

# ICC-ES Evaluation Report

**ESR-3275**

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This report also contains:

**- FBC Supplement**

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<p><b>DIVISION: 03 00 00 - CONCRETE</b></p> <p><b>Section: 03 15 00—Concrete Accessories</b></p> <p><b>Section: 03 16 00—Concrete Anchors</b></p> <p><b>DIVISION: 04 00 00 - MASONRY</b></p> <p><b>Section: 04 05 19.16—Masonry Anchors</b></p> <p><b>DIVISION: 05 00 00 - METALS</b></p> <p><b>Section: 05 05 23—Metal Fastenings</b></p> <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>DIVISION: 09 00 00 - FINISHES</b></p> <p><b>Section: 09 22 16.23—Fasteners</b></p>	<p><b>REPORT HOLDER: DEWALT</b></p> <p><b>ADDITIONAL LISTEE: MAX COMPANY, LTD.</b></p>	<p><b>EVALUATION SUBJECT: TRAK-IT® C4 AND TRAK-IT® C5 FASTENERS IN CONCRETE, MASONRY AND STEEL (DEWALT)</b></p>	
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## 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® \(IRC\)](#)

**Property evaluated:**

- Structural

**2.0 USES**

Trak-It C4 and Trak-It C5 fasteners are used to attach building elements, such as wood and cold-formed steel, to base materials of uncracked, normalweight and sand-lightweight concrete, steel deck with sand-lightweight concrete fill, concrete masonry units (CMUs) and structural steel. The fasteners are alternatives to the cast-in-place anchors described in IBC Section 1901.3 (2012 IBC Section 1908) for placement in concrete; the embedded anchors described in Section 8.1.3 of TMS 402, referenced in IBC Section 2107 (Section 2.1.4 of TMS 402, referenced in Section 2107 of the 2012 IBC) for placement in masonry; and the welds and bolts used to attach materials to steel described in IBC Sections 2204.1 and 2204.2, respectively. For structures regulated under the IRC, the fasteners may be used where an engineered design is submitted in accordance with IRC Section R301.1.3.

**3.0 DESCRIPTION****3.1 Trak-It C4 and Trak-It C5 Fasteners:**

Trak-It C4 and Trak-It C5 fasteners are low-velocity power-actuated fasteners (PAFs) manufactured from hardened steel complying with the manufacturer's quality documentation.

The Trak-It C4 and Trak-It C5 fasteners are collated into plastic strips as illustrated in [Figure 3](#). Product names for the report holder and the additional listee are presented in the table below.

COMPANY NAME	PRODUCT NAMES	
DEWALT	Trak-It C4 Fasteners	Trak-It C5 Fasteners
Max Company, Ltd.	Powerlite Pins	Max Concrete Pins

The fasteners have straight, stepped or tapered shanks which are either smooth or knurled. See [Table A](#) for shank type, fastener dimensions, coating and applicable base materials. Maximum point length is the maximum specified length from the tip of the fastener to the location where the diameter of the shank becomes constant. Minimum effective shank length is the minimum specified length from the underside of the fastener head to the tip of the fastener.

**3.2 Substrate Materials:**

**3.2.1 Concrete:** Normalweight and sand-lightweight concrete must conform to IBC Chapter 19 or IRC Section R402.2, as applicable. The minimum concrete compressive strength at the time of fastener installation must be as noted in [Tables 1](#) and [2](#).

**3.2.2 Concrete Masonry:** Concrete masonry units (CMUs) must be minimum 8-inch-thick (203 mm) blocks conforming to ASTM C90. Mortar must comply with ASTM C270. See [Table 3](#) for applicable mortar type. Grout must be coarse grout complying with ASTM C476.

**3.2.3 Steel Substrates:** Structural steel must comply with the minimum requirements of ASTM A36, A572 Grade 50, A992 or A1011, and have a thickness as described in [Tables 4](#) and [5](#), as applicable.

**3.2.4 Steel Deck Panels:** Steel deck panel properties and configurations must be as described in the footnotes to [Table 2](#) and [Figures 1A](#) and [1B](#), as applicable.

**4.0 DESIGN AND INSTALLATION****4.1 Design:**

**4.1.1 General:** Selection of fasteners must take into consideration the applicable base material and the length of the fastener. The minimum fastener length must be determined as follows:

- For installation into concrete, concrete-filled steel deck panels, CMU and steel base materials, the minimum effective shank length shown in [Table A](#) must equal or exceed the sum of the thickness of the attached material and the minimum embedment depth (penetration) shown in the applicable tables in this report.
- For installation through steel base materials, the minimum effective shank length shown in [Table A](#) must equal or exceed the sum of the following: the thickness of the attached material, the thickness of the base material and the required point penetration shown in the applicable tables in this report.

**4.1.2 Allowable Loads:** The applicable allowable load tables for Trak-It C4 and Trak-It C5 fasteners driven into different base materials may be determined by referencing [Table A](#).

The most critical applied loads, excluding seismic load effects, resulting from the load combinations in Section 2.4 of ASCE 7-16/S1 (referenced in 2021 IBC Section 1605.1) or 2021 IBC Section 1605.2 (Section 1605.3.1 or 1605.3.2 of the 2018, 2015, and 2012 IBC) must not exceed these allowable loads. For fasteners which are subjected to seismic loads, see Section 4.1.5 for additional information. The stress increases and load reductions described in 2021 IBC Section 1605.2 (2018, 2015 and 2012 IBC Section 1605.3) are not allowed.

