical Assessment ETA-14/0349 of 13.04.2026

Table 3: 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 [1]		
	Strength class of boards	EN 338	See Table 2
	Modulus of elasticity		
	– parallel to the grain of the boards $E_{0,\,mean}$	EAD 130005-00-0304, 2.2.1.1, I_{eff}	C16/T11 8 000 MPa C24/T14 12 000 MPa [2] C30/T21 12 000 MPa
	– perpendicular to the grain of the boards $E_{90,\,mean}$	EN 338	C16/T11 270 MPa C24/T14 370 MPa C30/T21 400 MPa
	Shear modulus		
	– parallel to the grain of the boards $G_{090,\,mean}$	EN 338	C16/T11 500 MPa C24/T14 690 MPa C30/T21 750 MPa
	– perpendicular to the grain of the boards (rolling shear) $G_{9090,\,mean}$	EAD 130005-00-0304, 2.2.1.1	50 MPa
	Bending strength		
	– parallel to the grain of the boards $f_{m,\,k}$	EAD 130005-00-0304, 2.2.1.1, W_{eff}	C16/T11 $1/k_{sys} \cdot 17.6$ MPa [3] C24/T14 $1/k_{sys} \cdot 26.4$ MPa [3] C30/T21 $1/k_{sys} \cdot 33.0$ MPa [3]
	Tensile strength		
	– perpendicular to the grain of the boards $f_{t,\,90,\,k}$	EN 338, reduced	0.12 MPa
	Compressive strength	EN 338	
	– perpendicular to the grain of the boards $f_{c,\,90,\,k}$		C16/T11 2.2 MPa C24/T14 2.5 MPa C30/T21 2.7 MPa

NOTE [1] CLT – Cross Laminated Timber with transverse layers of lamellae type “REX” may be considered equivalent to C24/T14

[2] $E_{0,\,mean}$ = 6 800 MPa for lamellae type “REX”, $E_{0,\,mean}$ = 11 000 MPa for layer type “Yield 99”

[3] $k_{sys} = \max\{1.0; 1.1 - 0.025 \cdot n\}$ n … number of boards within cover layer

CLT – Cross Laminated Timber	Annex 3
Characteristic data of cross laminated timber	of European Technical Assessment ETA-14/0349 of 13.04.2026

BWR	Essential characteristic	Assessment method	Level / Class / Description
	Shear strength		
	– parallel to the grain of the boards $f_{v,\,090,\,k}$	EN 338	C16/T11: 3.2 MPa C24/T14: 4.0 MPa C30/T21: 4.0 MPa
	– perpendicular to the grain of the boards (rolling shear strength) $f_{v,\,9090,\,k}$	EAD 130005-00-0304, 2.2.1.3, A_{gross}	Spruce: $min\left\{1.25; 1.45 - \frac{t_Q}{100}\right\}$ MPa [4)] Pine: $min\left\{1.70; 1.90 - \frac{t_Q}{100}\right\}$ MPa [4)] Lamellae type "REX": $min\left\{1.25; 1.45 - \frac{t_Q}{100}\right\}$ MPa [4)]

NOTE [4)] t_Q is the thickness of the largest cross layer

CLT – Cross Laminated Timber	Annex 3
Characteristic data of cross laminated timber	of European Technical Assessment ETA-14/0349 of 13.04.2026

BWR	Essential characteristic	Assessment method	Level / Class / Description
	2. Mechanical actions in plane of cross laminated timber [1)]		
	Strength class of boards	EN 338	See Table 2
	Modulus of elasticity – parallel to the grain of the boards $E_{0,\,mean}$	EAD 130005-00-0304, 2.2.1.1, A_{net}, I_{net}	C16/T11 8 000 MPa C24/T14 12 000 MPa [2)] C30/T21 12 000 MPa
	Shear modulus – parallel to the grain of the boards $G_{090,\,mean}$	EAD 130005-00-0304, 2.2.1.3, A_{net}	460 MPa
	Bending strength – parallel to the grain of the boards $f_{m,\,k}$	EAD 130005-00-0304, 2.2.1.1, W_{net}	C16/T11 16 MPa C24/T14 24 MPa C30/T21 30 MPa
	Tensile strength – parallel to the grain of the boards $f_{t,\,0,\,k}$	EN 338	C16/T11 8.5 MPa C24/T14 14.5 MPa C30/T21 19.0 MPa
	Compressive strength – parallel to the grain of the boards $f_{c,\,0,\,k}$	EN 338	C16/T11 17 MPa C24/T14 21 MPa C30/T21 24 MPa
	Shear strength – parallel to the grain of the boards $f_{v,\,090,\,k}$	EAD 130005-00-0304, 2.2.1.3, A_{net} [3)]	3.9 MPa [5)]

NOTE [5)] $A_{net} = max\begin{cases}A_{net,x}\\A_{net,z}\end{cases}$

BWR	Essential characteristic	Assessment method	Level / Class / Description	
	3. Other mechanical actions			
	Creep and duration of load	EN 1995-1-1		
	Dimensional stability Moisture content during service shall not change to such an extend that adverse deformation will occur.			
	Fasteners	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			
	Cross laminated timber products	Commission Delegated Regulation (EU) 2017/2293	Minimum mean density 350 kg/m^3, minimum layer thickness 18 mm Euroclass D-s2, d0	
	Resistance to fire [6]			
	Structures with specified fire resistance	EN 13501-2[16]	Annex 4	
	Charring rate - Charring of the cover layer - Charring of more layers than the cover layer	EAD 130005-00-0304	Floor/Roof 0.65 mm/min 1.3 mm/min [7]	Wall 0.63 mm/min 0.86 mm/min
	Glue line integrity maintained (tested adhesive: HBX) [8] [9] - Charring of the whole cross-section depth of the member		0,65 mm/min	0,65 mm/min

