

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

**TER No. 1704-01**

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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. Products Evaluated:**

- 1.1. DuraLam-S Laminated Veneer Lumber (LVL) Scaffold Plank
  - 1.1.1. For product used in the United States, see TER 1702-01.
- 1.2. For the most recent version of this Technical Evaluation Report (TER), visit [drjengineering.org](http://drjengineering.org). For more detailed state professional engineering and code compliance legal requirements and references, visit [drjengineering.org/statelaw](http://drjengineering.org/statelaw). DrJ is fully compliant with all state professional engineering and code compliance laws.
- 1.3. This TER can be used to obtain product approval in any country that is an IAF MLA Signatory (all countries found [here](#)) and covered by an [IAF MLA Evaluation](#) per the [Purpose of the MLA](#) (as an example, see [letter to ANSI](#) from the Standards Council of Canada). Manufacturers can go to jurisdictions in the U.S., Canada and other [IAF MLA Signatory Countries](#) and have their products readily approved by authorities having jurisdiction using [DrJ's ANSI accreditation](#).
- 1.4. Building code regulations require that evaluation reports are provided by an approved agency meeting specific requirements, such as those found in [IBC Section 1703](#). Any agency accredited in accordance with ANSI ISO/IEC 17065 meets this requirement within ANSI's scope of accreditation. For a list of accredited agencies, visit ANSI's [website](#). For more information, see [drjcertification.org](http://drjcertification.org).

***DrJ is a Professional Engineering Approved Source***

 **Learn more about DrJ's Accreditation**

- DrJ is an ISO/IEC 17065 accredited product certification body through ANSI Accreditation Services.
- DrJ provides certified evaluations that are signed and sealed by a P.E.
- DrJ's work is backed up by professional liability insurance.
- DrJ is fully compliant with IBC Section 1703.

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- 1.5. Requiring an evaluation report from a specific private company (i.e. ICC-ES, IAPMO, CCMC, DrJ, etc.) can be viewed as discriminatory and is a violation of international, federal, state, provincial and local anti-trust and free trade regulations.
- 1.6. DrJ's code compliance work:
  - 1.6.1. Conforms to code language adopted into law by individual states and any relevant consensus based standard such as an ANSI or ASTM standard.
  - 1.6.2. Complies with accepted engineering practice, all professional engineering laws and by providing an engineer's seal DrJ takes professional responsibility for its specified scope of work.

### 2. Applicable Codes and Standards:<sup>1</sup>

- 2.1. *2010 and 2015 National Building Code of Canada (NBC)*
- 2.2. *CAN/CSA-086-14 – Engineering Design in Wood*
- 2.3. *CAN/CSA-S269.2-16 – Access Scaffolding for Construction Purposes*
- 2.4. *ASTM D143 – Standard Test Methods for Small Clear Specimens of Timber*
- 2.5. *ASTM D198 – Static Tests of Lumber in Structural Sizes*
- 2.6. *ASTM D2559 – Standard Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions*
- 2.7. *ASTM D5456 – Standard Specification of Evaluation of Structural Composite Lumber Products*

### 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 *CAN/CSA-S269.2*
- 3.2. Any code compliance issues not specifically addressed in this section are outside the scope of this evaluation.

### 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: 1-1/2" (38 mm), 1-5/8" (41.2 mm)
- 4.4.2. Widths: 9-1/4" (235 mm), 9-1/2" (241 mm) & 11-1/4" (286 mm)
- 4.4.3. Lengths: up to 48' (14,630 mm)

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<sup>1</sup> Unless otherwise noted, all references in this code compliant technical evaluation report (TER) are from the 2015 version of the codes and the standards referenced therein, including, but not limited to, *ASCE 7*, *SDPWS* and *WFCM*. This product also complies with the 2005 version of the *NBC* and the standards referenced therein. As required by law, where this research report is not approved, the building official shall respond in writing, stating the reasons this research report was not approved. For variations in state and local codes, if any, see [Section 8](#).

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### 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 *CAN/CSA-086*.

5.2.2. Unless otherwise noted, adjustment of the design stresses for duration of load shall be in accordance with the applicable code.

