

# ICC-ES Evaluation Report

**ESR-3042**

Reissued September 2024

This report also contains:



Revised March 2025

- [FL Supplement w/ HVHZ](#)

Subject to renewal September 2025

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<p><b>DIVISION: 06 00 00 — WOOD, PLASTICS, AND COMPOSITES</b></p> <p><b>Section: 06 05 23 — Wood, Plastic and Composite Fastenings</b></p>	<p><b>REPORT HOLDER:</b> DEWALT</p> <p><b>ADDITIONAL LISTEE:</b> ALL POINTS SCREW, BOLT &amp; SPECIALTY CO. THE HILLMAN GROUP</p> 	<p><b>EVALUATION SUBJECT:</b> ULTRACON®+ SCREW ANCHORS IN WOOD (DEWALT)</p>	
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## 1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021, 2018 and 2015 [International Building Code® \(IBC\)](#)
- 2024, 2021, 2018 and 2015 [International Residential Code® \(IRC\)](#)

Property evaluated:

- Structural

## 2.0 USES

UltraCon+ screw anchors are used in wood-to-wood connections that are designed in accordance with the IBC. For structures regulated under the IRC, the screw anchors may be used when an engineered design is submitted in accordance with IRC Section R301.1.3.

## 3.0 DESCRIPTION

### 3.1 Notation and Symbols

- $a$  = Connection geometry parameter (See [Table 6](#) and [Figures 2](#) and [3](#).)
- $C_M$  = Wet-service factor
- $D$  = Outside thread diameter
- $D_r$  = Minor thread (root) diameter
- $D_H$  = Diameter of head or integral washer, as applicable
- $D_s$  = Unthreaded shank diameter
- $F_{yb,test}$  = Bending yield strength, determined from testing in accordance with ASTM F1575 using  $D_r$ .
- $L$  = Fastener length, measured from bottom of screw head to tip for hex washer head fasteners and from the top of the screw head to the tip for countersunk flat head fasteners.

$L_{emb,l}$	=	Minimum required embedded thread length in holding member, including tip, applicable to tabulated lateral design values
$L_{thread}$	=	Length of thread including tip
$N_a$	=	Allowable tension strength of the fastener for use in ASD
$SG_{NDS}$	=	Assigned specific gravity (See Section 3.3.2.)
$t_{s,w}$	=	Thickness of wood side member
$V_a$	=	Allowable shear strength of the fastener for use in ASD
$W$	=	Reference unit withdrawal design value for fasteners installed perpendicular to face of the wood
$W_H$	=	Reference head pull-through design value
$Z$	=	Reference lateral design value

### 3.2 General:

UltraCon+ screw anchors are self-drilling, self-tapping screws comprised of a one-piece anchor body with a hex flange head, slotted hex washer head, or a countersunk flat head with either a phillips drive or star drive recess. The screw anchor body is formed with alternating high and low threads, and a gimlet point tip.

Product names for the report holder and the additional listees are presented in [Table 1](#) of this report. The screw anchors are available with nominal diameters of  $3/16$  inch and  $1/4$  inch (5 mm and 6 mm). See [Table 2B](#) for typical dimensions for the screw anchors. The  $3/16$  inch screw anchor is available in lengths ranging from  $1\ 3/4$  inches to 4 inches (44.5 mm to 102 mm), and the  $1/4$  inch screw anchor is available in lengths ranging from  $1\ 3/4$  inches to 6 inches (44.5 mm to 152 mm), as indicated in [Table 2A](#).

### 3.3 Materials:

**3.3.1 UltraCon+ Screw Anchors:** The screw anchors are manufactured from low-carbon steel wire, grade C1016 or C1022, and are case hardened after forming. They are coated with a proprietary Stalgard® (Perma-Seal® for screw anchors labeled for additional listees) coating available in various colors.

**3.3.2 Wood Members:** For purposes of connection design, wood side and main members must have a moisture content less than or equal to 19 percent at the time of screw anchor installation and while in service. Wood members must be solid-sawn lumber or boards having an assigned specific gravity,  $SG_{NDS}$ , as specified in Table 12.3.3A of the ANSI/AWC National Design Specification (NDS) for Wood Construction or wood structural panel having an assigned specific gravity, as specified in Table 12.3.3B of the NDS within the ranges given in [Tables 3, 4](#) and [5](#) of this report. The thickness of the wood main member,  $t_m$ , must be sufficient to ensure that the tip of the screw is fully embedded in the wood. For the purposes of resisting lateral loads, the side member must have a minimum thickness,  $t_{s,w}$ , as shown in [Table 3](#). For the purposes of resisting pull-through loads, the side member must have a minimum thickness,  $t_{s,w}$ , of 1.0 inch (25.4 mm).

