Code Compliance Research Report
CCRR-0475

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DIVISION: 06 00 00 – WOOD, PLASTICS and COMPOSITES
Section: 06 17 23 - Parallel Strand Lumber

REPORT HOLDER:
Weyerhaeuser
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Federal Way, WA 98001
www.weyerhaeuser.com

REPORT SUBJECT:
Treated Parallam® Plus PSL; for use in preservative treated wood structural applications.

1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2024, 2021 and 2018 *International Building Code®* (IBC)
- 2024, 2021 and 2018 *International Residential Code®* (IRC)

NOTE: This report references the most recent Code editions noted. Section numbers in earlier editions may differ.

1.2 Treated Parallam Plus PSL has been evaluated for the following properties (see Table 1):

- Preservative Treated Wood
- Structural Composite Lumber
- Protection against decay and termites

1.3 Treated Parallam Plus PSL has been evaluated for the uses as detailed in Table 2.

2.0 STATEMENT OF COMPLIANCE

Treated Parallam Plus PSL complies with the Codes listed in Section 1.1, for the properties stated in Section 1.2 and uses stated in Section 1.3, when installed as described in this report, including the Conditions of Use stated in Section 6.

2.1 2024 IBC and IRC Evaluation Reports

The Intertek CCRR is an Evaluation Report for approval of an alternate material, design, or method of construction in accordance with Section 104.2.3.6.1 of the 2024 IBC and Section R104.2.2.6.1 of the 2024 IRC.

3.0 DESCRIPTION

3.1 Treated Parallam Plus PSL: Manufactured by Weyerhaeuser from southern pine wood veneers laminated together using an exterior-type structural adhesive. All veneers are oriented with the wood grain parallel to the length of the member.

Product is pressure treated by a qualified third-party treater for resistance to fungal decay and termites to a retention level specified in this report with Micronized Copper Azole (MCA) in accordance with the American Wood Protection Association (AWPA) standards. Product is kiln dried after treatment to an average moisture content of 19% or less. Product comes in a maximum thickness of 7 inches, maximum depth of 18 inches, and lengths up to 66 feet.

4.0 PERFORMANCE CHARACTERISTICS

4.1 Table 2 outlines the allowed typical applications of Treated Parallam Plus PSL beams and columns and the corresponding AWPA use categories and Design Service Levels.

4.2 Table 3 provides the specified allowable stress design properties for the preservative treated product which consider treatment and moisture content effects for Treated Parallam Plus PSL.

4.3 Table 4 provides the connection design adjustment factors for the effect of treatment and moisture content.

5.0 INSTALLATION

5.1 General:

Treated Parallam Plus PSL must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. A copy of the manufacturer's instructions must be available on the jobsite during installation.

5.2 Application:

5.2.1 Hardware: Corrosion-resistant hardware is required in accordance with IRC R304.3 or IBC 2304.10.6.1. Refer to connector manufacturer for additional requirements. For columns and beams in above-ground applications follow UC4A requirements. For columns exposed to saltwater splash follow UC4B requirement.

6.0 CONDITIONS OF USE

6.1 Installation must comply with this Research Report, the manufacturer's published installation instructions, and the applicable Code. In the event of a conflict, this report governs.

6.2 Treated Parallam Plus PSL is manufactured at the Weyerhaeuser manufacturing plant located in Buckhannon, WV and preservative treated at Culpeper Wood Preservers in Orangeburg, SC or Universal Forest Products LLC, Hamilton, OH. All material is manufactured and treated under an approved Quality control system with follow up inspections performed by an approved inspection agency.

6.3 The product is intended for structural applications for dry-service use and wet-service use. Design values are adjusted to different levels of moisture content as defined by Service Levels and correspond to Use Categories for different applications defined by the American Wood Protection Association (AWPA) standards.

6.4 For structural applications beyond the scope and/or limitations of the above referenced Weyerhaeuser publication, or when required by AHJ, the drawings or related documents shall bear the authorized seal of a design professional skilled in wood design and licensed to practice under the appropriate state.

6.5 Treated Parallam Plus PSL is manufactured under a quality control program with inspections by Intertek Testing Services NA, Inc.

7.0 SUPPORTING EVIDENCE

7.1 Reports of tests in accordance with ASTM D5456

7.2 Intertek Listing Report "Weyerhaeuser – Treated Parallam Plus PSL", on the Intertek Directory of Building Products.

8.0 IDENTIFICATION

Treated Parallam Plus PSL is identified with the manufacturer's name (Weyerhaeuser) or Trade name (Trus Joist), the product name (Treated Parallam Plus PSL), treatment type, retention, approved use category, the Intertek Mark as shown below, the Intertek Control Number and the Code Compliance Research Report number (CCRR-0475).

