

## Declaration of Performance

- |                              |  |
|------------------------------|--|
| 1. Ref. no.:                 | PM – 001 – 2013  |
| 2. Type:                     | Laminated veneer lumber made of beech  |
| 3. Purpose:                  | Laminated veneer lumber in compliance with<br>EN 14374:2005-02 for all load-bearing,<br>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-<br>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                      | IIIIIIIIIIIII  |
| 80                                  | 23                      | IIIIIIIIIIIIII |
| 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-IIIII-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<br>lumber "Beech LVL<br>with longitudinal<br>layers" | Laminated veneer<br>lumber "Beech LVL<br>with crosswise<br>layers" |
|--|-------------------|---|--|
| Nominal<br>thickness in mm                       |                   | $20 \leq B \leq 80$   | $20^a) \leq B \leq 80$   |
| <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<br>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  |

| Stiffness values  |                     |       |       |
|---|---------------------|-------|-------|
| 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   |
| Density   |                     |       |       |
| Mean density  | $\rho_{mean}$       | 740   |       |
| Characteristic density  | $\rho_k$            | 680   |       |
| a) "Beech LVL with crosswise layers" with a nominal thickness of 20 mm according to Annex 2 must not be used in edge bending.   |                     |       |       |
| b) Values apply for $H \leq 300$ mm. For $300 < H \leq 1000$ mm, the characteristic strength value must be multiplied by the factor $k_h = (300/h)^{0.12}$ . H is the dimension of the overall cross-section in mm, which is decisive for the bending stress. |                     |       |       |
| c) If used in service class 1, the compressive strength can be increased by the factor 1.2.   |                     |       |       |

#### 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%<br>Version B: 60%                       | Not permitted |
| Dowels and bolts  | Gl. 8.32, EN 1995-1-1               | 100 %       | Load angle to grain parallel: 70%<br>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