NOTE
[6] Not valid for layers type ”Yield_99” and lamellae type “LCB”.
[7] until 25 mm of charring. Afterwards the charring rate 0.65 mm/min applies up to the next glue line.
[8] model in accordance with EN 1995-1-2:2025.
[9] may also be applied to other adhesives of the same adhesive line if the tested adhesive represents the most critical fire performance.

[16] EN 13501-2:2023

BWR	Essential characteristic	Assessment method	Level / Class / Description
3	**Hygiene, health and environment**		
	Vapour permeability, μ, for wood	EN ISO 10456[17]	50 (dry) to 20 (wet)
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.	
5	**Protection against noise**		
	Airborne sound insulation	EN ISO 10140-2[18], EN ISO 717-1[19]	For R_w (C; C_{tr}), see Annex 5
	Impact sound insulation	EN ISO 10140-3[20], EN ISO 717-2[21]	For $L_{n,w}$ (C_I) see Annex 5
	Sound absorption	EN ISO 354[22], EN ISO 11654[23]	For α_s see Annex 5
6	**Energy economy and heat retention**		
	Thermal conductivity, λ, of wood	EN ISO 10456	0.12 W/(m·K)
	Air permeability [10)]	EN 12114[24]	Class 4 according to EN 12207[25]
	Thermal inertia, specific heat capacity, c_p, of wood	EN ISO 10456	1600 J/(kg·K)

NOTE [10)] Tested for CLT of standard boards and of lamellae type “LCB”.

[17] EN ISO 10456:2007 + AC:2009
[18] EN ISO 10140-2:2021
[19] EN ISO 717-1:2020
[20] EN ISO 10140-3:2021
[21] EN ISO 717-2:2020
[22] EN ISO 354:2003
[23] EN ISO 11654:1997
[24] EN 12114:2000
[25] EN 12207:2016

Examples with specified fire resistance

Wall structures

Cladding on the fire exposed side	Mounting	CLT element	Test load	Tested wall height	Classifi-cation
		Designation and structure [mm]	[kN/m]	[m]	i => o
–	–	CLT 90 C3s 30-30-30	70	3	REI 30

Cladding on the fire exposed side	Mounting	CLT element	Test load	Tested wall height	Classifi-cation
		Designation and structure [mm]	[kN/m]	[m]	i => o
–	–	CLT 100 C3s 30-40-30	35	3	REI 60
–	–	CLT 100 C3s 40-20-40	55	3	REI 60
–	–	CLT 100 C5s 20-20-20-20-20	35	3	REI 60
–	–	CLT 140 C5s 40-20-20-20-40	190	4	REI 60
12.5 mm gypsum plasterboard type DF according to EN 520[26], ρ ≥ 800 kg/m³	Drywall screws 3.9 mm x 35 mm with a = 75/150 mm (edge/centre) row distance 625 mm	CLT 80 C3s 30-20-30	35	3	REI 60
50 mm wood wool board Heraklith BM type L1/L2-W1-T1-S1/S2-P1-CS(10/Y)150-CI3 according to EN 13168[27], ρ = 18.5 kg/m³ 15 mm plaster	Heraklith screws 5 mm x 80 mm with a = 150 mm row distance 625 mm	CLT 80 C3s 30-20-30	35	3	REI 60
10 mm fermacell Firepanel A1 with fibrous reinforcement type GF-I-W2-C1 according to EN 15283-2[28], ρ = 1 200 ± 50 kg/m³	Staples with a = 150 mm, row distance 390 mm	CLT 80 C3s 30-20-30	45	3	REI 60

[26] EN 520:2004+A1:2009
[27] EN 13168:2012+A1:2015
[28] EN 15283-2:2008+A1:2009

Cladding on the fire exposed side	Mounting	CLT element	Test load	Tested wall height	Classifi-cation
		Designation and structure [mm]	[kN/m]	[m]	i => o
12.5 mm fermacell Gypsum Fibreboard with fibrous reinforcement type GF-I-W2-C1 according to ETA-03/0050[29], ρ = 1 150 ± 50 kg/m³	Staples with a = 150 mm, row distance 400 mm	CLT 120 C3s 40-40-40	200	3	REI 60
Hat- spring bar Protektor 60-27 according to EN 14195[30] 40 mm glass wool Ursa Trennwandfilz TWF 1 according to ÉN 13162[31] 12.5 mm fermacell Gypsum Fibreboard with fibrous reinforcement type GF-I-W2-C1 according to ETA-03/0050, ρ = 1 150 ± 50 kg/m³	Wood screws with flat head 4.2 mm x 35 mm with a = 600 mm Drywall screws 3.9 mm x 30 mm with a = 250 mm	CLT 120 C3s 40-40-40	200	3	REI 60
2 x 18 mm gypsum plasterboard type DF according to EN 520, ρ ≥ 800 kg/m³	First layer: staples with a = 200 mm, row distance 625 mm Second layer: staples with a = 80 mm, row distance 625 mm	CLT 80 C3s 20-40-20	120	3.28	REI-M 60
12.5 mm gypsum plasterboard type DF according to EN 520, ρ ≥ 800 kg/m³	Drywall screws 3.5 mm x 35 mm with a = 250 mm row distance 400 mm	CLT 100 C5s 20-20-20-20-20	160	3	REI 60

