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European Technical Assessment

ETA-25/0265 of 29.04.2025

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	FLO.LAM.OAK
Product family to which the construction product belongs	Glued laminated timber (GLT) made of solid hardwood
Manufacturer	FLORIAN LEGNO s.p.a. Via Castellana 48/A 31039 Riese Pio X (TV) ITALY
Manufacturing plant	Via Cesare Battisti, 71 31028 Vazzola (TV) ITALY Flo drvo d.o.o. Ulica Tečine 4 32276, Babina Greda CROATIA
This European Technical Assessment contains	13 pages including 2 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) 130320-00-0304 “Glued laminated timber made of solid hardwood”.

Specific parts

1 Technical description of the product

1.1 General

This European Technical Assessment (ETA) applies to the glued laminated timber (GLT) made of solid hardwood “FLO.LAM.OAK”. FLO.LAM.OAK is made of hardwood boards which are bonded together in order to form glued laminated timber.

FLO.LAM.OAK consist of at least three adjacent layers which are bonded at the faces. Surfaces are planed.

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

Holes and large finger joints in FLO.LAM.OAK 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 Boards

The specification of the boards is given in Annex 2, Table 3 and Table 4. Boards are visually graded according to Annex 1 of the European Technical Assessment. Only technically dried wood shall be used.

Surfaces are planed. The bonding operation shall take place within 24 hours after planing.

Wood species is European oak or equivalent hardwood.

1.2.2 Adhesive

The adhesive for bonding of the glued laminated timber and the finger joints of the individual boards shall conform to EN 301 and is tested according to EN 302-6.

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

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

2.1 Intended use

FLO.LAM.OAK is intended to be used as a structural or non structural element in buildings and timber structures.

FLO.LAM.OAK shall be subjected to static and quasi static actions only.

FLO.LAM.OAK is intended to be used in service classes 1 to 3 according to EN 1995-1-1[2].

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[1] 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] EN 1995-1-1:2004 +AC:2006 +A1:2008 +A2:2014

2.2 General assumptions

FLO.LAM.OAK 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.

Layers of planed boards shall be bonded together to the required thickness of the FLO.LAM.OAK. The waiting periods according to the technical file as well a minimum temperature according to EN 14080 in the manufacturing room must be met.

Adhesive shall be applied minimum on one face of the boards per glue joint. The applied quantity of adhesive as well as minimum binding pressure are given in the technical file of the European Technical Assessment. Further requirements for bonding of the boards as well as the adhesive-joint-temperature and the minimum pressing time are given in the technical file of the European Technical Assessment.

The individual boards shall be jointed in longitudinal direction by means of finger joints according to EN 14080, there shall be no butt joints. Hardening of finger joints takes place at a temperature of and humidity according to EN 14080 for minimum 2 hours.

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 FLO.LAM.OAK. Verification of stability of the works including application of loads on FLO.LAM.OAK is not subject to the European Technical Assessment.

The following conditions shall be observed:

Design of FLO.LAM.OAK is carried out under the responsibility of an engineer experienced in such products.

Design of the works shall account for the protection of the FLO.LAM.OAK.

FLO.LAM.OAK is installed correctly.

Design of FLO.LAM.OAK can be according to EN 1995-1-1 and EN 1995-1-2[3], taking into account of 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.

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.

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

2.3 Assumed working life

The provisions made in the European Technical Assessment (ETA) are based on an assumed intended working life of FLO.LAM.OAK of 50 years, when installed in the works, provided that the glued 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[4].

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 references to the methods used for its assessment

3.1 Performance 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 strength of the glued laminated timber – with flatwise bending of the laminations	EAD 130320-00-0304, Clause 2.2.1	Annex 2
Bending strength of the glued laminated timber – with edgewise bending of the laminations	EAD 130320-00-0304, Clause 2.2.2	Annex 2
Tensile strength parallel to the grain of the glued laminated timber	EAD 130320-00-0304, Clause 2.2.3	Annex 2
Tensile strength perpendicular to the grain of the glued laminated timber	EAD 130320-00-0304, Clause 2.2.4	Annex 2
Compression strength parallel to the grain of the glued laminated timber	EAD 130320-00-0304, Clause 2.2.5	Annex 2
Compression strength perpendicular to the grain of the glued laminated timber	EAD 130320-00-0304, Clause 2.2.6	Annex 2
Shear strength of the glued laminated timber	EAD 130320-00-0304, Clause 2.2.7	Annex 2
Rolling shear strength of the glued laminated timber	EAD 130320-00-0304, Clause 2.2.8	Annex 2
Modulus of elasticity parallel to the grain of the glued laminated timber	EAD 130320-00-0304, Clause 2.2.9	Annex 2
Modulus of elasticity perpendicular to the grain of the glued laminated timber	EAD 130320-00-0304, Clause 2.2.10	Annex 2
Shear modulus of the glued laminated timber	EAD 130320-00-0304, Clause 2.2.11	Annex 2
Rolling shear modulus of the glued laminated timber	EAD 130320-00-0304, Clause 2.2.12	Annex 2

[4] The real working life of a product incorporated in a specific works depends on the environmental conditions to which that works is subject, and the particular conditions of the design, execution, use and maintenance of that works may be outside this ETA. Therefore, it cannot be excluded that in these cases the real working life of the product may also be shorter than the assumed working life.

