



Most Widely Accepted and Trusted

# ICC-ES Report

## ESR-3275

ICC-ES | (800) 423-6587 | (562) 699-0543 | www.icc-es.org

Reissued 09/2016  
This report is subject to renewal 09/2017.

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

701 EAST JOPPA ROAD  
TOWSON, MARYLAND 21286

### EVALUATION SUBJECT:

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



Look for the trusted marks of Conformity!

*“2014 Recipient of Prestigious Western States Seismic Policy Council (WSSPC) Award in Excellence”*



*ICC-ES Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.*



**ICC-ES Evaluation Report****ESR-3275**

Reissued September 2016

This report is subject to renewal September 2017.

[www.icc-es.org](http://www.icc-es.org) | (800) 423-6587 | (562) 699-0543

A Subsidiary of the International Code Council®

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

**EVALUATION SUBJECT:**

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

**ADDITIONAL LISTEES:**

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

**MAX COMPANY, LTD.**  
6-6 NIHONBASHI-HAKAZAKI-CHO  
CHOU-KU, TOKYO  
JAPAN  
+(03) 3669-8131

**1.0 EVALUATION SCOPE****Compliance with the following codes:**

- 2015, 2012, 2009 and 2006 *International Building Code*® (IBC)

- 2015, 2012, 2009 and 2006 *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 2015 IBC Section 1901.3 (2012 IBC Section 1908; 2009 and 2006 IBC Section 1911) for placement in concrete; the embedded anchors described in Section 8.1.3 of TMS 402-13, referenced in Section 2107 of the 2015 IBC (Section 2.1.4 of TMS 402-11, -08 and -05, referenced in Section 2107 of the 2012, 2009 and 2006 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 gas-driven power-actuated fasteners (PAFs) manufactured from carbon steel complying with ASTM A510, Grade 1060, and austempered to a Rockwell C51-55 core hardness. The fasteners are zinc-plated in accordance with ASTM B633, SC1, Type III with the exception of the tapered shank fasteners which are zinc-plated in accordance with ASTM B695, Class 55.

The Trak-It C4 and Trak-It C5 fasteners are collated into plastic strips as illustrated in Figure 1. Product names for the report holder and the additional listees are presented in Table 1 of this report.

The fasteners have straight, stepped or tapered shanks which are either smooth or knurled. See Table 2 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 3 and 4.

**3.2.2 Concrete Masonry:** Concrete masonry units (CMUs) must be minimum 8-inch-thick (203 mm), normal-weight blocks conforming to ASTM C90. 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 A1101, and have a thickness as described in Tables 6 and 7, as applicable.

**3.2.4 Steel Deck Panels:** Steel deck panel properties and configurations must be as described in the footnotes to Table 4 and Figures 2A and 2B, 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 2 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 2 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 2.

The most critical applied loads, excluding seismic load effects, resulting from the load combinations in IBC Section 1605.3.1 or 1605.3.2 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 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 6 and 7 are used in connections of two steel elements in accordance with Section E5 of AISI S100-12, 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 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 E5.2.1 of AISI S100-12 using a value of 260,000 psi for  $F_{uh}$ .
- **Pull-out Strength:** See Table 6 or 7 for available pull-out strength, as applicable.
- **Pull-over Strength:** The available pull-over strengths must be calculated in accordance with Section E5.2.3 of AISI S100-12.

**4.1.4.2 Connection Strength - Shear:** To determine shear connection strength in accordance with 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 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 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 6 or 7, as applicable, or must be calculated in accordance with 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 E5.3.4 of AISI S100-12 and the shear strength limited by edge distance must be determined in accordance with Section E5.3.5 of AISI S100-12.

**4.1.5 Seismic Considerations:** The Trak-It C4 and Trak-It C5 fasteners are recognized 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 3 and 4, 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 6 and 7, 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:**

Fasteners must be installed with a power-actuated fastening tool in accordance with the manufacturer’s recommendations. 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 3 through 7, as applicable. For fasteners installed into concrete, the fasteners must not be driven until the concrete has reached the designated concrete compressive strength.