[29] ETA-03/0050 of 13.12.2023
[30] EN 14195:2014
[31] EN 13162:2012+A1:2015

Cladding on the fire exposed side	Mounting	CLT element	Test load	Tested wall height	Classifi-cation
		Designation and structure [mm]	[kN/m]	[m]	i => o
–	–	CLT 160 C5s 40-20-20-20-40	242,4	4	REI 90
2 x 15 mm gypsum plasterboard type DF according to EN 520, ρ ≥ 800 kg/m³	First layer: ribbed nails l = 40 mm Second layer: ribbed nails l = 40 mm (left side) and staples l = 45 mm (right side) with a = 75/150 mm (edge/centre) row distance 625 mm	CLT 80 C3s 30-20-30	–	3	EI 90
12.5 mm gypsum plasterboard type DF according to EN 520, ρ ≥ 800 kg/m³	Drywall screws 3.9 mm x 35 mm with a = 75/150 mm (edge/centre) row distance 625 mm	CLT 100 C3s 30-40-30	35	3	REI 90
12.5 mm gypsum plasterboard type DF according to EN 520, ρ ≥ 800 kg/m³ 40 mm mineral wool according to ÉN 13162, ρ = 11 kg/m³	Drywall screws 3.9 mm x 35 mm with a = 75/150 mm (edge/centre) row distance 625 mm	CLT 100 C3s 30-40-30	35	3	REI 90
50 mm wood wool board Heraklith BM type L1/L2-W1-T1-S1/S2-P1-CS(10/Y)150-CI3 according to EN 13168, ρ = 18.5 kg/m³ 15 mm plaster	Heraklith screws 5 mm x 80 mm with a = 150 mm row distance 625 mm	CLT 100 C3s 30-40-30 CLT 100 C5s 20-20-20-20-20	35	3	REI 90
Hat- spring bar Protektor 60-27 according to EN 14195 40 mm glass wool Ursa Trennwandfilz TWF 1 according to ÉN 13162 12.5 mm fermacell Gypsum Fibreboard with fibrous reinforcement type GF-I-W2-C1 according to ETA-03/0050, ρ = 1 150 ± 50 kg/m³	Wood screws with flat head 4.2 mm x 35 mm with a = 600 mm Drywall screws 3.9 mm x 30 mm with a = 250 mm	CLT 120 C3s 40-40-40	120	3	REI 90
12.5 mm fermacell Gypsum Fibreboard with fibrous reinforcement type GF-I-W2-C1 according to ETA-03/0050, ρ = 1 150 ± 50 kg/m³	Staples with a = 150 mm, row distance 400 mm	CLT 120 C3s 40-40-40	120	3	REI 90
2 x 15 mm fermacell Gypsum Fibreboard with fibrous reinforcement type GF-I-W2-C1 according to ETA-03/0050, ρ = 1 150 ± 50 kg/m³	First layer: staples with a = 200 mm, row distance 625 mm Second layer: staples with a = 150 mm, row distance 400 mm	CLT 120 C3s 40-40-40	200	3	REI 90

CLT – Cross Laminated Timber	Annex 4
Resistance to fire	of European Technical Assessment ETA-14/0349 of 13.04.2026

Cladding on the fire exposed side	Mounting	CLT element	Test load	Tested wall height	Classifi-cation
		Designation and structure [mm]	[kN/m]	[m]	i => o
22 mm earthen board according to DIN 18948[32], ρ ≥ 1450 kg/m³	Staples (wide back) (d_n = 2 mm, l = 75 mm, b = 25 mm) edge and center distance: ≤ 125 mm center distance: ≤ 62.5 mm	CLT 100 C5s 20-20-20-20-20	100	3	REI 90

[32] DIN 18948:2024

Cladding on the fire exposed side	Mounting	CLT element	Test load	Tested wall height	Classifi-cation
		Designation and structure [mm]	[kN/m]	[m]	i => o
2 x 18 mm gypsum plasterboard type DF according to EN 520, $\rho \geq 800$ kg/m³	First layer: staples with a = 200 mm, row distance 625 mm Second layer: staples with a = 80 mm, row distance 625 mm	CLT 80 C3s 20-40-20	100	3.28	REI-M 90
15 mm and 18 mm fermacell Gypsum Fibreboard with fibrous reinforcement type GF-I-W2-C1 according to ETA-03/0050, ρ = 1 150 ± 50 kg/m³	First layer: staples with a ≤ 200 mm, row distance 625 mm Second layer: staples with a ≤ 150 mm, row distance 400 mm	CLT 80 C3s 20-40-20	120	3	REI-M 90
12.5 mm gypsum plasterboard type DF according to EN 520, $\rho \geq 800$ kg/m³	Drywall screws 3.5 mm x 35 mm with a = 250 mm row distance 400 mm	CLT 100 C3s 30-40-30	50	3	REI 90

