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European Technical Assessment

ETA-14/0354
of 22.07.2024

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

Träger BauBuche GL75, Beam BauBuche GL75,
Poutre BauBuche GL75, Trave BauBuche GL75,
Viga BauBuche GL75, Belka BauBuche GL75,
Draagbalk BauBuche GL75

Product family to which the construction product belongs

Glued laminated timber made of hardwood –
Structural laminated veneer lumber made of
beech

Manufacturer

Pollmeier Furnierwerkstoffe GmbH
Pferdsdorfer Weg 6
99831 Amt Creuzburg
GERMANY

Manufacturing plants

See Annex 1

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 Regulation (EU) No 305/2011, on the basis of

European Assessment Document (EAD)
130010-01-0304 “Glued laminated timber made
of hardwood – Structural laminated veneer
lumber made of beech”.

This European Technical Assessment replaces

European Technical Assessment ETA-14/0354 of
20.09.2021.

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Specific parts

1 Technical description of the product

1.1 General

This European Technical Assessment (ETA)¹ applies to the glued laminated timber with trade names "Träger BauBuche GL75, Beam BauBuche GL75, Poutre BauBuche GL75, Trave BauBuche GL75, Viga BauBuche GL75, Belka BauBuche GL75 and Draagbalk BauBuche GL75" hereinafter referred to as Träger BauBuche. Träger BauBuche is composed of lamellae of structural laminated veneer lumber (LVL) made of beech. Lamella conform to EN 14374. The glued laminated timber may be block glued.

Träger BauBuche consists of at least two lamellae which are bonded at the faces. Surfaces are grinded.

Träger BauBuche and the lamellae for its manufacturing correspond to the specifications given in Annex 1. The material characteristics, dimensions and tolerances of Träger BauBuche, not indicated in these Annexes, are given in the technical file² of the European Technical Assessment.

Holes in the glued laminated timber are not subject 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 Lamellae

The specification of the lamellae is given in Annex 1, Table 2. Lamella conform to EN 14374.

Surfaces shall be grinded at the earliest 24 hours before bonding. Provided that there is a possibility for clean storage in suitable facilities as well as proper quality control for prevention of dirt at the surfaces, the lamellae may be stored for a maximum period of 4 weeks after grinding. The lamellae shall be bonded at the faces. No recycled wood shall be used.

Wood species is European Beech (*Fagus sylvatica* L.).

1.2.2 Adhesive

The adhesive for bonding of the glued laminated timber shall conform to EN 301 (PRF-adhesives) or EN 15425, Type I. The adhesive for block gluing of GLT- XXL is gapfilling and conforms to EN 301 (PRF-adhesives), Type I 90 GF 1,5M.

Adhesives with tested adhesive-hardener-ratio are given in the technical file of the European Technical Assessment.

¹ In 2015 ETA-14/0354 was firstly issued as European Technical Assessment ETA-14/0354 of 20.02.2015, amended to ETA-14/0354 of 11.07.2018, amended to ETA-14/0354 of 20.09.2021 and amended to ETA-14/0354 of 22.07.2024.

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.

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

2.1 Intended use

Träger BauBuche is intended to be used as a structural or non-structural element in buildings and timber structures.

The product shall be subjected to static and quasi static actions only.

Träger BauBuche is intended to be used in service classes 1 and 2 according to EN 1995-1-1³.

2.2 General assumptions

The glued laminated timber is manufactured in accordance with the provisions of the European Technical Assessment using the manufacturing process as identified in the inspection of the manufacturing plants 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.

Manufacture shall be in accordance with EN 14080. In addition, the provisions laid down in this European Technical Assessment shall be considered.

Layers of grinded lamellae of LVL shall be bonded together to the required thickness of the glued laminated timber. Adhesive shall be applied on one face of each lamellae. There shall be no finger joints in the individual lamellae.

Minimum bonding pressure for gluing of the lamellae is 1.0 N/mm². Minimum temperature in the manufacturing room shall be 20°C. Minimum pressing time and spread rate according to the technical file shall be met.

Mechanical loading during minimum pressure and hardening time is not permitted, except insignificant loading during transport.

Design

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

The following conditions shall be observed:

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

Design of glued laminated timber can be according to EN 1995-1-1 and EN 1995-1-2, taking into account of Annex 1 and Annex 2 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.

³ Reference documents are listed in Annex 3.

