



CERTIFICATION



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Technical Evaluation Report

TER 1704-01

**DuraLam-S Laminated Veneer Lumber
(LVL) Scaffold Plank – Limit States
Design**

McCausey Specialty Products

Product:

**DuraLam-S Laminated Veneer
Lumber (LVL) Scaffold Plank**

Issue Date:

May 24, 2017

Revision Date:

April 19, 2022

Subject to Renewal:

April 19, 2022



COMPANY
INFORMATION:

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DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

SECTION: 06 17 00 - Shop-Fabricated Structural Wood

SECTION: 06 17 13 - Laminated Veneer Lumber

1 PRODUCT EVALUATED¹

1.1 DuraLam-S Laminated Veneer Lumber (LVL) Scaffold Plank

1.1.1 Where product is used in the United States, see [TER 1702-01](#).

2 APPLICABLE CODES AND STANDARDS^{2,3}

2.1 Codes

2.1.1 *NBC—10, 15: National Building Code of Canada*

2.2 Standards and Referenced Documents

2.2.1 *ANSI A10.8: Scaffolding Safety Requirements*

2.2.2 *ASTM D143: Standard Test Methods for Small Clear Specimens of Timber*

2.2.3 *ASTM D198: Standard Test Methods of Static Tests of Lumber in Structural Sizes*

2.2.4 *ASTM D2559: Standard Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions*

2.2.5 *ASTM D5456: Standard Specification for Evaluation of Structural Composite Lumber Products*

2.2.6 *CSA O86: Engineering Design in Wood*

2.2.7 *CSA S269.2: Access Scaffolding for Construction Purposes*

¹ For more information, visit drjcertification.org or call us at 608-310-6748.

² Unless otherwise noted, all references in this TER are from the 2015 version of the *NBC*. This *alternative solution* is also approved for use with the 2010 *NBC* and the standards referenced therein.

³ All terms defined in the applicable building codes are italicized.

3 PERFORMANCE EVALUATION

- 3.1 DuraLam-S LVL Scaffold Plank was evaluated to determine its resistance properties, which are used to develop specified strength and modulus of elasticity values for Limit States Design (LSD). This TER examines DuraLam-S LVL Scaffold Plank for:
 - 3.1.1 Use in flatwise bending as a scaffold plank as defined by CSA S269.2
- 3.2 Any code compliance issues not specifically addressed in this section are outside the scope of this TER.
- 3.3 Any engineering evaluation conducted for this TER was performed on the dates provided in this TER and within DrJ's professional scope of work.

4 PRODUCT DESCRIPTION AND MATERIALS

- 4.1 DuraLam-S LVL Scaffold Plank is distributed by McCausey Specialty Products at its facility in Roseville, Michigan.
- 4.2 The product is manufactured by laminating wood veneers with an exterior type adhesive (complying with ASTM D2559) in a continuous process with the grain of the wood oriented parallel to the length of the member in accordance with an ISO 9001 quality certification system.
- 4.3 The wood veneer properties and species, adhesive, manufacturing parameters, and finished product dimensions and tolerances are specified in the approved quality documentation and in-plant manufacturing standards.
- 4.4 *Material Availability*
 - 4.4.1 Thickness: 1½" (38 mm), 1⅝" (41 mm)
 - 4.4.2 Widths: 9¼" (235 mm), 9½" (241 mm), and 11¼" (286 mm)
 - 4.4.3 Lengths: up to 48' (14.6 m)

5 APPLICATIONS

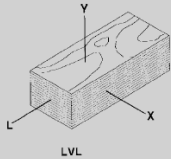
- 5.1 Structural applications include use in flatwise bending as a scaffold plank.
- 5.2 Design
 - 5.2.1 Design of DuraLam-S LVL Scaffold Plank is governed by the applicable code and the provisions for Structural Composite Lumber Products in CSA O86.
 - 5.2.2 Unless otherwise noted, adjustment of the design stresses for duration of load shall be in accordance with the applicable code.
 - 5.2.3 The design provisions for wood construction noted in CSA O86 Section 13.4 apply to DuraLam-S LVL Scaffold Plank for Limit States Design (LSD) unless otherwise noted in this report. Specified strength and modulus of elasticity values for DuraLam-S LVL Scaffold Plank are specified in Table 1.

