

## Declaration of Performance

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|------------------------------|--|
| 1. Ref. no.:                 | PM – 001 – 2013  |
| 2. Type:                     | Laminated veneer lumber made of beech  |
| 3. Purpose:                  | Laminated veneer lumber in compliance with EN 14374:2005-02 for all load-bearing, stiffening or non-load-bearing components. |
| 4. Brand name:               | BauBuche Platte (BauBuche Board)<br><br>Pollmeier Furnierwerkstoffe GmbH<br>Pferdsdorfer Weg 6<br>99831 Creuzburg, Germany   |
| 5. Contact address:          | not relevant (see 4.)  |
| 6. Constancy of performance: | System 1   |
| 7. Certifying body           | MPA Stuttgart 0672<br>Certificate of performance No. 0672-CPR-0415   |
| 8. Certifying body           | Not relevant   |

**9. Declared performance:**

**9.1 Product description**

The laminated veneer lumber is manufactured from adhesively bonded, dried beech veneers up to a width W of 1850 mm and up to a length L of 35 m.

Table 1: Composition of "Beech LVL with longitudinal layers"

Nominal component thickness B in mm	Number of veneer layers	Composition
20	6	IIIII
30	9	IIIIIII
40	12	IIIIIIIII
50	15	IIIIIIIIII
60	18	IIIIIIIIIIII
70	20	IIIIIIIIIIIIII
80	23	IIIIIIIIIIIIIIII
I longitudinal veneer layer		

Table 2: Composition of "Beech LVL with crosswise layers"

Nominal component thickness in mm	Number of veneer layers			Composition
	longl	crossw.	total	
20	4	2	6	I-II-I
30	7	2	9	II-III-II
40	10	2	12	II-IIII-II
50	11	4	15	II-I-IIII-I-II
60	14	4	18	II-I-IIIIII-I-II
70	16	4	20	II-I-IIIIIIII-I-II
80	17	6	23	II-I-I-IIIIIIII-I-I-II
I longitudinal veneer layer				
- crosswise veneer layer				

**9.2 Area of use**

Laminated veneer lumber "Beech LVL with longitudinal layers" and "Beech LVL with crosswise layers" may be used for all load-bearing, stiffening or non-load-bearing

components which are designed and constructed in compliance with EN 1995-1-1 in conjunction with the National Annex EN 1995-1-1/NA.

Laminated veneer lumber "Beech LVL with longitudinal layers" and "Beech LVL with crosswise layers" may be used in the areas which are categorised in service classes 1 and 2 according to EN 1995-1-1.

**9.3 Declared strength and stiffness values and densities**

Table 3: Characteristic strength and stiffness values in N/mm<sup>2</sup> and density in kg/m<sup>3</sup>

Type of load		Laminated veneer lumber "Beech LVL with longitudinal layers"	Laminated veneer lumber "Beech LVL with crosswise layers"
Nominal thickness in mm		20 ≤ B ≤ 80	20 <sup>a)</sup> ≤ B ≤ 80
<b>Strength values</b>			
<b>Flatwise bending</b>			
Bending	$f_{m,0,k,flat}$	65	45
Compressive	$f_{c,90,k,flat}$	10	10
Shear	$f_{v,0,k,flat}$	8	3.3
Shear (rolling)	$f_{v,k,roll}$	not declared	3.3
<b>Edgewise bending</b>			
Bending <sup>b)</sup>	$f_{m,0,k,edge}$	70	60
Tensile    to the grain	$f_{t,0,k}$	60	40
Tensile ⊥ to the grain	$f_{t,90,k,edge}$	1.5	17
Tensile ⊥ to the grain in thickness direction	$f_{t,90,k,flat}$	0.6	0.6
Compressive    to the grain	$f_{c,0,k}$	41.6 <sup>c)</sup>	24.2 <sup>c)</sup>
Compressive ⊥ to the grain	$f_{c,90,k,edge}$	14	14
Shear	$f_{v,0,k,edge}$	8	9

