Technical data sheet

SSWT - STEEL STRONG-WALL FOR TIMBER FRAME RACKING RESISTANCE

The Steel Strong-Wall™ is a corrugated steel panel which is designed to be fixed directly to the concrete foundations of a building, within either the external or external wall sections, via a bolted connection.

FEATURES

Material

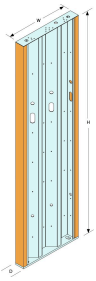
- Steel Strong-Wall™: Galvanised mild steel
- Timber Studs: 38 x 89mm, C16 graded, preservative treated
- SDS Screws: Hot dip galvanised, carbon steel
- AT-HP Adhesive: Styrene Free Methacrylate Mortar Resin
- Threaded Rods: Grade 5.8 Carbon Steel, Zinc plated
- Nuts and Washers: Carbon Steel, Zinc Plated

Benefits

- Available in two widths: 305mm and 610mm.
- Standard height: 2172mm.
- At only 89mm wide, it can be fitted into standard 89mm and 140mm deep stud walls.
- Supplied with pre-attached timber studs.
- All fixings and adhesives required for installtion are provided in the kit.

TECHNICAL DATA

Dimensions



Technical data sheet

SSWT - STEEL STRONG-WALL FOR TIMBER FRAME RACKING RESISTANCE

References	Dimension of the wall [mm]			Fixing to the ground		Fixing to the top part	
	Width (A)	Heigth (B)	Depth (C)	Quantity	Diameter [mm]	Quantity	Screws
SSWT305	305	-	-	-	-	-	-
SSWT610	610	-	-	-	-	-	
SSWT305/2369-AT	305	2369	142	2	20	4	SDS25312 (6,35 x 88,9 mm)
SSWT305/2369-SET	305	2369	142	2	20	4	
SSWT305/2673-AT	305	2673	142	2	20	4	
SSWT305/2673-SET	305	2673	142	2	20	4	
SSWT610/2369-AT	610	2369	142	2	24	14	
SSWT610/2369-SET	610	2369	142	2	24	14	
SSWT610/2673-AT	610	2673	142	2	24	14	
SSWT610/2673-SET	610	2673	142	2	24	14	
SSW300-FR/X*	300	1900 - 2700	142	2	20	4	
SSW450/X	450	1900 - 2700	142	2	24	10	
SSW600-FR/X*	600	1900 - 2700	142	2	24	14	

Characterstic Performance

References	Dimension of the wall [mm]		Max. characteristic resistance(1) [Rk] [kN]	Characteristic capacity with pre-cast anchors(2) [Rk] [kN]	Characteristic capacity with chemical anchors(3) [Rk] [kN]
	Width (A)	Heigth (B)			
SSWT305/2369-AT	305	2369	14.3	10.7	7.1
SSWT305/2369-SET	305	2369	14.3	10.7	7.1
SSWT305/2673-AT	305	2673	9	9	6.3
SSWT305/2673-SET	305	2673	9	9	6.3
SSWT610/2369-AT	610	2369	47.8	32.1	16
SSWT610/2369-SET	610	2369	47.8	32.1	16
SSWT610/2673-AT	610	2673	35.9	28.5	14.2
SSWT610/2673-SET	610	2673	35.9	28.5	14.2
SSW300/1900-2350*	300	1900 - 2350	13.1	10.7	7.1
SSW300/2350-2700*	300	2350 - 2700	8.1	9.3	6.2
SSW450/1900-2350*	450	1900 - 2350	29.3	22.9	11.4
SSW450/2350-2700*	450	2350 - 2700	22.9	19.9	9.9
SSW600/1900-2350*	600	1900 - 2350	45.7	32	16
SSW600/2350-2700*	600	2350 - 2700	39	27.8	13.9

The characteristic resistance must be used with the formula:

$$R_d = \frac{k_{mod} \times R_k}{\gamma_M}$$

This performance must be used for ULS checking.

1) Maximum characteristic resistance in case the anchors are dimensionned to resist the racking loads

2) Resistance with pre-cast anchors. For Steel Strong-Wall™ of a width of 300mm, the hypothesis is that the design tension load in the anchor is 90kN. For Steel Strong-Wall™ of a width of 600mm, the hypothesis is that the design tension load in the anchor is 120kN.

3) The values are given with the maximum load in non-cracked concrete according to ETAG001 : 60kN.

