



ICC-ES Evaluation Report ESR-5299

Issued October 2023

Revised November 2023

This report is subject to renewal October 2024.

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 17 13—Laminated Veneer Lumber

REPORT HOLDER:

XUZHOU AMISH NEW MATERIAL TECHNOLOGY CO., LTD

EVALUATION SUBJECT:

AMISH LAMINATED VENEER LUMBER

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, and 2012 *International Building Code*® (IBC)
- 2021, 2018, 2015, and 2012 *International Residential Code*® (IRC)

Properties evaluated:

- Structural

2.0 USES

The Amish Laminated Veneer Lumber (LVL) is used as an alternative to sawn lumber for structural applications including beams, headers, joists and rafters.

3.0 DESCRIPTION

3.1 General

The Amish LVL complies with the requirements noted in Section 2303.1.10 of the 2021, 2018 and 2015 IBC (Section 2303.1.9 of the 2012 IBC) for allowable stress design in accordance with Section 2302.1(1) of the 2021 and 2018 IBC and Section 2301.2(1) of the 2015 and 2012 IBC. The Amish LVL may also be used in structures regulated under the IRC when an engineered design is submitted in accordance with IRC Section R301.1.3.

The Amish LVL has been evaluated by testing in accordance with the performance requirements outlined in ASTM D5456 for LVL and is available in one grade of 3100F_b-2.1E.

3.2 Material

The Amish LVL is manufactured with layers of wood veneers laminated together using an exterior-type structural phenol-formaldehyde adhesive, conforming to ASTM D2559 and ASTM D5456. The wood veneer properties and

species, adhesive, manufacturing parameter and finished product dimensions and tolerances are as specified in the approved quality documentation and manufacturing standard. The Amish LVL is available in thickness from 1½ inches (38 mm) to 3½ inches (89 mm), width from 3½ inches (89 mm) to 52 inches (1320 mm), and length up to 51 feet (15.5 m).

4.0 DESIGN AND INSTALLATION

4.1 General:

Design and installation of Amish LVL must be in accordance with this report, the applicable code provisions and the manufacturer's published installation instructions. The requirements specified for allowable stress design in accordance with the 2021 and 2018 IBC Section 2302.1(1) and 2015 and 2012 IBC Section 2301.2(1), and the design provisions for structural composite lumber in the 2018 American Wood Council *National Design Specification* (NDS) for Wood Construction are applicable to Amish LVL. Reference design values are noted in Table 1.

4.2 Connections:

The design of mechanical connections in Amish LVL must be in accordance with the NDS. Equivalent specific gravities for the design of nail and bolt connections under dry use conditions are given in Table 2. Minimum spacing, edge and end distance for nails and bolts in the faces and edges of the Amish LVL must comply with the NDS.

4.3 Installation

The Amish LVL must be installed in accordance with this evaluation report, applicable codes and the specifications of design professional responsible for the design of structure. Drawings and/or the manufacturer's published installation instructions must be available at the jobsite at all times during installation.

5.0 CONDITIONS OF USE

The Amish LVL described in this report complies with, or is a suitable alternative to what is specified in those codes listed in Section 1.0, subject to the following conditions:

- 5.1** Installation, fabrication, identification, and connection restrictions must be in accordance with the applicable building code, this evaluation report and the manufacturer's published installation instructions. In the event of a conflict between the manufacturer's published installation instructions and this report, this report governs.

- 5.2 The construction documents prepared or reviewed by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed specifying the Amish LVL must indicate compliance with this evaluation report and applicable codes and must be submitted to the code official for approval.
- 5.3 The Amish LVL is limited to use in dry, interior applications where the in-service average moisture content in sawn lumber is less than 16 percent.
- 5.4 Connections other than nailed and bolted connections described in this report, are outside of this report.
- 5.5 Evaluation of the effect of fire-retardant or preservative treatment on the Amish LVL is outside of the scope of this report.
- 5.6 The Amish LVL is manufactured under an approved quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Structural Wood-based Products (AC47), dated June 2017 (editorially revised February 2021).