9.0 OTHER CODES

This section is not applicable.

10.0 CODE COMPLIANCE RESEARCH REPORT USE

10.1 Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

10.2 Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

10.3 Reference to the https://bpdirectory.intertek.com is recommended to ascertain the current version and status of this report.

TABLE 1 - PROPERTIES EVALUATED

PROPERTY	APPLICABLE CODE SECTIONS[1]	
	IBC	IRC
Preservative-treated Wood	2303.1.9	N/A
Structural Composite Lumber	2303.1.10	R502.1.5
Protection against decay and termites	2304.12	R304 R305

[1]Section numbers pertain to the most recent edition cited in Section 1.1 of this Report

TABLE 2: Typical Applications for Treated Parallam Plus PSL

AWPA Use Category(1)	Service Condition	Use Environment	Typical Applications	Treated Parallam Plus PSL Acceptable Conditions		
				Service Level(2)	MCA Beams and Headers	MCA Columns
UC1	Interior Construction, Above Ground, dry	Continuously protected from weather or other sources of moisture	Interior termite resistant construction	SL0 or SL1	✓	✓
UC2	Interior Construction, Above Ground, damp	Protected from weather but may be subject to sources of moisture	Sill Plates, Crawl Space Beams	SL0 or SL1	✓	✓
UC3B	Exterior Construction, Above Ground, poor water runoff	Exposed to all weather cycles, including intermittent wetting but with sufficient air circulation so wood can readily dry	Above ground joists and beams for decks and freshwater docks.	SL2	✓	✓
UC4A	Ground contact or fresh water, Non-critical Components	Exposed to all weather cycles, including continuous or prolonged wetting	Fence and deck posts	SL3	Not Permitted	✓
UC4B	Ground Contact or fresh Water, Critical Components, or difficult replacement	Exposed to all weather cycles, including continuous or prolonged wetting, high decay potential includes saltwater splash	Embedded deck posts, freshwater dock support posts and wood used in saltwater splash zones.	SL3	Not Permitted	✓

(1) Refer to the AWPA Book of Standards (Standard U-1 Table 2-1) for a complete description of use category designations and typical applications.
(2) Treated Parallam Plus PSL Service Levels consider moisture content ranges that affect design properties. The average equilibrium moisture content (EMC) for each service level is as follows: SL0 ≤ 12%, 12% < SL1 ≤16%, 16% < SL2 ≤ 28%, and SL3 > 28%.

TABLE 3: Allowable Design Stresses for Treated Parallam Plus PSL (Normal Load Duration(1), C_D=1.0)

Treated Product	Design Service Level(2)	Joist/Beam Orientation					Face/Plank Orientation					Axial	
		Modulus of Elasticity		Bending F_b(8) (psi)	Shear F_v (psi)	Compression ⊥ to grain $F_{c\perp}$ (psi)	Modulus of Elasticity		Bending F_b(8) (psi)	Shear F_v (psi)	Compression ⊥ to grain $F_{c\perp}$ (psi)	Tension F_t(9) (psi)	Compression F_c (psi)
		$E^{(5)(6)} \times 10^6$ (psi)	$E_{min}{}^{(7)} \times 10^6$ (psi)				$E^{(5)(6)} \times 10^6$ (psi)	$E_{min}{}^{(7)} \times 10^6$ (psi)					
Treated Parallam Plus PSL Beams(3) (MCA, 0.15 pcf)	SL0	1.69	0.860	2370	225	415	1.79	0.911	2290	165	255	1785	2175(10)
	SL1	1.65	0.840	2275	215	380	1.76	0.893	2205	160	235	1745	2005(10)
	SL2	1.49	0.759	1885	180	240	1.61	0.819	1855	130	150	1595	1310(10)
	SL3	1.39	0.708	1675	150	170	1.50	0.763	1605	110	90	1480	1050(10)
Treated Parallam Plus PSL Columns (4) (MCA, 0.31 pcf)	SL0	1.52	0.774	2045	180	335	1.61	0.820	1965	150	225	1545	1875
	SL1	1.49	0.756	1960	170	305	1.58	0.804	1890	145	205	1515	1725
	SL2	1.34	0.683	1625	140	195	1.45	0.737	1590	120	135	1380	1130
	SL3	1.25	0.637	1445	120	135	1.35	0.687	1375	100	77	1280	905

(1) Allowable Design Stresses may be adjusted for load duration in accordance with Section 8.3 of the NDS.