<b>Stiffness values</b>			
Modulus of elasticity	$E_{m,0,mean}$	16800	11800
Modulus of elasticity	$E_{m,0,05}$	14900	10700
Modulus of elasticity	$E_{90,mean}$	470	3700
Modulus of elasticity	$E_{90,05}$	400	3400
Shear modulus edgewise	$G_{v,0,edge,mean}$	760	890
Shear modulus edgewise	$G_{v,0,edge,05}$	630	660
Shear modulus flatwise	$G_{v,0,flat,mean}$	850	430
Shear modulus flatwise	$G_{v,0,flat,05}$	760	380
<b>Density</b>			
Mean density	$\rho_{mean}$	740	
Characteristic density	$\rho_k$	680	
<p>a) "Beech LVL with crosswise layers" with a nominal thickness of 20 mm according to Annex 2 must not be used in edge bending.</p> <p>b) Values apply for <math>H \leq 300</math> mm. For <math>300 &lt; H \leq 1000</math> mm, the characteristic strength value must be multiplied by the factor <math>k_h = (300/h)^{0.12}</math>. H is the dimension of the overall cross-section in mm, which is decisive for the bending stress.</p> <p>c) If used in service class 1, the compressive strength can be increased by the factor 1.2.</p>			

**9.4 Fasteners**

Fasteners must be designed in compliance with Section 4.2 as per EN 1995-1-1 in conjunction with EN 1995-1-1/NA using the equations for solid timber. For this purpose, the arrangements in Table 4 with the stated reductions are possible. All surfaces which predominantly comprise cross-grained timber are classified as end surfaces. The other surfaces are defined here as narrow surfaces.

Table 4: Applications and reduction factors for the design of fasteners in "Beech LVL with longitudinal layers" and "Beech LVL with crosswise layers"

	Calculation as per	Top surface	Narrow surface	End surface
<b>Embedment</b>				
Nails, screws, predrilled	Gl. 8.16, EN 1995-1-1	100 %	Version A: 100% Version B: 60%	Not permitted
Dowels and bolts	Gl. 8.32, EN 1995-1-1	100 %	Load angle to grain parallel: 70% perpendicular: 40%	Not permitted
<b>Load-bearing strength of a fastener</b>				
Toothed rings, connector plates	NCI NA 8.1, EN 1995-1-1/NA	100 %	100%	100%
<b>Withdrawal capacity</b>				
Wood screws ( $45 \leq \alpha \leq 90^\circ$ )	Gl. 8.38 ( $k_d = 1$ ), EN 1995-1-1	100 %	100 %	100 %
Version A - "Beech LVL with longitudinal layers"; Version B - "Beech LVL with crosswise layers"				

The calculations must be made with the density of  $680 \text{ kg/m}^3$ . Combined loads must be calculated in accordance with Section 8.3.3 of EN 1995-1-1.

Only dowels and bolts (also dowel bolts), nails, wood screws, toothed rings and connector plates may be used for connecting "Beech LVL with longitudinal layers" and "Beech LVL with crosswise layers", in compliance with the provisions stated below.

The applications stated in Table 4 must be observed.

The minimum spacings for the fasteners when subjected to shearing and withdrawal forces are the same as for solid timber and plywood.

In the case of shearing forces in the narrow surfaces of "Beech LVL with longitudinal layers", nails must have a diameter of at least 3.1 mm and screws a diameter of at least 6 mm.

In the case of withdrawal forces in the end and narrow surfaces of "Beech LVL with crosswise layers", only screws with a diameter of at least 6 mm may be used.

## 9.5 Fire protection

For the verification of their behaviour in fire, the laminated veneer lumber "Beech LVL with longitudinal layers" and "Beech LVL with crosswise layers" must be treated as building materials with normal flammability (Class E acc. EN 13501:2007).

The corresponding values in EN 1995-1-2 can be taken as the basis for assessing the burning rate of laminated veneer lumber.

## 9.6 Moisture protection, sound insulation, thermal insulation

For the required verification of moisture protection, sound insulation and thermal insulation, the regulations, standards and guidelines issued for glued laminated timber ("Beech LVL with longitudinal layers") or builder's glued plywood ("Beech LVL with crosswise layers"), depending on the product, apply.

The values for shrinkage and swelling behaviour can be found in the National Annex EN 1995-1-1/NA.

**9.7 Formaldehyde class**

Laminated veneer lumber "Beech LVL with longitudinal layers" and "Beech LVL with crosswise layers" complies with formaldehyde emission class E1, in accordance with the specifications of EN 14374.

**10. Declaration**

The performance of the product stated under Numbers 1 and 2 above conforms to the declared performance stated under Number 9. This Declaration of Performance is issued under the sole responsibility of the manufacturer named under Number 4.

Signed for the manufacturer:

Creuzburg, 10.09.2014



Ralf Pollmeier

Managing Director