



**CERTIFICATION**



**Approved. Sealed. Code Compliant.**

**Technical Evaluation Report**

**TER 1603-03**

MLT Ultralam™ Laminated Veneer  
Lumber (LVL) TOPplank

**Modern Lumber Technology,  
Ltd. (MLT Ltd.)**

**Product:**

**MLT Ultralam™ 2.0E Fb 2900  
TOPplank**

Issue Date:

April 28, 2016

Revision Date:

October 11, 2020

Subject to Renewal:

July 1, 2021



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

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## 1 PRODUCT EVALUATED<sup>1</sup>

1.1 MLT Ultralam™ 2.0E Fb 2900 TOPplank

## 2 APPLICABLE CODES AND STANDARDS<sup>2,3</sup>

### 2.1 Codes

- 2.1.1 *IBC—12, 15, 18: International Building Code®*
- 2.1.2 *IRC—12, 15, 18: International Residential Code®*
- 2.1.3 *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 *ANSI/AWC NDS®: National Design Specification (NDS®) for Wood Construction*
- 2.2.3 *ASTM D143: Standard Test Methods for Small Clear Specimens of Timber*
- 2.2.4 *ASTM D198: Standard Test Methods of Static Tests of Lumber in Structural Sizes*
- 2.2.5 *ASTM D2559: Standard Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions*
- 2.2.6 *ASTM D5456: Standard Specification for Evaluation of Structural Composite Lumber Products*

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<sup>1</sup> Building codes require data from valid research reports be obtained from approved sources. Agencies who are accredited through ISO/IEC 17065 have met the code requirements for approval by the building official. DrJ is an ISO/IEC 17065 ANAB-Accredited Product Certification Body – Accreditation #1131.

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

Building official approval of a licensed registered design professional (RDP) is performed by verifying the RDP and/or their business entity complies with all professional engineering laws of the relevant jurisdiction. Therefore, the work of licensed RDPs is accepted by building officials, except when plan (i.e., peer) review finds an error with respect to a specific section of the code. Where this TER is not approved, the *building official* responds in writing stating the reasons for disapproval.

For more information on any of these topics or our mission, product evaluation policies, product approval process, and engineering law, visit [drjcertification.org](http://drjcertification.org) or call us at 608-310-6748.

<sup>2</sup> Unless otherwise noted, all references in this TER are from the 2018 version of the codes and the standards referenced therein (e.g., ASCE 7, NDS®, ASTM). This material, design, or method of construction also complies with the 2000-2015 versions of the referenced codes and the standards referenced therein.

<sup>3</sup> All terms defined in the applicable building codes are italicized.



- 2.2.7 *CSA O86: Engineering Design in Wood*
- 2.2.8 *CSA S269.2: Access Scaffolding for Construction Purposes*
- 2.2.9 *OSHA 29 CFR 1910.28: Duty to Have Fall Protection and Falling Object Protection*
- 2.2.10 *OSHA 29 CFR 1926 Subpart L App A: Scaffold Specifications*

### 3 PERFORMANCE EVALUATION

- 3.1 MLT Ultralam™ 2.0E LVL TOPplank was evaluated to determine its resistance properties, which are used to develop reference design values for Allowable Stress Design (ASD) and specified strength and modulus of elasticity values for Limit States Design (LSD). This TER examines MLT Ultralam™ 2.0E LVL TOPplank for the following:
  - 3.1.1 Use in flatwise bending as a scaffold plank as defined by *ANSI A10.8* Section 3.59
  - 3.1.2 Use in flatwise bending as a scaffold plank as defined by *OSHA 29 CFR 1926.450(b)*
  - 3.1.3 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 MLT Ultralam™ 2.0E LVL TOPplank is manufactured by Modern Lumber Technology, Ltd. (MLT) at its facility in Torzhok, Russia.
- 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 MLT's in-plant manufacturing standard.
- 4.4 *Material Availability*
  - 4.4.1 Thickness: 1½" (38 mm), 1<sup>5</sup>/<sub>8</sub>" (42 mm)
  - 4.4.2 Widths: 8<sup>7</sup>/<sub>8</sub>" (225 mm), 9¼" (235 mm), 9½" (241 mm), and 11¼" (286 mm)
  - 4.4.3 Lengths: up to 60' (18.3 m)

### 5 APPLICATIONS

- 5.1 Structural applications include use in flatwise bending as a scaffold plank.
- 5.2 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.
- 5.3 *Design*
  - 5.3.1 Design of MLT Ultralam™ 2.0E LVL TOPplank is governed by the applicable code and the provisions for Structural Composite Lumber (SCL) in *NDS®* and Structural Composite Lumber Products in *CSA O86*.