Cladding on the fire exposed side	Mounting	CLT element	Test load	Tested wall height	Classifi-cation
		Designation and structure [mm]	[kN/m]	[m]	i => o
12.5 mm gypsum plasterboard type DF according to EN 520, ρ ≥ 800 kg/m³ 40 mm mineral wool according to ÉN 13162, ρ = 11 kg/m³	Drywall screws 3.9 mm x 35 mm with a = 75/150 mm (edge/centre) row distance 625 mm	CLT 100 C3s 30-40-30	35	3	REI 120
12.5 mm fermacell Firepanel A1 with fibrous reinforcement type GF-I-W2-C1 according to EN 15283-2, ρ = 1 200 ± 50 kg/m³ 40 mm Rockwool panel 211, ρ = 40 kg/m³ 10 mm fermacell Firepanel A1 with fibrous reinforcement type GF-I-W2-C1 according to EN 15283-2, ρ = 1 200 ± 50 kg/m³	Staples with a = 150 mm, row distance 390 mm	CLT 80 C3s 30-20-30	45	3	REI 120
18 mm fermacell Gypsum Fibreboard with fibrous reinforcement type GF-I-W2-C1 according to ETA-03/0050, ρ = 1 150 ± 50 kg/m³	Staples with a = 200 mm, row distance 400 mm	CLT 120 C3s 40-40-40	120	3	REI 120
2 x 15 mm fermacell Gypsum Fibreboard with fibrous reinforcement type GF-I-W2-C1 according to ETA-03/0050, ρ = 1 150 ± 50 kg/m³	First layer: staples with a = 200 mm, row distance 625 mm Second layer: staples with a = 150 mm, row distance 400 mm	CLT 120 C3s 40-40-40	150	3	REI 120

Floor structures

Cladding on the fire exposed side	Mounting	CLT element	Test load	Classification
		Designation and structure [mm]		b => a
–	–	CLT 120 L5s 30-20-20-20-30	$M_{d,fi}$ = 16.1 kNm/m $V_{d,fi}$ = 10.3 kN/m	REI 60
–	–	CLT 140 L5s 40-20-20-20-40	$M_{d,fi}$ = 25 kNm/m $V_{d,fi}$ = 18 kN/m	REI 60
12.5 mm gypsum plasterboard type DF according to EN 520, ρ ≥ 800 kg/m³	Drywall screws 3.9 mm x 35 mm with a = 75/150 mm (edge/centre) row distance 625 mm	CLT 100 L3s 30-40-30	$M_{d,fi}$ = 1.9 kNm/m $V_{d,fi}$ = 2.8 kN/m	REI 60

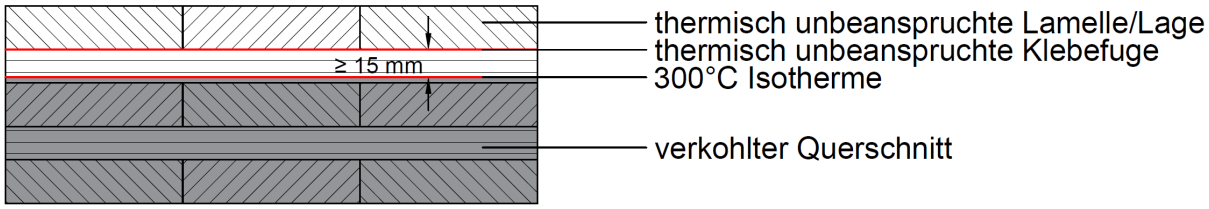
Cladding on the fire exposed side	Mounting	CLT element	Test load	Classification
		Designation and structure [mm]		b => a
–	–	CLT 160 L5s 40-20-40-20-40	$M_{d,fi}$ = 42.1 kNm/m $V_{d,fi}$ = 27 kN/m	REI 90
–	–	CLT 200 L5s 40-40-40-40-40	$M_{d,fi}$ = 68.8 kNm/m $V_{d,fi}$ = 50 kN/m	REI 90
12.5 mm gypsum plasterboard type DF according to EN 520, ρ ≥ 800 kg/m³	Drywall screws 3.9 mm x 35 mm with a = 75/150 mm (edge/centre) row distance 625 mm	CLT 140 L5s 40-20-20-20-40	–	EI 90
35 mm wood wool board Heraklith EPV type L2-W1-T2-S2-P2-CS(10/Y)200-CI3 according to EN 13168	Heraklith screws 4.5 mm x 60 mm with a = 215 mm row distance 625 mm	CLT 140 L5s 40-20-20-20-40	–	EI 90

Cladding on the fire exposed side	Mounting	CLT element	Test load	Classification
		Designation and structure [mm]		b => a
–	–	CLT 220 L7s 40-20-40-20-40-20-40	$M_{d,fi}$ = 62 kNm/m $V_{d,fi}$ = 45.2 kN/m	REI 120

