ICC-ES Evaluation Report

ESR-4831

Reissued October 2024

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Subject to renewal October 2025

This report also contains:

- **FL Supplement w/ HVHZ**

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES **Section: 06 17 13—Laminated Veneer Lumber**	**REPORT HOLDER: METSÄLIITTO COOPERATIVE** **METSÄ WOOD** **ADDITIONAL LISTEE: METSÄ WOOD USA**	**EVALUATION SUBJECT: KERTO LVL Q-PANEL**	

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2024, 2021, 2018, 2015, and 2012 *International Building Code® (IBC)*
- 2024, 2021, 2018, 2015, and 2012 *International Residential Code®* (IRC)

Property evaluated:

Structural

1.2 Evaluation to the following green code(s) and/or standards:

- 2022 *California Green Building Standards Code* (CALGreen), Title 24, Part 11
- 2020, 2015, 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2020, ICC 700-2015, ICC 700-2012 and ICC 700-2008)

Attributes verified:

See Section 3.1

2.0 USES

The Kerto LVL Q-panel is a laminated veneer lumber (LVL) product and is used for structural applications, as beams, headers, and panels for roofs, floors, and walls.

3.0 DESCRIPTION

3.1 General:

The Kerto LVL Q-panel described in this report complies with the requirements noted in IBC Section 2303.1.10 (2012 IBC Section 2303.1.9), for allowable stress design in accordance with the 2024, 2021 and 2018 IBC Section 2302.1(1) and 2015 and 2012 IBC Section 2301.2(1). The Kerto LVL Q-panel may also be used in structures regulated under the IRC when an engineered design is submitted in accordance with IRC Section R301.1.3. Kerto LVL Q-panel is manufactured by Metsäliitto Cooperative Metsä Wood, of Finland, distributed by Metsä Wood USA, of Norwalk, Connecticut.

The attributes of the Kerto LVL Q-panel have been verified as conforming to the provisions of (i) CALGreen Sections A4.404.3 for efficient framing techniques; (ii) ICC 700-2020 Sections 608.1(2), 11.608.1(2) and 13.104.3.1 for resource-efficient materials and ICC 700-2015 and ICC 700-2012 Sections 608.1(2),

11.608.1(2) and 12(A).608.1 for resource-efficient materials; and (iii) ICC 700-2008 Section 607.1(2) for resource-efficient materials. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

3.2 Material:

Kerto LVL Q-panel is manufactured by laminating nominally 0.12-inch-thick (3 mm) softwood veneers together using an exterior-type structural adhesive in a continuous process with the approximately 80% wood veneers oriented parallel to and approximately 20% of wood veneers perpendicular to the length of the member. Kerto LVL Q-panel members are available in nominal thicknesses from $^{13}/_{16}$ inch to 3 inches (21 mm to 75 mm) and widths of $3^{1}/_{2}$ inches to 98 inches (89 mm to 2500 mm) and lengths up to 82 feet (25 m). The wood veneer properties and species, adhesive, manufacturing parameters and finished product dimensions and tolerances are as specified in the approved manufacturer's quality documentation and manufacturing standard. Table 1 lists the Kerto LVL Q-panel layups.

4.0 DESIGN AND INSTALLATION

4.1 General:

Design and installation of Kerto LVL Q-panel must be in accordance with this report, the applicable code provisions, and the manufacturer's installation instructions. The manufacturer's installation instructions must be available at the jobsite at all times during installation.

4.2 Design:

The requirements specified for allowable stress design in accordance with the 2024, 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 American Wood Council's *National Design Specification for Wood Construction* (NDS), are applicable to Kerto LVL Q-panel, except as modified within this report. Allowable stress design values, presented in Tables 2 through 5 of this report, are for loads of a normal duration and are to be adjusted for the other duration of load in accordance with the NDS. Where members qualify as repetitive members, the allowable flexural stress in Table 2 is permitted to be increased by 4 percent. The allowable stresses are for covered dry conditions of use as described in Section 5.4 of this report.