Essential characteristic	Method of assessment	Performance
Density of the glued laminated timber	EAD 130320-00-0304, Clause 2.2.13	Annex 2
PH-value	No performance assessed.	
Dimensional stability	EAD 130320-00-0304, Clause 2.2.15	Annex 2
Basic Works Requirement 2: Safety in case of fire		
Reaction to fire	No performance assessed.	
Charring rate	EAD 130320-00-0304, Clause 2.2.16.2	Annex 2
Basic Works Requirement 3: Hygiene, health and the environment		
Content, emission and/or release of dangerous substances	EAD 130320-00-0304, Clause 2.2.17	Clause 3.1.1
Formaldehyde emission	No performance assessed.	
Durability aspects		
Durability of bonding strength of the glued laminated timber/ Durability of bonding strength of finger joints of the lamination	EAD 130320-00-0304, Clause 2.2.18	Annex 2
Mechanical durability of the glued laminated timber	EAD 130320-00-0304, Clause 2.2.19	Annex 2
Durability against biological attack	EAD 130320-00-0304, Clause 2.2.120	Annex 2

3.1.1 General

The release of dangerous substances is determined according to EAD 130320-00-0304, “Glued laminated timber made of solid hardwood”. No dangerous substances is the performance of FLO.LAM.OAK 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 FLO.LAM.OAK 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 and durability aspects in use in the sense of the basic requirements for construction works № 1, 2 and 3 of Regulation (EU) № 305/2011 has been made in accordance with the European Assessment Document EAD 130320-00-0304, Glued laminated timber made of solid hardwood.

3.2.2 Identification

The European Technical Assessment for FLO.LAM.OAK 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 (hereinafter 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[5] the system of assessment and verification of constancy of performance to be applied to "FLO.LAM.OAK" is System 1. System 1 is detailed in Commission Delegated Regulation (EU) № 568/2014[6] 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[7];

(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 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

5.1 Tasks for the manufacturer

5.1.1 Factory production control

In the manufacturing plant the manufacturer establishes and continuously maintains a factory production control. All data, procedures, and specifications adopted by the manufacturer are documented in a systematic manner in the form of instructions manual (user's guides) and process instructions. Purpose of factory production control is to ensure the constancy of performances of the product with regard to the essential characteristics.

The manufacturer only uses raw materials supplied with the relevant inspection documents as laid down in the control plan. The incoming raw materials are subjected to controls by the manufacturer before acceptance. Check of incoming materials includes control of inspection documents presented by the manufacturer of the raw materials.

The frequency of control and testing performed within factory production control as well as on the finished product, is in accordance with the determined manufacturing process and the prescribed

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5 Official Journal of the European Communities OJ L 73, 14.3.1997, p. 19

6 Official Journal of the European Union OJ L 157, 27.5.2014, p. 76

7 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.

test plan. The factory production control's results of testing are recorded and evaluated. The records are kept at least for ten years after the product has been placed on the market. On request the records are presented to Österreichisches Institut für Bautechnik. The records shall include at least:

- 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

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 FLO.LAM.OAK 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 twice 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 29.04.2025
by Österreichisches Institut für Bautechnik

The original document is signed by:

Thomas Rockenschaub
Deputy Managing Director

Table 2: Visual strength grading (DIN 4074-5) – Grading requirements for boards

Grading criteria	**Grading classes**
	LS10 and higher
1. Knots	
Single knot	≤ 1/3
Group of knots	≤ 1/2
2. Slope of grain	≤ 12 %
3. Pith	Not permitted
4. Rate of growth	-
5. Fissures	
Shrinkage fissures	Permitted
Fissures caused by a flash, frost, ring-shake	Not permitted
6. Wane	≤ 1/4
7. Sweep	
Bow	≤ 8 mm
Twist	≤ 1 mm / 25 mm width
Cupling	≤ 1/30
8. Stain, rot	
Nail-strong brown and red stripes	≤ 2/5
Rot	Not permitted
9. Degrade by greenwood insects	Not permitted
10. Other characteristics	considered analogous according to the other grading rules

Table 3: Dimensions and specifications

Characteristic		Dimension / Specification
FLO.LAM.OAK		
Height h	mm	90 to 600
Width b	mm	$80 \leq b \leq 200$
Length l	m	≤ 16
Number of layers n	—	minimum 3
Boards		
Surface	—	planed [1)]
Thickness t (planed dimension)	mm	$30^{\pm 2}$
Width b	mm	80 to 200
Boards shall be graded with visual procedure according to Annex 1.	—	LS 10 and higher
Moisture of wood according to EN 13183-2	%	7 to 12 %
Finger joints	—	EN 14080
Profile of finger joints	mm	15 / 5
Maximum length of boards without finger joints	mm	1 500

[1)] The bonding operation shall take place within 24 hours after planing.

