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ESR-3275

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DIVISION: 03 00 00—CONCRETE; SECTION: 03 15 00—CONCRETE ACCESSORIES

DIVISION: 03 00 00—CONCRETE; 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)



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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:

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EVALUATION SUBJECT:

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

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1.0 EVALUATION SCOPE

Compliance with the following codes:

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

- 2015, 2012 and 2009 *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 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 and -08, referenced in Section 2107 of the 2012 and 2009 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 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 and 2009 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, except for the Trak-It C5 tapered fastener, which does not have a head marking. 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 Fasteners	Trak-It C5 Fasteners
Powers Fasteners	Trak-It C4 Fasteners	Trak-It C5 Fasteners
Max Company, Ltd.	Powerlite Pins	Max Concrete Pins

TABLE 2—TRAK-IT C4 AND TRAK-IT C5 FASTENERS

FASTENER FAMILY	SHANK TYPE	SHANK DIAMETER ¹ (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	3, 4, 5
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	3, 4, 5
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	3, 4
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	3, 4, 5
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	3, 4, 5
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	3, 5, 6, 7
Trak-It C4	Tapered, smooth	0.137	0.25	N/A	2 1/2	2.37	ASTM B695 Class 55	Concrete	3
Trak-It C5	Step, knurl	0.120 / 0.102	0.25	0.15	1/2 0.680 0.730	0.53 0.585 0.635	ASTM B633, SC1, Type III	Concrete Steel	3, 6, 7
Trak-It C5	Tapered, smooth	0.120	0.25	N/A	1/2	1/2	ASTM B695 (2 µm)	Steel	6, 7

For SI: 1 inch = 25.4 mm.

¹For 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 ^{1,2,3}

FASTENER FAMILY	SHANK TYPE	SHANK DIAMETER (inch)	MINIMUM EMBEDMENT DEPTH (inch)	MINIMUM SPACING (inches)	MINIMUM EDGE DISTANCE (inches)	ALLOWABLE LOADS (lbf)						
						Concrete Compressive Strength:			f'c = 2,500 psi		f'c = 3,000 psi	
Load Direction:						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 ⁴	215 ⁴	
			1 1/8	4	3 1/4	240	225	240	255	245	310	
Trak-It C4 or Trak-It C5		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 ⁵	80 ⁵	
Trak-It C4 or 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	0.145 / 0.120	1 1/8	4	1 3/4	215	250	250	250	320	250		
		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	—	—	

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

¹Fasteners must not be driven until the concrete has reached the tabulated compressive strength.

²Concrete thickness must be a minimum of three times the embedment depth of the fastener.

³The 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.

⁴For installations in 6,000 psi concrete, the tabulated tension and shear loads may be increased to 200 lbf and 220 lbf, respectively.

⁵For 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^{1,5}

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 through 3" Deep Steel Deck Panel into Concrete ³				Installed through 1 1/2" Deep Steel Deck into Concrete ⁴				
Load Direction:				Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear			
Trak-It C5	Straight	0.102	5/8	115 ⁶	135 ⁶	110 ⁶	85 ⁶	225 ⁶	195 ⁶	50 ⁶	105 ⁶	125 ⁶	195 ⁶	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 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.

¹Fasteners must not be driven until the concrete has reached the tabulated compressive strength.

²For 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.

³The steel deck must have a minimum base material thickness of 0.035 inch, minimum yield strength, F_y, 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.

⁴The steel deck must have a minimum base material thickness of 0.035 inch, minimum yield strength, F_y, 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 7/8 inches and fastener spacing must be a minimum of 4 inches.

⁵Unless 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.

⁶For installation 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 0.88 to determine the applicable allowable load value.

⁷The 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.

TABLE 5—ALLOWABLE LOADS FOR TRAK-IT C4 AND TRAK-IT C5 FASTENERS DRIVEN INTO THE FACE SHELL OF CONCRETE MASONRY UNITS^{1,2,3}

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.

¹Concrete 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, 1/4-inch-thick face shell thickness.

²Fasteners 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.

³The 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^{1,2,9}

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

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

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

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

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

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

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

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

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

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

⁹The 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.

¹⁰For 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^{1,2,9}

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

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

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

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

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

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

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

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

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

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

⁹The 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.

¹⁰For 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.

