



## European Technical Assessment

## ETA 19/0456 of 20/04/2022

### General Part

<b>Technical Assessment Body issuing the European Technical Assessment:</b>	<b>TECNALIA RESEARCH &amp; INNOVATION</b>
<b>Trade name of the construction product</b>	LignumStrand
<b>Product family to which the construction product belongs</b>	Structural composite lumber product: Laminated Strand Lumber (LSL)
<b>Manufacturer</b>	TABSAL SCL S.L. Paraje Zerradoa s/n, E-31840 Uharte-Arakil, Navarra, Spain <a href="http://www.tabsal.com">http://www.tabsal.com</a>
<b>Manufacturing plant</b>	TABSAL SCL S.L. Paraje Zerradoa s/n, E-31840 Uharte-Arakil, Navarra, Spain
<b>This European Technical Assessment contains</b>	11 pages
<b>This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of</b>	EAD 130308-00-0304 “Structural Composite Lumber Product: Laminated Strand Lumber (LSL)”
<b>This version replaces</b>	ETA 19/0456 of 26/08/2019

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## Specific parts

### 1. Technical description of the product

LIGNUMSTRAND is a structural composite lumber called Laminated Strand Lumber (LSL). It is a composite of wood strand elements with wood fibers primarily oriented along the length of the member. The least dimension of the strands shall not exceed 2,54 mm and the average length shall be a minimum of 150 times the least dimension. The width generally shall not exceed 25 mm. LIGNUMSTRAND does not contain recycled wood strand elements.

The current product is manufactured from poplar and has a homogeneous density profile between 600 and 800 kg/m<sup>3</sup>, due to the process of pressing with steam injection. The adhesive used is diphenylmethane diisocyanate.

Dimension of the LSL boards are between 7500 and 8200 mm length, 620 mm width and between 30 and 80 mm thickness.

LIGNUMSTRAND may be treated with boric acid as flame retardant.

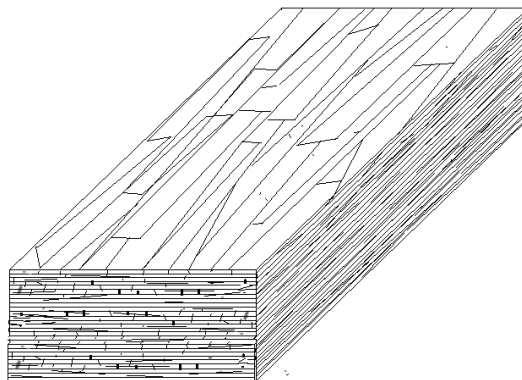


Figure 1. LignumStrand

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

#### 2.1 Intended use

LIGNUMSTRAND is intended to be used to one- or two-dimensional structural buildings applications including beams, posts, upright, end walls, lintels, purlins, sills, stair stringers, rim boards, studs, ceiling joists and components of trusses and other resistant elements as well as structural panels both vertical and horizontal. And other resistant compositions such as I-joists and box beams.

LIGNUMSTRAND is intended for indoor applications in dry conditions, service class 1 and 2 according to EN 1995-1-1.

LIGNUMSTRAND shall be employed in hazard classes 1 and 2 only, as defined in EN 335.

## 2.2 Working life/Durability

The provisions made in this European Technical Assessment are based on an assumed working life of 50 years as minimum, provided that LIGNUMSTRAND are subject to appropriate use and maintenance. These provisions are based upon the current state of the art and the available knowledge and experience.

The indications given on the working life cannot be interpreted as a guarantee given by the producer or Assessment Body but are to be regarded only as a means for choosing the right 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 Mechanical resistance and stability (BWR 1)

#### 3.1.1 Bending strength parallel to grain: edgewise bending

The characteristic value at the 5%-percentile of bending strength, parallel to grain (edgewise bending), in N/mm<sup>2</sup> is shown in the table below.

Treatment	5%-percentile (N/mm <sup>2</sup> )
Samples without treatment	35,0
Samples treated with boric acid	27,3

#### 3.1.2 Bending strength parallel to grain: flatwise bending

The characteristic value at the 5%-percentile of bending strength, parallel to grain (flatwise bending), in N/mm<sup>2</sup> is shown in the table below.

Treatment	5%-percentile (N/mm <sup>2</sup> )
Samples without treatment	39,6
Samples treated with boric acid	34,4

#### 3.1.3 Tensile strength parallel to grain

The characteristic value at the 5%-percentile of tensile strength, parallel to grain, in N/mm<sup>2</sup> is shown in the table below.