The allowable tension (pull-out) and shear loads listed in this report apply only to the connection of the fastener to the base materials. Other limit states applicable to the design of a connection, such as fastener pull-through (pull-over) and lateral bearing on the attached material, which are governed by the properties of attached materials, are outside the scope of this report. Design of the connection to the attached material must comply with the applicable requirements of the IBC. When designing the connection of wood members to base materials, the bending yield strength of the PAFs can be assumed to be the same as that of a nail with the same shank diameter.

**4.1.3 Combined Loading:** For fasteners subjected to tension and shear loads, compliance with the following interaction equation must be verified:

$$(p/P_a) + (v/V_a) \leq 1$$

where:

$p$  = Actual applied tension load on fastener, lbf (N).

$P_a$  = Allowable tension load on fastener, lbf (N).

$v$  = Actual applied shear load on fastener, lbf (N).

$V_a$  = Allowable shear load on fastener, lbf (N).

**4.1.4 Steel-to-steel Connections:** When the Trak-It C5 fasteners listed in [Tables 4](#) and [5](#) are used in connections of two steel elements in accordance with Section J5 of AISI S100 (Section E5 of AISI S100-12 for the 2015 and 2012 IBC), connection capacity must be determined in accordance with Sections 4.1.4.1 and 4.1.4.2, as applicable.

**4.1.4.1 Connection Strength - Tension:** To determine tensile connection strength in accordance with Section J5.2 of AISI S100 (Section E5.2 of AISI S100-12), the fastener tension strength, pull-out strength and pull-over strength must be known. These characteristics must be determined as follows:

- **PAF Tensile Strength:** The available tension strengths must be calculated in accordance with Section J5.2.1 of AISI S100 (Section E5.2.1 of AISI S100-12) using a value of 260,000 psi for  $F_{uh}$ .
- **Pull-out Strength:** See [Table 4](#) or [5](#) for available pull-out strength, as applicable.
- **Pull-over Strength:** The available pull-over strengths must be calculated in accordance with Section J5 of AISI S100 (Section E5.2.3 of AISI S100-12).

**4.1.4.2 Connection Strength - Shear:** To determine shear connection strength in accordance with Section J5.3 of AISI S100 (Section E5.3 of AISI S100-12), the fastener shear strength, bearing and tilting strength, pull-out strength in shear, net section rupture strength and shear strength limited by edge distance must be known. These characteristics must be determined as follows:

- **PAF Shear Strength:** The available shear strengths must be calculated in accordance with Section J5.3.1 of AISI S100 (Section E5.3.1 of AISI S100-12) using a value of 260,000 psi for  $F_{uh}$ .
- **Bearing and Tilting Strength:** The available bearing and tilting strengths must be calculated in accordance with Section J5.3.2 of AISI S100 (Section E5.3.2 of AISI S100-12).
- **Pull-out Strength in Shear:** The available pull-out strength in shear must be the applicable allowable shear strength from [Table 4](#) or [5](#), as applicable, or must be calculated in accordance with Section J5.3.3 of AISI S100 (Section E5.3.3 of AISI S100-12).
- **Net Section Rupture Strength and Shear Strength Limited by Edge Distance:** The net section rupture strength must be determined in accordance with Section J5.3.4 of AISI S100 (Section E5.3.4 of AISI S100-12) and the shear strength limited by edge distance must be determined in accordance with Section J5.3.5 of AISI S100 (Section E5.3.5 of AISI S100-12).

**4.1.5 Seismic Considerations:** The Trak-It C4 and Trak-It C5 fasteners have been evaluated for use when subjected to seismic loads as follows:

1. The fasteners may be used for attachment of nonstructural components listed in Section 13.1.4 of ASCE 7, which are exempt from the requirements of ASCE 7.
2. Concrete base materials: The fasteners installed in concrete may be used to support acoustical tile or lay-in panel suspended ceiling systems, distributed systems and distribution systems where the service load on any individual fastener does not exceed the lesser of 90 lbf (400 N) or the published allowable load in [Tables 1](#) and [2](#), as applicable.
3. Steel base materials: The fasteners installed in steel may be used where the service load on any individual fastener does not exceed the lesser of 250 lbf (1112 N) or the published allowable load shown in [Tables 4](#) and [5](#), as applicable.
4. For interior, nonstructural walls that are not subject to sustained tension loads and are not a bracing application, the power-driven fasteners may be used to attach steel track to concrete or steel in all Seismic Design Categories. In Seismic Design Categories D, E, and F, the allowable shear load due to transverse pressure must be no more than 90 pounds (400 N) when attaching to concrete; or 250 pounds (1,112 N) when attaching to steel. Substantiating calculations must be submitted addressing the fastener-to-base-material capacity and the fastener-to-attached-material capacity. Interior nonstructural walls are limited to locations where bearing walls, shear walls or braced walls are not required by the approved plans. The design load on the fastener must not exceed the allowable load established in this report for the concrete or steel base material.

