PWT™ Preservative-Treated Laminated Veneer Lumber PR-L329

PWT

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Products: PWT™ Preservative-Treated Laminated Veneer Lumber
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1. Basis of the product report:
   - 2024 International Building Code (IBC): Sections 104.2.3 Alternative material and 2303.1.10 Structural composite lumber
   - 2021, 2018, and 2015 IBC: Sections 104.11 Alternative materials and 2303.1.10 Structural composite lumber
   - 2024 International Residential Code (IRC): Section R104.2.2 Alternative materials, and Sections R502.1.5, R602.1.5, and R802.1.4 Structural composite lumber
   - 2021, 2018, and 2015 IRC: Sections R104.11 Alternative materials, and R502.1.5, R602.1.5, and R802.1.4 Structural composite lumber
   - ASTM D5456-21e1, D5456-18, ASTM D5456-14b, and ASTM D5456-13, recognized by the 2024 IBC and IRC, 2021 IBC and IRC, 2018 IBC and IRC, and 2015 IBC and IRC, respectively
   - APA Reports T99P-18, T99P-19, T99P-20, T2001P-52, T2001P-76, T2002P-31, T2003P-50, T2004P-1, T2006P-10, T2006P-88, T2008P-47, T2009P-45, T2011P-48, T2012P-32, T2015P-23, T2018P-07, T2019P-43, T2019P-52, and T2020P-06, and other qualification data

2. Product description:
   PWT™ preservative-treated laminated veneer lumber (LVL), designated as PWT TREATED LVL, is an LVL product pressed into billets that are approximately 48 inches in width, 3/4 to 3-1/2 inches in thickness, and up to approximately 66 feet in length. LVL billets are ripped into products that are 1-3/4 to 48 inches in depth. Products up to 7 inches in thickness may be fabricated by means of a secondary face-bonding process.

   PWT TREATED LVL is treated with Propiconazole Tebuconazole Imidacloprid (PTI) as part of the in-glueline treatment during the LVL manufacturing process for fungal decay and resistance to wood destroying insects, including Formosan termites, to a retention level equivalent to that specified in ICC-ES Evaluation Report ESR-3834 for the Use Categories UC1 through UC4A. PWT TREATED LVL shall be limited to interior or exterior construction above-ground applications without ground contact (UC3B in accordance with AWPA U1). The efficacy of the preservative treatment of the PWT TREATED LVL is outside the scope of this report and the APA certification program.

3. Design properties:
   The structural design provisions for wood construction provided in the building code are applicable to PWT TREATED LVL. Table 1 lists Allowable Stress Design reference values. Minimum fastener spacings when installed in the edge of a member are provided in Table 2. Table 3 lists the equivalent specific gravities for connection design. The allowable spans for PWT TREATED LVL shall be in accordance with the recommendations provided by the manufacturer (www.pwtewp.com).

   Service conditions are considered dry use where the environmental conditions (temperature and relative humidity) will result in an average equilibrium moisture content (EMC) of sawn

lumber of less than 16%. When the environmental conditions exceed the dry use conditions, the wet use properties specified in Table 1 shall be applied.

4. Product installation:
PWT TREATED LVL shall be installed in accordance with the recommendations provided by the manufacturer (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), or Section 722.1 of IBC, shall be applicable to PWT TREATED LVL. Fire-rated assemblies shall be constructed in accordance with the recommendations provided by APA Design/Construction Guide: *Fire-Rated Systems*, Form W305 (www.apawood.org/resource-library) and the manufacturer (see link above).

6. Limitations:
   a) PWT TREATED LVL shall be designed in accordance with the code using the design properties specified in this report.
   b) PWT TREATED LVL shall be limited to interior or exterior construction above-ground applications without ground contact (UC3B in accordance with AWPA U1).
   c) The efficacy of the preservative treatment of the PWT TREATED LVL is outside the scope of this report and the APA certification program.
   d) PWT TREATED LVL is produced at the PWT manufacturing plant located in Burlington, Washington, under a quality control program audited by APA.
   e) This report is subject to re-examination in one year.

7. Identification:
PWT TREATED LVL is sold under the PWT brand. All products are identified by a label bearing the manufacturer's name (PWT) and/or trademark, the APA assigned plant number (1047), the LVL grade, the APA logo, this report number (PR-L329), and a means of identifying the date of manufacture.

Table 1. Allowable Stress Design Reference Values for PWT TREATED LVL[a]

Grade	Service Conditions	E_{true}[b], 10^6 psi	Beam[c]			Plank[d]			Axial	
			F_b[e,g], psi	F_v, psi	$F_{c\perp}$, psi	F_b[f,g], psi	F_v, psi	$F_{c\perp}$, psi	F_t[h], psi	F_c[i], psi
$2.0E_{true}$	Dry Use	2.0	2800	285	850[j]	2800	150	650[k]	2100	2500
$2.0E_{true}$	Wet Use	1.4	1680	160	465[l]	1680	100	355[l]	1780	875

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 lbf = 4.448 N, 1 psi = 6.9 kPa

[a] Except for modulus of elasticity (E_{true}) and compression perpendicular to grain ($F_{c\perp}$), the tabulated values are permitted to be adjusted for duration of load, as provided in the code.