## 4.0 DESIGN AND INSTALLATION

### 4.1 Design:

Reference lateral ( $Z$ ), withdrawal ( $W$ ), and head pull-through ( $W_H$ ) design values for UltraCon+ screw anchor connections in wood members are given in [Tables 3, 4](#) and [5](#), respectively. Reference design values must be multiplied by all applicable adjustment factors. Adjustment factors must be as specified for dowel-type fasteners and wood screws in the NDS. Allowable tensile and shear loads for the UltraCon+ screw anchors, based on fastener strength, along with bending yield strengths determined from testing, are given in [Table 2B](#). Connections containing multiple UltraCon+ screw anchors must be designed in accordance with Sections 11.1.2, 11.2.2 and 12.6 of the NDS. Where UltraCon+ screw anchors are subjected to combined lateral and withdrawal loads, connections must be designed in accordance with Section 12.4.1 of the NDS.

### 4.2 Installation:

UltraCon+ screw anchors must be installed in accordance with the manufacturer's published installation instructions and this report. Screw anchors must be installed such that their main axis is oriented perpendicular to the wood grain. An appropriate screw anchor length must be used, such that the screw anchor will penetrate into the main member as shown in [Tables 3](#) and [4](#). The side member must be in direct contact with the main member, such that no gap exists between the wood members. End distances, edge distances and spacing of the screw anchors must be sufficient to prevent splitting of the wood, or as required by [Table 6](#), whichever is greater. Installation may be performed without predrilling the wood members. The screw anchor must be driven using the manufacturer-recommended socket tool (for hex washer head versions) or a phillips or star bit tip (for flat head versions), with a rotary drill or percussion drill set to rotary only mode. Upon installation, for hex

washer head screw anchors, the underside of the screw anchor head must be flush with the surface of the side member; and for flat head screw anchors the head of the screw anchor must be flush with the surface of the side member. The screw anchors must not be overdriven.

## 5.0 CONDITIONS OF USE:

The UltraCon+ screw anchors 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 The screw anchors must be installed in accordance with the manufacturer's published installation instructions and this report. In case of a conflict between this report and the manufacturer's installation instructions, this report governs.
- 5.2 Calculations and details demonstrating compliance with this report must be submitted to the code official. The calculations and details 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 UltraCon+ screw anchors must be installed and used in dry in-service conditions where the moisture content of the wood members does not exceed 19 percent.
- 5.4 See ESR-3213 for use of UltraCon+ screw anchors in locations exposed to saltwater or saltwater spray.
- 5.5 See [ESR-3213](#) for installations in which UltraCon+ screw anchors are used in contact with treated wood.
- 5.6 Lateral loading of  $3/16$ -inch UltraCon+ screw anchors is outside the scope of this evaluation report.
- 5.7 UltraCon+ screw anchors are manufactured under a quality-control program with inspections by ICC-ES.

## 6.0 EVIDENCE SUBMITTED

Data in accordance with the [ICC-ES Acceptance Criteria for Dowel-type Threaded Fasteners Used in Wood \(AC233\)](#), dated June 2023 (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-3042) along with the name, registered trademark, or registered logo of the report holder and listee must be included in the product label.
- 7.2 In addition, the UltraCon+ screw anchors are identified in the field by dimensional characteristics and packaging. A length letter code, as specified in [Table 2A](#), is stamped on each screw anchor head. Packages are identified with the product name; part number; head type; screw anchor size and length; and the company name as set forth in [Table 1](#) of this report.

