

# ICC-ES Evaluation Report


**ESR-5517**

Issued April 2026

Subject to renewal April 2027

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<p><b>DIVISION: 06 00 00 – WOOD, PLASTICS, AND COMPOSITES</b></p> <p><b>Section: 06 17 19 – Cross-Laminated Timber Name</b></p>	<p><b>REPORT HOLDER:</b></p> <p><b>THEURL HOLZ STEINFELD GMBH</b></p>	<p><b>EVALUATION SUBJECT:</b></p> <p><b>THEURL CLTPLUS</b></p>	
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## 1.0 EVALUATION SCOPE

### Compliance with the following codes:

- 2024, 2021 and 2018 [International Building Code® \(IBC\)](#)
- 2024, 2021 and 2018 [International Residential Code® \(IRC\)](#)
- ANSI/APA PRG 320-2019 Performance Standard for Cross-Laminated Timber
- ANSI/APA PRG 320-2025 Performance Standard for Cross-Laminated Timber

### Properties evaluated:

- Structural
- Fire Resistance

## 2.0 USES

The Theurl CLTPLUS are cross laminated timber (CLTPLUS) panels and are certified engineered wood products. When installed under the 2024 and 2021 IBC, the CLTPLUS panels can be used as floor, roof and wall panels in Types III, IV and V Construction, and in Type I and II Construction where permitted by IBC Section 603 and elsewhere in the Code. When installed under the 2018 IBC, CLTPLUS panels can be used as components in floors and roofs in Type I and II Construction and in roof and floor decks in Type III (interior floor decks only), IV and V construction.

When the CLTPLUS panels are installed under the IRC, an engineered design is required in accordance with IRC Section R301.1.3.

## 3.0 DESCRIPTION

### 3.1 General:

The Theurl CLTPLUS panels described in this evaluation report comply with requirements noted in IBC Section 2303.1.4 for allowable stress design (ASD) in accordance with IBC Section 2302.1(1). The CLTPLUS panels are fabricated with at least three planed sawn lumber laminations with adjacent laminations glued together at an angle of 90°. The CLTPLUS panels are fabricated with nominal thicknesses from 2<sup>3</sup>/<sub>8</sub> to 14<sup>3</sup>/<sub>16</sub> inches (60 to 360 mm actual), widths from 7<sup>3</sup>/<sub>8</sub> to 11<sup>1</sup>/<sub>2</sub> feet (2.25 to 3.5 m actual), and lengths from 26.25 to 52.5 feet (8 to 16 m actual). The CLTPLUS panels are fabricated by face-bonding each layer of laminations using a structural adhesive, complying with Section 3.2.2 of this evaluation report. The lumber laminations in a layer may be edge bonded. The layers are placed in a press to form a dimensionally stable structural element. Refer to [Table 2](#) for CLTPLUS panel layouts.

### 3.2 Material:

**3.2.1 Wood Laminations:** Wood laminations used in fabricating CLTPLUS panels are finger-jointed sawn lumber and must be fabricated in accordance with the approved in-plant manufacturing standard for grade and species of sawn lumbars, complying with ANSI/PRG 320-2025 Section 6.1.2 Item c. The ASD reference design values provided in [Table 1](#) of this evaluation report.

**3.2.2 Adhesives:** Adhesive used to fabricate CLTPLUS panels and adhesive used for finger-joints of wood laminations are non-formaldehyde, one-component polyurethane based, exterior-type structural adhesives, conforming to ANSI/APA PRG 320 and the product specifications in the approved quality documentation.

## 4.0 DESIGN AND INSTALLATION

### 4.1 General:

Design and installation of CLTPLUS panels must be in accordance with this evaluation report, the applicable code provisions and the manufacturer's published design and installation instructions. The manufacturer's design and installation instructions must be available at the jobsite at all times during installation. The design requirements specified for ASD in accordance with IBC Section 2302.1(1), Chapter 10 of the 2024, 2018 or 2015 *National Design Specification<sup>®</sup> for Wood Construction* (NDS), and Sections 4.5 and 4.6, and Appendix B of the 2024 and 2021 *Special Design Provisions for Wind and Seismic* (SDPWS) with Commentary, are applicable to the CLTPLUS panels.

### 4.2 Reference Design Values:

[Tables 3](#) and [4](#) provide the ASD reference design values for bending and shear capacities; and in-plane shear capacities of CLTPLUS panels, respectively. For the Load and Resistance Factor Design (LRFD), the reference design values must be adjusted using the adjustment factors specified in Table 10.3.1 of the 2024, 2018 or 2015 NDS. The reference design values must be adjusted in accordance with Section 4.3 of this evaluation report.

