Kalesnikoff Structural Glued Laminated Timber
Kalesnikoff Mass Timber Inc.

Products: Kalesnikoff Structural Glued Laminated Timber
Kalesnikoff Mass Timber Inc., PO Box 3000 BC-3A, Castlegar, British Columbia, Canada V1N 4N1
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1. Basis of the product report:
   - 2012 IRC: Sections R502.1.5, R602.1.2, and R802.1.4 Structural glued laminated timber
   - ANSI 117-2020 and ANSI 117-2015 recognized in the 2021 IBC and IRC, and 2018 IBC and IRC, respectively
   - ANSI A190.1-2022 Product Standard for Structural Glued Laminated Timber
   - ASTM D3737-18e1, D3737-12, and D3737-08 recognized in the 2021 IBC and IRC, 2018 and 2015 IBC and IRC, and 2012 IBC and IRC, respectively
   - Qualification test data

2. Product description:
   Kalesnikoff glulam products are manufactured with Douglas fir-Larch, Hem-fir, Softwood Species, and Spruce-pine-fir lumber in accordance with ANSI A190.1. These layup combinations are recognized in ANSI 117. Kalesnikoff glulam products are used as beams, headers, rafters, purlins, and columns, and are manufactured in nominal widths up to 32-1/4 inches, depths up to 49-1/2 inches, and lengths up to 60 feet.

3. Design properties:
   Allowable design properties for Kalesnikoff glulam beams and columns are listed in Tables 1 and 2. The allowable spans for Kalesnikoff glulam beams shall be in accordance with the recommendations provided by the manufacturer and APA Data File: Glued Laminated Beam Design Tables, Form S475 (www.apawood.org/resource-library), as applicable, or shall be determined based on the design properties listed in Table 1, as appropriate. The allowable loads for Kalesnikoff glulam columns shall be in accordance with the recommendations provided by the manufacturer and APA Data File: Design of Structural Glued Laminated Timber Columns, Form Y240 (see link above), as applicable, or shall be determined based on the design properties listed in Table 2, as appropriate.

4. Product installation:
   Kalesnikoff glulam beams and columns shall be installed in accordance with the recommendations provided by the manufacturer and APA Construction Guide: Glulam Connection Details, Form T300 (see link above). Permissible field notching and drilling shall be in accordance with the recommendations provided by the manufacturer and APA Technical Notes: Field Notching and Drilling of Glued Laminated Timber Beams, Form S560, and Effect of Large Diameter Horizontal Holes on the Bending and Shear Properties of Structural Glued Laminated Timber, Form V700 (see link above).
5. Fire-rated assemblies:
   Design of fire-resistant exposed wood members in accordance with Chapter 16 of the National Design Specification for Wood Construction (NDS), Section 722.1 of the 2021, 2018, and 2015 IBC, or Section 722.6.3 of the 2012 IBC shall be applicable to Kalesnikoff glulam products. Fire-rated assemblies shall be constructed in accordance with the recommendations provided by the manufacturer and APA Design/Construction Guide: Fire-Rated Systems, Form W305 (see link above).

6. Limitations:
   a) Kalesnikoff glulam beams and columns listed in this report shall be designed in accordance with the code using the design properties specified in this report.
   b) Kalesnikoff glulam beams shall meet the dimensions specified in ANSI 117 and ANSI A190.1.
   c) Kalesnikoff glulam beams and columns listed in this report are produced at the Kalesnikoff Mass Timber’s facility in South Slocan, British Columbia, under a quality assurance program audited by APA.
   d) This report is subject to re-examination in one year.