TABLE 1. FLATWISE USE REFERENCE DESIGN VALUES FOR DURALAM-S LVL SCAFFOLD PLANK (LIMIT STATES DESIGN)^{2,6,7,8}

Moisture Content	Bending, F_b psi (MPa)	Horizontal Shear, F_v psi (MPa)	Plank Modulus of Elasticity, E psi (MPa)	
	Plank ^{1,4}	Plank ^{1,5}	Apparent ³	True ³
MC ≤ 16%	5,200 (35.9)	190 (1.31)	1,900,000 (13,100)	2,000,000 (13,790)
16% < MC ≤ 30%	4,100 (28.3)	190 (1.31)	1,500,000 (10,342)	1,600,000 (11,032)

SI: 1 MPa = 145 psi

- The reference design values in this table are for normal load duration. Loads of longer or shorter duration shall be adjusted in accordance with the applicable code. Duration of load adjustments shall not be applied to E.
- Orientation nomenclature for DuraLam-S LVL Scaffold Plank.



- The Apparent E can be used directly in traditional beam deflection formulas. Using True E, deflection is calculated as follows for uniformly loaded simple span beams.

$$\Delta = [5WL^4/(32Eb^3)] + [12WL^2/(5Ebh)]$$
 where: Δ = deflection in inches
 W = uniform load in pli
 L = span in inches
 E = modulus of elasticity in psi
 b = width of beam in inches
 h = depth of beam in inches
- The bending values in these tables are based on a referenced depth of 1½".
- Horizontal shear value for L-X plane only
- DuraLam-S LVL Scaffold Plank are generally used in elevated locations with good air circulation conducive to drying of the wood fibers.
- The specified strength and modulus of elasticity values have been developed in accordance with ANSI A10.8 Appendix C and CSA O86.
- Values are for new or like-new product.

- 5.2.3.1 Allowable spans for several live load conditions defined in CSA S269.2 are provided in Table 2 for various member sizes.

TABLE 2. ALLOWABLE SPANS FOR DURALAM-S LVL SCAFFOLD PLANK

Size	Live Load ²	Allowable Span, ¹ ft (mm)	
		MC ≤ 16 %	16% ≤ MC ≤ 30%
1.5" x 9.25" (38mm x 235mm)	50 psf	9' - 6" (2,895)	8' - 9" (2,667)
	75 psf	8' - 3" (2,514)	7' - 8" (2,336)
	500 lbs	5' - 4" (1,633)	4' - 3" (1,295)
	Light Duty (25 psf + 250 plf)	8' - 4" (2,554)	7' - 6" (2,286)
	Heavy Duty (75 psf + 265 plf)	6' - 8" (2,032)	5' - 8" (1,730)
1.5" x 11.25" (38mm x 298mm)	50 psf	9' - 6" (2,895)	8' - 9" (2,667)
	75 psf	8' - 3" (2,514)	7' - 8" (2,336)
	500 lbs	6' - 5" (1,995)	5' - 1" (1,549)
	Light Duty (25 psf + 250 plf)	8' - 4" (2,540)	7' - 6" (2,286)
	Heavy Duty (75 psf + 265 plf)	6' - 8" (2,032)	5' - 8" (1,727)
1.625" x 9.5" (42mm x 241mm)	50 psf	10' - 3" (3,134)	9' - 6" (2,897)
	75 psf	9' - 0" (2,738)	8' - 4" (2,530)
	500 lbs	6' - 5" (1,956)	5' - 1" (1,552)
	Light Duty (25 psf + 250 plf)	9' - 3" (2,827)	8' - 5" (2,557)
	Heavy Duty (75 psf + 265 plf)	7' - 5" (2,257)	6' - 4" (1,926)