### 4.3 Adjustment Factors:

The reference design values in [Tables 3](#) and [4](#) must be adjusted using the adjustment factors specified in Table 10.3.1 of the 2024, 2018 or 2015 NDS and must not be increased for the lumber size adjustment factor in accordance with the NDS. The time dependent deformation (creep) factor,  $K_{er}$ , of 2.0, as specified in Section 3.5.2 of the NDS must be used to calculate the total deflection due to long-term loading for CLTPLUS panels used as components in floor and roof decks under dry service condition such as in most covered structures, where the moisture content in lumber in service is less than 16 percent, as specified in Section 10.1.5 of the 2024, 2018 or 2015 NDS.

### 4.4 Fire Resistance:

**4.4.1 Under the 2024 and 2021 IBC:** When fire performance is required, the fire resistance rating (FRR) of the exposed CLTPLUS panels may be determined by calculation in accordance with Chapter 16 of the NDS. Additionally, the Heavy Timber construction provisions of IBC Section 602.4 are applicable to CLTPLUS. As an alternative to these provisions, CLTPLUS panels must be tested in accordance with ASTM E119 with a fire resistance rating in accordance with the test results and the conditions of such tests, and such tests must be submitted to the code official for approval and are outside the scope of this evaluation report.

**4.4.2 Under the 2018 IBC:** Procedures specified in Chapter 16 of the 2018 or 2015 NDS shall be permitted for use in designing CLTPLUS panels for a fire exposure up to 2 hours. The CLTPLUS panels can be in 2-hour fire-resistance-rated construction, when tested in accordance with ASTM E119 with a fire resistance rating in accordance with the test results and the conditions of such tests, and such tests must be submitted to the code official for approval and are outside the scope of this evaluation report.

## 5.0 CONDITIONS OF USE:

The Theurl CLTPLUS panels described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** Fabrication, design, and installation of the CLTPLUS panels must comply with this evaluation report and the manufacturer's published design and installation instructions. In the event of a conflict between the manufacturer's published design and installation instructions and this evaluation report, the more restrictive requirements govern.
- 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 CLTPLUS panels, must indicate compliance with this evaluation report and applicable codes and must be submitted to the code official for approval.

- 5.3 The reference design values in [Table 4](#) are applicable for in-plane-shear design of CLT diaphragms. The complete diaphragm designs have not been evaluated and are outside the scope of this report. To be considered as part of a floor and roof diaphragm, CLTPLUS panels used to resist in-plane shear forces must be accompanied by complete detailing and diaphragm design in accordance with 2024 or 2021 SDPWS Section 4.5.
- 5.4 Use of CLTPLUS panels to resist in-plane-shear forces in shear walls must be accompanied by complete detailing and design of shear walls in accordance with 2024 or 2021 SDPWS Appendix B.
- 5.5 Use of CLTPLUS panels to resist gravity or out-of-plane transverse forces in walls must be accompanied by complete detailing and wall design that are acceptable to the code official.
- 5.6 Connections between wall panels and roof/floor panels, and other support members shall be accompanied by complete detailing and design that are satisfactory to the code official. Fasteners and connectors must be properly specified, including size, length, dimension, fastener bearing length and location. Connections must be designed in accordance with the mechanical connection provisions in the NDS or proprietary connectors and fasteners recognized in a current ICC-ES evaluation report.
- 5.7 Roofs constructed with CLTPLUS panels must be covered with approved roof coverings secured to the building or structure in accordance with applicable provisions of IBC Chapter 15.
- 5.8 Cutting, drilling, and notching of CLTPLUS panels when used as components in floor and roof decks have not been evaluated and are outside the scope of this evaluation report.
- 5.9 Use of CLTPLUS panels must be limited to dry service conditions where the equilibrium moisture content in lumber in service is less than 16 percent, as in most covered structures.
- 5.10 Special inspection must be conducted in accordance with the applicable requirements of Sections 1704 and 1705 of the IBC.
- 5.11 The Theurl CLTPLUS panels may be used as components in floor and roof decks under the IRC when an engineered design is submitted in accordance with Section R301.1.3.
- 5.12 The Theurl CLTPLUS panels are fabricated at the Theurl Holz Steinfeld GmbH facility located in Steinfeld, Austria, 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 Cross-laminated Timber Panels for Use as Components in Walls, Floors, and Roofs \(AC455\)](#), dated October 2022 (editorially revised June 2024).