7. Identification:
   Kalesnikoff glulam beams and columns listed in this report are identified by a label bearing the manufacturer's name (Kalesnikoff Mass Timber) and/or trademark, the APA assigned plant number (1134), the product standard (ANSI A190.1), the APA logo, the combination symbol, the report number PR-L333, and a means of identifying the date of manufacture.
Table 1. Allowable Design Values for Kalesnikoff Mass Timber Glulam Beams for Normal Duration of Load\(^{(1,2)}\)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Species</th>
<th>Core</th>
<th>Outer/Bottom of Face</th>
<th>Parallel to Wide Faces of Laminations</th>
<th>Beam Width</th>
<th>Beam Depth</th>
<th>Beam Length</th>
<th>Allowable Design Values (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16F-E2</td>
<td>DF/DF</td>
<td>SPF</td>
<td>SPF</td>
<td>DF/DF</td>
<td>2,400</td>
<td>2,400</td>
<td>650</td>
<td>1,500 1,500 650 1,500 650 1,500</td>
</tr>
<tr>
<td>16F-E4</td>
<td>DF/DF</td>
<td>SPF</td>
<td>SPF</td>
<td>DF/DF</td>
<td>2,400</td>
<td>2,400</td>
<td>650</td>
<td>1,500 1,500 650 1,500 650 1,500</td>
</tr>
<tr>
<td>20F-E2</td>
<td>DF/DF</td>
<td>SPF</td>
<td>SPF</td>
<td>DF/DF</td>
<td>2,600</td>
<td>2,600</td>
<td>650</td>
<td>1,600 1,600 650 1,600 650 1,600</td>
</tr>
<tr>
<td>20F-E8</td>
<td>DF/DF</td>
<td>SPF</td>
<td>SPF</td>
<td>DF/DF</td>
<td>2,600</td>
<td>2,600</td>
<td>650</td>
<td>1,600 1,600 650 1,600 650 1,600</td>
</tr>
<tr>
<td>26F-E2</td>
<td>DF/DF</td>
<td>SPF</td>
<td>SPF</td>
<td>DF/DF</td>
<td>3,000</td>
<td>3,000</td>
<td>650</td>
<td>1,800 1,800 650 1,800 650 1,800</td>
</tr>
<tr>
<td>26F-E8</td>
<td>DF/DF</td>
<td>SPF</td>
<td>SPF</td>
<td>DF/DF</td>
<td>3,000</td>
<td>3,000</td>
<td>650</td>
<td>1,800 1,800 650 1,800 650 1,800</td>
</tr>
</tbody>
</table>

\(^{(1)}\) The combinations in this table are applicable to members consisting of 4 or more laminations and are intended primarily for members stressed in bending due to loads applied perpendicular to the wide faces of the laminations. Allowable design values are tabulated, however, for loading both perpendicular and parallel to the wide faces of the laminations.

\(^{(2)}\) Axially Loaded

\(^{(3)}\) Fasteners

\(^{(4)}\) The tabulated allowable design values are for normal duration of loading. For other durations of loading, see the applicable building code. The tabulated allowable design values are for dry conditions of use. For wet conditions of use, multiply the tabulated values by the wet-use factors shown at the bottom of the table.

\(^{(5)}\) The tabulated values of F\(_{\text{ax}}\) are based on members 5-1/8 inches in width by 12 inches in depth by 21 feet in length. For members with a larger volume, F\(_{\text{ax}}\) shall be multiplied by a volume factor, V\(_{\text{F}}\) = (5.125/b)\(^{1/10}\) (12/d)\(^{1/10}\), where b is the beam width (in.), d is the beam depth (in.), and L is the beam length between the points of zero moment (ft).

\(^{(6)}\) For prismatic members, members subject to impact or cyclic loading, or shear design of bending members at connections (NDS 3.4.3.3), the F\(_{\text{ax}}\) and F\(_{\text{by}}\) values shall be multiplied by a factor of 0.72. The tabulated F\(_{\text{ax}}\) values are for timbers with laminations made from a single piece of lumber across the width or multiple pieces that have been edge bonded. For timber manufactured from multiple piece laminations (across width) that are not edge bonded, value shall be multiplied by 0.4 for members with 5, 7, or 9 laminations or by 0.5 for all other members.