Performances E and I – integrity and insulation

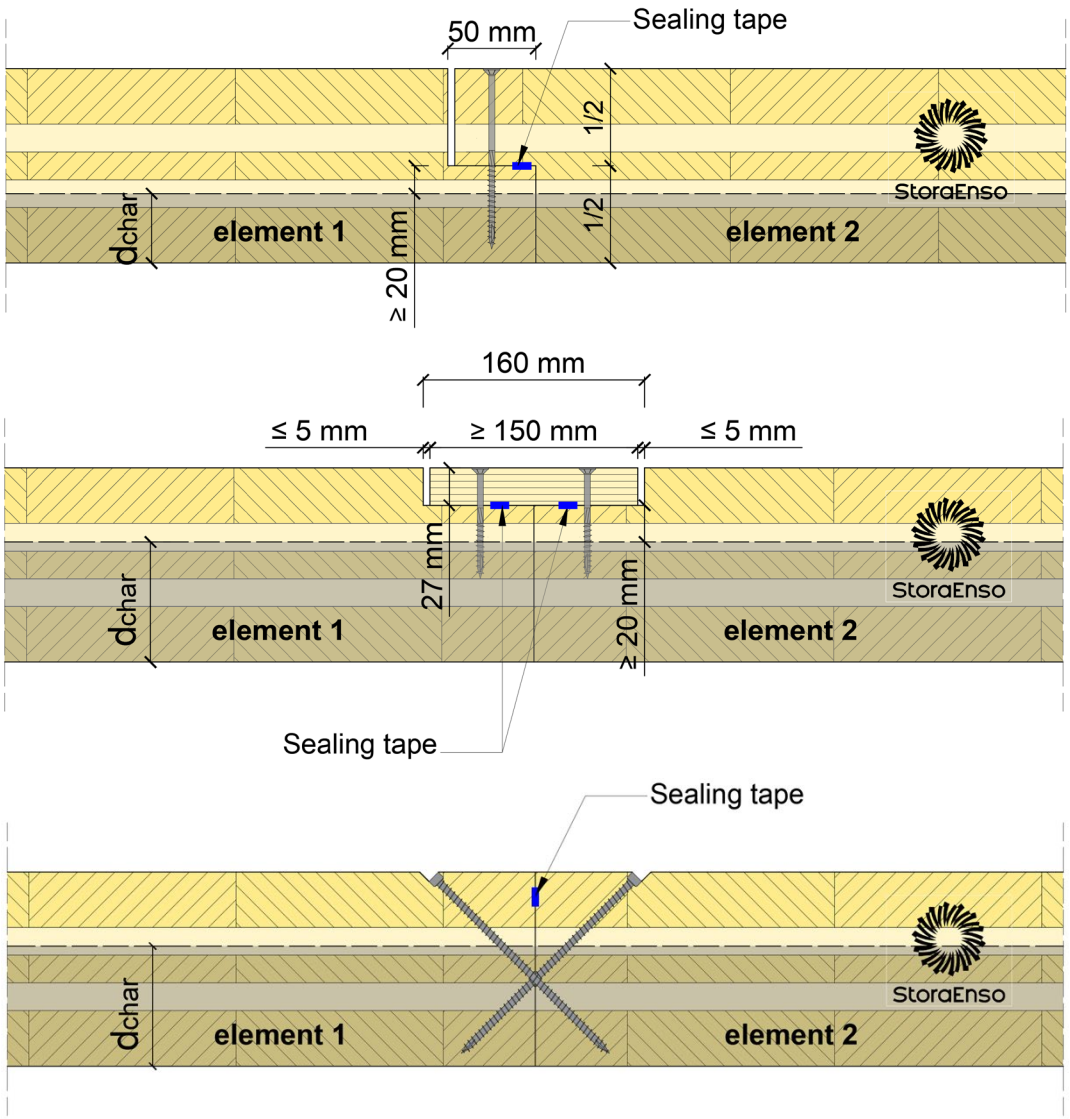
The criteria E (integrity) and I (insulation) as well as the smoke tightness at an undisturbed element in terms of fire protection and the surface temperature at the unexposed fire side are considered to be fulfilled (without further testing) if

- the distance between the non-charred bond line and the 300°C isotherm is ≥ 15 mm and
- the residual timber cross-section consists of at least one non-charred bond line and a layer above it.



The design of element joints, e.g. with stepped rebate or top-side cover board, fulfil the criteria E (integrity) and I (insulation) if a residual timber cross-section of 2 cm (minimum) exists up to the element joint, e.g. stepped rebate or cover board.

This also applies to butt-jointed element joints if the screw connection is made with a minimum distance of 250 mm, diagonally with fully threaded screws.

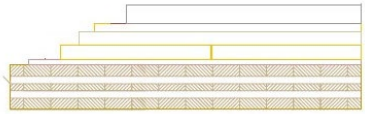
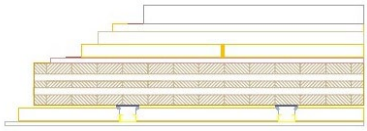
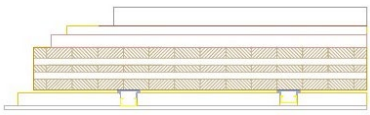


Sealing tapes are not required for the above-mentioned joints if

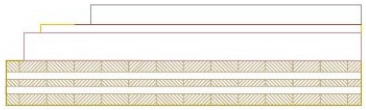
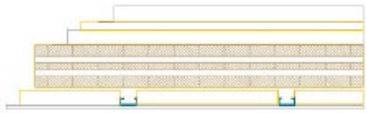
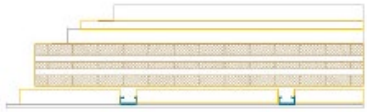
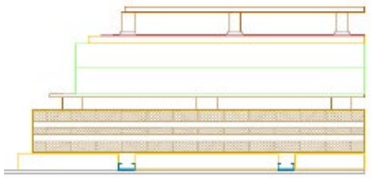
- the surface temperature is < 120°C and
- the maximum distance of the screw connection of 250 mm is observed.
- For stepped rebate joints, the temperature in the rebate area must be < 150°C and the maximum distance of the screw connection must be < 250 mm.