## 7.0 IDENTIFICATION

- 7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5517) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.
- 7.2 In addition, each Theurl CLTPLUS panel is identified with a product label bearing the panel grade and layup, the production lot number, and the ICC-ES evaluation report number (ESR-5517).
- 7.3 The report holder’s contact information is the following:

**THEURL HOLZ STEINFELD GMBH**  
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**AUSTRIA**  
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**TABLE 1—ASD REFERENCE DESIGN VALUES FOR LUMBER LAMINATIONS USED IN CLTPLUS PANELS<sup>1</sup>**

CLT GRADE	MAJOR STRENGTH DIRECTION							MINOR STRENGTH DIRECTION						
	f <sub>b,0</sub> (psi)	E (10 <sup>6</sup> psi)	f <sub>t,0</sub> (psi)	f <sub>c,0</sub> (psi)	f <sub>v,0</sub> (psi)	f <sub>s,0</sub> (psi)	f <sub>c,-</sub> (psi)	f <sub>b,90</sub> (psi)	E (10 <sup>6</sup> psi)	f <sub>t,90</sub> (psi)	f <sub>c,90</sub> (psi)	f <sub>v,90</sub> (psi)	f <sub>s,90</sub> (psi)	f <sub>c,-</sub> (psi)
CLTPLUS	1,650	1.6	750	1,700	150	50	490	1,650	1.6	750	1,700	150	50	490

For **SI**: 1 psi = 6,895 Pa

<sup>1</sup>Tabulated values are allowable design values and not permitted to be increased for the lumber flat use or size factor in accordance with the NDS. The tabulated design values shall be used in conjunction with the section properties analytically derived using the equations outlined in the ANSI/APA PRG 320 based on the actual layup used in manufacturing the CLT panel (see [Table 2](#)).

TABLE 2—CLTPLUS PANEL LAYUPS

CLT GRADE	LAYUP <sup>1</sup>	THICKNESS t <sub>p</sub> <sup>2</sup> (in.)		LAMINATION ACTUAL THICKNESS <sup>3</sup> (in.)						
					⊥		⊥		⊥	
CLTPLUS	60-3s	[mm]	60	20	20	20				
		[in.]	2.36	0.79	0.79	0.79				
	80-3s	[mm]	80	30	20	30				
		[in.]	3.15	1.18	0.79	1.18				
	90-3s	[mm]	90	30	30	30				
		[in.]	3.54	1.18	1.18	1.18				
	100-3s	[mm]	100	30	40	30				
		[in.]	3.94	1.18	1.57	1.18				
	120-3s	[mm]	120	40	40	40				
		[in.]	4.72	1.57	1.57	1.57				
	100-5s	[mm]	100	20	20	20	20	20		
		[in.]	3.94	0.79	0.79	0.79	0.79	0.79		
	120-5s	[mm]	120	30	20	20	20	30		
		[in.]	4.72	1.18	0.79	0.79	0.79	1.18		
	140-5s	[mm]	140	40	20	20	20	40		
		[in.]	5.51	1.57	0.79	0.79	0.79	1.57		
	160-5s	[mm]	160	40	20	40	20	40		
		[in.]	6.30	1.57	0.79	1.57	0.79	1.57		
	180-5s	[mm]	180	40	30	40	30	40		
		[in.]	7.09	1.57	1.18	1.57	1.18	1.57		
	200-5s	[mm]	200	40	40	40	40	40		
		[in.]	7.87	1.57	1.57	1.57	1.57	1.57		
	160-5s-2	[mm]	160	30 + 30	40	30 + 30				
		[in.]	6.30	1.18 + 1.18	1.57	1.18 + 1.18				
	180-7s	[mm]	180	30	20	30	20	30	20	30
		[in.]	7.09	1.18	0.79	1.18	0.79	1.18	0.79	1.18
	200-7s	[mm]	200	20	40	20	40	20	40	20
		[in.]	7.87	0.79	1.57	0.79	1.57	0.79	1.57	0.79
	220-7s	[mm]	220	40	20	40	20	40	20	40
		[in.]	8.66	1.57	0.79	1.57	0.79	1.57	0.79	1.57
	240-7s	[mm]	240	30	40	30	40	30	40	30
		[in.]	9.45	1.18	1.57	1.18	1.57	1.18	1.57	1.18
	180-7s-2	[mm]	180	30 + 30	20	20	20	30 + 30		
		[in.]	7.09	1.18 + 1.18	0.79	0.79	0.79	1.18 + 1.18		
	200-7s-2	[mm]	200	30 + 30	30	20	30	30 + 30		
		[in.]	7.87	1.18 + 1.18	1.18	0.79	1.18	1.18 + 1.18		
	220-7s-2	[mm]	220	40 + 40	20	20	20	40 + 40		
		[in.]	8.66	1.57 + 1.57	0.79	0.79	0.79	1.57 + 1.57		
	240-7s-2	[mm]	240	40 + 40	20	40	20	40 + 40		
		[in.]	9.45	1.57 + 1.57	0.79	1.57	0.79	1.57 + 1.57		
260-7s-2	[mm]	260	40 + 40	30	40	30	40 + 40			
	[in.]	10.24	1.57 + 1.57	1.18	1.57	1.18	1.57 + 1.57			
280-7s-2	[mm]	280	40 + 40	40	40	40	40 + 40			
	[in.]	11.02	1.57 + 1.57	1.57	1.57	1.57	1.57 + 1.57			
300-8s-3	[mm]	300	40 + 40	30	40 + 40	30	40 + 40			
	[in.]	11.81	1.57 + 1.57	1.18	1.57 + 1.57	1.18	1.57 + 1.57			