The carbon steel, tapered shank fasteners described in Table 2 may be used in contact with preservative-treated wood in dry, interior locations only. The carbon steel fasteners described in Table 2 may be used in contact with fire-retardant-treated wood in dry, interior locations only, in accordance with 2015 IBC Section 2304.10.5.4 (2012, 2009 and 2006 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 E5 of AISI S100-12, calculations demonstrating that the available connection strength has been determined in accordance with 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 February 2016.

**7.0 IDENTIFICATION**

The Trak-It C4 and Trak-It C5 fasteners are identified by a “P” stamped onto the head of the fastener. Packages bear one of the company names listed in Table 1, the product name, the fastener shank type, length and diameter, and the evaluation report number (ESR-3275).

**TABLE 1—PRODUCT NAMES BY COMPANY**

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

TABLE 2—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	0.16	<sup>3</sup> / <sub>4</sub> to 1 <sup>1</sup> / <sub>2</sub>	Length - 0.025	ASTM B633, SC1, Type III	Concrete Conc.-filled deck CMU	3, 4, 5
Trak-It C4		0.145	0.25	0.28	<sup>3</sup> / <sub>4</sub> 1	0.85 1.00	ASTM B633, SC1, Type III	Concrete Conc.-filled deck CMU	3, 4, 5
Trak-It C5		0.145	0.25	0.28	<sup>3</sup> / <sub>4</sub> 1	0.85 1.00	ASTM B633, SC1, Type III	Concrete Conc.-filled deck	3, 4
Trak-It C4	Step, smooth	0.145 / 0.102	0.25	0.16	1 <sup>1</sup> / <sub>4</sub> to 2 <sup>1</sup> / <sub>2</sub>	Length - 0.033	ASTM B633, SC1, Type III	Concrete Conc.-filled deck CMU	3, 4, 5
Trak-It C5		0.145 / 0.102	0.25	0.16	1 <sup>1</sup> / <sub>4</sub> to 1 <sup>1</sup> / <sub>2</sub>	Length - 0.033	ASTM B633, SC1, Type III	Concrete Conc.-filled deck CMU	3, 4, 5
Trak-It C5	Step, knurl	0.145 / 0.120	0.25	0.19	1 to 2 <sup>1</sup> / <sub>2</sub>	Length - 0.22	ASTM B633, SC1, Type III	Concrete CMU Steel	3, 5, 6, 7
Trak-It C4	Tapered	0.137	0.25	n/a	2 <sup>1</sup> / <sub>2</sub>	2.37	ASTM B695 Class 55	Concrete	3
Trak-It C5	Step, knurl	0.120 / 0.102	0.25	0.15	<sup>1</sup> / <sub>2</sub> 0.680 0.730	0.53 0.585 0.635	ASTM B633, SC1, Type III	Concrete Steel	3, 6, 7

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

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.

<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>For installations in 6,000 psi concrete, the tabulated tension and shear loads may be increased to 200 lbf and 220 lbf, respectively.

<sup>5</sup>For installations in 6,000 psi concrete, the tabulated shear load may be increased to 125 lbf. The tabulated tension load must not be increased.



**TABLE 4—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)										Minimum Required Concrete Topping Thickness Above Deck Panel (inches)				
				Fastener Location:		Installed Directly into Concrete <sup>2</sup>				Installed through 3" Deep Steel Deck Panel into Concrete <sup>3</sup>					Installed through 1 1/2" Deep Steel Deck into Concrete <sup>4</sup>			
						Tension	Shear	Upper Flute	Lower Flute	Upper Flute	Lower Flute	Upper Flute	Lower Flute		Upper Flute	Lower Flute		
Trak-It C5	Straight	0.102	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 or Trak-It C5		0.145	3/4	70	80	110	80	220	200	–	60	–	200	2 1/4				
Trak-It C4 or Trak-It C5	Step	0.145/0.102	1 1/8	280	230	–	160	–	300	–	150	–	300	3 1/4				

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 fasteners installed directly into concrete, the concrete thickness must be a minimum of three times the embedment depth of the fastener. Fastener edge distance must be a minimum of 3 inches and fastener spacing must be a minimum of 4 inches.

