



ICC-ES Evaluation Report

Reissued December 2022

ESR-1408

This report is subject to renewal December 2024.

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

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

REPORT HOLDER:

PRIMESOURCE BUILDING PRODUCTS, INC.

EVALUATION SUBJECT

PRO-TWIST™ MARKER® & DARTS® SELF-DRILLING SCREWS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2021, 2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)[†]

[†]The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see [ESR-1408 LABC and LARC Supplement](#).

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. The screws are used in engineered connections of cold-formed steel and connections prescribed by the code for cold-formed steel framing.

3.0 DESCRIPTION

3.1 General:

Pro-Twist™ Marker® & Darts® self-drilling tapping screws are manufactured from carbon steel wire complying with

ASTM A510, minimum grade 1018. See Table 1 for part numbers of evaluated screws, screw descriptions (size, tpi, length), nominal diameter, head style, head diameter, drill point, coating information, drilling capacities and minimum required protrusion length.

3.2 Pan Framer Screws:

The #7 pan framer screws comply with the material and performance requirements of ASTM C1513. The dimensions of the screws comply with the manufacturer's quality documentation. See Figure 1.

3.3 Pancake Framer Screws:

The #10 and #12 pancake framer screws comply with ASTM C1513. See Figure 2.

3.4 Hex Washer Head Screws:

The #8, #10, #12 and #14 hex washer head screws comply with ASTM C1513. See Figure 3 for coarse thread screws (HWD) and Figure 4 for fine thread screws (X5).

3.5 Modified Truss Head Screws:

The #8 and #10 modified truss head screws comply with ASTM C1513. See Figure 5.

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 General: Screw thread length must be selected on the basis of thickness of the fastened steel members plus the minimum required protrusion past the back of the supporting steel. Point selection must be based on the drilling capacity of the screw. See Table 1 for minimum required protrusion lengths and drilling capacities.

When tested for corrosion resistance in accordance with ASTM B117, the zinc coated and phosphate coated screws meet the minimum requirement listed in ASTM F1941, as required by ASTM C1513, with no white corrosion after three hours and no red rust after 12 hours. The screws coated with PrimeGuard Plus showed no red rust after 24 hours of testing in accordance with ASTM B117.

4.1.2 Prescriptive Design: The pancake framer, hex washer head and modified truss head screws described in Sections 3.3, 3.4, 3.5, respectively, may be used where

ASTM C1513 screws of the same size and head style/dimension are prescribed in the IRC and in the AISI Standards referenced in IBC Section 2211 (2009 IBC Section 2210) for steel-to-steel connections.

4.1.3 Engineered Design: The pan framer, pancake framer, hex washer head and modified truss head screws described in Sections 3.2, 3.3, 3.4 and 3.5, respectively, may be used in engineered connections of cold-formed steel light-framed construction. Design of the connections must comply with Section J4 of AISI S100 (Section E4 of AISI S100 for the 2015, 2012 and 2009 IBC), using the nominal and allowable fastener tension and shear strengths for the screws provided in Table 2. Design provisions for tapping screw connections subjected to combined shear and tension loading are outside the scope of this report.

Under the 2021 IBC, for screws used in framing connections, in order for the screws to be considered fully effective, the minimum spacing between the fasteners must be 3 times the nominal screw diameter and the minimum edge distance must be 1.5 times the nominal screw diameter. Under the 2018, 2015, 2012 and 2009 IBC, for screws used in framing connections, in order for the screws to be considered fully effective, the minimum spacing between the fasteners and the minimum edge distance must be 3 times the nominal diameter of the screw, except when the edge is parallel to the direction of the applied force, in which case the minimum edge distance must be 1.5 times the nominal screw diameter. When the spacing between screws is less than 3 times the nominal screw diameter, but at least 2 times the fastener diameter, the connection shear strength determined in accordance with Section J4 of AISI S100 (Section E4 of AISI S100 for the 2015, 2012 and 2009 IBC) must be reduced by 20 percent. [Refer to Section B1.5.1.3 of AISI S240 (Section D1.5 of AISI S200 for the 2015, 2012 and 2009 IBC)].

For screws used in applications other than framing connections, the minimum spacing between the fasteners must be three times the nominal screw diameter and the minimum edge and end distances must be 1.5 times the nominal screw diameter. Additionally, under the 2009 IBC, when the distance to the end of the connected part is parallel to the line of the applied force, the allowable connection shear strength determined in accordance with Section E4.3.2 of Appendix A of AISI S100 must be considered.