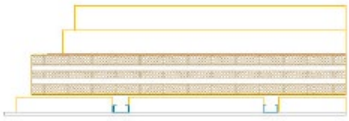
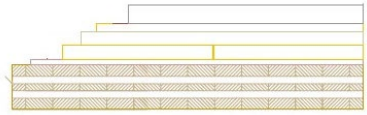
CLT – Cross Laminated Timber	Annex 4
Resistance to fire	of European Technical Assessment ETA-14/0349 of 13.04.2026

Examples for airborne and impact sound insulation

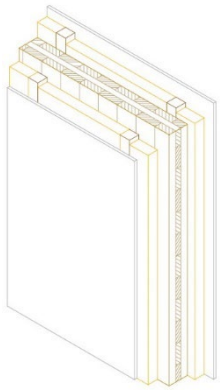
№	Floor elements		
F 1	140 mm	CLT 140 NVI L5S, 428 kg/m³	**$L_{n,w}(C_I)$ = 88 (-5) dB** 
F 2	70 mm 0.2 mm 30 mm 50 mm 50 mm 0.2 mm 18 mm 140 mm	Cement screed, 2210 kg/m³ Vapour barrier sheet Impact sound insulation board, 72 kg/m³, s' = 10 MN/m³ Ballast weight, 1650 kg/m³ Paving slab, 2320 kg/m³ Trickle course Soft fibre board, 250 kg/m³ CLT 140 NVI L5S, 428 kg/m³	**$L_{n,w}(C_I)$ = 41 (1) dB** 
F 3	70 mm 0.2 mm 30 mm 50 mm 50 mm 0.2 mm 18 mm 140 mm 3 mm 70 mm 15 mm	Cement screed, 2210 kg/m³ Vapour barrier sheet Impact sound insulation board, 72 kg/m³, s' = 10 MN/m³ Ballast weight, 1650 kg/m³ Paving slab, 2320 kg/m³ Trickle protection Soft fibre board, 250 kg/m³ CLT 140 NVI L5S, 428 kg/m³ Connection sealing tape Acoustical mounting including 50 mm thermal insulation, 16 kg/m³ Gypsum plasterboard, 800 kg/m³	**$L_{n,w}(C_I)$ = 36 (3) dB** 
F 4	70 mm 0.2 mm 30 mm 50 mm 140 mm 3 mm 70 mm 15 mm	Cement screed, 2210 kg/m³ Vapour barrier sheet Impact sound insulation board, 72 kg/m³, s' = 10 MN/m³ Ballast weight, 1650 kg/m³ CLT 140 NVI L5S, 428 kg/m³ Connection sealing tape Acoustical mounting including 50 mm thermal insulation, 16 kg/m³ Gypsum plasterboard, 800 kg/m³	**$L_{n,w}(C_I)$ = 46 (1) dB** 
F 5	70 mm 0.2 mm 30 mm 50 mm 140 mm	Cement screed, 2210 kg/m³ Vapour barrier sheet Impact sound insulation board, 72 kg/m³, s' = 10 MN/m³ Ballast weight, 1650 kg/m³ CLT 140 NVI L5S, 428 kg/m³	**$L_{n,w}(C_I)$ = 50 (-1) dB** 
F 6	70 mm 0.2 mm 30 mm 50 mm 20 mm 140 mm	Cement screed, 2210 kg/m³ Vapour barrier sheet Impact sound insulation board, 72 kg/m³, s' = 10 MN/m³ Ballast weight, 1650 kg/m³ Impact sound insulation board, 69 kg/m³, s' = 14 MN/m³ CLT 140 NVI L5S, 428 kg/m³	**$L_{n,w}(C_I)$ = 49 (1) dB** 

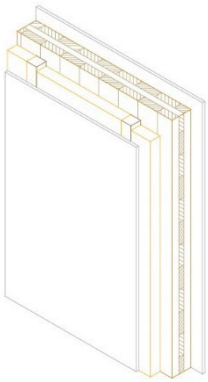
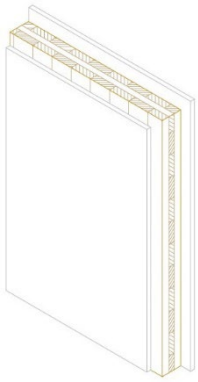
CLT – Cross Laminated Timber	Annex 5
Protection against noise	of European Technical Assessment ETA-14/0349 of 13.04.2026