<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 2A. Fastener edge distance must be a minimum of 1 1/8 inches and fastener spacing must be a minimum of 4 inches.

<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 2B. Fastener edge distance must be a minimum of 3/4 inches and fastener spacing must be a minimum of 4 inches.

<sup>5</sup>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>The fasteners and assemblies 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.

**TABLE 5—ALLOWABLE LOADS FOR TRAK-IT C4 AND TRAK-IT C5 FASTENERS DRIVEN INTO THE FACE SHELL OF CONCRETE MASONRY UNITS, lbf<sup>1,2,3</sup>**

FASTENER FAMILY	SHANK TYPE	SHANK DIAMETER (inch)	MINIMUM EMBEDMENT DEPTH (inch)	MINIMUM END AND EDGE DISTANCE (inches)	ALLOWABLE LOADS (lbf)					
					Masonry Type:		HOLLOW CMU		GROUTED CMU	
					Load Direction:		Tension	Shear	Tension	Shear
Trak-It C5	Straight	0.102	7/8	3 3/4	65	80	–	–		
Trak-It C4 or Trak-It C5		0.145	3/4	3 3/4	–	–	80	90		
Trak-It C5	Step	0.145/0.120	3/4	3 3/4	–	–	85	100		
Trak-It C4 or Trak-It C5		0.145/0.102	1 1/8	3 3/4	–	–	180	215		

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. 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>Fasteners must be placed into unit face only. Only one PAF may be installed at each cell, and it must be a minimum of 1 1/2 inches from the mortar joints and 1 1/2 inches from the CMU web. Allowable loads for fasteners installed in mortar head and bed joints, or into the web of the CMU, are outside the scope of this report.

<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 Item 1 of Section 4.1.5.

TABLE 6—ALLOWABLE LOADS FOR TRAK-IT C5 FASTENERS DRIVEN INTO ASTM A36/A1101 STEEL<sup>1,2,7</sup>

FASTENER FAMILY	SHANK TYPE	SHANK DIAMETER (inch)	MINIMUM SPACING (inch)	MINIMUM EDGE DISTANCE (inch)	ALLOWABLE LOADS (lbf)									
					Steel Thickness (inch):		<sup>3</sup> / <sub>16</sub>		<sup>1</sup> / <sub>4</sub>		<sup>3</sup> / <sub>8</sub>		<sup>1</sup> / <sub>2</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>8</sup>	280	230 <sup>8</sup>	280	250 <sup>8</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>
		0.145 / 0.120	1	<sup>1</sup> / <sub>2</sub>	95 <sup>8</sup>	300	285 <sup>8</sup>	300	225 <sup>8</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 of <sup>3</sup>/<sub>8</sub> inch and thickness 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 of <sup>3</sup>/<sub>8</sub> inch and thickness 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. 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>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 3 and 4, as applicable.

<sup>8</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 7—ALLOWABLE LOADS FOR TRAK-IT C5 FASTENERS INSTALLED IN ASTM A572 GRADE 50 OR ASTM A992 STEEL<sup>1,2,7</sup>

FASTENER FAMILY	SHANK TYPE	SHANK DIAMETER (inch)	MINIMUM SPACING (inch)	MINIMUM EDGE DISTANCE (inch)	ALLOWABLE LOADS (lbf)									
					Steel Thickness (inch):		<sup>3</sup> / <sub>16</sub>		<sup>1</sup> / <sub>4</sub>		<sup>3</sup> / <sub>8</sub>		<sup>1</sup> / <sub>2</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>8</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>
		0.145 / 0.120	1	<sup>1</sup> / <sub>2</sub>	100 <sup>8</sup>	320	305 <sup>8</sup>	320	245 <sup>8</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 of <sup>3</sup>/<sub>8</sub> inch and thickness 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 of <sup>3</sup>/<sub>8</sub> inch and and thickness 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>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>8</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.