\(^{(7)}\) The tabulated E values include true E (also known as "shear-free E"), apparent E, and E for beam stability calculation (NDS 3.3.3.8). For calculating beam deflections, the tabulated E\(_{\text{ax}}\) values shall be used unless the shear deflection is determined in addition to bending deflection based on the tabulated E\(_{\text{by}}\). The axial modulus of elasticity, E\(_{\text{ax}}\), the axial modulus of apparent shear, E\(_{\text{ax}}\text{app}\), and the axial modulus of beam stability, E\(_{\text{ax}}\text{stab}\), are equal to the tabulated E\(_{\text{ax}}\text{true}\) and E\(_{\text{by}}\text{true}\) values.

\(^{(8)}\) The values of F\(_{\text{by}}\) are based on members 12 inches in depth. For depths less than 12 inches, F\(_{\text{by}}\) shall be permitted to be increased by multiplying the flat use factor, (12/d)\(^{1/10}\), where d is the beam depth in inches. When d is less than 3 inches, use the size adjustment factor for 3 inches.

\(^{(9)}\) 20F-E/SPF1 is limited to 1-1/2 to 3-1/2 inches in width, and 7-1/2, 9, 9-1/2, 11-7/8, and 14 inches in depth.

\(^{(10)}\) See NDS.
Table 2. Allowable Design Values for Kalesnikoff Mass Timber Glulam Columns for Normal Duration of Load\(^{(1)}\)

<table>
<thead>
<tr>
<th>Combination</th>
<th>Species(^{(2)})</th>
<th>Grade</th>
<th>All Loading</th>
<th>Axially Loaded</th>
<th>Bending about Y-Y Axis</th>
<th>Bending about X-X Axis</th>
<th>Fasteners</th>
<th>Specific Gravity for Dowel Type Fastener Design</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Modulus of Elasticity(^{(3)})</td>
<td>Tension Perpendicular to Grain</td>
<td>Compression Parallel to Grain</td>
<td>(E_{y app}) or (E_{y true}) (psi)</td>
<td>(F_{xt_true}) (psi)</td>
<td>(F_{xt_app}) (psi)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(E_{x app}) or (E_{x true}) (psi)</td>
<td>(E_{x app}) or (E_{x true}) (psi)</td>
<td>(F_{yt_true}) (psi)</td>
<td>(F_{yt_app}) (psi)</td>
<td>(F_{yt_app}) (psi)</td>
<td>(F_{yt_app}) (psi)</td>
</tr>
<tr>
<td>1</td>
<td>DF</td>
<td>L3</td>
<td>1.6 1.5 0.79 560 950 1,250 1,250 1,450 1,250 1,000 230 1,250 265 0.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>DF</td>
<td>L2</td>
<td>1.7 1.6 0.85 560 1,250 1,950 1,900 1,800 1,600 1,300 230 1,700 265 0.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>DF</td>
<td>L2D</td>
<td>2.0 1.9 1.00 650 1,450 2,300 1,900 2,100 1,850 1,550 230 2,000 265 0.50</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>4</td>
<td>DF</td>
<td>L1CL</td>
<td>2.0 1.9 1.00 590 1,400 2,100 1,950 2,200 2,000 1,650 230 2,100 265 0.50</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5</td>
<td>DF</td>
<td>L1</td>
<td>2.1 2.0 1.06 650 1,650 2,400 2,100 2,400 2,100 1,800 230 2,200 265 0.50</td>
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<td></td>
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<tr>
<td>14</td>
<td>HF</td>
<td>L3</td>
<td>1.4 1.3 0.69 375 800 1,100 1,050 1,200 1,050 850 190 1,100 215 0.43</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>15</td>
<td>HF</td>
<td>L2</td>
<td>1.5 1.4 0.74 375 1,050 1,350 1,350 1,500 1,350 1,100 190 1,450 215 0.43</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>HF</td>
<td>L1</td>
<td>1.7 1.6 0.85 375 1,200 1,500 1,500 1,750 1,550 1,300 190 1,600 215 0.43</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>22(8)</td>
<td>SW</td>
<td>L3</td>
<td>1.1 1.0 0.53 315 525 850 725 800 700 575 170 725 195 0.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Wet-use factors: 0.833 0.53 0.8 0.08 0.73 0.08 0.0875 0.8 0.0875 0.8 0.875 see NDS

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\(^{(1)}\) The tabulated allowable design values are for normal duration of loading. For other durations of loading, see applicable building code. The tabulated allowable design values are for dry conditions of use. For wet conditions of use, multiply the tabulated values by the factors shown at the bottom of the table.