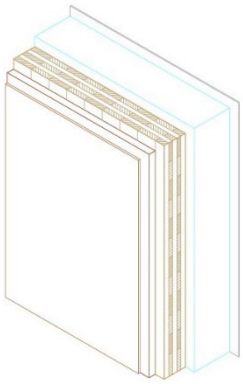
F 7	70 mm 0.2 mm 30 mm 100 mm 140 mm	Cement screed, 2210 kg/m³ Vapour barrier sheet Impact sound insulation board, 72 kg/m³, s' = 10 MN/m³ Latex bonded ballast weight, 1650 kg/m³ CLT 140 NVI L5S, 428 kg/m³	**$L_{n,w}(C_I)$ = 43 (-3) dB** 
F 8	60 mm 0.05 mm 30 mm 60 mm 0.1 mm 150 mm 70 mm 12.5 mm	Cement screed, 2200 kg/m³ PE-foil (separating layer) Impact sound insulation board, 120 kg/m³, s' ≤ 35 MN/m³ Ballast weight, 1700 kg/m³ PE-foil (trickle protection) CLT 5s Acoustical mounting including 60 mm thermal insulation, 22 kg/m³ Gypsum plasterboard, 720 kg/m³	**$L_{n,w}(C_I)$ = 53 (3) dB** 
F 9	60 mm 0.05 mm 30 mm 60 mm 0.1 mm 150 mm 70 mm 12.5 mm	Cement screed, 2200 kg/m³ PE-foil (separating layer) Impact sound insulation board, 80 kg/m³, s' = 10 MN/m³ Ballast weight, 1700 kg/m³ PE-foil (trickle protection) CLT 5s Acoustical mounting including 60 mm thermal insulation, 22 kg/m³ Gypsum plasterboard, 720 kg/m³	**$L_{n,w}(C_I)$ = 46 (2) dB** 
F 10	60 mm 0.05 mm 30 mm 60 mm 0.1 mm 150 mm	Cement screed, 2200 kg/m³ PE-foil (separating layer) Impact sound insulation board, 120 kg/m³, s' ≤ 35 MN/m³ Ballast weight, 1700 kg/m³ PE-foil (trickle protection) CLT 5s	**$L_{n,w}(C_I)$ = 57 (-1) dB** 
F 11	60 mm 0.05 mm 30 mm 60 mm 0.1 mm 150 mm	Cement screed, 2200 kg/m³ PE-foil (separating layer) Impact sound insulation board, 120 kg/m³, s' ≤ 35 MN/m³ Bonded ballast weight, 1840 kg/m³ PE-foil (trickle protection) CLT 5s	**$L_{n,w}(C_I)$ = 65 (-2) dB** 
F 12	20 + 80 mm 10 mm 2 mm 0.1 mm 30 mm 2 x 100 mm 0.1 mm 15 mm 50 mm 150 mm 70 mm 12.5 mm	Floor covering on timber beams 50/80 Protection mat Roofing membrane PE-foil Impact sound insulation board, 133 kg/m³, s' = 10 MN/m³ EPS F, 15 kg/m³ PE-foil (vapour barrier) OSB, 580 kg/m³ Timber beams 50/80 CLT 5s Acoustical mounting including 60 mm thermal insulation, 22 kg/m³ Gypsum plasterboard, 720 kg/m³	**$L_{n,w}(C_I)$ = 52 (3) dB** 

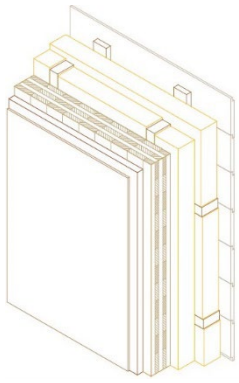
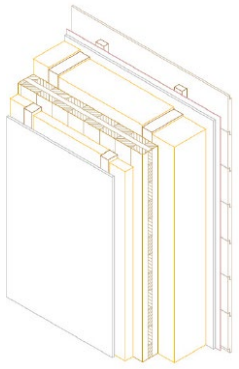
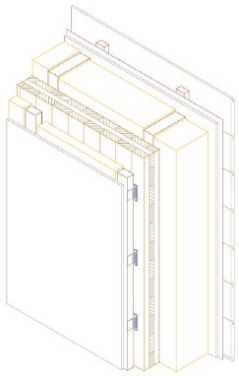
№	Roof elements		
R 1	2 mm 2 x 100 mm 0.1 mm 125 mm 70 mm 12.5 mm	Roofing membrane EPS F, 15 kg/m³ PE-foil (vapour barrier) CLT 5s Acoustical mounting including 60 mm thermal insulation, 22 kg/m³ Gypsum plasterboard, 720 kg/m³	**$R_w(C; C_{tr})$ = 48 (-3; -9) dB** 
R 2	70 mm 0.7 mm 2 mm 2 x 100 mm 0.1 mm 125 mm	Ballast weight, 1600 kg/m³ Separation geotextile Roofing membrane Mineral fibre board, 146 kg/m³ PE-foil (vapour barrier) CLT 5s	**$R_w(C; C_{tr})$ = 44 (0; -3) dB** 

№	Wall elements		
W 1	120 mm	CLT 120 NVI C5S, 445 kg/m³	**$R_w(C; C_{tr})$ = 36 (-1; -4) dB** 
W 2	100 mm	CLT 100 NVI C3S, 371 kg/m³	**$R_w(C; C_{tr})$ = 34 (-1; -3) dB** 