The connection shear strengths are for connections where the connected steel elements are in direct contact with one another. Connected members must be checked for rupture in accordance with Section J6 of AISI S100-16 (Section E6 of AISI S100 for the 2015 IBC, Section E5 of AISI S100 for the 2012 and 2009 IBC).

4.2 Installation:

Installation of the Pro-Twist™ Marker® & Darts® self-drilling tapping screws must be in accordance with the manufacturer's published installation instructions and this report. The manufacturer's published installation instructions must be available at the jobsite at all times during installation.

Pro-Twist™ Marker® & Darts® self-drilling tapping screws must be installed perpendicular to the work surface using a

screw gun with a depth-sensitive nosepiece having a maximum speed of 2,500 rpm for Nos. 7, 8 and 10, and a maximum speed of 1,800 rpm for Nos. 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 Evaluation of screws subjected to cyclic or fatigue loading is outside the scope of this report. Applicable Seismic Design Categories shall be determined in accordance with the code for the entire assembly constructed with the screws.
- 5.4 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.
- 5.5 The use of screws in engineered steel deck diaphragms has not been evaluated and is outside the scope of this evaluation report.
- 5.6 The screws 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 Tapping Screw Fasteners Used in Steel-to-steel Connections (AC118), dated January 2018 (editorially revised December 2020).

7.0 IDENTIFICATION

- 7.1 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 6), fastener type and size, lot number, and the evaluation report number (ESR-1408).
- 7.2 The report holder's contact information is the following:

PRIMESOURCE BUILDING PRODUCTS, INC.
1321 GREENWAY DRIVE
IRVING, TEXAS 75038
(972) 999-8500
www.protwist.com