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

No	Essential characteristic	Product performance
Basic requirement for construction works 1: Mechanical resistance and stability ¹⁾		
1	Bending strength	Annex 1
2	Tensile strength parallel to the grain	Annex 1
3	Tensile strength perpendicular to the grain	Annex 1
4	Compression strength parallel to the grain	Annex 1
5	Compression strength perpendicular to the grain	Annex 1
6	Shear strength	Annex 1
7	Modulus of elasticity parallel to the grain	Annex 1
8	Modulus of elasticity perpendicular to the grain	Annex 1
9	Shear modulus	Annex 1
10	Creep and duration of the load	Annex 1
11	Dimensional stability	Annex 1
12	Bonding quality	Annex 1
13	Bonding quality of block bonding	Annex 1
14	In-service environment	Annex 1
15	Density	Annex 1
16	Withdrawal strength of screws in GLT made of hardwood	Annex 1
17	Embedment strength of screws in GLT made of hardwood	Annex 1
18	Head pull-through parameter of screws in GLT made of hardwood	Annex 1
Basic requirement for construction works 2: Safety in case of fire		
19	Reaction to fire	Annex 1
20	Resistance to fire (Charring rate)	No performance assessed.
Basic requirement for construction works 3: Hygiene, health and the environment		
21	Emission of formaldehyde	Annex 1
Basic requirement for construction works 4: Safety and accessibility in use		
22	Same as Basic requirement for construction works 1	
Basic requirement for construction works 6: Energy economy and heat retention		
23	Thermal conductivity	Annex 1
24	Thermal inertia	Annex 1
¹⁾ These characteristics also relate to basic requirement for construction works 4.		

3.2 Assessment methods

3.2.1 General

The assessment of the essential characteristics in Clause 3.1 of Träger BauBuche 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 and for energy economy and heat retention in use in the sense of the basic requirements for construction works № 1, 2, 3, 4 and 6 of Regulation (EU) № 305/2011 has been made in accordance with the European Assessment Document EAD 130010-01-0304, Glued laminated timber made of hardwood – Structural laminated veneer lumber made of beech.

3.2.2 Identification

The European Technical Assessment for Träger BauBuche 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 the system of assessment and verification of constancy of performance to be applied to Träger BauBuche is System 1. System 1 is detailed in Commission Delegated Regulation (EU) № 568/2014 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 plan⁵;

(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).

⁵ 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 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.

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by Österreichisches Institut für Bautechnik

The original document is signed by:

Thomas Rockenschaub
Deputy Managing Director

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Table 3: Product characteristics of Träger BauBuche

BR	Essential characteristic	Method of verification	Class / Use category / Numeric value
1	Mechanical resistance and stability		
	Bending strength $f_{m,k}$	EN 408	$k_{h,m} \cdot 75 \text{ MPa}^1$ with $k_{h,m} = \left(\frac{600}{h}\right)^{0.10}$
	Modulus of elasticity parallel to the grain of the lamellas		
	– $E_{0,mean}$	EN 408	16 800 MPa
	– $E_{0,05}$	EN 408	15 300 MPa
	Modulus of elasticity perpendicular to the grain of the lamellas		
	– $E_{90,mean}$	EN 14374	470 MPa
	– $E_{90,05}$	EN 14374	400 MPa
Tensile strength			
– parallel to the grain of the lamellas $f_{t,0,k}$	EAD 130010-01-0304	$k_{h,t} \cdot 60 \text{ MPa}^2$ with $k_{h,t} = \left(\frac{600}{h}\right)^{0.10}$	
– perpendicular to the grain of the lamellas $f_{t,90,k}$	EN 384	0.6 MPa	
Compressive strength			
– parallel to the grain of the lamellas $f_{c,0,k}$	EN 408 and EAD 130010-01-0304	$k_{c,0} \cdot 59.4 \text{ MPa}$ in service class 1 ³⁾ $k_{c,0} \cdot 49.5 \text{ MPa}$ in service class 2 ³⁾ with $k_{c,0} = \min \left\{ \begin{array}{l} 0.0009 \cdot h + 0.892 \\ 1.18 \end{array} \right.$ for $n > 3$	
– perpendicular to the grain of the lamellas $f_{c,90,k}$	EN 384 and EAD 130010-01-0304	14.8 MPa in service class 1 12.3 MPa in service class 2	
Shear strength $f_{v,k}$			
	EN 408	$k_{h,v} \cdot 4.5 \text{ MPa}^1$ with $k_{h,v} = \left(\frac{600}{h}\right)^{0.13}$	

1) h is the height of Träger BauBuche in mm.