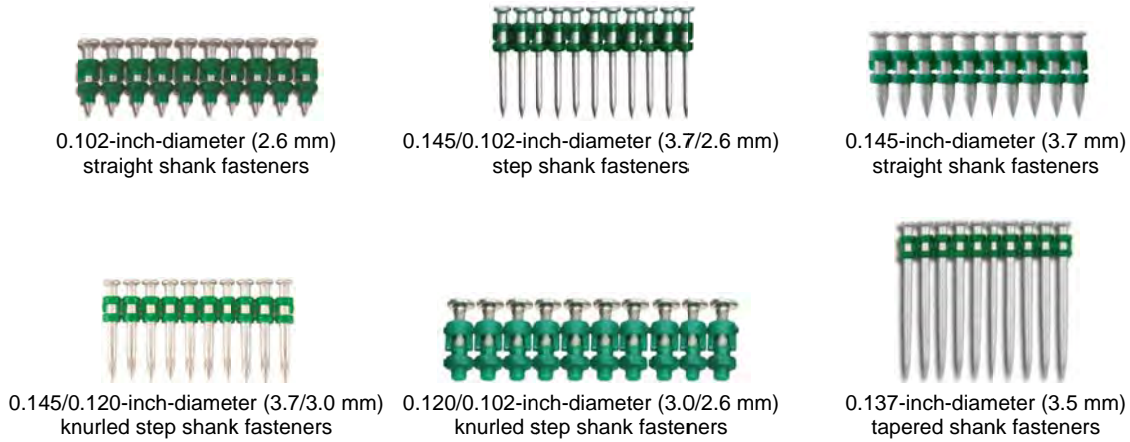


FIGURE 1—TRAK-IT C4 AND TRAK-IT C5 FASTENERS

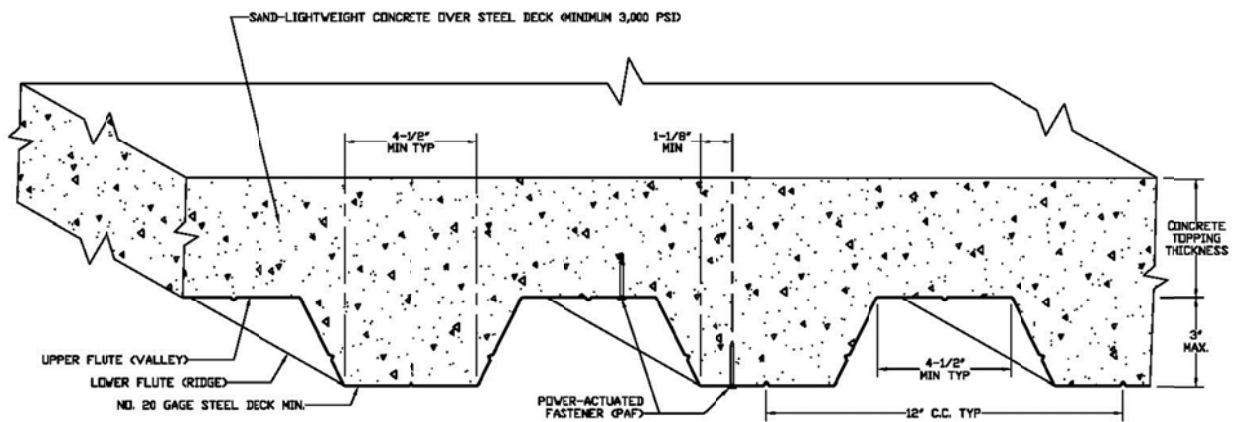


FIGURE 2A—FASTENER INSTALLATION LOCATION THROUGH THE SOFFIT OF 3-INCH-DEEP CONCRETE-FILLED COMPOSITE STEEL DECK FLOOR AND ROOF ASSEMBLIES