## 4.2 Installation:

**4.2.1 General:** Fasteners must be installed with a power-actuated fastening tool (gas-actuated) in accordance with the manufacturer's recommendations. Installers of gas-actuated fasteners do not require an operator's license. The fasteners must be installed in accordance with the manufacturer's published installation instructions. A copy of these instructions must be available on the jobsite at all times during fastener installation.

The fastener size, minimum embedment depth or penetration, minimum spacing and edge distances must comply with [Tables 1](#) through [5](#), as applicable. For fasteners installed into concrete, the fasteners must not be driven until the concrete has reached the designated concrete compressive strength.

**4.2.2 Use with Treated Lumber:** The Trak-It C4 tapered shank fasteners described in [Table A](#), which have an ASTM B695 Class 55 mechanically galvanized coating, may be used in contact with preservative-treated wood or fire-retardant-treated wood in dry, interior locations only in accordance with IBC Section 2304.10.6.1 (2018 and 2015 IBC Section 2304.10.5, 2012 IBC Section 2304.9.5).

Any power-driven fastener described in this report may be used in contact with wood treated with SBX/DOT and zinc borate preservatives in dry, interior locations only, in accordance with the exception to IBC Section 2304.10.6.1 (2018 and 2015 IBC Section 2304.10.5.1, 2012 IBC Section 2304.9.5.1).

Any power-driven fastener described in this report may be used in contact with fire-retardant-treated wood in dry, interior locations only, in accordance with IBC Section 2304.10.6.4 (2018 and 2015 IBC Section 2304.10.5.4, 2012 IBC Section 2304.9.4.5) and the report holder's recommendations.

Except as noted above, use of the carbon steel fasteners in contact with preservative-treated wood or in contact with fire-retardant-treated wood in exterior applications is outside the scope of this report.

## 5.0 CONDITIONS OF USE:

The Trak-It C4 and Trak-It C5 fasteners 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 fasteners must be manufactured and identified in accordance with this report.
- 5.2 The fasteners must be installed in accordance with this report and the manufacturer's published installation instructions. In the event of a conflict between the instructions in this report and the manufacturer's published installation instructions, the more restrictive requirements govern.
- 5.3 Calculations demonstrating that the applied loads are less than the allowable loads described in this report must be submitted to the code official for approval. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is constructed.

- 5.4 For steel-to-steel connections that meet the applicability requirements of Section J5 of AISI S100 (Section E5 of AISI S100-12 for the 2015 and 2009 IBC), calculations demonstrating that the available connection strength has been determined in accordance with Section J5 of AISI S100 (Section E5 of AISI S100-12) and Section 4.1.4 of this report, and equals or exceeds the applied load, must be submitted to the code official. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.5 For fasteners installed in concrete, the concrete must have a minimum thickness of three times the fastener embedment depth, unless noted otherwise.
- 5.6 The use of fasteners in concrete or masonry is limited to installation in uncracked concrete or masonry. Cracking occurs when  $f_t > f_r$  due to service loads or deformations.
- 5.7 The use of the fasteners in this report is limited to installation in dry, interior environments, which include exterior walls which are protected by an exterior wall envelope.
- 5.8 See Section 4.2 regarding use of fasteners in contact with preservative-treated or fire-retardant-treated wood.
- 5.9 See Section 4.1.5 for seismic considerations.
- 5.10 The products addressed in this report 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 Power-actuated Fasteners Driven into Concrete, Steel, and Masonry Elements \(AC70\)](#), dated December 2019 (editorially revised January 2021).

## 7.0 IDENTIFICATION

- 7.1 The Trak-It C4 and Trak-It C5 fasteners are identified by a "P" or "D" stamped onto the head of the fastener, except for the Trak-It C5 tapered fastener, which does not have a head marking. Packages bear one of the company names listed in Section 3.1, the product name, the fastener shank type, length and diameter, and the evaluation report number (ESR-3275).
- 7.2 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)
- 7.3 The additional listee's contact information is the following:  
**MAX COMPANY, LTD.**  
**6-6 NIHONBASHI-HAKAZAKI-CHO**  
**CHOU-KU, TOKYO**  
**JAPAN**  
**+(03) 3669-8131**