W 3	100 mm 3 mm 50 mm 12.5 mm	CLT 100 NVI C3S, 371 kg/m³ Connection sealing tape Acoustical mounting, 388 kg/m³ including 50 mm thermal insulation, 16 kg/m³ Gypsum plasterboard, 816 kg/m³	**$R_w(C; C_{tr})$ = 51 (-2; -8) dB** 
W 4	100 mm 50 mm 12.5 mm	CLT 100 NVI C3S, 371 kg/m³ Wooden battens, 388 kg/m³ including 50 mm thermal insulation, 16 kg/m³ Gypsum plasterboard, 816 kg/m³	**$R_w(C; C_{tr})$ = 45 (-1; -5) dB** 
W 5	12.5 mm 50 mm 100 mm 50 mm 12.5 mm	Gypsum plasterboard, 816 kg/m³ Wooden battens, 388 kg/m³ including 50 mm thermal insulation, 16 kg/m³ CLT 100 NVI C3S, 371 kg/m³ Wooden battens, 388 kg/m³ including 50 mm thermal insulation, 16 kg/m³ Gypsum plasterboard, 816 kg/m³	**$R_w(C; C_{tr})$ = 50 (-3; -10) dB** 

W 6	12.5 mm 100 mm 50 mm 12.5 mm	Gypsum plasterboard, 816 kg/m^3 CLT 100 NVI C3S, 371 kg/m^3 Wooden battens, 388 kg/m^3 including 50 mm thermal insulation, 16 kg/m^3 Gypsum plasterboard, 816 kg/m^3	**$R_w(C; C_{tr})$ = 46 (-2; -6) dB** 
W 7	12.5 mm 100 mm 12.5 mm	Gypsum plasterboard, 816 kg/m^3 CLT 100 NVI C3S, 371 kg/m^3 Gypsum plasterboard, 816 kg/m^3	**$R_w(C; C_{tr})$ = 37 (-1; -3) dB** 
W 8	100 mm 12.5 mm	CLT 100 NVI C3S, 371 kg/m^3 Gypsum plasterboard, 816 kg/m^3	**$R_w(C; C_{tr})$ = 37 (-1; -3) dB** 

W 9	100 mm 27 mm 12.5 mm	CLT 100 NVI C3S, 371 kg/m³ Acoustical mounting including 50 mm thermal insulation, 16 kg/m³ Gypsum plasterboard, 816 kg/m³	**$R_w(C; C_{tr})$ = 48 (-5; -12) dB** 
W 10	120 mm 35 mm 10 mm	CLT 120 NVI C5S, 445 kg/m³ Clay building board, 1043 kg/m³ Clay rendering including glass fibre reinforcement	**$R_w(C; C_{tr})$ = 47 (-1; -5) dB** 
W 11	5 mm 200 mm 120 mm 35 mm 10 mm	Exterior basecoat including reinforcing mesh Stone wool rendering panel, 121 kg/m³ CLT 120 NVI C5S, 445 kg/m³ Clay building board, 1043 kg/m³ Clay rendering including glass fibre reinforcement	**$R_w(C; C_{tr})$ = 48 (-3; -8) dB** 

W 12	20 mm 27 mm 0.4 mm 100 mm 100 mm 120 mm 35 mm 10 mm	Rabbet edge shuttering of larch, 536 kg/m³ Spread shuttering, 640 kg/m³ Shuttering layer Wooden battens, 542 kg/m³ including 100 mm façade insulation board, 25 kg/m³, cross layer Wooden battens, 542 kg/m³ including 100 mm façade insulation board, 25 kg/m³ CLT 120 NVI C5S, 445 kg/m³ Clay building board, 1043 kg/m³ Clay rendering including glass fibre reinforcement	**$R_w(C; C_{tr})$ = 54 (-2; -7) dB** 
W 13	20 mm 30 mm 0.3 mm 15 mm 200 mm 100 mm 94 mm 60 mm 12.5 mm	Shuttering, laterally closed*/open all around** Timber beams 30/50 Foil (diffusion open) Gypsum fibre board, 1190 kg/m³ Wooden battens 200/60, e = 62.5 cm including 200 mm thermal hemp-mats, 30 kg/m³ CLT 3s or 5s Wooden battens 60/60, e = 62.5 cm including 50 mm mineral wool, 13 kg/m³ Gypsum plasterboard, 810 kg/m³	**$R_w(C; C_{tr})$ = 46 (-2; -5) dB *** **$R_w(C; C_{tr})$ = 45 (-1; -4) dB **** 
W 14	20 mm 30 mm 0.3 mm 15 mm 200 mm 100 mm 94 mm 70 mm 12.5 mm	Shuttering Timber beams 30/50 Foil (diffusion open) Gypsum fibre board, 1190 kg/m³ Wooden battens 200/60, e = 62.5 cm including 200 mm thermal hemp-mats*, 30 kg/m³ or wood fibre insulation board**, 58kg/m³ CLT 3s or 5s Acoustical mounting including 50 mm mineral wool, 13 kg/m³ Gypsum plasterboard, 810 kg/m³	**$R_w(C; C_{tr})$ = 51 (-2; -7) dB *** **$R_w(C; C_{tr})$ = 53 (-2; -8) dB **** 

W 15	100 mm 140 mm 8 mm	CLT 100 3s Mineral wool, 120 kg/m³ Plaster including reinforcement, 3 kg/m²	**$R_w(C; C_{tr})$ = 44 (-2; -8) dB** 
W 16	100 mm 160 mm 11 mm	CLT 100 3s Hemp fibre insulation, 100 kg/m³ Plaster including reinforcement, 4 kg/m²	**$R_w(C; C_{tr})$ = 51 (-3; -10) dB** 

Sound absorption

f in Hz	63	125	250	500	1000	2000	4000
α_s	0.02	0.03	0.04	0.04	0.05	0.05	0.05