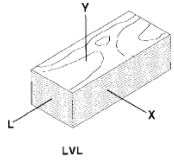
5.2.2.1. The design provisions for wood construction noted in CAN/CSA-086 Section 13.4 apply to DuraLam-S LVL Scaffold Plank for Limit States Design, unless otherwise noted in this report. Specified strength and modulus of elasticity values for DuraLam-S LVL Scaffold Plank are specified in [Table 1](#).

Flatwise Use Specified Strength and Modulus of Elasticity Values				
Moisture Content	Bending, $F_b$ (psi) [Mpa]	Horizontal Shear, $F_v$ (psi) [Mpa]	Plank Modulus of Elasticity, E, psi [Mpa]	
	Plank <sup>2,5</sup>	Plank <sup>2,6</sup>	Apparent <sup>4</sup>	True <sup>4</sup>
MC ≤ 16%	5,200	190	1,900,000	2,000,000
	[35.9]	[1.31]	[13,100]	[13,790]
16% < MC ≤ 30%	4,100	190	1,500,000	1,600,000
	[28.3]	[1.31]	[10,342]	[11,032]

1. 1 psi = 0.00689 MPa or 1 MPa = 145 psi.

2. The specified strength and modulus of elasticity values in this table are for standard term 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.

3. Orientation nomenclature for DuraLam-S LVL Scaffold Plank.



4. 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.

$$\Delta = [5WL^4/(32Ebh^3)] + [12WL^2/(5Ebh)]$$

where:  $\Delta$  = 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

5. The bending values in these tables are based on a referenced depth of 1-1/2".

6. Horizontal shear value for X-L plane only.

7. DuraLam-S LVL Scaffold Plank are generally used in elevated locations with good air circulation conducive to drying of the wood fibers.

8. The specified strength and modulus of elasticity values have been developed in accordance with ANSI A10.8 Appendix C and CAN/CSA-086.

9. Values are for new or like-new product.

**Table 1:** Specified Strength and Modulus of Elasticity Values for DuraLam-S LVL Scaffold Plank (Limit States Design)

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5.2.2.4 Allowable spans for several live load conditions defined in CAN/CSA 269.2 are provided in [Table 2](#) for various member sizes.

DuraLam-S LVL Scaffold Plank Allowable Spans (ft-in) [mm] <sup>1</sup>			
Size	Live Load <sup>2</sup>	MC ≤ 16 %	16% ≤ MC ≤ 30%
1.5" x 9.25"	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"	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"	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]

1. 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.

2. Loads are as defined in Clause 6 of CAN/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.

**Table 2:** Allowable Spans for DuraLam-S LVL Scaffold Plank

### 6. Installation:

6.1. DuraLam-S LVL Scaffold Plank is part of an overall scaffolding system. Consult the OSHA regulations on installation and the use of DuraLam-S LVL Scaffold Plank referenced in [Section 2.3](#).

### 7. Test and Engineering Substantiating Data:

- 7.1. Test reports and data in accordance with *ASTM D143*, *ASTM D198*, *ASTM D2559*, and *ASTM D5456*.
- 7.2. The product(s) evaluated by this TER fall within the scope of one or more of the model, state or local building codes for building construction. The testing and/or substantiating data used in this TER is limited to buildings, structures, building elements, construction materials and civil engineering related specifically to buildings.
- 7.3. The provisions of model, state or local building codes for building construction do not intend to prevent the installation of any material or to prohibit any design or method of construction. Alternatives shall use consensus standards, performance-based design methods or other engineering mechanics based means of compliance. This TER assesses compliance with defined standards, accepted engineering analysis, performance-based design methods, etc. in the context of the pertinent building code requirements.
- 7.4. Some information contained herein is the result of testing and/or data analysis by other sources, which DrJ relies on to be accurate, as it undertakes its engineering analysis.
- 7.5. DrJ has reviewed and found the data provided by other professional sources are credible. The information in this TER conforms with DrJ's procedure for acceptance of data from approved sources.
- 7.6. Where appropriate, DrJ relies on the derivation of design values, which have been codified into law through codes and standards (e.g., *IRC*, *WFCM*, *IBC*, *SDPWS*, *NDS*, *ACI*, *AISI*, *PS-20*, *PS-2*, etc.). This includes review of code provisions and any related test data that aids in comparative analysis or provides support for equivalency to an intended end-use application. Where the accuracy of design values provided herein is reliant

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upon the published properties of commodity materials (e.g. lumber, steel, concrete, etc), DrJ relies upon grade/properties provided by the raw material supplier to be accurate and conforming to the mechanical properties defined in the relevant material standard.