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

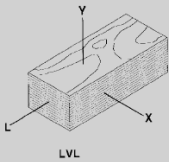
5.3.2.1 The design provisions for wood construction noted in IBC Section 2302.1<sup>4</sup> and IRC Section R301.1.3 apply to MLT Ultralam™ 2.0E LVL TOPplank for ASD, unless otherwise noted in this report. Allowable unit stresses for MLT Ultralam™ 2.0E LVL TOPplank are specified in Table 1.

TABLE 1. FLATWISE USE REFERENCE DESIGN VALUES FOR MLT ULTRALAM™ 2.0E LVL TOPPLANK (ALLOWABLE STRESS DESIGN)<sup>2,6,7,8</sup>

Moisture Content	Bending, F <sub>b</sub> psi (MPa)	Horizontal Shear, F <sub>v</sub> psi (MPa)	Plank Modulus of Elasticity, E psi (MPa)	
	Plank <sup>1,4</sup>	Plank <sup>1,5</sup>	Apparent <sup>3</sup>	True <sup>3</sup>
MC ≤ 16%	2,900 (20.0)	100 (0.69)	1,900,000 (13,100)	2,000,000 (13,790)
16% < MC ≤ 30%	2,300 (15.9)	100 (0.69)	1,500,000 (10,3442)	1,600,000 (11,0342)

SI: 1 psi = 0.00689 MPa

- 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 MLT Ultralam™ 2.0E LVL TOPplank



- 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.  

$$\Delta = [5WL^4/(32Eb^3)] + [12WL^2/(5Eb^3h)]$$
 where:  $\Delta$  = deflection in inches  
 W = uniform load in pounds/inch  
 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 X-L plane only
- TOPplank are generally used in elevated locations with good air circulation conducive to drying of the wood fibers.
- These design values have been developed in accordance with *ANSI A10.8* Appendix C.
- Values are for new or like-new product.

<sup>4</sup> 2015 IBC Section 2301.2

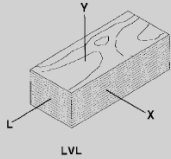
5.3.2.2 The design provisions for wood construction noted in CSA O86 Section 13.4 apply to MLT Ultralam™ 2.0E LVL TOPplank for Limit States Design, unless otherwise noted in this report. Specified strength and modulus of elasticity values for MLT Ultralam™ 2.0E LVL TOPplank are specified in Table 2.

TABLE 2. FLATWISE USE SPECIFIED STRENGTH AND MODULUS OF ELASTICITY VALUES FOR MLT ULTRALAM™ 2.0E LVL TOPPLANK (LIMIT STATES DESIGN)<sup>2,6,7,8</sup>

Moisture Content	Bending, $F_b$ psi (MPa)	Horizontal Shear, $F_v$ psi (MPa)	Plank Modulus of Elasticity, $E$ psi (MPa)	
	Plank <sup>1,4</sup>	Plank <sup>1,5</sup>	Apparent <sup>3</sup>	True <sup>3</sup>
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 MLT Ultralam™ 2.0E LVL TOPplank



- 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 pounds/inch  
 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 X-L plane only
- TOPplanks are generally used in elevated locations with good air circulation conducive to drying of the wood fibers.
- These design values have been developed in accordance with ANSI A10.8 Appendix C.
- Values are for new or like-new product.



5.3.2.3 Allowable spans for live load conditions defined in *ANSI A10.8* are provided in Table 3 for various member sizes.

TABLE 3. ALLOWABLE SPANS FOR TOPPLANK LVL SCAFFOLD PLANK USED IN THE UNITED STATES

Size	Live Load <sup>2</sup>	Allowable Span, ft (mm) <sup>1</sup>	
		MC ≤ 16 %	16% ≤ MC ≤ 30%
1.5" x 8.85" (38mm x 225mm)	One Person Load	9' - 10" (2,995)	8' - 8" (2,652)
	Two Person Load	7' - 11" (2,403)	7' - 2" (2,178)
	Three Person Load	6' - 2" (1,885)	5' - 4" (1,618)
	Light Duty (25 psf)	9' - 10" (2,995)	8' - 8" (2,652)
	Medium Duty (50 psf)	9' - 10" (2,995)	8' - 8" (2,652)
	Heavy Duty (75 psf)	8' - 11" (2,724)	8' - 3" (2,506)
1.5" x 9.25" (38mm x 235mm)	One Person Load	10' - 0" (3,054)	8' - 10" (2,703)
	Two Person Load	8' - 0" (2,444)	7' - 3" (2,214)
	Three Person Load	6' - 4" (1,941)	5' - 5" (1,662)
	Light Duty (25 psf)	10' - 0" (3,054)	8' - 10" (2,703)
	Medium Duty (50 psf)	10' - 0" (3,054)	8' - 10" (2,703)
	Heavy Duty (75 psf)	8' - 11" (2,724)	8' - 3" (2,506)
1.5" x 11.25" (38mm x 286mm)	One Person Load	10' - 11" (3,322)	9' - 8" (2,938)
	Two Person Load	8' - 8" (2,640)	7' - 10" (2,383)
	Three Person Load	7' - 2" (2,174)	6' - 2" (1,881)
	Light Duty (25 psf)	10' - 11" (3,322)	9' - 8" (2,938)
	Medium Duty (50 psf)	10' - 2 (3,087)	9' - 4" (2,834)
	Heavy Duty (75 psf)	8' - 11" (2,724)	8' - 3" (2,506)