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

PART NUMBER	DESCRIPTION ¹ (Nominal size- tpi x length)	BASIC (NOMINAL) SCREW DIAMETER (inch)	HEAD DIAMETER (inch)	HEAD STYLE	DRILL POINT	COATING ²	DRILLING CAPACITY (inch)	MINIMUM REQUIRED PROTRUSION (inch)
PFD716	7-18 X 7/16	0.151	0.305	Pan Framer	TEK PT/2	Black Phosphate	0.033-0.112	0.167
PFZD716	7-18 X 7/16	0.151	0.305	Pan Framer	TEK PT/2	Zinc	0.033-0.112	0.167
PPH1058	10-16 X 5/8	0.190	0.431	Pancake Framer	TEK PT/3	Zinc	0.110-0.175	0.188
PPH12034	12-14 X 3/4	0.216	0.457	Pancake Framer	TEK PT/3	Zinc	0.110-0.210	0.214
HWD812	8-18 X 1/2	0.164	0.335	Hex Washer	TEK PT/2	Zinc	0.033-0.112	0.167
HWD858	8-18 X 5/8	0.164	0.335	Hex Washer	TEK PT/2	Zinc	0.033-0.112	0.167
HWD834	8-18 X 3/4	0.164	0.335	Hex Washer	TEK PT/2	Zinc	0.033-0.112	0.167
HWD8100	8-18 X 1	0.164	0.335	Hex Washer	TEK PT/2	Zinc	0.033-0.112	0.167
HWD8114	8-18 X 1 1/4	0.164	0.335	Hex Washer	TEK PT/2	Zinc	0.033-0.112	0.167
HWD8112	8-18 X 1 1/2	0.164	0.335	Hex Washer	TEK PT/2	Zinc	0.033-0.112	0.167
HWD8200	8-18 X 2	0.164	0.335	Hex Washer	TEK PT/2	Zinc	0.033-0.112	0.167
HWD1012	10-16 X 1/2	0.190	0.399	Hex Washer	TEK PT/3	Zinc	0.110-0.175	0.188
HWD1058	10-16 X 5/8	0.190	0.399	Hex Washer	TEK PT/3	Zinc	0.110-0.175	0.188
HWD1034	10-16 X 3/4	0.190	0.399	Hex Washer	TEK PT/3	Zinc	0.110-0.175	0.188
HWD10100	10-16 X 1	0.190	0.399	Hex Washer	TEK PT/3	Zinc	0.110-0.175	0.188
HWD10114	10-16 X 1 1/4	0.190	0.399	Hex Washer	TEK PT/3	Zinc	0.110-0.175	0.188
HWD10112	10-16 X 1 1/2	0.190	0.399	Hex Washer	TEK PT/3	Zinc	0.110-0.175	0.188
HWD10200	10-16 X 2	0.190	0.399	Hex Washer	TEK PT/3	Zinc	0.110-0.175	0.188
HWD12034	12-14 X 3/4	0.216	0.415	Hex Washer	TEK PT/3	Zinc	0.110-0.210	0.214
HWD12078	12-14 X 7/8	0.216	0.415	Hex Washer	TEK PT/4	Zinc	0.110-0.210	0.214
HWD12100	12-14 X 1	0.216	0.415	Hex Washer	TEK PT/3	Zinc	0.110-0.210	0.214
HWD12114	12-14 X 1 1/4	0.216	0.415	Hex Washer	TEK PT/3	Zinc	0.110-0.210	0.214
HWD12112	12-14 X 1 1/2	0.216	0.415	Hex Washer	TEK PT/3	Zinc	0.110-0.210	0.214
HWD12200	12-14 X 2	0.216	0.415	Hex Washer	TEK PT/3	Zinc	0.110-0.210	0.214
HWD12212	12-14 X 2 1/2	0.216	0.415	Hex Washer	TEK PT/3	Zinc	0.110-0.210	0.214
HWD12300	12-14 X 3	0.216	0.415	Hex Washer	TEK PT/3	Zinc	0.110-0.210	0.214
HWD14034	14-14 X 3/4	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250	0.214
HWD14100	14-14 X 1	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250	0.214
HWD14114	14-14 X 1 1/4	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250	0.214
HWD14112	14-14 X 1 1/2	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250	0.214
HWD14200	14-14 X 2	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250	0.214
HWD14212	14-14 X 2 1/2	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250	0.214
HWD14300	14-14 X 3	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250	0.214
HWD14400	14-14 X 4	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250	0.214
HWD14500	14-14 X 5	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250	0.214
HWD14600	14-14 X 6	0.250	0.500	Hex Washer	TEK PT/3	Zinc	0.110-0.250	0.214
X512114	12-24 X 1 1/4	0.216	0.415	Hex Washer	TEK PT/5	PGP	0.250-0.500	0.125
X512112	12-24 X 1 1/2	0.216	0.415	Hex Washer	TEK PT/5	PGP	0.250-0.500	0.125
X512200	12-24 X 2	0.216	0.415	Hex Washer	TEK PT/5	PGP	0.250-0.500	0.125
MTD812	8-18 X 1/2	0.164	0.437	Modified Truss	TEK PT/2	Zinc	0.033-0.112	0.125
MTD834	8-18 X 3/4	0.164	0.437	Modified Truss	TEK PT/2	Zinc	0.033-0.112	0.167
MTD8100	8-18 X 1	0.164	0.437	Modified Truss	TEK PT/2	Zinc	0.033-0.112	0.167
MTD8114	8-18 X 1 1/4	0.164	0.437	Modified Truss	TEK PT/2	Zinc	0.033-0.112	0.167
MTD8158	8-18 X 1 5/8	0.164	0.437	Modified Truss	TEK PT/2	Zinc	0.033-0.112	0.167

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

PART NUMBER	DESCRIPTION ¹ (Nominal size— tpi x length)	BASIC (NOMINAL) SCREW DIAMETER (inch)	HEAD DIAMETER (inch)	HEAD STYLE	DRILL POINT	COATING ²	DRILLING CAPACITY (inch)	MINIMUM REQUIRED PROTRUSION (inch)
MTD8178	8-18 X 1 ⁷ / ₈	0.164	0.437	Modified Truss	TEK PT/2	Zinc	0.033-0.112	0.167
MTD8200	8-18 X 2	0.164	0.437	Modified Truss	TEK PT/2	Zinc	0.033-0.112	0.167
MTD8212	8-18 X 2 ¹ / ₂	0.164	0.437	Modified Truss	TEK PT/2	Zinc	0.033-0.112	0.167
MTD8300	8-18 X 3	0.164	0.437	Modified Truss	TEK PT/2	Zinc	0.033-0.112	0.167
MTD1034	10-16 X 3 ³ / ₄	0.190	0.437	Modified Truss	TEK PT/3	Zinc	0.110-0.175	0.188

For SI: 1 inch = 25.4 mm.