(2) The equilibrium moisture content (EMC) associated with each Design Service Level is as follows: SL0 ≤ 12%, 12% < SL1≤ 16%, 16% < SL2 ≤ 28%, SL3 > 28%.

(3) Beams are defined as those products which are 2.0E Treated Parallam PSL prior to treatment.

(4) Columns are defined as those products which are 1.8E Treated Parallam PSL prior to treatment.

(5) To properly calculate deflections for the full range of typical SCL span and loading applications, bending and shear deflections must be considered.

Use the following equation for simple span, uniformly loaded beams:

$$\Delta = \frac{270wL^4}{Ebd^3} + \frac{28.8wL^2}{Ebd}$$

Where:

Δ = deflection (in.) d = beam depth (in.) b = beam thickness (in.)

L = span (feet) w = uniform load (plf) E = modulus of elasticity (psi)

For other span and loading conditions, use engineering mechanics to account for both bending and shear deflection.

See note 6 for long-term loading consideration.

(6) Total deflection under long-term loading may be estimated in accordance with NDS Section 3.5.2. Use $K_{cr} = 1.5$ for SL0 and SL1, and $K_{cr} = 2.0$ for SL2 and SL3.

(7) Reference modulus of elasticity for beam and column stability calculation per NDS®

(8) For 12 in. depth., for other depths, multiply by $[12/t]^{0.111}$ where it is the joist/beam depth.

(9) Reference tension design values are based on a standard length of 4 feet. For lengths longer than 4 feet multiply F_t by the following adjustment:

Treated Parallam PSL: $(4/L)^{0.056}$, where L is in feet

(10) For beam products used in column applications, capacity can be determined using the provisions of Chapter 15 of the NDS in conjunction with the published F_C value above and a minimum eccentricity, e_2, measured parallel to the narrow face of the column. See Figure 1 for an illustration

$$e_2 = \frac{t}{6} + \frac{5L^2}{4608}$$

Where:
e_2 = Eccentricity applied parallel to the narrow face of the column, inches
t = Member thickness of the column, inches
L = Unbraced column length about the weak axis, feet

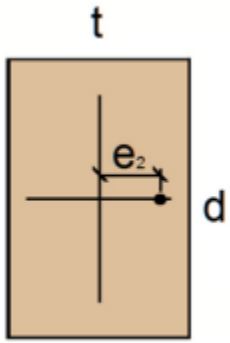

FIGURE 1: Illustration of Eccentricity, e_2, for Treated Parallam Plus PSL beams used in column design.

TABLE 4: Connection Design Adjustment Factors[1]

Design Service Level of Beam or Column Applications[2]	Nails (Installed in Edge and Face)		Screws (Installed in Edge and Face)		Bolt and Lag Screws[6] (Installed in Face)
	Lateral	Withdrawal	Lateral	Withdrawal	Lateral
SL0	0.70	0.81[3]	0.70	0.81	0.74[5]
SL1	0.66	0.79[3]	0.66	0.79	0.69[5]
SL2	0.49	0.25[4]	0.49	0.70	0.50[5]
SL3	0.36	0.25[4]	0.36	0.64	0.39

(1) Adjustment factors are applied after connection is designed with 0.5 Equivalent Specific Gravity.
(2) The equilibrium moisture content (EMC) for each Design Service Level is as follows: SL0 ≤ 12%, 12% < SL1≤ 16%, 16% < SL2 ≤ 28%, SL3 > 28%.
(3) If product moisture content is expected to temporarily exceed Service Level 1, use nominal connection design adjustment value of 0.25 per NDS
(4) Factory assumes that moisture fluctuations between dry conditions (SL0 or SL1) and wet conditions (SL2 or SL3) may occur in service. If product moisture content will be continuously subject to SL2 or greater levels, use connection design adjustment factor of 0.70 for SL2 and 0.64 for SL3.
(5) Nominal connection design adjustment value shall be 0.4 when a bolted/lag screw connection is installed in wet material (SL2 or SL3) that is allowed to dry (SL0, SL1), subject the exceptions noted in Footnote 2 of 2024 NDS Table 11.3.3 (single fastener or row, separate side member for each row).
(6) Bolts and lag screws must not be installed into the edge of Treated Parallam Plus PSL