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

**DEWALT**  
701 EAST JOPPA ROAD  
TOWSON, MARYLAND 21286  
(800) 524-3244  
[www.DEWALT.com](http://www.DEWALT.com)  
[anchors@DEWALT.com](mailto:anchors@DEWALT.com)

- 7.4 The additional listees' contact information is the following:

**ALL POINTS SCREW, BOLT & SPECIALTY CO.**  
1590 N.W. 27TH AVENUE #9  
POMPANO BEACH, FLORIDA 33069  
[info@allpointsscrew.com](mailto:info@allpointsscrew.com)

**THE HILLMAN GROUP**  
10590 HAMILTON AVENUE  
CINCINNATI, OHIO 45231  
[info@hillmangroup.com](mailto:info@hillmangroup.com)

TABLE 1—PRODUCT NAMES BY COMPANY

COMPANY NAME	PRODUCT NAME
DEWALT	UltraCon®+ Screw Anchors
The Hillman Group	Hillman Tapper+ Screw Anchors
All Points Screw, Bolt & Specialty Co.	AP Tapper+ Screw Anchors

TABLE 2A—FASTENER LENGTH SPECIFICATIONS – ULTRACON+ SCREW ANCHORS

FASTENER DESIGNATION	HEAD MARKING ID	L <sup>1</sup> (inches)	L <sub>thread</sub> <sup>2</sup> (inches)
3/16-inch and 1/4-inch UltraCon+ Screw Anchor	A	1 3/4	1 5/8
	B	2 1/4	1 7/8
	C	2 3/4	1 7/8
	D	3 1/4	1 7/8
	E	3 3/4	1 7/8
	F	4	1 7/8
1/4-inch UltraCon+ Screw Anchor	H	5	1 7/8
	J	6	1 7/8

For SI: 1 inch = 25.4 mm.

<sup>1</sup>For purposes of measuring overall fastener length, fasteners with hex washer heads are measured from underside of head to tip of point and fasteners with countersunk flat heads are measured from the top of the head to tip of point.

<sup>2</sup>Length of thread includes tip. See detailed illustration in [Figure 1](#).

TABLE 2B—FASTENER SPECIFICATIONS AND STRENGTHS – ULTRACON+ SCREW ANCHORS

FASTENER DESIGNATION	HEAD STYLE	D <sub>H</sub> (inch)	D <sub>r</sub> (inch)	D <sub>s</sub> (inch)	D (inch)	F <sub>yb, test</sub> (psi)	ALLOWABLE STEEL STRENGTHS	
							N <sub>a</sub> (lbf)	V <sub>a</sub> (lbf)
3/16-inch UltraCon+ Screw Anchor	Slotted Hex Washer	11/32	0.127	0.145	0.197	69,000	635	435
	Countersunk Flat	3/8						
1/4-inch UltraCon+ Screw Anchor	Hex Flange Head	39/64	0.170	0.187	0.241	97,000	1050	785
	Slotted Hex Washer	13/32						
	Countersunk Flat	1/2						

For SI: 1 inch = 25.4 mm; 1 pound = 4.45 N; 1 psi = 6.9 kPa.

**TABLE 3—REFERENCE LATERAL DESIGN VALUES (Z) FOR SINGLE SHEAR (TWO-MEMBER) WOOD-TO-WOOD CONNECTIONS BASED ON TESTING<sup>1,2,3</sup>**

FASTENER DESIGNATION	HEAD MARKING	MIN. $t_{s,w}$ <sup>4</sup> (inches)	$L_{emb,l}$ (inches)	REFERENCE LATERAL DESIGN VALUES, (Z) (lbf) BASED ON $SG_{NDS}$							
				0.67	0.55	0.50	0.46	0.43	0.42	0.36	0.31
<sup>3</sup> / <sub>16</sub> -inch UltraCon+ Screw Anchor	A through F	( <sup>3</sup> / <sub>16</sub> -inch UltraCon+ screw anchors have not been evaluated for lateral loading)									
<sup>1</sup> / <sub>4</sub> -inch UltraCon+ Screw Anchor	A	0.75	1.00	199	148	124	107	94	90	68	51
	B		1.50		152	134	120	110	107	90	71
	C through J		≥ 2.00								
	B	1.00	1.25	212	177	154	137	122	116	89	66
	C through J		≥ 1.75					124	120	98	81
	C	1.50	1.25	212	177	162	149	134	129	105	82
D through J	≥ 1.75		151				141	138	120	96	

For SI: 1 inch = 25.4 mm; 1 lbf = 4.45 N.

