

# ICC-ES Evaluation Report

## ESR-1408

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**DIVISION: 05 00 00—METALS**  
**Section: 05 05 23—Metal Fastenings**

**DIVISION: 09 00 00—FINISHES**  
**Section: 09 22 16.23—Fasteners**

### REPORT HOLDER:

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### EVALUATION SUBJECT

**PRO-TWIST™ MARKER® & DARTS® PAN FRAMER  
SELF-DRILLING SCREW;  
PRO-TWIST™ MARKER® & DARTS® PANCAKE FRAMER  
SELF-DRILLING SCREW;  
PRO-TWIST™ MARKER® & DARTS® BUGLE HEAD  
SELF-DRILLING SCREW; AND  
PRO-TWIST™ MARKER® & DARTS® HEX WASHER  
HEAD SELF-DRILLING SCREW**

### 1.0 EVALUATION SCOPE

#### Compliance with the following codes:

- 2009 *International Building Code*® (IBC)
- 2009 *International Residential Code*® (IRC)
- Other Codes (see Section 8.0)

#### Property evaluated:

Structural

### 2.0 USES

The Pro-Twist™ Marker® & Darts® self-drilling tapping screws described in this report are used to connect cold-formed steel members together and to connect gypsum board and other panel products to cold-formed steel. The screws are used in engineered connections of cold-formed steel and connections prescribed by the code for cold-formed steel framing and for sheathing to steel connections.

### 3.0 DESCRIPTION

#### 3.1 General:

Pro-Twist™ Marker® & Darts® self-drilling tapping screws are manufactured from carbon steel wire complying with ASTM A 510, minimum grade 1018. See Table 1 for part numbers of recognized screws, screw descriptions (size, tpi, length), head style, drill point, coating information and drilling capacities.

The screws have a zinc or black phosphate coating and meet the minimum corrosion resistance requirement listed in ASTM F 1941, as required by ASTM C 1513.

#### 3.2 Pan Framer Screws:

The #7 pan framer screw complies with the material and performance requirements of ASTM C 1513. The dimensions of the screws comply with the manufacturer's quality documentation.

#### 3.3 Pancake Framer Screws:

The #10 pancake framer screw complies with ASTM C 1513.

#### 3.4 Bugle Head Screws:

The #6 and #8 bugle head screws comply with ASTM C 954.

#### 3.5 Hex Washer Head Screws:

The #10, #12 and #14 hex washer head screws comply with ASTM C 1513.

### 4.0 DESIGN AND INSTALLATION

#### 4.1 Design:

**4.1.1 General:** Screw thread length and point style must be selected on the basis of thickness of the fastened material and the thickness of the supporting steel, in accordance with the manufacturer's published installation instructions.

**4.1.2 Prescriptive Design:** The Pro-Twist™ Marker® & Darts® pancake framer screws and hex washer head screws described in Sections 3.3 and 3.5, respectively, are recognized for use where ASTM C 1513 screws of the same size are prescribed in the IRC and in the AISI Standards referenced in IBC Section 2210.

The Pro-Twist™ Marker® & Darts® bugle head screws described in Section 3.4 are recognized for use in fastening gypsum board to cold-formed steel framing 0.033 inch to 0.112 inch (0.8 to 2.8 mm) thick, in accordance with IBC Section 2506 and IRC Section R702.3.6. They are also recognized for use in attaching gypsum board sheathing to cold-formed steel framing as prescribed in Section C2.2.3 of AISI S213, which is referenced in IBC Section 2210.6.

**4.1.3 Engineered Design:** The Pro-Twist™ Marker® & Darts® pan framer screws, pancake framer screws and hex washer head screws described in Sections 3.2, 3.3 and 3.5, respectively, are recognized for use in engineered connections of cold-formed steel light-framed construction. Design of the connections must comply with Section E4 of

AISI S100, using the nominal and allowable fastener tension and shear strengths for the screws, which are provided in Table 2.

#### 4.2 Installation:

Pro-Twist™ Marker® & Darts® self-drilling tapping screws are installed, without predrilling holes, using a screw gun with a depth-sensitive nosepiece having a maximum speed of 2,500 rpm for No. 6, 7, 8 and 10, and a maximum speed of 1,800 rpm for No. 12 and 14. The fastener must penetrate a minimum of three thread pitches beyond the steel substrate.

### 5.0 CONDITIONS OF USE

The Pro-Twist™ Marker® & Darts® self-drilling tapping screws described in this report comply with, or are suitable alternatives to what is specified in, the code indicated in Section 1.0 of this report, subject to the following conditions:

- 5.1 Fasteners must be installed in accordance with the manufacturer's published installation instructions and this report. In the event of a conflict between this report and the manufacturer's published installation instructions, this report governs.
- 5.2 The allowable loads specified in Section 4.1.3 are not allowed to be increased when the fasteners are used to resist wind or seismic forces.
- 5.3 Drawings and calculations verifying compliance with this report and the applicable code must be submitted to the code official for approval. The drawings and calculations are to be prepared by a registered design professional when required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.4 The rust-inhibitive (corrosion-resistant) coating on the screws must be suitable for the intended use, as determined by the registered design professional.