TABLE A—TRAK-IT C4 AND TRAK-IT C5 FASTENERS

FASTENER FAMILY	SHANK TYPE	SHANK DIAMETER <sup>1</sup> (inch)	HEAD DIAMETER (inch)	MAXIMUM POINT LENGTH (inch)	AVAILABLE LENGTHS (inch)	MINIMUM EFFECTIVE SHANK LENGTH (inch)	FASTENER COATING	APPLICABLE BASE MATERIAL	APPLICABLE LOAD TABLES
Trak-It C5	Straight, smooth	0.102	0.25	0.15	3/4 to 1 1/2	Length - 0.025	ASTM B695, Class 5, Type 1	Concrete Conc.-filled deck CMU	1, 2, 3
Trak-It C4		0.145	0.25	0.27	3/4 1	0.85 1.00	ASTM B695, Class 5, Type 1	Concrete Conc.-filled deck CMU	1, 2, 3
Trak-It C5		0.145	0.25	0.27	3/4 1	0.85 1.00	ASTM B695, Class 5, Type 1	Concrete Conc.-filled deck CMU	1, 2, 3
Trak-It C4	Step, smooth	0.145 / 0.102	0.25	0.16	1 1/4 to 2 1/2	Length - 0.033	ASTM B695, Class 5, Type 1	Concrete Conc.-filled deck CMU	1, 2, 3
Trak-It C5		0.145 / 0.102	0.25	0.16	1 1/4 to 1 1/2	Length - 0.033	ASTM B695, Class 5, Type 1	Concrete Conc.-filled deck CMU	1, 2, 3
Trak-It C5	Step, knurl	0.145 / 0.120	0.25	0.19	1 to 2 1/2	Length - 0.22	ASTM B695, Class 5, Type 1	Concrete CMU Steel	1, 3, 4, 5
Trak-It C4	Tapered, smooth	0.137	0.25	Not applicable	2 1/2	2.37	ASTM B695 Class 55	Concrete	1
Trak-It C5	Step, knurl	0.120 / 0.102	0.25	0.15	1/2	0.53	ASTM B633, SC1, Type III	Steel	4, 5
					0.680 0.730	0.585 0.635		Concrete Steel	1, 4, 5
Trak-It C5	Tapered, smooth	0.120	0.25	Not applicable	1/2	0.50	ASTM B695 (2 µm)	Steel	4, 5
					3/4	0.75	ASTM B695 (2 µm)	Concrete Conc.-filled deck CMU	1, 2, 3

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

<sup>1</sup>For step shank fasteners the first diameter listed is for the portion of the shank adjoining the head of the fasteners and the second diameter listed is for the point end of the fastener.

TABLE 1—ALLOWABLE LOADS FOR TRAK-IT C4 AND TRAK-IT C5 FASTENERS DRIVEN INTO NORMALWEIGHT CONCRETE <sup>1,2,3</sup>

FASTENER FAMILY	SHANK TYPE	SHANK DIAMETER (inch)	MINIMUM EMBEDMENT DEPTH (inch)	MINIMUM SPACING <sup>4</sup> (inches)	MINIMUM EDGE DISTANCE (inches)	ALLOWABLE LOADS (lbf)							
						Concrete Compressive Strength:				<i>f</i> 'c = 2,500 psi		<i>f</i> 'c = 3,000 psi	
Load Direction:						Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear
Trak-It C5	Straight	0.102	5/8	4	3 1/4	120	135	120	140	120	145	–	–
			7/8	4	3 1/4	180	185	180	195	180	215	200	220
			1 1/8	4	3 1/4	240	225	240	255	245	310	–	–
Trak-It C4 / Trak-It C5	Straight	0.145	5/8	4	3 1/4	105	75	110	95	120	135	–	–
			7/8	4	3	125	105	135	110	–	–	–	–
Trak-It C5	Step	0.120 / 0.102	5/8	4	3	–	–	–	–	115	80	115	125
Trak-It C4 / Trak-It C5		0.145/0.102	3/4	4	3	80	215	85	235	–	–	–	–
			1	4	3	125	245	135	265	–	–	–	–
Trak-It C5	Step	0.145 / 0.120	1 1/8	4	1 3/4	215	250	250	250	320	250	–	–
Trak-It C5			3/4	4	3 1/4	145	180	155	185	170	190	–	–
Trak-It C4	Tapered	0.137	3/4	4	1 3/4	80	90	85	95	–	–	–	–
			1	4	1 3/4	90	70	100	75	–	–	–	–
Trak-It C5	Tapered	0.120	5/8	3 1/4   4	3 1/4	150	120	170	135	170	145	75	135
				2 3/4   4		150	120	170	135	165	135	75	135
				2   4		150	90	170	100	160	100	75	95

For SI: 1 lbf = 4.4 N, 1 inch = 25.4 mm, 1 psi = 6.895 kPa.

<sup>1</sup>Fasteners must not be driven until the concrete has reached the tabulated compressive strength.

<sup>2</sup>Concrete thickness must be a minimum of three times the embedment depth of the fastener, or 2 inches, whichever is greater.

<sup>3</sup>The fasteners listed in the table above may be used for static load conditions and for the seismic load conditions described in Section 4.1.5, as applicable. The tabulated allowable loads apply to static load conditions. For seismic load conditions, the allowable loads must be limited in accordance with Section 4.1.5, Items 2 and 4, as applicable.

<sup>4</sup>Where two values are reported, the first value applies to spacing of fasteners subject to tension only and also to spacing of fasteners in a row subject to tension and/or shear loading perpendicular to the row; the second value applies to the fastener spacing for all other conditions.