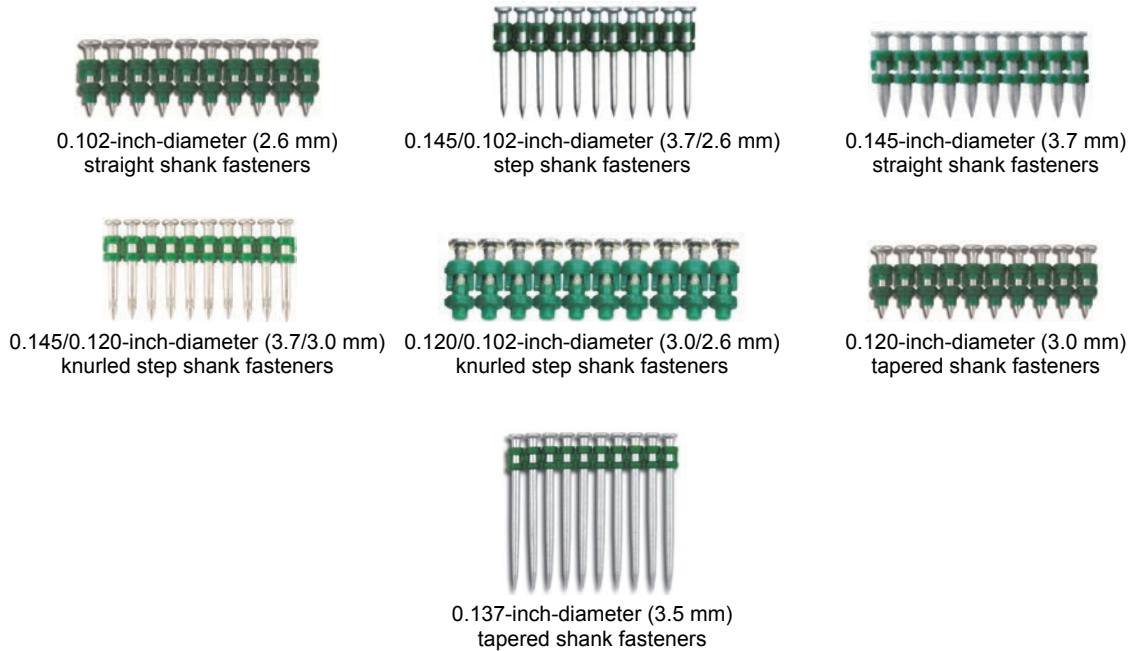


FIGURE 1—TRAK-IT C4 AND TRAK-IT C5 FASTENERS

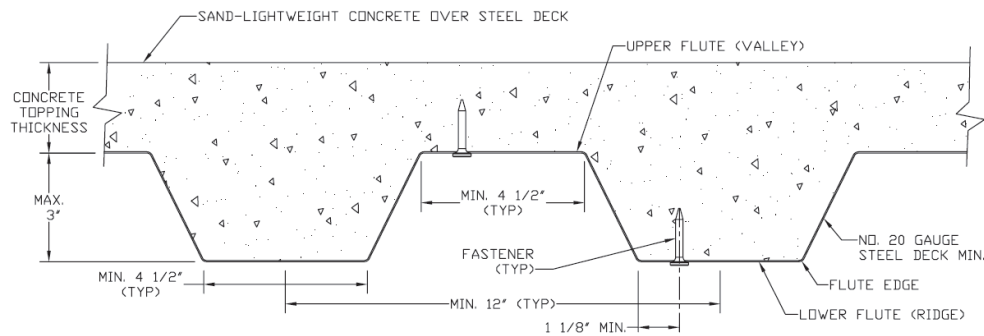


FIGURE 2A—FASTENER INSTALLATION LOCATION THROUGH THE SOFFIT OF 3-INCH-DEEP CONCRETE-FILLED COMPOSITE STEEL DECK FLOOR AND ROOF ASSEMBLIES

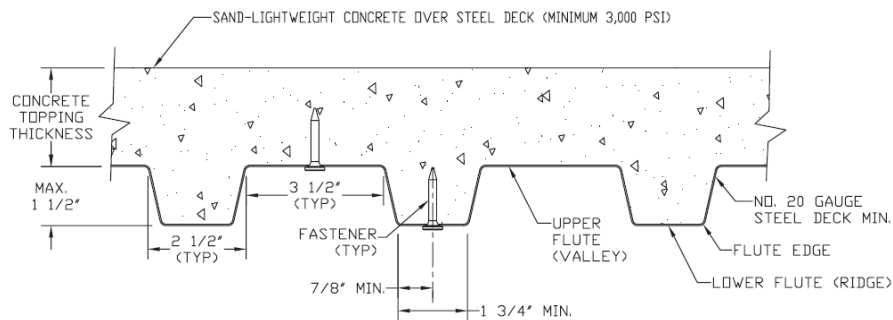


FIGURE 2B—FASTENER INSTALLATION LOCATION THROUGH THE SOFFIT OF 1 1/2-INCH-DEEP CONCRETE-FILLED COMPOSITE STEEL DECK FLOOR AND ROOF ASSEMBLIES

ICC-ES Evaluation Report

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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 has also been found to be in accordance with the High-Velocity Hurricane Zone provisions of the FBC-B and the FBC-R under the following conditions:

- Use of the power-driven fasteners for attachment to steel as a means of attachment of wood blocking, as defined in Section 2330.1.1 of the FBC-B, in a roof assembly in the High-Velocity Hurricane Zone, is prohibited.

- Design wind loads must be based on Section 1620 of the FBC-B, as applicable.
- The fasteners have not been evaluated for use as cast-in-place anchors for compliance with the High-Velocity Hurricane Zone provision and the use 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 2017.