Table 4: Product characteristics of the boards

BR	Essential characteristic	Method of verification	Class / Use category / Numeric value
1	**Mechanical resistance and stability**		
	Strength class of boards without finger joints	EAD130320-00-0304 2.2.1.1	$f_{m,l,edge,k}$ = 19,5 MPa $E_{m,0,l,mean}$ = 11 500 MPa $f_{t,0,l,k}$ = 16 MPa $E_{t,0,l,mean}$ = 13 700 MPa
	Tensile strength of finger joint – parallel to the grain $f_{t,0,j,k}$	EAD130320-00-0304 2.2.1	36 MPa
	Flatwise bending strength of finger joint – parallel to the grain $f_{m,j,k,flat}$	EAD130320-00-0304 2.2.1	55 MPa
	Edgewise bending strength of finger joint – parallel to the grain $f_{m,j,k,edge}$	EAD130320-00-0304 2.2.1	37 MPa
	Density – characteristic density $\rho_{l,k}$ – mean density $\rho_{l,m}$	EAD130320-00-0304 2.2.13	605 kg/m³ 690 kg/m³

Table 5: Product characteristics of FLO.LAM.OAK

BR	Essential characteristic	Method of verification	Class / Use category / Numeric value
1	**Mechanical resistance and stability**		
	Strength class of boards	Annex 1	LS10+
	Mechanical strength properties		
	– flatwise bending strength $f_{m,g,flat,k}$	EAD130320-00-0304 2.2.1	30 MPa [1)]
	– edgewise bending strength $f_{m,g,edge,k}$	EAD130320-00-0304 2.2.2	k_{sys} · 19,5 MPa [3)]
	– tensile strength parallel to the grain $f_{t,0,g,k}$	EAD130320-00-0304 2.2.3	16 MPa
	– tensile strength perpendicular to the grain $f_{t,90,g,k}$	EAD130320-00-0304 2.2.4	0.6 MPa
	– compression strength parallel to the grain $f_{c,0,g,k}$	EAD130320-00-0304 2.2.5	18,2 MPa [4)]
	– compression strength perpendicular to the grain $f_{c,90,g,k}$	EAD130320-00-0304 2.2.6	6.6 MPa [4)]
	– shear strength $f_{v,g,k}$	EAD130320-00-0304 2.2.7	3.9 MPa
	– rolling shear strength $f_{r,g,k}$	EAD130320-00-0304 2.2.8	1.2 MPa
	Stiffness Properties		
	– Modulus of elasticity parallel to the grain $E_{0,g,mean}$	EAD130320-00-0304 2.2.9	14 500 MPa
	– Modulus of elasticity parallel to the grain $E_{0,g,05}$	EAD130320-00-0304 2.2.9	12 700 MPa

NOTE
[1)] 1 MPa = 1 N/mm²
[2)] The characteristic strength property for lamellas loaded in flat bending and H < 330 mm may be multiplied by $k_h = \left(\frac{330}{h}\right)^{0,25}$, with h as the height of the FLO.LAM.OAK.
[3)] k_{sys} is the system factor acc. to EN 1995-1-1, Figure 6.12 depending on the number of laminations.
[4)] For service class 2 the characteristic value of compression strength shall be decreased by the factor 0.8.

BR	Essential characteristic	Method of verification	Class / Use category / Numeric value
	– Modulus of elasticity perpendicular to the grain $E_{90,g,mean}$	EAD130320-00-0304 2.2.10	960 MPa
	– shear modulus $G_{g,mean}$	EAD130320-00-0304 2.2.11	900 MPa
	– rolling shear modulus $G_{r,g,mean}$	EAD130320-00-0304 2.2.12	65 MPa
	– rolling shear modulus $G_{r,g,0.05}$	EAD130320-00-0304 2.2.12	54 MPa
	Density – characteristic density $\rho_{g,k}$	EAD130320-00-0304 2.2.13	660 kg/m³
	Dimensional stability Moisture content during service shall not change to such an extent that adverse deformation will occur. Dimensional changes in thickness and width of hardwood according to EN 336: - increase of 0.35 % per 1 % moisture increase for a moisture content 20% ≤ u ≤ 30% - decrease of 0.35 % per 1 % moisture decrease for a moisture u < 20%		
2	**Safety in case of fire**		
	Charring rate	EN 1995-1-2	β_0 = 0.50 mm/min β_n = 0.55 mm/min
–	**Aspects of durability**		
	Durability of bonding strength of the glued laminated timber/ Durability of bonding strength of finger joints of the lamination	EAD130320-00-0304 2.2.18	Pass
	Mechanical durability of the glued laminated timber	k_{mod} and k_{def} according to EN 1995-1-1 for solid wood	
	Durability against biological attack	Natural durability acc. to EN 350	