### 8. Findings:

- 8.1. DuraLam-S LVL Scaffold Plank meets all applicable requirements for use as scaffold plank in accordance with *CAN/CSA-086*, and *CAN/CSA-S269.2*.
- 8.2. DuraLam-S LVL Scaffold Plank meets the requirements of the *NBC*.
- 8.3. *NBC* Section 1.2.1 states:
  - 1.2.1 Compliance with this Code**
  - 1) Compliance with this Code shall be achieved by
    - a) complying with the applicable acceptable solutions in Division B (see Appendix A), or
    - b) using alternative solutions that will achieve at least the minimum level of performance required by Division B in the areas defined by the objectives and functional statements attributed to the applicable acceptable solutions (see Appendix A).
  - 2) For the purposes of compliance with this Code as required in Clause 1.2.1.1.(1)(b), the objectives and functional statements attributed to the acceptable solutions in Division B shall be the objectives and functional statements referred to in Subsection 1.1.2. of Division B.
- 8.4. *NBC* Section 2.3 includes additional guidance for Alternative Solutions.
- 8.5. This product has been evaluated with the codes listed in [Section 2](#), and is compliant with all known provincial and local building codes. Where there are known variations in state or local codes that are applicable to this evaluation, they are listed here:
  - 8.5.1. No known variations
- 8.6. This TER uses professional engineering law, the building code, *ANSI/ASTM* consensus standards and generally accepted engineering practice as its criteria for all testing and engineering analysis. DrJ's professional engineering work falls under the jurisdiction of each state Board of Professional Engineers, when signed and sealed.

### 9. Conditions of Use:

- 9.1. Where required by the authority having jurisdiction (AHJ) in which the project is to be constructed, this report 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 code official 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.
- 9.4. Design
  - 9.4.1. Building Designer Responsibility
    - 9.4.1.1. Unless the AHJ allows otherwise, the Construction Documents shall be prepared by a Building Designer (e.g., Registered Design Professional) for the Building and shall be in accordance with *NBC* Section 2.2.1.2.
    - 9.4.1.2. The Construction Documents shall be accurate and reliable and shall provide the location, direction and magnitude of all applied loads and shall be in accordance with *NBC* Section 2.2.4.3.
  - 9.4.2. Construction Documents
    - 9.4.2.1. Construction Documents shall be submitted to the Building Official for approval and shall contain the plans, specifications and details needed for the Building Official to approve such documents.
- 9.5. Responsibilities
  - 9.5.1. The information contained herein is a product, material, detail, design and/or application TER evaluated in accordance with the referenced building codes, testing and/or analysis through the use of accepted engineering practice, experience and technical judgment.

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- 9.5.2. Product, design and code-compliance quality control are the responsibility of the referenced company. Consult the referenced company for the proper detailing and application for the intended purpose. Consult your local jurisdiction or design professional to ensure compliance with the local building code.
- 9.5.3. DrJ TERs provide an assessment of only those attributes specifically addressed in the Products Evaluated or Code Compliance Process Evaluated sections.
- 9.5.4. The engineering evaluation was performed on the dates provided in this TER, within DrJ's professional scope of work.
- 9.5.5. 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, and the TER shall be reviewed for code compliance by the Building Official.
- 9.5.6. The use of this TER is dependent on the manufacturer's in-plant QC, the ISO/IEC 17020 third-party quality assurance program and procedures, proper installation per the manufacturer's instructions, the Building Official's inspection and any other code requirements that may apply to demonstrate and verify compliance with the applicable building code.

### 10. Identification:

- 10.1. DuraLam-S LVL Scaffold Plank described in this TER is 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](http://mccausey.com).

### 11. Review Schedule:

- 11.1. This TER is subject to periodic review and revision. For the most recent version of this TER, visit [drjengineering.org](http://drjengineering.org).
- 11.2. For information on the current status of this TER, contact [DrJ Engineering](http://DrJ Engineering).



- [Mission and Professional Responsibilities](#)
- [Product Evaluation Policies](#)
- [Product Approval – Building Code, Administrative Law and P.E. Law](#)