7.0 IDENTIFICATION

- 7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5299) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.
- 7.2 The Amish LVL must be identified with stamps bearing the product designation (Amish LVL), grade (3100Fb-2.1E), and production date and shift.
- 7.3 The report holder's contact information is the following:
XUZHOU AMISH NEW MATERIAL TECHNOLOGY CO., LTD
GUANHU, PIZHOU
JIANGSU PROVIENCE
CHINA 221321
86 516 86445383
amishlvi@163.com

TABLE 1—REFERENCE DESIGN VALUES FOR AMISH LVL^{1,2}

GRADE DESIGNATION	BEAM ORIENTATION ³				PLANK ORIENTATION ³				AXIAL	
	Bending MOE	Bending F_b ^{6,7} (psi)	Shear F_v (psi)	Compression Perp-to-Grain $F_{c\perp}$ ⁹ (psi)	Bending MOE	Bending F_b (psi)	Shear F_v (psi)	Compression Perp-to-Grain $F_{c\perp}$ ⁹ (psi)	Compression F_c (psi)	Tension F_t ⁸ (psi)
	$E_{\text{apparent}}^{4,5}$ ($\times 10^6$ psi)				$E_{\text{apparent}}^{4,5}$ ($\times 10^6$ psi)					
3100F _v -2.1E	2.1	3,100	300	500	2.1	3,500	200	500	3,200	2,100

For SI: 1 inch = 25.4 mm, 1 psi = 6894.8 Pa.

¹The tabulated values are design values for normal duration of load and must be adjusted by the applicable adjustment factors in accordance with Section 8.3 of the 2018 NDS. Modulus of elasticity and compression perpendicular-to-grain must not be adjusted for duration of load.

²The tabulated values are limited to dry, interior conditions where the average moisture content in lumber is less than 16 percent.

³Refer to Figure 1 for LVL orientations.

⁴Reference E_{apparent} values are the apparent modulus of elasticity, which include the effects of shear deformation. When calculating the total deflection, standard engineering formulae for the pure bending deflection are sufficient.

⁵Reference modulus of elasticity, E_{min} , used for beam stability calculations, must be calculated using the tabulated E_{apparent} in accordance with Appendix D of the 2018 NDS. The COV_E may be taken as 0.10 when calculating E_{min} .

⁶Reference bending design values in the beam orientation, F_b , may be increased by 4% when the member qualifies as a repetitive member, in accordance with Section 8.3.7 of the 2018 NDS.

⁷Reference bending design value in beam orientation is based on a reference depth of 12 inches. For other depths, the allowable bending stress, F_b , must be adjusted by multiplying F_b by $(12/d)^{0.25}$, where d is the depth members in inches. For depths 3 1/2 inches or less, multiply F_b by 1.361.

⁸Reference tension design values, F_t , is assigned for a standard length of 3 feet. For lengths longer than 3 feet, multiply F_t by $(3/L)^{0.125}$, where L is the length in feet. For lengths less than 3 feet, use the reference tension design value given in the table above.

⁹The bearing area factor, C_b , is permitted to be applied to the reference compression perpendicular-to-grain design values, $F_{c\perp}$, in accordance with the 2018 NDS.

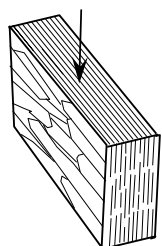
TABLE 2—EQUIVALENT SPECIFIC GRAVITY FOR FASTENER DESIGN^{1,2}

EQUIVALENT SPECIFIC GRAVITY					
Nails				Bolts ³	
Withdrawal		Dowel bearing		Dowel bearing (Installation in face)	
Installed in edge	Installed in face	Installed in edge	Installed in face	Load applied parallel to grain	Load applied perpendicular to grain
0.45	0.52	0.54	0.60	0.56	0.60

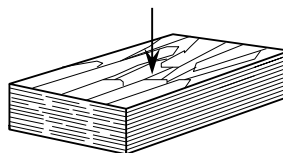
¹Fastener lateral and withdrawal design values calculated using the tabulated equivalent specific gravities for nail and bolt connections must be adjusted by the applicable adjustment factors specified in the 2018 NDS. Fastener types and orientations that are specifically described in Table 2 are outside the scope of this report.

²Minimum spacing, end and edge distance for nails and bolts must comply with the specified in the 2018 NDS.

³Equivalent specific gravities apply only to bolts installed into face of LVL, such that the bolt axis is perpendicular to the wide face of the veneer.



Beam Orientation



Plank Orientation

FIGURE 1—AN ILLUSTRATION OF BEAM AND PLANK ORIENTATION AS NOTED IN TABLE 1

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1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Amish Laminated Veneer Lumber (LVL), described in ICC-ES evaluation report ESR-5299, has also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2023 *Florida Building Code—Building*
- 2023 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The Amish LVL, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-5299, complies with the *Florida Building Code—Building* and the *Florida Building Code—Residential*. The design requirements must be determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-5299 for the 2021 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the Amish LVL for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* or the *Florida Building Code—Residential* has not been evaluated and is outside the scope of this supplemental report.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report, issued October 2023 and revised November 2023.