4.3 Connections:

The allowable withdrawal and lateral values of fasteners in the design of mechanical connections in Kerto LVL Q-panel must be in accordance with the NDS by using the equivalent specific gravities given in Table 6 under dry use conditions. Allowable design values for the mechanical connections must be adjusted by applicable adjustment factors noted in the code and NDS, except as otherwise noted in the report.

4.4 Installation:

Kerto LVL Q-panel must be installed in accordance with the applicable code, the approved construction documents, this report, and manufacturer's installation instructions. This report must be complied with, should the manufacturer's installation instructions conflict with this report.

Minimum nail spacing and end distance, as well as the minimum spacing, end and edge distances for bolts and lag screws must be as specified in the NDS. Minimum edge distance must be sufficient to prevent splitting of the LVL. Additionally, maximum nail penetration into the LVL must be limited as necessary to prevent splitting.

When Kerto LVL Q-panel is used as a beam or header member, the circular holes may be cut into the beam or header, if load conditions permit within the parameters and footnotes shown in Tables 3 through 5 of this report**.**

5.0 CONDITIONS OF USE:

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

5.1 Fabrication, design, installation, and connection restrictions must comply with this 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 Calculations and drawings demonstrating compliance with this report must be submitted to the code official. The calculations and drawings must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.3 The design stresses must not exceed those set forth in this report and must be adjusted with the applicable load duration factor specified in accordance with the *National Design Specification® for Wood Construction* (NDS).

5.4 The use of Kerto LVL Q-panel must be limited to the covered, dry conditions. The dry condition of use is the condition at which the service moisture content in sawn lumber is less than 16 percent.

5.5 Kerto LVL Q-panel having fire-retardant or preservative chemical treatments is outside the scope of this report.

5.6 Fastener allowable design values must be as specified in Section 4.3 of this report.

5.7 Cutting, notching, and boring in Kerto LVL Q-panels are permitted only when stress levels permit and as detailed for maximum circular hole sizes noted in Tables 3 through 5 of this report. The holes must be located on the center line of depth of the members.

5.8 Minimum bearing length and anchorage of Kerto LVL Q-panel must meet the requirements of Chapter 23 of the IBC and the IRC, as applicable, for solid sawn lumber.

5.9 Fabrication must be under a 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 January 2025).

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-4831) along with the name, registered trademark, or registered logo of the report holder and/or listee must be included in the product label.

7.2 In addition, Kerto LVL Q-panel must be identified with a stamp noting the product manufacturer (Metsäliitto Cooperative Metsä Wood), product distributor (Metsä Wood USA), product name, product name and product grade.

7.3 The report holder's contact information is the following:

METSÄLIITTO COOPERATIVE
METSÄ WOOD
POST OFFICE BOX 24
08101 LOHJA
FINLAND
www.metsagroup.com/metsawood

7.4 The Additional Listee's contact information is the following:

METSÄ WOOD USA
301 MERRITT 7, 2ND FLOOR
NORWALK, CONNECTICUT 06851
(203)-939-8703
www.metsagroup.com/metsawood

TABLE 1—KERTO LVL Q-PANEL LAY-UPS

ID	NOMINAL THICKNESS (inch)	NUNBER OF VENEERS	VENEER ORIENTATION		LAY-UP[1]
			PARALLEL (|)	PERPENDICULAR (-)	
21a	0.82	7	5	2	| - | | | - |
21b	0.82	7	5	2	| | - | - | |
24	0.94	8	6	2	| | - | | - | |
27	1.06	9	7	2	| | - | | | - | |
30	1.18	10	8	2	| | - | | | | - | |
33	1.29	11	9	2	| | - | | | | | - | |
39	1.53	13	10	3	| | - | | | - | | | - | |
45	1.77	15	12	3	| | - | | | | - | | | | - | |
51	2.00	17	14	3	| | - | | | | | - | | | | | - | |
57	2.24	19	15	4	| | - | | | - | | | | | - | | | - | |
63	2.48	21	16	5	| | - | | | - | | | - | | | - | | | - | |
69	2.71	23	18	5	| | - | | | | - | | | - | | | - | | | | - | |
75	2.95	25	20	5	| | - | | | | | - | | | - | | | - | | | | | - | |

For **SI**: 1 inch = 25.4 mm

[1]" | " is for veneers parallel to the length of the LVL panels and " – " is for veneers perpendicular to the length of LVL panels.