**TABLE 2—ALLOWABLE LOADS FOR TRAK-IT C4 AND TRAK-IT C5 FASTENERS DRIVEN INTO MINIMUM 3,000 PSI SAND-LIGHTWEIGHT CONCRETE AND SAND-LIGHTWEIGHT CONCRETE-FILLED STEEL DECK<sup>1,5</sup>**

FASTENER FAMILY	SHANK TYPE	SHANK DIAMETER (inch)	MINIMUM EMBEDMENT DEPTH (inch)	ALLOWABLE LOADS (lbf)										TOP COVER (inches)
				Installed Directly into Concrete <sup>2</sup>		Installed through 3" Deep Steel Deck into Concrete <sup>3</sup>				Installed through 1 1/2" Deep Steel Deck into Concrete <sup>4</sup>				
Fastener Location:				Tension	Shear	Upper Flute	Lower Flute	Upper Flute	Lower Flute	Upper Flute	Lower Flute	Upper Flute	Lower Flute	Minimum Required Concrete Topping Thickness Above Deck Panel
Load Direction:				Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear	
Trak-It C5	Straight	0.102	5/8 <sup>(6)</sup>	115	135	110	85	225	195	50	105	125	195	2
			3/4	120	150	120	105	225	195	115	105	225	195	2 1/4
			7/8	120	205	—	105	—	255	—	110	—	245	2 3/4
Trak-It C4 / Trak-It C5		0.145	3/4	70	80	110	80	220	200	—	60	—	200	2 1/4
Trak-It C4 / Trak-It C5	Step	0.145/0.102	1 1/8	280	230	—	160	—	300	—	150	—	300	3 1/4
Trak-It C5	Tapered	0.120	5/8 <sup>(6)</sup>	120	140	95	80	205	185	100	90	205	200	2

For SI: 1 lbf = 4.4 N, 1 inch = 25.4 mm, 1 psi = 6.895 kPa.

<sup>1</sup>Fasteners must not be driven until the concrete has reached the tabulated compressive strength.

<sup>2</sup>For straight shank and step shank fasteners installed directly into concrete (e.g. top of concrete-filled steel deck), fastener edge distance must be 3 inches minimum and fastener spacing must be 4 inches minimum. For tapered shank fasteners installed directly into concrete, fastener edge distance must be 3 inches minimum and fastener spacing must be 3.25 inches minimum. Shear loads may be applied in any direction.

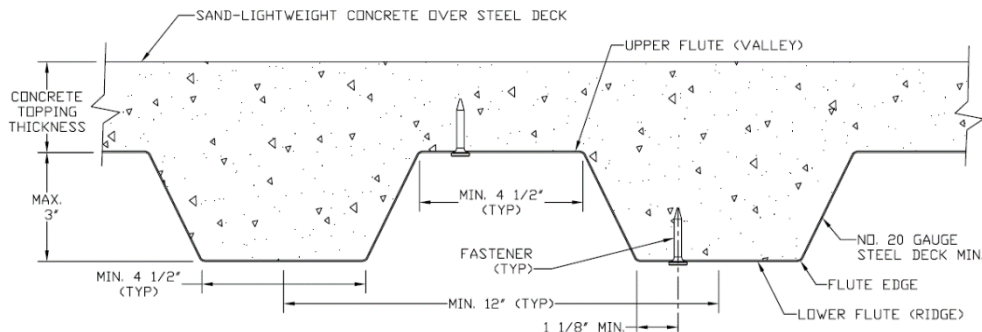
<sup>3</sup>The steel deck must have a minimum base material thickness of 0.035 inch, minimum yield strength, Fy, of 33 ksi, a minimum tensile strength of 45ksi, and conform to the profile requirements as shown in Figure 1A. Fastener edge distance (lower flute locations) must be a minimum of 1 1/8 inches. Fastener spacing must be a minimum of 4 inches for straight and step shank fasteners and a minimum of 3.25 inches for tapered shank fasteners. Shear loads may be applied in any direction.

<sup>4</sup>The steel deck must have a minimum base material thickness of 0.035 inch, minimum yield strength, Fy, of 33 ksi, a minimum tensile strength of 45ksi, and conform to the profile requirements as shown in Figure 1B. Fastener edge distance (lower flute locations) must be a minimum of 7/8 inches. Fastener spacing must be a minimum of 4 inches for straight and step shank fasteners and a minimum of 3.25 inches for tapered shank fasteners. Shear loads may be applied in any direction.

<sup>5</sup>Unless otherwise noted, for installation into lightweight concrete with f'c = 3,500 psi, multiply the tabulated values by 1.05 to determine the applicable allowable load value.

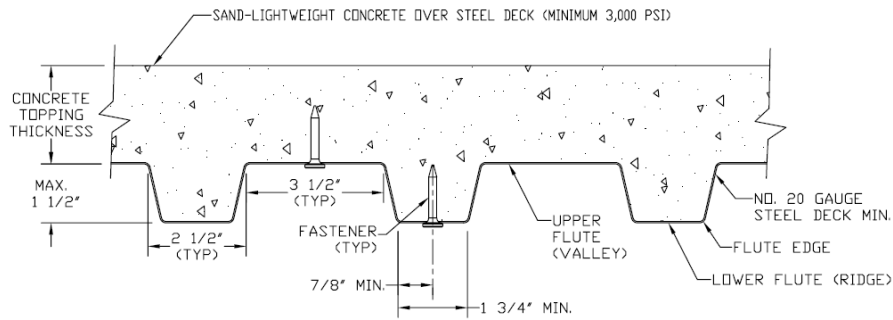
<sup>6</sup>For installation of 0.102-inch-diameter straight shank fasteners and 0.120-inch-diameter tapered shank fasteners into lightweight concrete with f'c = 3,500 psi, no increase in tabulated values is allowed. For installation into lightweight concrete with f'c = 2,500 psi, multiply the tabulated values by 0.87 to determine the applicable allowable load value.