2) h is the larger length of the cross section of Träger BauBuche perpendicular to the longitudinal axis in mm.

3) h is the height of Träger BauBuche in mm and n is number of lamellas of LVL.

Träger BauBuche	Annex 2 of European Technical Assessment ETA-14/0354 of 22.07.2024
Characteristic data of Träger BauBuche	

BR	Essential characteristic	Method of verification	Class / Use category / Numeric value	
	Shear modulus			
	– G_{mean}	EN 14374	850 MPa	
	– G_{05}	EN 14374	760 MPa	
	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 extent that adverse deformation will occur.			
	Moisture content	EAD 130010-01-0304	5 – 10 %	
	Bonding quality	EN 14374	Pass	
	Bonding quality of block bonding (GLT– Regular)	EAD 130010-01-0304	Pass Durability of block bonding: Untreated: $f_{v,mean} = 13.6$ MPa Treated: $f_{v,mean} = 6.9$ MPa	
	Bonding quality of block bonding (GLT– XXL)	EAD 130010-01-0304	Pass $f_{v,k} = 8.0$ MPa (large scale test) Durability of block bonding: Untreated: $f_{v,mean} = 16.8$ MPa Treated: $f_{v,mean} = 7.7$ MPa	
	In-service environment			
	Durability of timber			
	Service classes	EN 1995-1-1	1 and 2	
	Withdrawal strength of screws in GLT made of hardwood	EN 1382	Annex 2	
Embedment strength of screws in GLT made of hardwood	EN 383	Annex 2		
Head pull-through parameter of screws in GLT made of hardwood	EN 1383	Annex 2		
2	Safety in case of fire			
Reaction to fire	Commission Delegated Regulation (EU) 2017/2293	Euroclass D-s2, d0		
Resistance to fire (Charring rate)	EN 1995-1-2	Charring rate $\beta_0 = 0.65$ mm/min $\beta_n = 0.7$ mm/min		
Träger BauBuche		Annex 2		
Characteristic data of Träger BauBuche		of European Technical Assessment ETA-14/0354 of 22.07.2024		

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BR	Essential characteristic	Method of verification	Class / Use category / Numeric value
3	Hygiene, health and environment		
	Emission of formaldehyde	EN 717-1	E1
6	Energy economy and heat retention		
	Thermal conductivity λ	EN ISO 10456	0.17 W/(m·K)
	Thermal inertia, specific heat capacity c_p	EN ISO 10456	1 600 J/(kg·K)
Träger BauBuche		Annex 2	
Characteristic data of Träger BauBuche		of European Technical Assessment ETA-14/0354 of 22.07.2024	

Fasteners

Admissible fasteners in Träger BauBuche are nails, screws, rod dowels, bolts, split ring and shear connectors.

Calculation of fasteners shall follow EN 1995-1-1. However, for dowel-type fasteners with a diameter $d \geq 8$ mm the embedment strength shall be reduced by factor 0.8 for use in the edge faces. Calculation of embedment strength of dowel-type fasteners is not permissible for use in the face.

Screws in GLT made of hardwood

The following provisions are valid for connections in members made of Träger BauBuche with wood screws Assy 3.0 and Assy plus according to ETA 11/0190 and diameter d $5 \text{ mm} \leq d \leq 12 \text{ mm}$.

Träger BauBuche must be predrilled for threaded lengths of the screws $l_{ef} > l_{ef,max}$ given in Table 4.

Table 4: Max. threaded lengths of the screws to be used without predrilling

	Assy plus VG	Assy 3.0
Diameter d	$l_{ef,max}$	$l_{ef,max}$
mm	mm	mm
5	–	50
6	30	60
7	–	70
8	48	80
10	80	100
12	96	–

The minimum spacing, end and edge distances according to EN 1995-1-1, Table 8.2, Column 3 ($\rho \leq 420 \text{ kg/m}^3$), apply for screws without predrilling. The minimum spacing, end and edge distances according to EN 1995-1-1, Table 8.2, Column 5, apply for screws with predrilling.