Stiffness

References	Dimension of the wall [mm]		Stiffness [N/mm]
	Width (A)	Heigth (B)	
SSWT305/2369-AT	305	2369	290
SSWT305/2369-SET	305	2369	290

References	Dimension of the wall [mm]		Stiffness [N/mm]
	Width (A)	Heigth (B)	
SSWT305/2673-AT	305	2673	145
SSWT305/2673-SET	305	2673	145
SSWT610/2369-AT	610	2369	1293
SSWT610/2369-SET	610	2369	1293
SSWT610/2673-AT	610	2673	1051
SSWT610/2673-SET	610	2673	1051
SSW300/1900-2350*	300	1900 - 2350	225
SSW300/2350-2700*	300	2350 - 2700	139
SSW450/1900-2350*	450	1900 - 2350	766
SSW450/2350-2700*	450	2350 - 2700	620
SSW600/1900-2350*	600	1900 - 2350	1651
SSW600/2350-2700*	600	2350 - 2700	1068

The stiffness must be used for ELS checking

Seismic Performance

References	Dimension of the wall [mm]		Characteristic capacity [Rk,seismic] [kN]
	Width (A)	Heigth (B)	
SSWT305/2369-AT	305	2369	14.3
SSWT305/2369-SET	305	2369	14.3
SSWT305/2673-AT	305	2673	9
SSWT305/2673-SET	305	2673	9
SSWT610/2369-AT	610	2369	47.8
SSWT610/2369-SET	610	2369	47.8
SSWT610/2673-AT	610	2673	35.9
SSWT610/2673-SET	610	2673	35.9
SSW300/1900-2350*	300	1900 - 2350	13.1
SSW300/2350-2700*	300	2350 - 2700	8.1
SSW450/1900-2350*	450	1900 - 2350	29.3
SSW450/2350-2700*	450	2350 - 2700	22.9
SSW600/1900-2350*	600	1900 - 2350	45.7
SSW600/2350-2700*	600	2350 - 2700	39

The Steel Strong-Wall have a behaviour factor of q=3

Thermal Performance

References	U values [U] [W/m².K]
SSWT305/2369-AT	0.65
SSWT305/2369-SET	0.65
SSWT305/2673-AT	0.65
SSWT305/2673-SET	0.65
SSWT610/2369-AT	0.65
SSWT610/2369-SET	0.65
SSWT610/2673-AT	0.65
SSWT610/2673-SET	0.65
SSW300/1900-2350*	0.65
SSW300/2350-2700*	0.65
SSW450/1900-2350*	0.65
SSW450/2350-2700*	0.65
SSW600/1900-2350*	0.65
SSW600/2350-2700*	0.65

Product Range & Performance Values

SSWT - STEEL STRONG-WALL FOR TIMBER FRAME RACKING RESISTANCE

References	Dimension of the wall [mm]			Fixing to the ground		Fixing to the top part		Permissible loads [kN]		Anchor Loads at Max Permissible Racking Load (3) [kN]	
	Width (A)	Heigth (B)	Depth (C)	Quantity	Diameter [mm]	Quantity	Screws	Racking R_b	Axial	Tension	Shear
SSWT305	305	-	-	-	-	-	-	-	-	-	-
SSWT610	610	-	-	-	-	-	-	-	-	-	-
SSWT305/2369-AT	305	2369	142	2	20	4	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSWT305/2369-SET	305	2369	142	2	20	4	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSWT305/2673-AT	305	2673	142	2	20	4	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSWT305/2673-SET	305	2673	142	2	20	4	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSWT610/2369-AT	610	2369	142	2	24	14	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSWT610/2369-SET	610	2369	142	2	24	14	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSWT610/2673-AT	610	2673	142	2	24	14	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSWT610/2673-SET	610	2673	142	2	24	14	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSW300-FR/X*	300	1900 - 2700	142	2	20	4	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSW450/X	450	1900 - 2700	142	2	24	10	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSW600-FR/X*	600	1900 - 2700	142	2	24	14	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSW300/1900-2350*	300	1900 - 2350	142	2	20	4	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSW300/2350-2700	300	2350 - 2700	142	2	20	4	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSW450/1900-2350*	450	1900 - 2350	142	2	24	10	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSW450/2350-2700	450	2350 - 2700	142	2	24	10	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSW600/1900-2350*	600	1900 - 2350	142	2	24	14	SDS25312 (6,35 x 88,9 mm)	-	-	-	-
SSW600/2350-2700	600	2350 - 2700	142	2	24	14	SDS25312 (6,35 x 88,9 mm)	-	-	-	-

1. Fasteners are supplied with the Steel Strong Wall.
2. Rb is the racking resistance determined from test carried out in accordance to BS EN 549:2011
3. It is the responsibility of the building engineer / designer to ensure the foundation and hold down anchors can take the applied 'tension' and 'compression' loads.