<sup>7</sup>The fasteners listed in the table above may be used for static load conditions and for the seismic load conditions described in Section 4.1.5, as applicable. The tabulated allowable loads apply to static load conditions. For seismic load conditions, the allowable loads must be limited in accordance with Section 4.1.5, Items 2 and 4, as applicable.



**FIGURE 1A—FASTENER INSTALLATION LOCATION THROUGH THE SOFFIT OF 3-INCH-DEEP CONCRETE-FILLED COMPOSITE STEEL DECK FLOOR AND ROOF ASSEMBLIES**





**FIGURE 1B—FASTENER INSTALLATION LOCATION THROUGH THE SOFFIT OF 1 1/2-INCH-DEEP CONCRETE-FILLED COMPOSITE STEEL DECK FLOOR AND ROOF ASSEMBLIES**

**TABLE 3—ALLOWABLE LOADS FOR TRAK-IT C4 AND TRAK-IT C5 FASTENERS DRIVEN INTO CONCRETE MASONRY UNITS<sup>1,28</sup>**

FASTENER FAMILY	SHANK TYPE	SHANK DIAMETER (inch)	MINIMUM EMBEDMENT DEPTH (inch)	MINIMUM END AND EDGE DISTANCE <sup>3</sup> (inches)	APPLICABLE MORTAR TYPE	ALLOWABLE LOADS (lbf)							
						Masonry Type:		Fastener Location:					
						HOLLOW CMU		GROUTED CMU					
						Face Shell <sup>4</sup>		Face Shell <sup>4</sup>		Horizontal Mortar Joint		Top and Center of Grouted Cell <sup>7</sup>	
						Tension		Shear <sup>5</sup>		Tension		Shear <sup>5</sup>	
						Tension		Shear <sup>5</sup>		Tension		Shear <sup>6</sup>	
						Tension		Shear <sup>5</sup>		Tension		Shear <sup>5</sup>	
Trak-It C5	Straight	0.102	7/8	3 3/4	N, M or S	65	80	—	—	—	—	—	—
Trak-It C4 or Trak-It C5		0.145	3/4	3 3/4	N, M or S	—	—	80	90	—	—	—	—
Trak-It C5	Step	0.145/0.120	3/4	3 3/4	N, M or S	—	—	85	100	—	—	—	—
Trak-It C4 or Trak-It C5		0.145/0.102	1 1/8	3 3/4	N, M or S	—	—	180	215	—	—	—	—
Trak-It C5	Tapered	0.120	5/8	3 3/4	N	45	65	50	70	60	80	135	95

For SI: 1 lbf = 4.4 N, 1 inch = 25.4 mm.

<sup>1</sup>Concrete masonry units must be normalweight units conforming to ASTM C90, unless otherwise noted. The minimum allowable nominal size of the CMU must be 8 inches high by 8 inches wide by 16 inches long, with a minimum, 1 1/4-inch-thick face shell thickness.

<sup>2</sup>Only one PAF may be installed in each cell. Allowable loads for fasteners installed in vertical mortar joints including the intersection of the head joint and bed joint are outside the scope of this report.

<sup>3</sup>Refers to wall end and edge distance. See Figure 2.

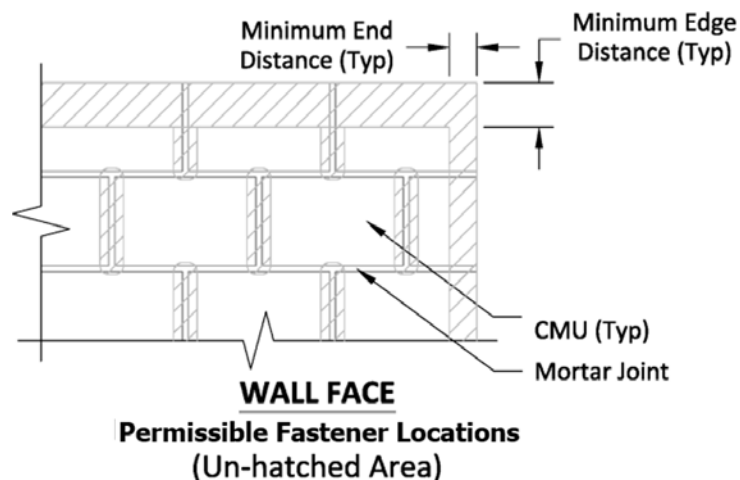
<sup>4</sup>Straight shank and step shank PAFs must be installed a minimum of 1 1/2 inches from the mortar joints and 1 1/2 inches from the CMU web. Tapered shank PAFs must be installed a minimum of 2 inches from the vertical mortar joints.

<sup>5</sup>Shear loads for fasteners installed in the face shell or top of grouted cells can be applied in any direction.

<sup>6</sup>Shear direction can be horizontal or vertical along the CMU wall plane.

<sup>7</sup>CMU may be lightweight or normalweight units conforming to ASTM C90.

<sup>8</sup>The fasteners listed in the table above may be used for static load conditions and for the seismic load conditions described in Item 1 of Section 4.1.5.