TABLE 2—ALLOWABLE STRESSES FOR KERTO LVL Q-PANEL[1,2]

ID	FLEXURAL STRESS (psi)			TENSION F_t (psi)		COMPRESSION F_C (psi)			HORIZONTAL SHEAR, F_v (psi)			TRUE MOE[8] ($x10^6$ psi)			APPARENT MOE[9] ($x10^6$ psi)		
	$EW^{3,4}$	FW_s	FW_w^5	$EW_{\|\|}^6$	$EW_{\perp}^7$	$EW_{\|\|}$	$EW_{\perp}$	$FW_{\perp}$	EW	FW_s	FW_w	EW	FW_s	FW_w^5	EW	FW_s	FW_w^5
21a – 24	1,850	2,210	385	1,440	295	1,600	1,250	450	420	55	20	1.40	1.40	0.15	1.30	1.00	0.10
27 – 75	2,110	2,450	500	1,750	260	2,060	1,250	450	420	55	29	1.50	1.50	0.28	1.40	1.30	0.22

For **SI:** 1 psi = 0.00689 MPa

EW = edgewise; FW_s = flatwise strong axis; FW_w = flatwise weak axis; $EW_{||}$ = edgewise parallel to grain; $EW_{\perp}$ = edgewise perpendicular to grain; $FW_{\perp}$ = flatwise perpendicular to grain.

[1]Allowable design stresses are based on covered dry conditions of use. See Section 5.3 of this report.

[2]The tabulated design stresses are based on a normal duration. Loads of longer or shorter duration must be adjusted in accordance with the *National Design Specification® for Wood Construction* (NDS). Duration of load adjustments must not be applied to F_c in $EW_{\perp}$ and $FW_{\perp}$ and MOE.

[3]The tabulated flexural stresses are based on loads of a normal duration and a referenced depth of 12 inches. For other depths, the tabulated flexural stress must be adjusted by a depth factor adjustment of $(12/d)^{0.15}$. For depths less than $3^1/_2$ inches, use the value for $3^1/_2$ inches.

[4]The allowable bending stress increase for repetitive members must not exceed 4 percent.

[5]The tabulated flatwise bending value of 385 psi, True MOE of $0.15x10^6$ psi, and Apparent MOE of $0.10x10^6$ psi may be increased to 875 psi, $0.55x10^6$ psi, and $0.37x10^6$ psi, respectively, for the 21a layup, | - | | | - |.

[6]The tabulated tension stress is based on a length of 55 inches. For lengths longer than 55 inches, the tabulated tension stress must be adjusted by a factor of $(55/L)^{0.125}$. The tabulated values for lengths shorter than 55 inches must not be increased.

[7]The tabulated tension stress perpendicular to grain is based on a length of 55 inches. For lengths longer than 55 inches, the tabulated tension stress must be adjusted by a factor of $(55/L)^{0.187}$. The tabulated values for lengths shorter than 7 inches must not be increased.

[8]The values in this column reflect the true MOE which is the shear-free modulus of elasticity. When calculating deflection, both bending and shear deformations must be included. Equations for various span and load conditions are available in engineering references. For example, the equation for a simply-supported beam under uniform load is:

$$\Delta = 270wL^4/Ebd^3+28.8wL^2/Ebd$$

where: Δ = Deflection in inches (in), w = Uniform load in pounds per linear foot (plf), L = Design span in feet (ft), b = Beam width in inches (in), d = Beam depth in inches (in) and E = Shear free modulus of elasticity in pounds per square inch (psi).

[9]The apparent MOE which includes the effect of shear deformation. When calculating deflection using the apparent MOE, standard engineering formulae for pure bending deflection are sufficient, and the second term in the footnote 8 equation may be ignored.

