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Legacy report on the 1997 Uniform Building Code™

DIVISION: 05—METALS
Section: 05090—Metal Fastenings

SELF-PIERCING AND SELF-DRILLING/SELF-TAPPING STEEL SCREWS

PRIMESOURCE BUILDING PRODUCTS, AN ITOCHU COMPANY
14516 HEATHROW FOREST PARKWAY
HOUSTON, TEXAS 77032

1.0 SUBJECT

Self-piercing and Self-drilling/Self-tapping Steel Screws.

2.0 DESCRIPTION

2.1 General:

PrimeSource Building Products brand screw fasteners are manufactured from heat-treated steel and have a coating consisting of zinc plating or phosphate. Screws are either self-piercing/or self-drilling/self-tapping steel screws, and are available in various nominal shank diameters, ranging from No. 6 to No. 14 [0.138 inch to 0.250 inch (3.51 mm to 6.35 mm)], with nominal shank lengths varying from 7/16 inch to 6 inches (11.1 to 152 mm). The available screw-head styles are phillips pan, hex washer, pancake, wafer-modified truss, wafer and bugle, as shown in Figure 1. The screws comply with SAE J78.

Allowable fastener loads are as shown in Table 1. Allowable values are for a single shear connection consisting of two steel sheets, of the same material type and thickness, in direct contact. Steel sheets of No. 12, 22 or 24 gage [0.105, 0.029 or 0.024 inch (2.66, 0.76 or 0.61 mm)] thickness must conform to ASTM A 366 CQ 1008. Steel sheets 1/4 inch (6.4 mm) or 3/16 inch (4.8 mm) thick must conform to ASTM A 108.

2.2 Installation:

Self-piercing/ and self-drilling/self-tapping screw fasteners are installed without predrilled holes. Number 6 through No. 14 screw-diameter fasteners must be installed with a screw gun

having a minimum speed of 1,500 to 2,500 rpm, and incorporating a depth-sensitive or torque-limiting nose piece. Installed fasteners must protrude beyond the attached members three full threads. The connection is for fastening steel members complying with Section 2.1 of this report. The distance from the center of a fastener to the edge and end of the steel member shall not be less than three times the screw diameter. The minimum edge and end distance for connections subjected to shear force in one direction only may be reduced to 1.5 times the screw diameter in the direction perpendicular to the force.

2.3 Identification:

Each carton of fasteners has two labels bearing the trademark Pro Twist™ owned by PrimeSource Building Products; the fastener part number; the head style; the size; the point type; the length; the quantity; the purchase order number; and the evaluation report number (ICBO ES ER-5454), as noted in Figure 2. Heads of all screw fasteners have the letters "PT" punched or formed thereon.

3.0 EVIDENCE SUBMITTED

Report of shear and tension tests and product description in accordance with the ICBO ES Acceptance Criteria for Tapping Screw Fasteners (AC118), dated July 1996.

4.0 FINDINGS

That the Self-piercing and Self-drilling/Self-tapping Steel Screws described in this report comply with the 1997 Uniform Building Code™, subject to the following conditions:

- 4.1 Fasteners are installed in accordance with the manufacturer's instructions and this report.
4.2 Allowable shear and tension values comply with Table 1.
4.3 Allowable loads shall not be increased due to duration of load, such as wind or earthquake forces.

This report is subject to re-examination in two years.

*Corrected May 2002

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TABLE 1—ALLOWABLE SCREW LOADS

SCREW SIZE NO. AND TYPE ¹	NOMINAL SCREW DIAMETER (inch)	STEEL PLATE THICKNESS ²		ALLOWABLE SHEAR LOAD PER FASTENER ^{4,5} (lbs.)	ALLOWABLE TENSION LOAD PER FASTENER ⁴ (lbs.)
		Gage ³ (GA)	Decimal (inch)		
14 S/D	0.250	1/4	0.250	1,109	1,280
12 S/D	0.216	3/16	0.1875	1,007	1,102
10 S/D	0.190	12	0.1046	594	403
10 PHP	0.190	24	0.239	127	50
8 S/D	0.163	12	0.1046	529	358
8 S/P	0.163	22	0.0299	196	99
6 S/D	0.163	24	0.0239	107	48

For SI: 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 psi = 6.89 kPa.

¹PHP = Phillips head self-drilling
 S/D = Self-drilling
 S/P = Self-piercing

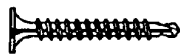
²Steel plate thickness is the thickness for a single sheet.

³Steel members 1/4-inch and 3/16-inch in thickness shall conform to ASTM A 108, with a minimum yield strength of 50,000 psi and 40,000 psi, respectively. Steel members No. 12 gage through No. 24 gage in thickness shall conform to ASTM A 366 CQ 1008, with a minimum 33,000 psi yield strength.

⁴Allowable screw loads are based on test methods provided in AISI CF 92-1, "Test Methods for Mechanically Fastened Cold-formed Steel Connections." Safety factor 2.5.

⁵Allowable values are for a single shear connection consisting of two steel sheets of the same material type and thickness.

SELF-DRILLING SCREWS



BUGLE HEAD (6S/D)



WAFER MODIFIED TRUSS HEAD (8S/D)



PAN HEAD (10S/D)



WAFER HEAD (10S/D)



PANCAKE HEAD (10 PHP)



HEX WASHER HEAD (14S/D AND 12S/D)

SELF-PIERCING SCREWS (S/P)



HEX WASHER HEAD (8S/P)

FIGURE 1—FASTENER TYPES

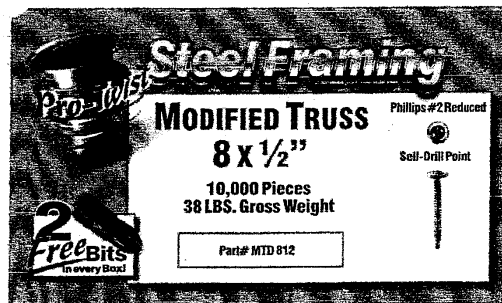
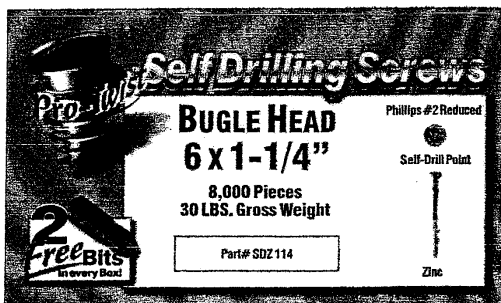


FIGURE 2—TYPICAL LABELS