**FIGURE 2—TAPERED SHANK FASTENERS INSTALLED INTO HOLLOW OR GROUT-FILLED CONCRETE MASONRY UNITS (AS APPLICABLE)**

TABLE 4—ALLOWABLE LOADS FOR TRAK-IT C5 FASTENERS DRIVEN INTO ASTM A36/A1011 STEEL<sup>1,2,9</sup>

FASTENER FAMILY	SHANK TYPE	SHANK DIAMETER (inch)	MINIMUM SPACING (inch)	MINIMUM EDGE DISTANCE (inch)	ALLOWABLE LOADS (lbf)									
					Steel Thickness (inch):		<sup>1</sup> / <sub>8</sub>		<sup>3</sup> / <sub>16</sub>		<sup>1</sup> / <sub>4</sub>		<sup>3</sup> / <sub>8</sub>	
Load Direction:					Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear
Trak-It C5	Step	0.120 / 0.102	1	<sup>1</sup> / <sub>2</sub>	115 <sup>10</sup>	280	230 <sup>10</sup>	280	250 <sup>10</sup>	240	115 <sup>3</sup> 165 <sup>4</sup>	120 <sup>3</sup> 125 <sup>4</sup>	110 <sup>5</sup> 220 <sup>6</sup>	120 <sup>5</sup> 205 <sup>6</sup>
	Tapered	0.120	1	<sup>1</sup> / <sub>2</sub>	–	–	–	–	130 <sup>7</sup>	230 <sup>7</sup>	215 <sup>4</sup>	325 <sup>4</sup>	185 <sup>8</sup>	325 <sup>8</sup>
	Step	0.145 / 0.120	1	<sup>1</sup> / <sub>2</sub>	95 <sup>10</sup>	300	285 <sup>10</sup>	300	225 <sup>10</sup>	190	–	–	–	–

For SI: 1 lbf = 4.4 N, 1 inch = 25.4 mm.

<sup>1</sup>Steel base material must have minimum yield and tensile strengths ( $F_y$  and  $F_u$ ) equal to 36 ksi and 58 ksi, respectively.

<sup>2</sup>Unless otherwise noted, fasteners must be driven to where the full point length of the fastener penetrates through the steel base material.

<sup>3</sup>An embedment depth of 0.250 inch is required. Allowable load value applies to steel base material with thickness from <sup>3</sup>/<sub>8</sub> inch up to but not including <sup>1</sup>/<sub>2</sub> inch.

<sup>4</sup>An embedment depth of 0.350 inch is required. Allowable load value applies to steel base material with thickness from <sup>3</sup>/<sub>8</sub> inch up to but not including <sup>1</sup>/<sub>2</sub> inch.

<sup>5</sup>An embedment depth of 0.250 inch is required for the tabulated value. Allowable load value applies to steel base material with thickness of <sup>1</sup>/<sub>2</sub> inch and greater.

<sup>6</sup>An embedment depth of 0.375 inch is required for the tabulated value. Allowable load value applies to steel base material with thickness of <sup>1</sup>/<sub>2</sub> inch and greater.

<sup>7</sup>For cases where the embedment depth is less than 0.375 inch, but is at least 0.350 inch, the allowable tension load is 165 lbf and the allowable shear load is 125 lbf.

<sup>8</sup>A penetration depth of 0.320 inch is required, which results in partial point penetration through the steel.

<sup>9</sup>An embedment depth of 0.340 inch is required for the tabulated value. Allowable load value applies to steel base material with thickness of <sup>1</sup>/<sub>2</sub> inch and greater.

<sup>10</sup>The fasteners listed in the table above may be used for static load conditions and for the seismic load conditions described in Section 4.1.5, as applicable. The tabulated allowable loads apply to static load conditions. For seismic load conditions, the allowable loads must be limited in accordance with Section 4.1.5, Items 3 and 4, as applicable.

<sup>10</sup>For steel-to-steel connections designed in accordance with Section 4.1.4, the tabulated allowable load may be increased by a factor of 1.25, and the design strength may be taken as the tabulated allowable load multiplied by a factor of 2.0.

TABLE 5—ALLOWABLE LOADS FOR TRAK-IT C5 FASTENERS INSTALLED IN ASTM A572 GRADE 50 OR ASTM A992 STEEL<sup>1,2,9</sup>

FASTENER FAMILY	SHANK TYPE	SHANK DIAMETER (inch)	MINIMUM SPACING (inch)	MINIMUM EDGE DISTANCE (inch)	ALLOWABLE LOADS (lbf)									
					Steel Thickness (inch):		<sup>1</sup> / <sub>8</sub>		<sup>3</sup> / <sub>16</sub>		<sup>1</sup> / <sub>4</sub>		<sup>3</sup> / <sub>8</sub>	
Load Direction:					Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear
Trak-It C5	Step	0.120 / 0.102	1	<sup>1</sup> / <sub>2</sub>	120 <sup>10</sup>	290	245 <sup>8</sup>	290	270 <sup>8</sup>	255	65 <sup>3</sup> 175 <sup>4</sup>	90 <sup>3</sup> 135 <sup>4</sup>	25 <sup>5</sup> 240 <sup>6</sup>	55 <sup>5</sup> 220 <sup>6</sup>
	Tapered	0.120	1	<sup>1</sup> / <sub>2</sub>	–	–	–	–	140 <sup>7</sup>	250 <sup>7</sup>	215 <sup>4</sup>	325 <sup>4</sup>	195 <sup>8</sup>	340 <sup>8</sup>
	Step	0.145 / 0.120	1	<sup>1</sup> / <sub>2</sub>	100 <sup>10</sup>	320	305 <sup>10</sup>	320	245 <sup>10</sup>	205	–	–	–	–

For SI: 1 lbf = 4.48 N, 1 inch = 25.4 mm.