**Notes to Table 3:**

<sup>1</sup>Tabulated reference lateral design values, Z, apply to the screw anchor oriented perpendicular to the grain and loaded laterally at any angle with respect to the grain. For connections in which the main and side members have different specific gravities, use the lower of the two. Gaps are not permitted between the main and side members.

<sup>2</sup>Values must be multiplied by all applicable adjustment factors, as applicable to dowel-type fasteners, in accordance with the NDS.

<sup>3</sup>UltraCon+ screw anchors must be installed and used in dry in-service conditions, such that the wet service factor, C<sub>M</sub>, is 1.0 in accordance with the NDS.

<sup>4</sup>Side members with thicknesses greater than the tabulated minimum side member thickness may be used, provided the corresponding tabulated minimum main member penetration is still achieved for the given screw anchor length.

**TABLE 4—REFERENCE WITHDRAWAL DESIGN VALUES (W)<sup>1,2,3,4</sup>**

FASTENER DESIGNATION	HEAD MARKING <sup>5</sup>	$L_{thread}$ <sup>5</sup> (inches)	W (lbf/in)	
			$SG_{NDS} \geq 0.56$	$0.56 > SG_{NDS} \geq 0.50$
<sup>3</sup> / <sub>16</sub> -inch UltraCon+ Screw Anchor	A through F	1 <sup>5</sup> / <sub>8</sub> through 1 <sup>7</sup> / <sub>8</sub>	109	109
<sup>1</sup> / <sub>4</sub> -inch UltraCon+ Screw Anchor	A through J	1 <sup>5</sup> / <sub>8</sub> through 1 <sup>7</sup> / <sub>8</sub>	181	137

For SI: 1 inch = 25.4 mm; 1 lbf/in = 175 N/m.

<sup>1</sup>Tabulated reference withdrawal design values, W, apply to screw anchors driven into the side grain of the main member, such that the screw anchors are oriented perpendicular to the grain and loaded in direct withdrawal.

<sup>2</sup>Values must be multiplied by all applicable adjustment factors, as applicable to wood screws, in accordance with the NDS.

<sup>3</sup>UltraCon+ screw anchors must be installed and used in dry in-service conditions, such that the wet service factor, C<sub>M</sub>, is 1.0 in accordance with the NDS.

<sup>4</sup>Reference withdrawal design values are to be multiplied by the length of thread penetration into the main member. Main member penetration must be ≥ 1 inch. Threaded length includes tapered tip.

<sup>5</sup>Refer to [Table 2A](#) for head markings and corresponding thread lengths.

**TABLE 5—REFERENCE HEAD PULL-THROUGH DESIGN VALUES (W<sub>H</sub>)<sup>1,2,3</sup>**

FASTENER DESIGNATION	HEAD TYPE	HEAD MARKING	MINIMUM $t_{s,w}$ (inch)	PULL-THROUGH DESIGN VALUES, $W_H$ (lbf) <sup>4</sup>	
				$SG_{NDS} \geq 0.56$	$0.56 > SG_{NDS} \geq 0.50$
<sup>3</sup> / <sub>16</sub> -inch UltraCon+ Screw Anchor	Hex Head / Slotted Hex Head	A through F	1.00	125	125
	Flat Head	A through F	1.00	125	125
<sup>1</sup> / <sub>4</sub> -inch UltraCon+ Screw Anchor	Hex Head / Slotted Hex Head	A through J	1.00	314	176
	Flat Head	A through J	1.00	176	176

For SI: 1 inch = 25.4 mm; 1 pound = 4.45 N.

<sup>1</sup>Tabulated head pull-through design values, W<sub>H</sub>, must be multiplied by all applicable adjustment factors, as applicable to wood screw withdrawal, in accordance with the NDS.

<sup>2</sup>Design values apply to connections with minimum side member thicknesses, t<sub>s,w</sub>, as given above.

<sup>3</sup>UltraCon+ screw anchors must be installed and used in dry in-service conditions, such that the wet service factor, C<sub>M</sub>, is 1.0 in accordance with the NDS.

<sup>4</sup>UltraCon+ screw anchors have not been evaluated for head pull-through resistance in wood members having specific gravities less than 0.50.