Treatment	5%-percentile (N/mm <sup>2</sup> )
Samples without treatment	29,1
Samples treated with boric acid	18,7

### 3.1.4 Tensile strength perpendicular to grain

The characteristic value at the 5%-percentile of tensile strength, perpendicular to grain (flatwise), in N/mm<sup>2</sup> is shown in the table below.

Treatment	5%-percentile (N/mm <sup>2</sup> )
Samples without treatment	0,66
Samples treated with boric acid	0,38

Tensile strength, perpendicular to grain (edgewise): Performance not assessed.

### 3.1.5 Compressive strength parallel to grain

The characteristic value at the 5%-percentile of compressive strength, parallel to grain, in N/mm<sup>2</sup> is shown in the table below.

Treatment	5%-percentile (N/mm <sup>2</sup> )
Samples without treatment	29,0
Samples treated with boric acid	21,0

### 3.1.6 Compressive strength perpendicular to grain: edgewise compression

The characteristic value at the 5%-percentile of compressive strength, perpendicular to grain (edgewise compression), in N/mm<sup>2</sup> is shown in the table below.

Treatment	5%-percentile (N/mm <sup>2</sup> )
Samples without treatment	8,7
Samples treated with boric acid	8,2

### 3.1.7 Compressive strength perpendicular to grain: flatwise compression

The characteristic value at the 5%-percentile of compressive strength, perpendicular to grain (flatwise compression), in N/mm<sup>2</sup> is shown in the table below.

Treatment	5%-percentile (N/mm <sup>2</sup> )
Samples without treatment	10,8
Samples treated with boric acid	11,2

### 3.1.8 Shear strength parallel to grain: edgewise shear

The characteristic value at the 5%-percentile of shear strength, parallel to grain, in N/mm<sup>2</sup> is shown in the table below.

Treatment	5%-percentile (N/mm <sup>2</sup> )
Samples without treatment	8,6
Samples treated with boric acid	7,0

### 3.1.9 Shear strength parallel to grain: flatwise shear

The characteristic value at the 5%-percentile of shear strength, parallel to grain, in N/mm<sup>2</sup> is shown in the table below.

Treatment	5%-percentile (N/mm <sup>2</sup> )
Samples without treatment	3,2
Samples treated with boric acid	1,7

### 3.1.10 Modulus of elasticity parallel to grain: edgewise

The arithmetic mean value of modulus of elasticity parallel to grain, in N/mm<sup>2</sup> is shown in the table below.

Treatment	Mean value (N/mm <sup>2</sup> )
Samples without treatment	10700
Samples treated with boric acid	9500



### 3.1.11 Modulus of elasticity parallel to grain: flatwise

The arithmetic mean value of modulus of elasticity parallel to grain, in N/mm<sup>2</sup> is shown in the table below.

Treatment	Mean value (N/mm <sup>2</sup> )
Samples without treatment	11600
Samples treated with boric acid	10600

### 3.1.12 Modulus of elasticity perpendicular to grain

The arithmetic mean value of modulus of elasticity perpendicular to grain in tension (flatwise), in N/mm<sup>2</sup> is shown in the table below.

Treatment	Mean value (N/mm <sup>2</sup> )
Samples without treatment	180
Samples treated with boric acid	170

Modulus of elasticity, perpendicular to grain in tension (edgewise): Performance not assessed.

### 3.1.13 Shear modulus: edgewise bending

The arithmetic mean value of shear modulus (edgewise bending), in N/mm<sup>2</sup> is shown in the table below.

Treatment	Mean value (N/mm <sup>2</sup> )
Samples without treatment	2100
Samples treated with boric acid	1500

### 3.1.14 Shear modulus: flatwise bending

The mean value of shear modulus, in N/mm<sup>2</sup> (flatwise bending) is shown in the table below.

Treatment	Mean value (N/mm <sup>2</sup> )
Samples without treatment	470
Samples treated with boric acid	440



### 3.1.15 Density

The arithmetic mean value of density, in kg/m<sup>3</sup> is shown in the table below.

Treatment	Mean value (kg/m <sup>3</sup> )
Samples without treatment	722
Samples treated with boric acid	736

### 3.1.16 Durability against biological attack

The durability against biological attack according to EN 335 is shown in the tables below.