TABLE 3—ALLOWABLE MOMENT CAPACITY (lbf-ft) FOR 1¾-INCH-THICK KERTO LVL Q-PANELS WITH HOLES[1,2,3,4]

BEAM DEPTH (in.)	MAXIMUM HOLE DIAMETER (in.)	NO HOLE	HOLE SIZE (in.)										
			2	3	4	5	6	7	8	9	10	11	12
9.25	5.75	5,080	3,705	3,520	3,520	3,520	***3,320***	NP	NP	NP	NP	NP	NP
9.5	6.00	5,335	3,870	3,640	3,640	3,640	3,640	NP	NP	NP	NP	NP	NP
11.25	7.50	7,295	5,150	4,725	4,455	4,455	4,455	4,455	***4.185***	NP	NP	NP	NP
11.875	7.917	8,055	5,695	5,195	4,920	4,805	4,805	4,805	***4,805***	NP	NP	NP	NP
14	9.333	10,935	8,005	7,315	6,870	6,620	6,515	6,515	6,515	6,515	***6,360***	NP	NP
16	10.667	14,000	10,525	9,655	9,045	8,650	8,425	8,340	8,340	8,340	8,340	***8,430***	NP
18	12.00	17,410	13,380	12,325	11,545	10,995	10,640	10,445	10,375	10,375	10,375	10,375	10,375

For SI: 1 in. = 25.4 mm, 1 ft-lb = 1.356 N-m
NP = Not Permitted

[1]Tabulated values are valid for members with edgewise bending (EW) that are considered braced against lateral torsional buckling. Unbraced members and/or members with combined edgewise and flatwise bending or combined bending and axial loading require a more detailed analysis. Adjustments for duration of load, wet service, temperature, and repetitive members shall be applied.
[2]Interpolation is permitted with a 5% reduction applied to the interpolated value. ***Bold Italic*** values exceed the maximum hole size and are presented for interpolation purposes only.
[3]Allowable moments for other thicknesses, t, must be determined by multiplying the tabulated value by a ratio of t / 1.75. For thicknesses less than 1 inch, an additional factor of 0.79 must be applied.
[4]The net bending stiffness may be determined by multiplying the gross bending stiffness by (1 - (1.6 ND/L)), where N = number of holes, D = largest hole diameter, and L = member span.
[5]See APA V900D, dated February 2021, for a complete description of hole placement requirements.

TABLE 4—ALLOWABLE SHEAR (lbf) FOR 1¾-INCH-THICK KERTO LVL Q-PANELS WITH LARGE HOLES AND MINIMUM EDGE DISTANCE[1,2,3,4]

BEAM DEPTH (in.)	MAXIMUM HOLE DIAMETER (in.)	NO HOLE	HOLE SIZE (in.)										
			2	3	4	5	6	7	8	9	10	11	12
9.25	5.75	3,990	815	605	425	280	***160***	NP	NP	NP	NP	NP	NP
9.5	6.00	4,100	850	635	455	305	185	NP	NP	NP	NP	NP	NP
11.25	7.50	4,855	1,090	870	670	495	350	230	***135***	NP	NP	NP	NP
11.875	7.917	5,125	1,180	950	750	570	415	285	***180***	NP	NP	NP	NP
14	9.333	6,040	1,480	1,240	1,025	830	655	500	370	255	***160***	NP	NP
16	10.667	6,905	1,760	1,515	1,295	1,085	895	725	575	440	320	***220***	NP
18	12.00	7,770	2,045	1,795	1,565	1,350	1,150	965	795	645	510	390	***285***

For SI: 1 in. = 25.4 mm, 1 lbf. = 4.45 N
NP = Not Permitted

[1]Tabulated values are valid for members with edgewise bending (EW) that are considered braced against lateral torsional buckling. Unbraced members and/or members with combined edgewise and flatwise bending or combined bending and axial loading require a more detailed analysis. Adjustments for duration of load, wet service, temperature, and repetitive members shall be applied
[2]Interpolation is permitted with a 5% reduction applied to the interpolated value. ***Bold italic*** values exceed the maximum hole size and are presented for interpolation purposes only.
[3]The tabulated allowable shear values were generated based on the test results of 45-mm-thick Kerto LVL Q-panel. For other thicknesses, t, the allowable shear values must be determined by multiplying the tabulated allowable shear values by a ratio of t / 1.75.
[4]See APA V900D, dated February 2021, for a complete description of hole placement requirements.

