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
   - 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
   - Full-scale glulam beam test data and model analysis

2. Product description:
   Arizona Structural Laminators 20F, 24F, 26F, 28F, and 30F glulam beams are used as beams, headers, rafters, or purlins, and are manufactured in accordance with ANSI A190.1 using the manufacturing specifications approved by APA. The glulam beams are manufactured in accordance with Arizona Structural Laminators’ in-plant manufacturing standard approved by APA. The adhesives used to manufacture the glulam beams are exterior-type adhesives meeting the requirements of ASTM D2559.

3. Design properties:
   Table 1 lists the design properties for Arizona Structural Laminators 20F, 24F, 26F, 28F, and 30F glulam beams. The allowable loads for Arizona Structural Laminators 20F, 24F, 26F, 28F, and 30F glulam beams shall be determined based on the design properties listed in Table 1. The allowable spans shall be in accordance with the recommendations provided by the manufacturer (www.azglulam.com), and APA Data file: Glued Laminated Beam Design Tables, Form S475 (www.apawood.org/resource-library), as applicable.

4. Product installation:
   Arizona Structural Laminators 20F, 24F, 26F, 28F, and 30F glulam beams 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 Arizona Structural Laminators 20F, 24F, 26F, 28F, and 30F glulam beams. 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) Arizona Structural Laminators 20F, 24F, 26F, 28F, and 30F glulam beams recognized in this report shall be designed in accordance with the code using the design properties specified in this report.
   b) Arizona Structural Laminators 20F, 24F, 26F, 28F, and 30F glulam beams shall have a minimum depth of four laminations with the exception of 20F-E/SP1, which shall have a minimum depth of three laminations.
   c) Arizona Structural Laminators 20F, 24F, 26F, 28F, and 30F glulam beams are produced at Arizona Structural Laminators' facility in Eagar, Arizona, under a quality assurance program audited by APA.
   d) This report is subject to re-examination in one year.

7. Identification:
   Arizona Structural Laminators 20F, 24F, 26F, 28F, and 30F glulam beams described in this report are identified by a label bearing the manufacturer's name (Arizona Structural Laminators) and/or trademark, the APA assigned plant number (1084), the product standard (ANSI A190.1), the APA logo, the layup combination symbol, the report number PR-L271, and a means of identifying the date of manufacture.
Table 1. Allowable Design Values for Arizona Structural Laminators 20F, 24F, 26F, 28F, and 30F Glulam Beams for Normal Duration of Load\(^{(1,2)}\)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Species Outer/Core (^{(3)}) (Bal or Unbal (^{(4)}))</th>
<th>Bending About X-X Axis (Loaded Perpendicular to Wide Faces of Laminations)</th>
<th>Bending About Y-Y Axis (Loaded Parallel to Wide Faces of Laminations)</th>
<th>Axially Loaded Fasteners</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Extreme Fiber in Bending (^{(5)})</td>
<td>Compression Perpendicular to Grain</td>
<td>Shear Parallel to Grain (^{(6)})</td>
<td>Modulus of Elasticity (^{(7)})</td>
</tr>
<tr>
<td>F_{ax} (^{(8)}) (psi)</td>
<td>F_{bx} (^{(8)}) (psi)</td>
<td>F_{dx} (^{(9)}) (psi)</td>
<td>F_{lx} (^{(9)}) (psi)</td>
<td>E_{ax} (^{(10)}) (10^6 psi)</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------------------------------------------------</td>
<td>-----------------------------------------------------------------</td>
<td>----------------------------------------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>20F/E/SP1</td>
<td>SP/PP (^{(12)}) (U)</td>
<td>2000</td>
<td>1450</td>
<td>805</td>
</tr>
<tr>
<td>24F/E/SP2</td>
<td>SP/PP (^{(12)}) (B)</td>
<td>2400</td>
<td>2400</td>
<td>805</td>
</tr>
<tr>
<td>24F/V4</td>
<td>DF/DF (^{(12)}) (U)</td>
<td>2400</td>
<td>1850</td>
<td>650</td>
</tr>
<tr>
<td>24F/V8</td>
<td>DF/DF (^{(12)}) (B)</td>
<td>2400</td>
<td>2400</td>
<td>650</td>
</tr>
<tr>
<td>26F/V5</td>
<td>SP/SP (^{(12)}) (B)</td>
<td>2600</td>
<td>2600</td>
<td>740</td>
</tr>
<tr>
<td>28F/E2</td>
<td>SP/SP (^{(12)}) (B)</td>
<td>2800</td>
<td>2800</td>
<td>805</td>
</tr>
<tr>
<td>30F/E2</td>
<td>SP/SP (^{(12)}) (B)</td>
<td>3000</td>
<td>3000</td>
<td>805</td>
</tr>
<tr>
<td>Wet-use factor</td>
<td>0.8</td>
<td>0.53</td>
<td>0.875</td>
<td>0.833</td>
</tr>
</tbody>
</table>

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

\(^{(2)}\) 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.

\(^{(3)}\) SP = Southern pine, PP = Ponderosa pine, and DF = Douglas fir-larch.

\(^{(4)}\) The balance (B) layup is intended primarily for multiple-span or cantilevered beam applications, but may be used in simple-span applications. The unbalanced (U) layup is intended primarily for simple-span applications, but may be used in multiple-span or cantilevered beam applications.

\(^{(5)}\) The values of \(F_{ax}\) are based on members 5-1/8 inches in width by 12 inches in depth by 21 feet in length. For a larger beam volume, \(F_{ax}\) shall be multiplied by a volume factor, \(C_{ax} = (5.125b/12)^{0.6} (2d/12)^{0.6} (21L)^{0.6}\) for 20F/E/SP1, 24F/E/SP2, 26F/V5/SP, 28F/E2/SP, and 30F/E2/SP layup combinations or \(C_{ax} = (5.125b/12)^{0.6} (12d/12)^{0.6} (21L)^{0.6}\) for 24F/V4/DF and 24F/V8/DF layup combinations, 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). The beam thicknesses in inches by 12 inches in depth by 21 feet in length for larger beam volume, \(F_{ax}\) shall be multiplied by a factor of 0.72. The tabulated \(F_{ax}\) values are for members subject to impact or cyclic loading, or shear design of bending members at connections (NDS 3.4.3.3). The \(F_{ax}\) and \(F_{bx}\) values shall be multiplied by a factor of 0.72. The tabulated \(F_{ax}\) values are for beams loaded perpendicular to the wide faces of the laminations. For calculating beam deflections, the tabulated \(E_{ax}\) values shall be used unless the shear deflection is determined in addition to bending deflection based on the tabulated \(E_{ax}\). The axial modulus of elasticity, \(E_{ax}\), and \(E_{ax}\) shall equal to the tabulated \(E_{ax}\) and \(E_{ax}\) values.

\(^{(6)}\) The values of \(E_{ax}\) are based on members 12 inches in depth. For depths less than 12 inches, \(F_{ax}\) shall be permitted to be increased by multiplying by the flat use factor, \((12/d)^{0.6}\), where \(d\) is the beam depth in inches. When \(d\) is less than 3 inches, use the size adjustment factor for 3 inches.

\(^{(7)}\) The bottom face is a Southern pine lamination and shall be permitted to be designed with a specific gravity of 0.55.

\(^{(8)}\) For 28F/E2/SP and 30F/E2/SP members with more than 15 laminations, \(F_{ax} = 2.1 \times 10^6\) psi, \(E_{ax} = 2.0 \times 10^6\) psi, and \(E_{ax} = 1.06 \times 10^6\) psi.
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