¹tpi = threads per inch

²PGP = PrimeGuard Plus

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 _{ss}	Tension, P _{ts}		
Pan Framer	7-18	0.151	1,040	1,497	347	499
Pancake Framer	10-16	0.190	1,755	2,313	585	771
	12-14	0.216	2,089	2,927	696	976
Hex Washer	8-18	0.164	1,274	1,974	425	658
	10-16	0.190	1,484	1,158	495	386
	12-14	0.216	2,077	2,603	692	868
	12-24	0.216	2,447	4,200	816	1,400
	14-14	0.250	2,772	3,201	924	1,067
Modified Truss	8-18	0.164	1,363	1,993	454	664
	10-16	0.190	1,855	2,605	618	868

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



FIGURE 1—PFD AND PFZD PAN FRAMER HEAD SCREW

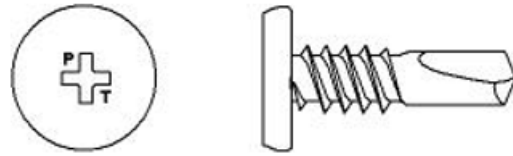


FIGURE 2—PPH PANCAKE FRAMER HEAD SCREW



FIGURE 3—HWD HEX WASHER HEAD SCREW

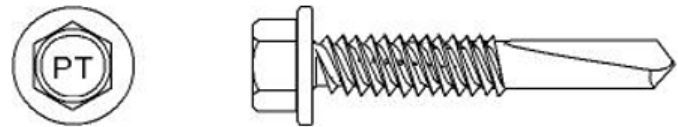


FIGURE 4—X5 HEX WASHER HEAD SCREW

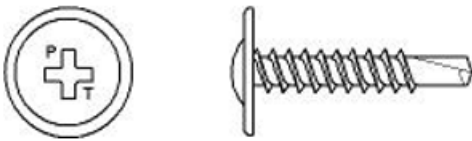


FIGURE 5—MTD MODIFIED TRUSS HEAD SCREW



FIGURE 6—PRO-TWIST™ MARKER® & DARTS® LOGO

DIVISION: 05 00 00—METALS

Section: 05 05 23—Metal Fastenings

DIVISION: 09 00 00—FINISHES

Section 09 22 16.23—Fasteners

REPORT HOLDER:

PRIMESOURCE BUILDING PRODUCTS, INC.

EVALUATION SUBJECT:

PRO-TWIST™ MARKER® & DARTS® SELF-DRILLING SCREWS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Pro-Twist™ Marker® & Darts® self-drilling tapping screws, described in ICC-ES evaluation report [ESR-1408](#), have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2020 *City of Los Angeles Building Code* (LABC)
- 2020 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The Pro-Twist™ Marker® & Darts® self-drilling tapping screws, described in Sections 2.0 through 7.0 of the evaluation report [ESR-1408](#), comply with the LABC Chapters 22 and 25 and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Pro-Twist™ Marker® & Darts® self-drilling tapping screws described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-1408](#).
- The design, installation, conditions of use and identification of the Pro-Twist™ Marker® & Darts® self-drilling tapping screws are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-1408](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.

This supplement expires concurrently with the evaluation report, reissued December 2022.

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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PRO-TWIST™ MARKER® & DARTS® SELF-DRILLING SCREWS

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that Pro-Twist™ Marker® & Darts® self-drilling tapping screws, described in ICC-ES evaluation report ESR-1408, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2019 California Building Code (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 California Residential Code (CRC)

2.0 CONCLUSIONS**2.1 CBC:**

The Pro-Twist™ Marker® & Darts® self-drilling tapping screws, described in Sections 2.0 through 7.0 of the evaluation report ESR-1408, comply with CBC Chapters 22 and 25, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16 and 17, as applicable.

2.1.1 OSHPD:

The applicable OSHPD Sections of the CBC are beyond the scope of this supplement.

2.1.2 DSA:

The applicable DSA Sections of the CBC are beyond the scope of this supplement.

2.2 CRC:

The Pro-Twist™ Marker® & Darts® self-drilling tapping screws, described in Sections 2.0 through 7.0 of the evaluation report ESR-1408, complies with CRC Chapter 3, provided the design and installation are in accordance with the 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report, reissued December 2022.