

ICC-ES Legacy Report**ER-5617**

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Legacy report on the 1997 *Uniform Building Code*™**DIVISION: 05—METALS****Section: 05090—Metal Fastenings****VS® BRAND SELF-DRILLING, SELF-TAPPING STEEL
SCREWS****D.B. BUILDING FASTENERS, INC.
5555 EAST GIBRALTAR AVENUE
ONTARIO, CALIFORNIA 91764-5121****1.0 SUBJECT**

VS® Brand Self-drilling, Self-tapping Steel Screws.

2.0 DESCRIPTION**2.1 General:**

VS Brand self-drilling, self-tapping screw fasteners are used for fastening of cold-formed steel structural members complying with Chapter 22, Division VII, of the 1997 *Uniform Building Code*™. The fasteners are manufactured from heat-treated carbon steel conforming to ASTM A 48, Grade 1022, and have a coating of electroplated zinc and/or baked ceramic finish. Screws are self-drilling, self-tapping screws, and are available in various nominal shank diameters ranging from 0.190 to 0.250 inch, with nominal shank lengths varying from 5/8 inch to 6 inches. The screws are available in a hex washer head style, also available preassembled with bonded EPDM sealing washers. The screws comply with SAE J78, SAE J933 and ANSI/ASME B18.6.4.

2.2 Design:

Allowable shear and tension pullout values are as listed in Table 1. Allowable shear values are for a single shear connection consisting of two sheets of the same material type and thickness. Steel sheets of No. 20 gage and No. 18 gage [0.0341-inch and 0.0451-inch (0.87 mm and 1.15 mm) minimum uncoated steel thicknesses] comply with ASTM A 653 SS, Grade 38, with a minimum 38,000 psi (262 MPa) yield strength, and Grade 50, with a minimum 55,000 psi (379 MPa) yield strength, for No. 16, No. 14, No. 12 and No. 10 gage [0.0578-inch, 0.072-inch, 0.0998-inch and 0.127-inch (1.47 mm, 1.83 mm, 2.53 mm and 3.23 mm) minimum uncoated steel thicknesses].

2.3 Installation:

VS Brand self-drilling, self-tapping screw fasteners are installed without predrilled holes using an electric screw gun having a speed of 1,800 to 2,500 rpm, incorporating a depth-sensitive or torque-limiting nose piece. Installed fasteners must protrude beyond the attached members a minimum of three full threads. The distance from the center of the fastener to the end or edge of a steel member or element must not be less than three times the screw diameter. The minimum edge and end distance from 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.

2.4 Identification:

VS Brand self-drilling, self-tapping screw fasteners are marked with a "VS®" screw-head mark, as shown in Figure 1. Each box of fasteners is labeled showing the company name (D.B. Building Fasteners), fastener name, part number, description, head style, diameter, length, point type, quantity, country of origin (Taiwan), evaluation report number (ER-5617), and recommended screw gun rpm as note in Figure 2.

3.0 EVIDENCE SUBMITTED

Data in accordance with the Acceptance Criteria for Tapping Screw Fasteners (AC118), dated July 1999.

4.0 FINDINGS

That the VS® Brand 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 are not increased due to duration of loads such as wind or earthquake forces.

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

TABLE 1—ALLOWABLE SCREWS LOADS^{1,2,3,4}

FASTENER TYPE (Size Number)	FASTENER DIMENSIONS			STEEL THICKNESS ⁵											
				No. 20 Gage (0.0341 inch)		No. 18 gage (0.0451 inch)		No. 16 gage (0.0578 inch)		No. 14 gage (0.072 inch)		No. 12 gage (0.0998 inch)		No. 10 gage (0.127 inch)	
	Nominal Screw Diameter (inch)	Head O.D. (inch)	Point Type ⁶	Shear (pounds)	Tension pullout (pounds)	Shear (pounds)	Tension pullout (pounds)	Shear (pounds)	Tension pullout (pounds)	Shear (pounds)	Tension pullout (pounds)	Shear (pounds)	Tension pullout (pounds)	Shear (pounds)	Tension pullout (pounds)
10	0.190	0.312	SD #3	186	83	326	133	—	—	—	—	—	—	—	—
12	0.220	0.312	SD #3 or 2	—	—	341	171	570	256	664	387	—	—	—	—
¹ / ₄ - 14	0.250	0.375	SD #3	—	—	—	—	741	261	867	447	1,002	555	—	—
12 - 24	0.220	0.312	SD #4.5	—	—	—	—	—	—	—	—	926	549	1,033	882

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

¹Steel members must conform with Chapter 22, Division VII, of the UBC, and with Section A3 of the AISI Specification Manual.

No. 20 gage and No. 18 gage steel comply with ASTM A 653, with a minimum 38,000-psi yield strength.

No. 16 gage, No. 14 gage, No. 12 gage and No. 10 gage steel comply with ASTM A 653, with a minimum 55,000-psi yield strength.

²Allowable screw shear and tension pullout loads are based on test methods provided in AISI CF 92-1, "Test Methods for Mechanically Fastened Cold-formed Steel Connections."

³Allowable shear values are based on two steel sheets of the same material type, thickness and minimum yield strength.

⁴Allowable tension pullout values are for withdrawal of a screw fastener from a single sheet of steel.

⁵Steel thickness is the thickness for a single sheet.

⁶SD = Self-drill point size number.

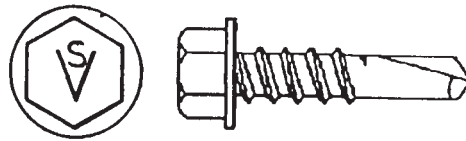


FIGURE 1—HEAD MARKINGS



FIGURE 2—LABELING ON SELF-DRILLING, SELF-TAPPING SCREW CARTONS