\(^{(2)}\) DF = Douglas fir-Larch and SW = Softwood Species.

\(^{(3)}\) The tabulated E values include shear-free (true) modulus of elasticity \((E_{y true}, E_{x true}, \text{and } E_{w true})\), apparent modulus of elasticity \((E_{y app}, E_{x app}, \text{and } E_{w app})\), and 5\(^{th}\) percentile modulus of elasticity \((E_{5\%_x}, E_{5\%_y}, \text{and } E_{5\%_w})\). For column stability calculation (NDS 3.7.1), \(E_{5\%_w}\) shall be used. For calculating the total deflection due to bending, the tabulated \(E_{x app}\) or \(E_{y app}\) values shall be used, or as an alternative, the true (shear-free) bending deflection shall be calculated using the tabulated \(E_{x true}\) or \(E_{y true}\), which shall be added to the calculated shear deflection to determine the total deflection due to bending.

\(^{(4)}\) The values of \(F_{xt}\) are based on members 12 inches in depth. For depths less than 12 inches, \(F_{xt}\) shall be permitted to be increased by multiplying by the flat use factor, \((12/d)^{0.5}\), where \(d\) is the beam depth in inches. When \(d\) is less than 3 inches, use the size adjustment factor for 3 inches.

\(^{(5)}\) For non-prismatic, notched members, members subject to impact or cyclic loading, or shear design of bending members at connections (NDS 3.4.3.3), the tabulated \(F_{xt}\) and \(F_{yt}\) values shall be multiplied by 0.72.

\(^{(6)}\) The tabulated \(F_{xt}\) values are for members of 4 or more lams. The tabulated \(F_{yt}\) values shall be multiplied by a factor of 0.95 for 3 lams and 0.84 for 2 lams. For members with 5, 7, or 9 lams manufactured from multiple-piece lams with unbonded edge joints, the tabulated \(F_{xt}\) values shall be multiplied by a factor of 0.5. For all other members manufactured from multiple-piece lams with unbonded edge joints, the tabulated \(F_{xt}\) values shall be multiplied by a factor of 0.4. This adjustment shall be cumulative with the adjustment specified in Footnote 5.

\(^{(7)}\) The values of \(F_{xt}\) are based on members 5-1/8 inches in width by 12 inches in depth by 21 feet in length. For members with a larger volume, \(F_{xt}\) shall be multiplied by a volume factor, \(C_v = (5.125b)^{0.16} (12/d)^{0.10} (21L)^{0.10}\), where \(b\) is the beam width (in.), \(d\) is the beam depth (in.), and \(L\) is the beam length between the points of zero moment (ft).

\(^{(8)}\) The tabulated \(F_{xt}\) values are for members without special tension lams up to 15 inches in depth. If the member depth is greater than 15 inches without special tension lams, the tabulated \(F_{xt}\) values must be multiplied by a factor of 0.86. If special tension lams are used, the tabulated \(F_{xt}\) values are permitted to be increased by a factor of 1.18 regardless of the member depth provided that the increased \(F_{xt}\) value does not exceed 2,400 psi. This factor shall be cumulative with the volume factor, \(C_v\), specified in Footnote 7.

\(^{(9)}\) When Western Cedars, Western Cedars (North), Western Woods, and Redwood are used in combinations for Softwood Species (SW), the design value for modulus of elasticity shall be reduced by 100,000 psi. When Coast Sitka Spruce, Coast Species, Western White Pine, and Eastern White Pine are used in combinations for Softwood Species (SW) tabulated design values for shear parallel to grain, \(F_{yt}\) and \(F_{xt}\), shall be reduced by 10 psi, before applying any other adjustments.
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