[b] Tabulated E_{true} values are the shear-free modulus of elasticity. Coefficient of variation of E_{true}, $COV_E = 0.10$. The deflection equation for a simple-span beam under uniform load is:

$$\delta = \frac{270\, w\, L^4}{E_{true}\, b\, h^3} + \frac{28.8\, w\, L^2}{E_{true}\, b\, h}$$

where: δ = Estimated total deflection, inches; w = uniform load, plf; L = span, feet; E_{true} = tabulated shear-free E, psi; b = beam width, inches; h = beam depth, inches

[c] Beam values apply to members loaded and supported on faces showing the narrow edge of all veneers, typically the narrow faces of the member.

[d] Plank values apply to members loaded and supported on faces showing the face of one veneer, typically the wide faces of the member.

[e] Flexural stress, F_b, in the beam orientation is based on a reference depth of 12 inches. For other depths, multiply by a size factor of $(12/d)^{1/5}$, where *d* is the depth in inches. For depths less than 1-3/4 inches, multiply by 1.47.

[f] Flexural stress, F_b, in the plank orientation is based on a reference depth of 1-3/4 inches. For other depths, multiply by a size factor of $(1.75/d)^{1/3}$, where *d* is the depth in inches. For depths less than 1-3/4 inches, use the tabulated value.

[g] Flexural stress, F_b, values are permitted to be increased by 4% for repetitive members, as provided in the code.

[h] Tensile stress parallel to grain, F_t, is based on a reference gage length of 4 feet. For longer lengths, multiply by a length factor of $(4/L)^{1/10}$, where L is the length in feet.

[i] Compressive stress parallel to grain, F_c.

[j] Tabulated compressive stress perpendicular to grain ($F_{c\perp}$) value in the beam orientation is based on the average stress at the 0.04-in. deformation in accordance with ASTM D5456.

[k] Tabulated $F_{c\perp}$ value in the plank orientation is based on the average stress at the proportional limit or 0.04-in. deformation, whichever is less, in accordance with ASTM D5456.

[l] Deformation up to 1/8 inch could occur at the tabulated compressive stress perpendicular to grain in wet use conditions.

Table 2. Minimum Spacing and Distance for Fasteners Installed into Edge of PWT TREATED LVL

Nominal LVL Thickness	Orientation	Nail Size[b]	Nail Diameter (in.)	Nail Length (in.)	Minimum End Distance (in.)	Minimum Nail Spacing[b] (in.)		Maximum Nail Penetration[c] (in.)
						Single Row	Double Row	
Less than 1-1/2 in.	Edge	8d & smaller	0.131	2.5	2-1/2	3	NA	2.25
		10d & 12d	0.148	3.25	2-1/2	4		2.5
		16d	0.162	3.5	3-1/2	5		2
	Face[d]	12d & smaller	0.148	3.25	1-1/2	3	3	NA
		16d	0.162	3.5	1-1/2	5	5	NA
1-1/2 in. and greater	Edge	8d & smaller	0.131	2.5	2-1/2	3	4	2.25
		10d & 12d	0.148	3.25	3-1/2[e]	4	5	2.5
		16d	0.162	3.5	3-1/2	5	6[f]	2
	Face[d]	12d & smaller	0.148	3.25	1-1/2	3	3	NA
		16d	0.162	3.5	1-1/2	5	5	NA

For SI: 1 inch = 25.4 mm

[a] Edge distance shall be sufficient to prevent splitting.
[b] Nail sizes and closest on-center spacing not specifically described in this table are outside the scope of this report.
[c] Penetration length includes the nail tip.
[d] Tabulated closest on-center spacing for face orientation is applicable to nails that are installed in rows parallel to the grain (length) of the LVL. For nails installed in rows perpendicular to the direction of grain (width/depth) of the LVL, the closest on-center spacing for face orientation shall be sufficient to prevent splitting of the LVL.
[e] Minimum end distance is permitted to be reduced to 2-1/2 in. for single row nailing.
[f] Minimum nail spacing may be reduced to 5 in. when LVL is 1-3/4 in. or thicker.

Table 3. Equivalent Specific Gravity for Connection Design for PWT TREATED LVL

Connection Type	Face[a]	Edge[b]
Nails and Wood Screws – Withdrawal	0.50	0.47
Nails and Wood Screws – Lateral	0.50	0.50
Bolts and Lag Screws – Lateral	0.50	NA[c]

[a] Face: member faces showing the face of one veneer, typically the wide faces of the member.
[b] Edge: member faces showing the narrow edge of all veneers, typically the narrow faces of the member.
[c] Not available.

APA – The Engineered Wood Association is an approved national standards developer accredited by American National Standards Institute (ANSI). APA publishes ANSI standards and Voluntary Product Standards for wood structural panels and engineered wood products. APA is an accredited certification body under ISO/IEC 17065 by Standards Council of Canada (SCC), an accredited inspection agency under ISO/IEC 17020 by ANSI National Accreditation Board (ANAB), and an accredited testing organization under ISO/IEC 17025 by ANAB. APA is also an approved Product Certification Agency, Testing Laboratory, Quality Assurance Entity, Validation Entity, and Product Evaluation Entity by the State of Florida, and an approved testing laboratory by City of Los Angeles.

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