SI: 1 in = 25.4 mm, 1 lb = 4.45 N, 1 lb/ft = 0.0146 kN/m, 1 psf = 0.0479 kN/m²

- Allowable spans are determined through an evaluation of ultimate bending strength/4, ultimate horizontal shear strength/4, Live Load/80. The member self-weight is included in the span checks for bending and shear strength. Spans shown are center of bearing to center of bearing. Always use appropriate length planks for the span condition. Refer to CSA for minimum and maximum cantilever requirements.
- Loads are as defined in Clause 6 of CSA S269.2. PLF loads are applied across the plank width at mid span. Proper scaffold plank selection must be based on the most restrictive load case anticipated when planks are in service.

- 5.2.4 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.

6 INSTALLATION

- 6.1 DuraLam-S LVL Scaffold Plank is part of an overall scaffolding system. Consult the OHS or OSHA regulations on installation and the use of DuraLam-S LVL Scaffold Plank referenced in Section 2.2.
- 6.2 Installation shall comply with the manufacturer's installation instructions and this TER. In the event of a conflict between the manufacturer's installation instructions and this TER, the more restrictive shall govern.

7 SUBSTANTIATING DATA

- 7.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:
- 7.1.1 Bending testing in accordance with *ASTM D198* and *ASTM D5456*
 - 7.1.2 Shear testing in accordance with *ASTM D143* and *ASTM D5456*
 - 7.1.3 Adhesive testing in accordance with *ASTM D2559* and *ASTM D5456*

- 7.2 Information contained herein is the result of testing and/or data analysis by sources which conform to the evaluation requirements of *NBC* Volume 1 Relationship of the *NBC* to Standards Development and Conformity Assessment and/or professional engineering regulations. DrJ relies upon accurate data to perform its ISO/IEC 17065 evaluations.
- 7.3 Where appropriate, DrJ's analysis is based on provisions that have been codified into law through provincial, territorial, or local adoption of codes and standards. The providers of the codes and standards are legally responsible for their content. DrJ analysis may use code adopted provisions as a control sample. A control sample versus a test sample establishes a product as being equivalent to that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the accuracy of the provisions provided herein is reliant upon the published properties of materials, DrJ relies upon the grade mark, grade stamp, mill certificate, and/or test data provided by material suppliers to be minimum properties. DrJ analysis relies upon these properties to be accurate.

8 FINDINGS

- 8.1 When used and installed in accordance with this TER and the manufacturer's installation instructions, the product(s) listed in Section 1.1 are approved for the following:
- 8.1.1 DuraLam-S LVL Scaffold Plank meets all applicable requirements for use as scaffold plank in accordance with CSA O86 and CSA S269.2.
- 8.1.2 DuraLam-S LVL Scaffold Plank meets the requirements of the *NBC*.
- 8.2 This product has been evaluated in the context of the codes listed in Section 2 and is compliant with all known provincial, territorial, and local building codes. Where there are known variations in provincial, territorial, or local codes applicable to this TER, they are listed here.

- 8.2.1 No known variations

- 8.3 *NBC* Volume 1 Relationship of the *NBC* to Standards Development and Conformity Assessment:

Certification

Certification is the confirmation by an independent organization that a product or service meets a requirement...Certification bodies publish lists of certified products and companies.

Evaluation

An evaluation is a written opinion by an independent professional organization that a product will perform its intended function in a building. An evaluation is very often done to determine the ability of an innovative product, for which no standards exist, to satisfy the intent of the Code requirement...Several organizations, including the Canadian Construction Materials Centre (CCMC), offer such evaluation services.