### 6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Tapping Screw Fasteners (AC118), dated October 2010.

### 7.0 IDENTIFICATION

The Pro-Twist™ Marker® & Darts® screws are identified by a "PT" marking on the fastener heads. Each box of fasteners has a label showing the PrimeSource Building Products, Inc. name and address, the Pro-Twist™ Marker® & Darts® logo (see Figure 2), fastener type and size, lot number, and the evaluation report number (ESR-1408).

### 8.0 OTHER CODES

#### 8.1 Evaluation Scope:

In addition to the code referenced in Section 1.0, the products in this report were evaluated for compliance with the requirements of the following codes:

- 2006 *International Building Code*® (2006 IBC)
- 1997 *Uniform Building Code*™ (UBC)

The Pro-Twist™ Marker® & Darts® screws described in this report comply with, or are suitable alternatives to what is specified in the codes listed above, subject to the provisions of Section 8.2 through 8.7.

#### 8.2 Uses:

See Section 2.0.

#### 8.3 Description:

See Section 3.0.

#### 8.4 Design and Installation:

##### 8.4.1 Design under 2006 IBC:

###### 8.4.1.1 General: See Section 4.1.1.

**8.4.1.2 Prescriptive Design:** The Pro-Twist™ Marker® & Darts® pancake framer screws and hex washer head screws described in Sections 3.3 and 3.5, respectively, are recognized for use where ASTM C 1513 screws of the same size are prescribed in AISI Standards referenced in IBC Section 2210.

The Pro-Twist™ Marker® & Darts® bugle head screws described in Section 3.4 are recognized for use in fastening gypsum board to cold-formed steel framing 0.033 inch to 0.112 inch (0.8 to 2.8 mm) thick, in accordance with IBC Section 2506. They are also recognized for use in attaching gypsum board sheathing to cold-formed steel framing as prescribed in Section C2.2.3 of AISI Lateral, which is referenced in 2006 IBC Section 2210.5.

**8.4.1.3 Engineered Design:** The Pro-Twist™ Marker® & Darts® pan framer screws, pancake framer screws and hex washer head screws described in Sections 3.2, 3.3 and 3.5, respectively, are recognized for use in engineered connections of cold-formed steel light-framed construction. Design of the connections must comply with Section E4 of AISI NAS, using the nominal and allowable fastener tension and shear strengths for the screws, which are provided in Table 2.

##### 8.4.2 Design under UBC:

###### 8.4.2.1 General: See Section 4.1.1.

**8.4.2.2 Prescriptive Design:** The Pro-Twist™ Marker® & Darts® screws are recognized for use where screws having the same head style and dimensions are prescribed in UBC Chapter 22, Division VIII.

**8.4.2.3 Engineered Design:** The Pro-Twist™ Marker® & Darts® screws are recognized for use in engineered connections of cold-formed steel light-framed construction. Design of the connections must comply with UBC Section 2218, Item 3, using the nominal and allowable fastener tension and shear strengths for the screws, which are provided in Table 2.

#### 8.5 Conditions of Use:

See Section 5.0.

#### 8.6 Evidence Submitted:

Data in accordance with the ICC-ES Acceptance Criteria for Tapping Screw Fasteners (AC118), dated November 2009.

#### 8.7 Identification:

See Section 7.0.