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INSTALLATION

Fasteners

Fixations Bois

SDS - Vis pour connecteurs (Réf: SDS25312) : La vis SDS Simpson Strong-Tie® est une vis à bois structurelle, idéale pour l'installation de nombreux connecteurs ainsi que pour les applications bois sur bois. Aucun pré-perçage n'est nécessaire. La vis possède une pointe brevetée pour une pénétration simplifiée et une résistance à la corrosion assurée par un revêtement double barrière.

Fixations Béton

L'ancrage étant un point clé de la résistance du Steel Strong-Wall, il faut que l'ancrage soit vérifié dans tous les cas

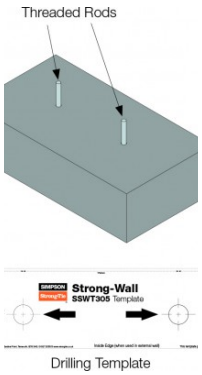
SET-XP - Résine très haute performance : Résine chimique 100% époxy très haute performance. Ancrage chimique pour béton fissuré et non fissuré.
AT-HP - Résine béton haute performance (Réf : AT-HP 280) : Résine Chimique méthacrylate sans styrène, haute performance, multi-matériaux. Ancrage chimique couvrant toutes les applications structurelles dans tous les matériaux, utilisable sans risque en intérieur.
THR - Tiges au mètre (Réf : THR 20-1000 ; THR 24-1000) : Tiges filetées au mètre utilisables en complément du scellement chimique SET-XP et AT-HP.

Thermal Performance

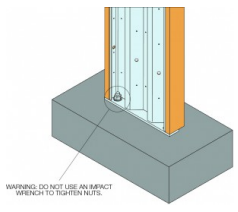
The thermal performance of Steel Strong-Wall™ has been independently assessed by TRADA Technology Ltd. for the stated insulation options below.

Typical Construction Details

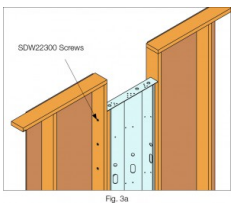
Insulation Description and Position	Overall Insulation Thickness (mm)	Insulation Lambda (W/mK)	Wall U-Value (W/m2K)
Celotex GA3000 on outside face of Steel Strong-Wall™	50	0.023	0.36
Kingspan TW55 on outside face of Steel Strong-Wall™	50	0.023	0.36
Steico Flex on outside face of Steel Strong-Wall™	50	0.038	0.42
Knauf Earthwool on outside face of Steel Strong-Wall™	50	0.032	0.40
Celotex GA3000 on outside face of Steel Strong-Wall™ + Cavity Fill	100	0.023	0.23
Kingspan TW55 on outside face of Steel Strong-Wall™ + Cavity Fill	100	0.023	0.22



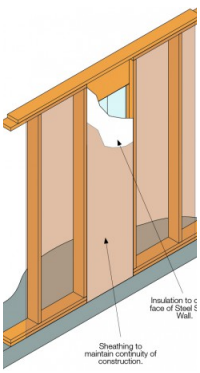
Drilling Template



2a: Position the Steel Strong-Wall over the anchor bolt rods



3a: The Steel Storng-Wall can be secured to the



1a: Position the drilling template (provided) on top of the foundations in the required position, ensuring the correct orientation of the template. The drilling template is the same size as the bottom of the Steel Strong-Wall. 1b: Drill vertically though the drilling template in the positions marked. Drill holes to the stated diameter and depth (indicated on the template). 1c: Ensure the holes are cleaned thoroughly. 1d: Install the anchor bolts supplied (AT-HP resin with M20X245 threaded rod for SSWT305 and M24X310 threaded rod for SSWT610.

and level by using the TFLS ssteel shims and structural grout if required. Plumb and where necessary provide temporary bracing, which can be adjacent timber frame panels if already installed. 2b: Install nuts and washers and tighten by hand. once the AT-HP resin has cured, tighten the nut to the recommended torque (M20: 150nM torque using 36mm socket). Do not over-tighten nuts as this may lead to premature failure.

adjacent timber frame wall panels using SDW22300 screw, installed from the time frame side as shown in fig 3a. the spacing of the SDW screws is to be determined by the engineer responsible for the design structure. Alternate fastening specification shall be in accordance to engineers instructions.

4a: Connect the top of the Steel Strong-Wall to the timber frame structure through the pre-drilled holes in the top plate with the SDS screws provided. If required, as a height make-up piece, a single solid timber packer (typically LVL) should be inserted between the top of the Steel Strong-Wall and the timber structure. 4b: Install the head binder over the timber frame and the Steel Strong-Wall. 4c: Install insulation on the outer face of the Steel Strong-Wall panel and close off the panel by installing sheathing to the face of the timber studs - thus maintaining continuity in the timber frame construction. Sheathing to be installed in accordance with engineers instructions.

TECHNICAL NOTES