- 8.4 Valid *evaluations* are obtained from *independent professional organizations*, which include but are not limited to ISO/IEC 17065 accredited evaluation services and professional engineers.⁴
- 8.5 ISO/IEC 17065 accreditation bodies, including but not limited to SCC and ANAB, confirm that product certification bodies have the expertise to provide *evaluation* services within their scope of accreditation. All SCC and ANAB product certification bodies meet *NBC* requirements to offer *evaluation* services for *alternative solutions*.⁵
- 8.5.1 DrJ is an ISO/IEC 17065 ANAB-Accredited Product Certification Body – Accreditation #1131 and employs professional engineers.⁶

⁴ *NBC* Division C Article 2.2.1.2

⁵ *NBC* Division A Clause A-1.2.1.1.(1)(b) provides information on code compliance via alternative solutions and defines alternative solutions as "...achiev[ing] at least the minimum level of performance required by Division B." *NBC* Division C Section 2.3 includes additional guidance for documentation of alternative solutions.

⁶ Through ANAB accreditation and the IAF MLA, DrJ certification can be used to obtain material, product, design, or method of construction approval in any jurisdiction or country that has IAF MLA Members & Signatories to meet the Purpose of the MLA – "certified once, accepted everywhere."

- 8.6 Product certification organizations, accredited by the SCC and ANAB, are defined as equivalent *evaluation* services:
- 8.6.1 The Canada-United States-Mexico Agreement (CUSMA) Article 11.6 Conformity Assessment confirms mutual recognition by stating, "...each Party shall accord to conformity assessment bodies located in the territory of another Party treatment no less favorable than that it accords to conformity assessment bodies located in its own territory or in the territory of the other Party."
- 8.6.2 The SCC National Conformity Assessment Principles states, "SCC is a member of a number of international organizations developing voluntary conformity assessment agreements that help ensure the international acceptance of Canadian conformity assessment results. Signatories to these agreements (like SCC) recognize each other's accreditations as being equivalent to their own."⁷
- 8.7 Building official approval of a licensed professional engineer is performed by verifying the professional engineer and/or their business entity are listed by the licensing board of the relevant jurisdiction.

9 CONDITIONS OF USE

- 9.1 Where required by the *authority having jurisdiction* (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of permit application.
- 9.2 Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the AHJ for review and approval.
- 9.3 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the *designer* (e.g., *owner*).
- 9.4 At a minimum, this product shall be installed per Section 6 of this TER.
- 9.5 This product has an internal quality control program and a third-party quality assurance program in accordance with ISO/IEC 17065 certification procedures.
- 9.6 The actual design, suitability, and use of this TER, for any particular building, is the responsibility of the owner or the owner's authorized agent.
- 9.7 This TER shall be reviewed for code compliance by the AHJ in concert with the duties and powers granted to the building official by the provincial regulations governing such duties and powers.
- 9.8 The implementation of this TER for this product is dependent on the design, quality control, third-party quality assurance, proper implementation of installation instructions, inspections, and any other code or regulatory requirements that may apply.

10 IDENTIFICATION

- 10.1 The product(s) listed in Section 1.1 are identified by a label on the board or packaging material bearing the manufacturer's name, product name, TER number, and other information to confirm code compliance.
- 10.2 Additional technical information can be found at mccausey.com.

11 REVIEW SCHEDULE

- 11.1 This TER is subject to periodic review and revision. For the most recent version, visit drjcertification.org.
- 11.2 For information on the current status of this TER, contact DrJ Certification.

⁷ The National Conformity Assessment Principles states, "Product regulations and standards may vary from country to country. If these are set arbitrarily, they could be deemed as protectionist. The World Trade Organization (WTO) Agreement on Technical Barriers to Trade (TBT Agreement) is intended to ensure that technical regulations, standards and conformity assessment procedures of member countries do not create unnecessary obstacles to trade. Under the TBT Agreement, members of the WTO agree to use international standards, including conformity assessment standards and guides, as a basis for their technical requirements."