TABLE 2—CLTPLUS PANEL LAYUPS (Continued)

CLT GRADE	LAYOUT <sup>1</sup>	THICKNESS $t_p$ <sup>2</sup> (in.)		LAMINATION ACTUAL THICKNESS <sup>3</sup> (in.)						
					⊥		⊥		⊥	
	320-8s-3	[mm]	320	40 + 40	40	40 + 40	40	40 + 40		
		[in.]	12.60	1.57 + 1.57	1.57	1.57 + 1.57	1.57	1.57 + 1.57		
	360-9s-3	[mm]	360	40 + 40	40	40	40	40	40	40 + 40
		[in.]	14.17	1.57 + 1.57	1.57	1.57	1.57	1.57	1.57	1.57 + 1.57

For SI: 1 in. = 25.4 mm

<sup>1</sup>The Theurl CLTPLUS CLT panel layups are developed based on the ANSI/APA PRG 320, using sawn lumber complying with Section 3.2.1 of the evaluation report. The CLT layout designation refers to the number of layers and the layout series.

<sup>2</sup>Gross thickness of CLT panels.

<sup>3</sup>Actual thickness of lamination after planing. “||”: Face laminations are oriented parallel to the major strength direction and “⊥”: Face laminations are oriented perpendicular to the major strength direction.

TABLE 3—ASD REFERENCE DESIGN VALUES FOR CLTPLUS PANELS<sup>1</sup>

CLT GRADE	LAYOUT <sup>2</sup>	THICKNESS $t_p$ <sup>3</sup> (in.)	MAJOR STRENGTH DIRECTION				MINOR STRENGTH DIRECTION			
			$(F_b S)_{eff,f,0}$ (lb <sub>r</sub> -ft/ft)	$(EI)_{eff,f,0}$ (x10 <sup>6</sup> lb <sub>r</sub> -in. <sup>2</sup> /ft)	$(GA)_{eff,f,0}$ (x10 <sup>6</sup> lb <sub>r</sub> /ft)	$V_{s,0}$ (lb <sub>r</sub> /ft)	$(F_b S)_{eff,f,90}$ (lb <sub>r</sub> -ft/ft)	$(EI)_{eff,f,90}$ (x10 <sup>6</sup> lb <sub>r</sub> -in. <sup>2</sup> /ft)	$(GA)_{eff,f,90}$ (x10 <sup>6</sup> lb <sub>r</sub> /ft)	$V_{s,90}$ (lb <sub>r</sub> /ft)
CLTPLUS	60-3s	2.36	1,260	20.0	0.34	945	170	1.0	0.34	315
	80-3s	3.15	2,280	49.0	0.51	1,260	170	1.0	0.37	315
	90-3s	3.54	2,825	69.0	0.52	1,420	385	3.0	0.52	470
	100-3s	3.94	3,400	92.0	0.54	1,570	680	6.0	0.68	630
	120-3s	4.72	5,025	163.0	0.69	1,890	680	6.0	0.69	630
	100-5s	3.94	2,900	78.0	0.69	1,570	1,480	20.0	0.69	945
	120-5s	4.72	4,600	149.0	0.85	1,890	1,480	20.0	0.71	945
	140-5s	5.51	6,575	248.0	1.00	2,200	1,480	20.0	0.74	945
	160-5s	6.30	8,300	358.0	1.40	2,525	2,400	44.0	0.81	1,260
	180-5s	7.09	9,925	481.0	1.40	2,835	4,000	92.0	1.10	1,570
	200-5s	7.87	11,579	624.0	1.37	3,150	5,925	163.0	1.40	1,890
	160-5s-2	6.30	9,125	394.0	1.00	2,525	280	6.0	0.74	630
	180-7s	7.09	9,350	454.0	1.50	2,825	4,400	121.0	1.10	1,890
	200-7s	7.87	8,100	437.0	1.20	3,150	9,750	358.0	2.10	2,525
	220-7s	8.66	14,750	874.0	2.10	3,475	5,425	174.0	1.20	2,200
	240-7s	9.45	13,725	888.0	1.60	3,775	11,675	481.0	2.00	2,825
	180-7s-2	7.09	11,325	550.0	1.40	2,825	1,480	20.3	0.81	945
	200-7s-2	7.87	13,600	734.0	1.40	3,150	2,675	49.0	1.1	1,260
	220-7s-2	8.66	17,200	1,020.0	1.90	3,475	1,480	20.0	0.89	945
	240-7s-2	9.45	20,225	1,307.0	2.30	3,775	2,400	44.0	0.98	1,260
	260-7s-2	10.24	23,225	1,628.0	2.10	4,100	4,000	92.0	1.20	1,570
	280-7s-2	11.02	26,325	1,986.0	2.10	4,400	5,925	163.0	1.50	1,890
	300-8s-3	11.81	30,000	2,426.0	3.00	4,725	6,850	220.0	1.40	2,200
320-8s-3	12.60	33,175	2,861.0	2.80	5,050	9,600	352.0	1.60	2,525	
360-9s-3	14.17	40,800	3,957.0	2.70	5,675	13,625	624.0	2.20	3,150	