Durability against beetles ( <i>Hylotrupes bajulus</i> )	
Treatment	Class
Samples without treatment	DC D
Samples treated with boric acid	DC D

Durability against termites ( <i>Reticulitermes spp.</i> )	
Treatment	Class
Samples without treatment	DC S
Samples treated with boric acid	DC D

Durability against fungi ( <i>Coniophora puteana</i> , <i>Gloeophyllum trabeum</i> and <i>Poria placenta</i> )	
Treatment	Class
Samples without treatment	DC 4
Samples treated with boric acid	DC 1





## 3.2 Safety in case of fire (BWR 2)

### 3.2.1 Reaction to fire

The class of reaction to fire of the product is shown in the table below.

Reaction to fire	
Treatment	Class
Samples without treatment	No performance assessed
Samples treated with boric acid	C-s1, d0

### 3.2.2 Charring rate

The corresponding performance for the resistance to fire is shown in the table below.

Treatment	Exposed area	$\beta_0$ (mm/min)	$\beta_n$ (mm/min)
Samples without treatment	Edge	0,56	0,59
	Face	0,53	
Samples treated with boric acid	Edge	0,52	0,54
	Face	0,45	



### 3.3 Hygiene, health and the environment (BWR 3)

#### 3.3.1 Content, emission and/or release of dangerous substances

The performance of the product according to EAD 130308-00-0304, clause 2.2.19 has been assessed.

The release scenarios for "LIGNUMSTRAND" with respect dangerous substances are:

- IA1: Product with direct contact with indoor air
- IA2: Product with indirect contact to indoor air

Substance(s) classified as EU-cat. Carc. 1A/1B <sup>a)</sup>	The product does not contain these dangerous substances actively used <sup>d)</sup>		
Substance(s) classified as EU-cat. Muta. 1A/1B <sup>b)</sup>			
Substance(s) classified as EU-cat. Repr. 1A and/or 1B <sup>c)</sup>			
SVOC and VOC <sup>e)</sup>	The product was tested for the emission of dangerous substances using the loading factor $L = 1,4 \text{ m}^2/\text{m}^3$ and was therefore assessed <sup>e)</sup> :		
	<b>Concentrations</b>	<b>after 3 days</b>	<b>After 28 days</b>
	TVOC ( $\geq C_6$ to $< C_{16}$ )	0,24 mg/m <sup>3</sup>	0,22 mg/m <sup>3</sup>
	Carcinogenic EU-cat. 1A /1B	<0,001mg/m <sup>3</sup>	<0,005mg/m <sup>3</sup>
	TSVOC ( $\geq C_{16}$ to $< C_{22}$ )	---	<0,005mg/m <sup>3</sup>
	TVOC without NIK	----	<0,005mg/m <sup>3</sup>
	Toluene	---	<1 $\mu\text{g}/\text{m}^3$
	Formaldehyde	---	3 $\mu\text{g}/\text{m}^3$
	Acetaldehyde	---	22 $\mu\text{g}/\text{m}^3$
	R-value with reference to EU-LCI	---	0,29
	R-value with reference to NIK	---	0,29
Wood preservatives	The product does not contain these substances actively used <sup>d)</sup> PCP not detected <sup>f)</sup>		
Formaldehyde <sup>g)</sup>	Samples without treatment: Class E1  Samples with treatment: Class E1		
Phenol	The product does not contain this substance in the raw material <sup>d)</sup>		
a) (H350, H350i), in accordance with Regulation (EC)No 1272/2008. b) (H340), in accordance with Regulation (EC) No1272/2008. c) (H360, H360F, H360D, H360FD), in accordance with Regulation (EC) No1272/2008. d) Performance based on a manufacturer's declaration about contained dangerous substances e) Statement according to test report. Test.acc. EN 16516 f) Statement according to test report. Test.acc. CEN/TR 14823 g) Statement according to test report. Test.acc. EN 717-1			

#### **4. Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base**

According to the Decision 97/176/EC of the European Commission, as amended by Decision 2001/596/EC of the European Commission, the system 1 of AVCP applies (see Annex V to Regulation (EU) No 305/2011).

#### **5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD**

All the necessary technical details for the implementation of the AVCP system are laid down in the Control Plan deposited at Tecnalía Research and Innovation, with which the Factory Production Control shall be in accordance.

The Control Plan is a confidential part of the ETA and is only handed over to the notified body involved in the assessment and verification of constancy of performance.

Issued in Azpeitia, on 20/04/2022



A handwritten signature in blue ink, appearing to read "M. Mateos", written over a horizontal line.

Miguel Mateos  
Innovation and Conformity Assessment Point  
Tecnalía Research & Innovation