**TABLE 6—CONNECTION GEOMETRY REQUIREMENTS FOR FASTENERS INSTALLED PERPENDICULAR TO THE FACE OF WOOD MEMBERS<sup>1,2,3</sup>**

CONDITION <sup>4</sup>		MINIMUM DISTANCE OR SPACING	
		Self-drilled	Predrilled Hole <sup>4</sup>
End distance (see Figure 2)	Loading toward end, $a_{end,1}$	20D	12D
	Loading perpendicular to grain or away from end, $a_{end,2}$	15D	7D
	Axial loading, $a_{end,2}$	10D	7D
Edge distance (see Figure 2)	Loading toward edge, $a_{edge,1}$	12D	7D
	Loading parallel to grain or away from edge, $a_{edge,2}$	7D	3D
	Axial Loading, $a_{edge,2}$	4D	3D
Spacing between fasteners, parallel to grain (see Figure 3)	Loading parallel to grain, $a_1$	15D	10D
	Loading perpendicular to grain, $a_1$	10D	5D
	Axial loading, $a_1$	7D	7D
Spacing between fasteners, perpendicular to grain (see Figure 3)	Loading parallel to grain, $a_2$	7D	4D
	Loading perpendicular to grain, $a_2$	7D	4D
	Axial loading, $a_2$	4D	3D

For SI: 1 inch = 25.4 mm.

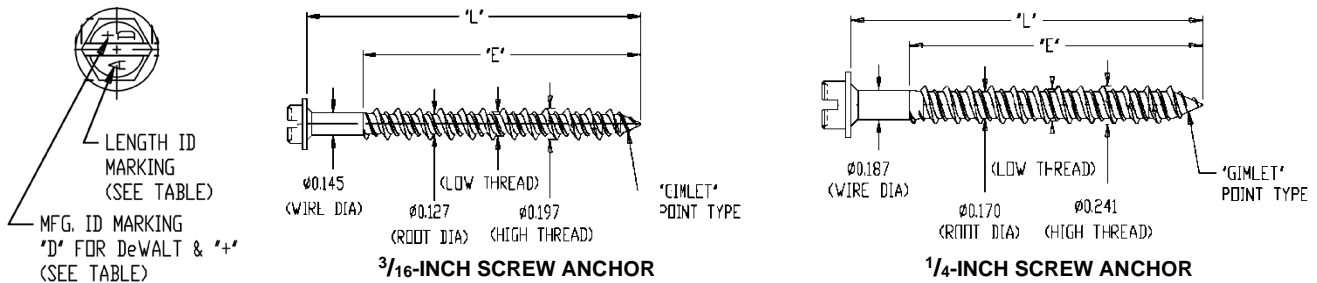
<sup>1</sup>End distances, edge distances and screw anchor spacing must be sufficient to prevent splitting of the wood, or as required by this table, whichever is the more restrictive.

<sup>2</sup>Wood member stresses must be checked in accordance with Section 11.1.2 and Appendix E of the NDS, and end distances, edge distances and fastener spacing may need to be increased accordingly.

<sup>3</sup>Tabulated values are applicable to wood-to-wood connections.

<sup>4</sup>Tabulated geometry is applicable to fasteners installed in predrilled holes that meet the following requirements:

- For installation in Douglas Fir and other species of similar or greater density, the hole must have a diameter between  $0.60D_s$  and  $0.75D_s$ .
- The hole diameter must not exceed  $0.9D_s$ .



**FIGURE 1—FASTENER SPECIFICATIONS FOR ULTRACON+ SCREW ANCHOR**

**Note:** Slotted Hex Head screw shown for illustration. Shank and thread specifications are the same for screws with other head types.