The characteristic withdrawal strength can be calculated by

$$F_{ax,\alpha,Rk} = n_{ef} \cdot k_{ax} \cdot f_{ax,90,k} \cdot d \cdot l_{ef}$$

with

$$f_{ax,90,k} = 0.52 \cdot d^{-0.35} l_{ef}^{-0.1} \cdot \rho_k^{0.8}$$

n_{ef} ... effective number of screws according to ETA-11/0190

$$k_{ax} = 1 \text{ for } 45^\circ \leq \alpha \leq 90^\circ$$

$$k_{ax} = 0.3 + 0.7 \cdot \alpha/45^\circ \text{ for } \alpha < 45^\circ$$

Träger BauBuche	Annex 3 of European Technical Assessment ETA-14/0354 of 22.07.2024
Fasteners in Träger BauBuche	

d ... diameter of the screw in mm

l_{ef} ... penetration length of the threaded part of the screw in the timber member in mm

ρ_k ... characteristic density of Träger BauBuche, $\rho_k = 730 \text{ kg/m}^3$

α ... angle force to grain

The characteristic embedment strength can be calculated by

$$f_{h,k} = \frac{0.082 \cdot \rho_k \cdot d^{-0.15}}{(k_{90} \cdot \sin^2 \alpha + \cos^2 \alpha) \cdot (1.2 \cdot \cos^2 \beta + \sin^2 \beta) \cdot (2.5 \cdot \cos^2 \varepsilon + \sin^2 \varepsilon)}$$

With

d ... diameter of the screw in mm

$k_{90} \dots = 0.5 + 0.024 \cdot d$

α ... angle force to grain

β ... angle screw-axis to wide face

ε ... angle screw-axis to grain

ρ_k ... characteristic density of Träger BauBuche, $\rho_k = 730 \text{ kg/m}^3$

The characteristic head pull-through resistance can be calculated by

$$F_{ax,\alpha,Rk} = n_{ef} \cdot f_{head,k} \cdot d_{head}^2$$

The characteristic head pull-through parameter can be calculated by

$$f_{head,k} = 70 - 0.8 \cdot d_{head}$$

with

d_{head} ... head diameter of the screw in mm

n_{ef} ... effective number of screws according to ETA-11/0190

Träger BauBuche	Annex 3 of European Technical Assessment ETA-14/0354 of 22.07.2024
Fasteners in Träger BauBuche	

EAD 130010-01-0304, European Assessment Document for “Glued laminated timber made of hardwood – Structural laminated veneer lumber made of beech”

European Technical Assessment of 23 July 2018 for „Würth self-tapping screws“ of Adolf Würth GmbH & Co. KG, Reinhold-Würth-Straße 12-17, 74653 Künzelsau, Germany.

EN 301 (11.2017), Adhesives, phenolic and aminoplastic, for load-bearing timber structures – Classification and performance requirements

EN 383 (01.2007), Timber structures – Test methods – Determination of embedment strength and foundation values for dowel type fasteners

EN 384:2016+A1 (11.2018), Structural timber – Determination of characteristic values of mechanical properties and density

EN 408:2010+A1 (07.2012), Timber structures – Structural timber and glued laminated timber – Determination of some physical and mechanical properties

EN 717-1 (10.2004), Wood-based panels – Determination of formaldehyde release – Part 1: Formaldehyde emission by the chamber method

EN 1382 (02.2016), Timber structures – Test methods – Withdrawal capacity of timber fasteners

EN 1383 (02.2016), Timber structures – Test methods – Pull through resistance of timber fasteners

EN 1995-1-1 (11.2004), +AC (06.2006), +A1 (06.2008), +A2 (05.2014), Eurocode 5 – Design of timber structures - Part 1-1: General – Common rules and rules for buildings

EN 1995-1-2 (11.2004) +AC (06.2006), +AC (03.2009), Eurocode 5 – Design of timber structures – Part 1-2: General – Structural fire design

EN 14080 (06.2013), Timber structures – Glued laminated timber and glued solid timber – Requirements

EN 14374 (11.2004), Timber structures – Structural laminated veneer lumber – Requirements

EN 15425 (01.2017), Adhesives – One component polyurethane for load bearing timber structures – Classification and performance requirements

EN ISO 10456 (12.2007), +AC (12.2009), Building materials and products – Hygrothermal properties – Tabulated design values and procedures for determining declared and design thermal values

Träger BauBuche	Annex 4
Reference documents	of European Technical Assessment ETA-14/0354 of 22.07.2024