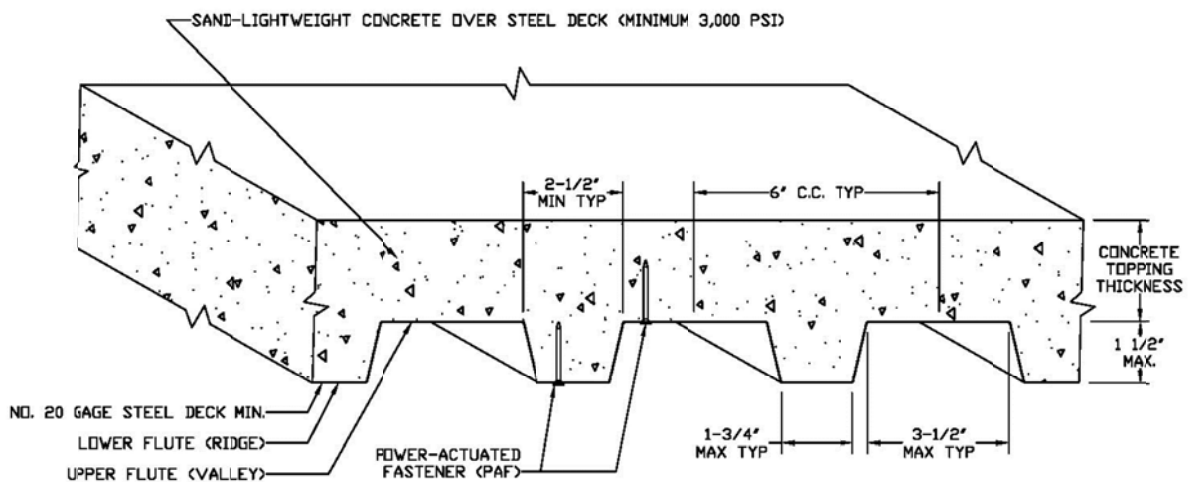


FIGURE 2B—FASTENER INSTALLATION LOCATION THROUGH THE SOFFIT OF 1 1/2-INCH-DEEP CONCRETE-FILLED COMPOSITE STEEL DECK FLOOR AND ROOF ASSEMBLIES



**ICC-ES Evaluation Report****ESR-3275 FBC Supplement**

Reissued September 2016

*This report is subject to renewal September 2017.*[www.icc-es.org](http://www.icc-es.org) | (800) 423-6587 | (562) 699-0543

A Subsidiary of the International Code Council®

**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: 9 22 16.23—Fasteners

**REPORT HOLDER:****DEWALT**

701 EAST JOPPA ROAD

TOWSON, MARYLAND 21286

(800) 524-3244

[www.dewalt.com](http://www.dewalt.com)[engineering@powers.com](mailto:engineering@powers.com)**EVALUATION SUBJECT:****TRAK-IT® C4 AND TRAK-IT® C5 FASTENERS IN CONCRETE, MASONRY AND STEEL (DEWALT / POWERS)****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, recognized in ICC-ES master report ESR-3275, have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2014 *Florida Building Code—Building* (FBC-B)
- 2014 *Florida Building Code—Residential* (FBC-R)

**2.0 CONCLUSIONS**

The Trak-It C4 and Trak-It C5 fasteners, described in Sections 2.0 through 7.0 of the master evaluation report ESR-3275, comply with the FBC-B and FBC-R, provided the design and installation are in accordance with the 2012 *International Building Code*® provisions noted in the master report, and the following conditions:

1. Design wind loads must be based on Section 1609 of the FBC-B or Section 301.2.1.1 of the FBC-R, as applicable.
2. Load combinations must be in accordance with Section 1605.2 or Section 1605.3 of the FBC-B, as applicable.

Use of the Trak-It C4 and Trak-It C5 fasteners in accordance with the High-Velocity Hurricane Zone provisions of the FBC-B and the FBC-R has not been evaluated, and is outside the scope of this evaluation report.

For products falling under Florida Rule 9N-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 master report, reissued September 2016.