TABLE 5—ALLOWABLE SHEAR (lbf) FOR 1¾-INCH-THICK KERTO LVL Q-PANELS WITH SMALL HOLES AND 1/3 DEPTH EDGE DISTANCE[1,2,3,4]

BEAM DEPTH (in.)	MAXIMUM HOLE DIAMETER (in.)	NO HOLE	HOLE SIZE (in.)										
			2	3	4	5	6	7	8	9	10	11	12
9.25	3.083	3,990	2,450	1,820	***1,285***	NP	NP	NP	NP	NP	NP	NP	NP
9.5	3.167	4,100	2,555	1,915	***1,370***	NP	NP	NP	NP	NP	NP	NP	NP
11.25	3.75	4,855	3,280	2,610	***2,015***	NP	NP	NP	NP	NP	NP	NP	NP
11.875	3.958	5,125	3,540	2,860	***2,250***	NP	NP	NP	NP	NP	NP	NP	NP
14	4.667	6,040	4,440	3,730	3,080	***2,495***	NP	NP	NP	NP	NP	NP	NP
16	5.333	6,905	5,280	4,555	3,885	3,260	***2,695***	NP	NP	NP	NP	NP	NP
18	6.00	7,770	6,135	5,395	4,700	4,050	2,450	NP	NP	NP	NP	NP	NP

For SI: 1 in. = 25.4 mm, 1 lbf. = 4.45 N
NP = Not Permitted

[1]Tabulated values are valid for members with edgewise bending (EW) that are considered braced against lateral torsional buckling. Unbraced members and/or members with combined edgewise and flatwise bending or combined bending and axial loading require a more detailed analysis. Adjustments for duration of load, wet service, temperature, and repetitive members shall be applied.
[2]Interpolation is permitted with a 5% reduction applied to the interpolated value. Bold values exceed the maximum hole size and are presented for interpolation purposes only.
[3]The tabulated allowable shear values were generated based on the test results of 45-mm-thick Kerto LVL Q-panel. For other thicknesses, t, the allowable shear values must be determined by multiplying the tabulated allowable shear values by a ratio of t / 1.75.
[4]See APA V900D, dated February 2021, for a complete description of hole placement requirements.

TABLE 6—EQUIVALENT SPECIFIC GRAVITY FOR FASTENER DESIGN [1,2,3]

NOMINAL THICKNESS ID	EQUIVALENT SPECIFIC GRAVITY					
	Nails and Screws				Bolts and Lag Screws [4]	
	Withdrawal		Dowel Bearing		Dowel Bearing (Installed in Face)	
	Installed in Edge	Installed in Face	Installed in Edge	Installed in Face	Load Applied Parallel to Grain	Load Applied Perpendicular to Grain
21a - 75	0.39	0.43	0.31	0.52	0.47	0.53

[1]Fastener types and orientation not specifically described above are outside the scope of this report.
[2]Fastener design values calculated using the tabulated equivalent specific gravities must be adjusted by the applicable adjustment factors specified in the NDS for connections.
[3]Minimum nail spacing and end distance, as well as the minimum spacing, end and edge distances for bolts must be as specified in the NDS.
[4]Equivalent specific gravity values apply only to bolts installed into the face of the Kerto LVL Q-panel, such that the bolt axis is perpendicular to the wide faces of the veneers.

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

REPORT HOLDER:

METSÄLIITTO COOPERATIVE
METSÄ WOOD

EVALUATION SUBJECT:

KERTO LVL Q-PANEL

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Kerto LVL Q-panel, described in ICC-ES evaluation report ESR-4831, 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 Kerto LVL Q-panel, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-4831, 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 noted in ICC-ES evaluation report ESR-4831 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 Kerto LVL Q-panel has been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code-Building* or the *Florida Building Code-Residential*.

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 ESR-4831, reissued October 2024 and revised February 2025.