<sup>1</sup>Steel base material must have minimum yield and tensile strengths ( $F_y$  and  $F_u$ ) equal to 50 ksi and 65 ksi, respectively.

<sup>2</sup>Unless otherwise noted, fasteners must be driven to where the full point length of the fastener penetrates through the steel base material.

<sup>3</sup>An embedment depth of 0.188 inch is required. Allowable load value applies to steel base material with thickness from <sup>3</sup>/<sub>8</sub> inch up to but not including <sup>1</sup>/<sub>2</sub> inch.

<sup>4</sup>An embedment depth of 0.350 inch is required. Allowable load value applies to steel base material with thickness from <sup>3</sup>/<sub>8</sub> inch up to but not including <sup>1</sup>/<sub>2</sub> inch.

<sup>5</sup>An embedment depth of 0.125 inch is required for the tabulated value. Allowable load value applies to steel base material with thickness of <sup>1</sup>/<sub>2</sub> inch and greater.

<sup>6</sup>An embedment depth of 0.375 inch is required for the tabulated value. Allowable load value applies to steel base material with thickness of <sup>1</sup>/<sub>2</sub> inch and greater. For cases where the embedment depth is less than 0.375 inch, but is at least 0.350 inch, the allowable tension load is 175 lbf and the allowable shear load is 135 lbf.

<sup>7</sup>A penetration depth of 0.320 inch is required, which results in partial point penetration through the steel.

<sup>8</sup>An embedment depth of 0.340 inch is required for the tabulated value. Allowable load value applies to steel base material with thickness of <sup>1</sup>/<sub>2</sub> inch and greater.

<sup>9</sup>The fasteners listed in the table above may be used for static load conditions and for the seismic load conditions described in Section 4.1.5, as applicable. The tabulated allowable loads apply to static load conditions. For seismic load conditions, the allowable loads must be limited in accordance with Section 4.1.5, Items 3 and 4, as applicable.

<sup>10</sup>For steel-to-steel connections designed in accordance with Section 4.1.4, the tabulated allowable load may be increased by a factor of 1.25, and the design strength may be taken as the tabulated allowable load multiplied by a factor of 2.0.



0.102-inch-diameter (2.6 mm) straight shank fasteners



0.145/0.102-inch-diameter (3.7/2.6 mm) step shank fasteners



0.145-inch-diameter (3.7 mm) straight shank fasteners



0.145/0.120-inch-diameter (3.7/3.0 mm) knurled step shank fasteners



0.120/0.102-inch-diameter (3.0/2.6 mm) knurled step shank fasteners



0.137-inch-diameter (3.5 mm) tapered shank fasteners



0.120-inch-diameter (3.0 mm) tapered shank fasteners

FIGURE 3—TRAK-IT C4 AND TRAK-IT C5 FASTENERS

**DIVISION: 03 00 00—CONCRETE**

Section: 03 15 00—Concrete Accessories

Section: 03 16 00—Concrete Anchors

**DIVISION: 04 00 00—MASONRY**

Section: 04 05 19.16—Masonry Anchors

**DIVISION: 05 00 00—METALS**

Section: 05 05 23—Metal Fastenings

**DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES**

Section: 06 05 23—Wood, Plastic and Composite Fastenings

**DIVISION: 09 00 00—FINISHES**

Section: 09 22 16.23—Fasteners

**REPORT HOLDER:**

DEWALT

**EVALUATION SUBJECT:**

TRAK-IT® C4 AND TRAK-IT® C5 FASTENERS IN CONCRETE, MASONRY AND STEEL (DEWALT)

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

The purpose of this evaluation report supplement is to indicate that Trak-It C4 and Trak-It C5 fasteners, described in ICC-ES evaluation report ESR-3275, have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2020 Florida Building Code—Building
- 2020 Florida Building Code—Residential

**2.0 CONCLUSIONS**

The Trak-It C4 and Trak-It C5 fasteners, described in Sections 2.0 through 7.0 of the evaluation report ESR-3275, comply with the *Florida Building Code—Building* and *Florida Building Code—Residential*, provided the design and installation are in accordance with the 2018 *International Building Code*® provisions noted in the evaluation report.

Use of the Trak-It C4 and Trak-It C5 fasteners has also been found to be in accordance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and *Florida Building Code—Residential*, under the following conditions:

- Trak-It C4 and Trak-It C5 fasteners shall not be used in wood blocking attachment in accordance with the *Florida Building Code—Building* Section 2330.1.10.
- Trak-It C4 and Trak-It C5 fasteners have not been evaluated for use as cast-in-place anchors for compliance with High-Velocity Hurricane Zone Provisions and this use is outside the scope of this supplement.

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 2023.