SURE-FAST
INDUSTRIAL FASTENERS

Mechanical Testing

Self-Drilling Needle Point Steel Framing Screws were tested for determination of withdrawal properties following the general principles of *AS 3566.1-2002 Self-Drilling Screws for the Building and Construction Industries – Part 1: General Requirements and Mechanical Properties*.

The test procedure included being driven into 90mm (w) x 35mm (d) x .75mm (t) Steel Framing Stud

Screw Type: Needle Point (Npt) 6.0 x 1.0 x 15mm long
Head Type: PH3 Phillips Drive
Head Markings: SX3
Head (Nominal): 9.8mm (Outside dia) – To suit PH3 Driver
Coating Type: Sure-Guard 3
Application: For pre-punched holes in steel framing

A series of 20 withdrawal tests were undertaken. 10 repeat tests were conducted in two variant configurations noted as “A” and “B”.

Configuration A: Screws were driven into pre-drilled and punched/recessed holes on the 35mm wide flanges of the framing member. The diameter of the pre-drilled holes was measured to be approximately 5mm. Prior to installation, witness marks were observed at the interfaces of the holes indicating that the screws had previously been driven into and then removed from each hole. The embedment/penetration depth adopted for testing was measured to be 7mm.

Configuration B: Screws were driven into the 90mm wide face of the framing stud. Prior to installation, 4mm diameter pilot holes were drilled into the substrate. The embedment/penetration depth adopted for testing was measured to be 8mm.

Testing was conducted following the general principles of AS3566.1 Appendix D. For both configurations, several full pitch threads were protruding from the underside of the test plate. Axial force was applied individually to each screw head until a reduction in strength and withdrawal of the fastener from the substrate was observed.

Table 1: Configuration A Test Results

Screw & Substrate Type	Specimen No.	Peak Test Force (kN)	Test Observations/Comments
6.0 × 1.0 × 15 mm (Gauge × Pitch × Length) 7 mm Penetration Depth Driven into 5 mm Dia. Pre-Drilled Holes	1	1.58	Withdrawal from steel substrate
	2	1.36	"
	3	1.43	"
	4	1.46	"
	5	1.40	"
	6	1.71	"
	7	1.71	"
	8	1.56	"
	9	1.68	"
	10	1.70	"
Mean		**1.56**	
Minimum		**1.36**	
Maximum		**1.71**	

Table 2: Configuration B Test Results

Screw & Substrate Type	Specimen No.	Peak Test Force (kN)	Test Observations/Comments
6.0 × 1.0 × 15 mm (Gauge × Pitch × Length) 8 mm Penetration Depth Driven into 4 mm Dia. Pre-Drilled Holes	1	2.35	Withdrawal from steel substrate
	2	2.46	"
	3	2.55	"
	4	2.49	"
	5	2.38	"
	6	2.46	"
	7	2.48	"
	8	2.42	"
	9	2.43	"
	10	2.44	"
Mean		**2.45**	
Minimum		**2.35**	
Maximum		**2.55**	