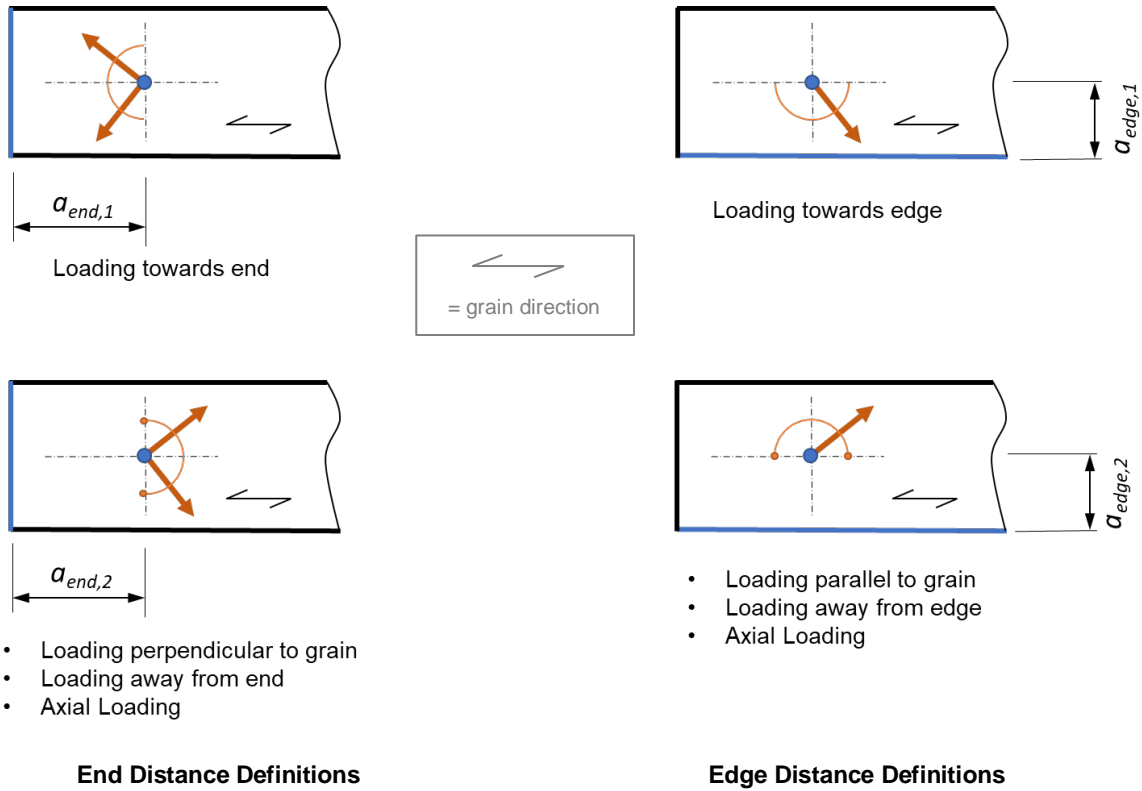


FIGURE 2—END AND EDGE DISTANCE DEFINITIONS FOR SCREWS INSTALLED PERPENDICULAR TO GRAIN

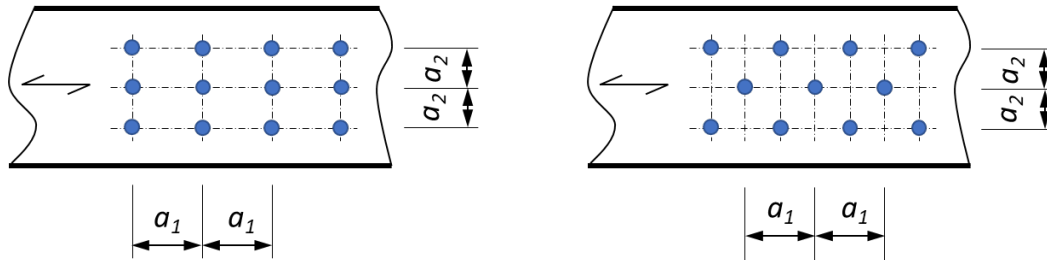


FIGURE 3—SPACING DEFINITIONS FOR SCREWS INSTALLED PERPENDICULAR TO GRAIN

**DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES**  
**Section: 06 05 23—Wood, Plastic and Composite Fastenings**

**REPORT HOLDER:**

DEWALT

**EVALUATION SUBJECT:**

ULTRACON®+ SCREW ANCHORS IN WOOD (DEWALT)

**1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that the Ultracon+ screw anchors in wood, described in ICC-ES evaluation report ESR-3042, have 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 Ultracon+ screw anchors in wood, described in Sections 2.0 through 7.0 of the evaluation report ESR-3042, comply 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* and the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-3042 for the 2021 *International Building Code*® meet the requirements of the *Florida Building Code—Building* and the *Florida Building Code—Residential*, as applicable.

Use of the Ultracon+ screw anchors in wood have also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential*, with the following condition:

- a. For anchorage of wood members, the connections subject to uplift must be designed for no less than 700 pounds (3114 N).

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, reissued September 2024 and revised March 2025.