TABLE 1—PRO-TWIST™ MARKER® & DARTS® SELF-DRILLING SCREWS

PART NUMBER	DESCRIPTION <sup>1</sup> (Nominal size— tpi × length)	BASIC (NOMINAL) SCREW DIAMETER (inch)	HEAD DIAMETER (inch)	HEAD STYLE	DRILL POINT	COATING	DRILLING CAPACITY (inch)
PFD716	7—18 X 7/16	0.151	0.305	Pan Framer	TEK PT/2	Black Phosphate	0.033-0.112
PFZD716	7—18 X 7/16	0.151	0.305	Pan Framer	TEK PT/2	Zinc	0.033-0.112
PPH1058	10—16 X 5/8	0.190	0.431	Pancake Framer	TEK PT/3	Zinc	0.110-0.175
SD100	6—20 X 1	0.138	0.325	Bugle	TEK PT/2	Black Phosphate	0.033-0.112
SDZ100	6—20 X 1	0.138	0.325	Bugle	TEK PT/2	Zinc	0.033-0.112
SD118	6—20 X 1 1/8	0.138	0.325	Bugle	TEK PT/2	Black Phosphate	0.033-0.112
SDZ118	6—20 X 1 1/8	0.138	0.325	Bugle	TEK PT/2	Zinc	0.033-0.112
SD114	6—20 X 1 1/4	0.138	0.325	Bugle	TEK PT/2	Black Phosphate	0.033-0.112
SDZ114	6—20 X 1 1/4	0.138	0.325	Bugle	TEK PT/2	Zinc	0.033-0.112
SD158	6—20 X 1 5/8	0.138	0.325	Bugle	TEK PT/2	Black Phosphate	0.033-0.112
SDZ158	6—20 X 1 5/8	0.138	0.325	Bugle	TEK PT/2	Zinc	0.033-0.112
SD178	6—20 X 1 7/8	0.138	0.325	Bugle	TEK PT/2	Black Phosphate	0.033-0.112
SDZ178	6—20 X 1 7/8	0.138	0.325	Bugle	TEK PT/2	Zinc	0.033-0.112
SD238	8—18 X 2 3/8	0.164	0.325	Bugle	TEK PT/2	Black Phosphate	0.033-0.112
SDZ238	8—18 X 2 3/8	0.164	0.325	Bugle	TEK PT/2	Zinc	0.033-0.112
SD258	8—18 X 2 5/8	0.164	0.325	Bugle	TEK PT/2	Black Phosphate	0.033-0.112
SDZ258	8—18 X 2 5/8	0.164	0.325	Bugle	TEK PT/2	Zinc	0.033-0.112
SD300	8—18 X 3	0.164	0.325	Bugle	TEK PT/2	Black Phosphate	0.033-0.112
SDZ300	8—18 X 3	0.164	0.325	Bugle	TEK PT/2	Zinc	0.033-0.112
HWD1012	10—16 X 1 1/2	0.190	0.399	Hex Washer	TEK PT/3	Zinc	0.110-0.175
HWD1058	10—16 X 5/8	0.190	0.399	Hex Washer	TEK PT/3	Zinc	0.110-0.175
HWD1034	10—16 X 3/4	0.190	0.399	Hex Washer	TEK PT/3	Zinc	0.110-0.175
HWD10100	10—16 X 1	0.190	0.399	Hex Washer	TEK PT/3	Zinc	0.110-0.175
HWD10114	10—16 X 1 1/4	0.190	0.399	Hex Washer	TEK PT/3	Zinc	0.110-0.175
HWD10112	10—16 X 1 1/2	0.190	0.399	Hex Washer	TEK PT/3	Zinc	0.110-0.175
HWD10200	10—16 X 2	0.190	0.399	Hex Washer	TEK PT/3	Zinc	0.110-0.175
HWD12034	12—14 X 3/4	0.216	0.415	Hex Washer	TEK PT/3	Zinc	0.110-0.210
HWD12078	12—14 X 7/8	0.216	0.415	Hex Washer	TEK PT/4	Zinc	0.110-0.210
HWD12100	12—14 X 1	0.216	0.415	Hex Washer	TEK PT/3	Zinc	0.110-0.210
HWD12114	12—14 X 1 1/4	0.216	0.415	Hex Washer	TEK PT/3, PT5	Zinc	0.110-0.210
HWD12112	12—14 X 1 1/2	0.216	0.415	Hex Washer	TEK PT/3, PT5	Zinc	0.110-0.210
HWD12200	12—14 X 2	0.216	0.415	Hex Washer	TEK PT/3, PT5	Zinc	0.110-0.210
HWD12212	12—14 X 2 1/2	0.216	0.415	Hex Washer	TEK PT/3	Zinc	0.110-0.210
HWD12300	12—14 X 3	0.216	0.415	Hex Washer	TEK PT/3	Zinc	0.110-0.210
HWD14034	14—14 X 3/4	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250
HWD14100	14—14 X 1	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250
HWD14114	14—14 X 1 1/4	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250
HWD14112	14—14 X 1 1/2	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250
HWD14200	14—14 X 2	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250
HWD14212	14—14 X 2 1/2	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250
HWD14300	14—14 X 3	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250
HWD14400	14—14 X 4	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250
HWD14500	14—14 X 5	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250
HWD14600	14—14 X 6	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250

For SI: 1 inch = 25.4 mm.

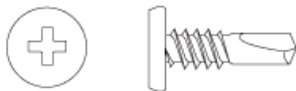
<sup>1</sup> tpi = threads per inch

TABLE 2—SHEAR AND TENSILE STRENGTHS OF PRO-TWIST™ MARKER® & DARTS® SELF-DRILLING TAPPING SCREWS

FASTENER DESCRIPTION			NOMINAL SCREW STRENGTH (lbf)		ALLOWABLE SHEAR LOAD PER FASTENER (lbf)	ALLOWABLE TENSION LOAD PER FASTENER (lbf)
Head Style	Nominal Size—tpi	Basic (Nominal) Screw Diameter (in.)	Shear, P <sub>ss</sub>	Tension, P <sub>ts</sub>		
Pan Framer	7—18	0.151	1,040	1,497	347	499
Pancake Framer	10—16	0.190	1,755	2,313	585	771
Bugle	6—20	0.138	904	1576	301	526
Bugle	8—18	0.164	1392	2179	464	726
Hex Washer	10—16	0.190	1484	1158	495	386
Hex Washer	12—14	0.216	2,077	2,603	692	868
Hex Washer	14—14	0.250	2,772	3,201	924	1067

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

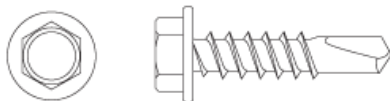
PANCAKE FRAMER HEAD



BUGLE HEAD



HEX WASHER HEAD



PAN FRAMER



FIGURE 1—FASTENER TYPES



FIGURE 2—PRO-TWIST™ MARKER® & DARTS® LOGO