SI: 1 in = 25.4 mm

- Allowable spans are determined through an evaluation of bending stress, horizontal shear stress, and an allowable deflection of L/60 using the live loads shown. The member self-weight is included in all span determinations. Spans shown are center of bearing to center of bearing. Always use appropriate length planks for the span condition. Refer to OSHA for minimum and maximum cantilever requirements.
- Live loads are as defined in *ANSI A10.8* Section 5.1.2. Proper scaffold plank selection must be based on the most restrictive load case anticipated when planks are in service.

5.3.2.4 Allowable spans for several live load conditions defined in *CSA S269.2* are provided in Table 4 for various member sizes.

TABLE 4. ALLOWABLE SPANS FOR TOPPLANK LVL SCAFFOLD PLANK USED IN CANADA

Size	Live Load <sup>2</sup>	Allowable Spans, ft (mm) <sup>1</sup>	
		MC ≤ 16 %	16% ≤ MC ≤ 30%
1.5" x 8.85" (38mm x 225mm)	50 psf	9' - 6" (2,895)	8' - 9" (2,667)
	75 psf	8' - 3" (2,514)	7' - 8" (2,336)
	500 lbs	5' - 1" (1,549)	4' - 1" (1,244)
	25 psf + 250 plf	8' - 4" (2,540)	7' - 6" (2,286)
	75 psf + 265 plf	6' - 8" (2,032)	5' - 8" (1,727)
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)
	25 psf + 250 plf	8' - 4" (2,554)	7' - 6" (2,286)
	75 psf + 265 plf	6' - 8" (2,032)	5' - 8" (1,730)
1.5" x 11.25" (38mm x 286mm)	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)
	25 psf + 250 plf	8' - 4" (2,540)	7' - 6" (2,286)
	75 psf + 265 plf	6' - 8" (2,032)	5' - 8" (1,727)

SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m<sup>2</sup>

- 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.

## 6 INSTALLATION

- 6.1 TOPplank is part of an overall scaffolding system. Consult the OSHA or OHS regulations on installation and the use of TOPplank 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 TEST ENGINEERING SUBSTANTIATING DATA

- 7.1 Test reports and data in accordance with *ASTM D143*, *ASTM D198*, *ASTM D2559*, and *ASTM D5456*.
- 7.2 Some information contained herein is the result of testing and/or data analysis by other sources which conform to [IBC Section 1703](#) and relevant [professional engineering law](#). DrJ relies on accurate data from these sources to perform engineering analysis. DrJ has reviewed and found the data provided by other professional sources to be credible.



- 7.3 Where appropriate, DrJ's analysis is based on design values that have been codified into law through codes and standards (e.g., *IBC*, *IRC*, *NDS*®, and *SDPWS*). 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 upon the published properties of commodity materials (e.g., lumber, steel, and concrete), DrJ relies upon the grade mark, stamp, and/or design values provided by raw material suppliers to be accurate and conforming to the mechanical properties defined in the relevant material standard.

## 8 FINDINGS

- 8.1 TOPplank meets all applicable requirements for use as scaffold plank in accordance with *ANSI A10.8*, *CSA O86*, and *CSA S269.2*.
- 8.2 TOPplank meets the requirements of *OSHA 29 CFR 1926.451* and *NBC*.
- 8.3 *IBC* Section 104.11 (*IRC* Section R104.11 and *IFC* Section 104.9 are similar) states:

**104.11 Alternative materials, design and methods of construction and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code...Where the alternative material, design or method of construction is not *approved*, the *building official* shall respond in writing, stating the reasons the alternative was not *approved*.

- 8.4 This product has been evaluated in the context of the codes listed in Section 2 and is compliant with all known state and local building codes. Where there are known variations in state or local codes applicable to this TER, they are listed here.
- 8.4.1 No known variations

## 9 CONDITIONS OF USE

- 9.1 Where required by the *building official*, also known as 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 Building Designer (e.g., *owner* or *registered design professional*).
- 9.4 At a minimum, this product shall be installed per Section 6 of this TER.
- 9.5 This product is manufactured under a third-party quality control program in accordance with *IBC* Section 104.4 and 110.4 and *IRC* Section R104.4 and R109.2.
- 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. Therefore, the TER shall be reviewed for code compliance by the *building official* for acceptance.
- 9.7 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 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 [ultralam.com/uk](http://ultralam.com/uk).

## 11 REVIEW SCHEDULE

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