For SI: 1 in. = 25.4 mm; 1 ft. = 304.8 mm; 1 lb<sub>r</sub> = 4.448 N

<sup>1</sup>The tabulated values are reference design values intended for Allowable Stress Design (ASD) and must be adjusted in accordance with Section 4.3. For LRFD, the reference design values must be adjusted using the adjustment factors specified in Table 10.3.1 of the 2024, 2018 or 2015 NDS.

<sup>2</sup>The CLTPLUS CLT panel layups are developed based on the ANSI/APA PRG 320, using sawn lumber complying with Section 3.2.1 of the evaluation report. The layout designation refers to the number of layers of CLTPLUS CLT panels.

<sup>3</sup>Gross thickness of CLTPLUS CLT panels.

TABLE 4—ASD REFERENCE DESIGN VALUES FOR IN-PLANE SHEAR OF CLTPLUS PANELS<sup>1</sup>

CLT LAYUP <sup>4</sup>	CLT PANEL THICKNESS $t_p$ (in.)	FACE LAMINATION ORIENTATION <sup>2</sup> (psi)	FACE LAMINATION ORIENTATION <sup>3</sup> (lbf/ft of width)
		$F_{v,e,0}$	$F_{v,e,0} t_p$
60-3s	2.36	245	6,900
80-3s	3.15	245	9,300
90-3s	3.54	245	10,400
100-3s	3.94	245	11,600
120-3s	4.72	245	13,900
100-5s	3.94	245	11,600
120-5s	4.72	245	13,900
140-5s	5.51	245	16,200
160-5s	6.30	245	18,500
180-5s	7.09	245	20,800
200-5s	7.87	245	23,100
160-5s-2	6.30	245	18,525
180-7s	7.09	245	20,800
200-7s	7.87	245	23,100
220-7s	8.66	245	25,500
240-7s	9.45	245	27,800
180-7s-2	7.09	245	20,800
200-7s-2	7.87	245	23,100
220-7s-2	8.66	245	25,500
240-7s-2	9.45	245	27,800
260-7s-2	10.24	245	30,100
280-7s-2	11.02	245	32,400
300-8s-3	11.81	245	34,700
320-8s-3	12.60	245	37,000
360-9s-3	14.17	245	41,700

For SI: 1 psi = 6.895 Pa

<sup>1</sup>The tabulated values are reference design values intended for Allowable Stress Design (ASD).

<sup>2</sup>The tabulated values are ASD reference edgewise shear stress of CLT panels with face laminations in the major strength direction ( $F_{v,e,0}$ ).

<sup>3</sup>The tabulated values are ASD reference edgewise shear capacity of the full thickness of the CLT panels with face laminations in the major strength direction ( $F_{v,e,0} t_p$ ). The values shall be reduced when the CLT panel thickness is less than the full thickness of the CLT panels ( $t_p$ ) specified in [Table 1](#).

<sup>4</sup>The CLT layups are developed based on ANSI/APA PRG 320, using visually graded sawn lumber noted in Section 3.2.1 of the evaluation report. The layup designation refers to the number of layers of CLTPLUS panels.



FIGURE 1—COMPANY LOGO FOR THEURL HOLZ STEINFELD GMBH