SMSA/DMSA *Machine Screw Anchors*

SIMPSON StrongTie ANCHOR SYSTEMS

The SMSA is a corrosion resistant, die cast machine bolt anchor with a single internal expanding cone for use in concrete, concrete block and brick.

The DMSA utilizes the same basic anchor design as the SMSA but with double expansion cones to provide higher loads and better performance in base materials of questionable strength.

MATERIAL: Die cast Zamac 3 alloy

CODES: DMSA Meets Federal Specifications A-A-1923A, Type 3, except DMSA25 and DMSA31. SMSA Meets Federal Specifications A-A-1923A, Type 2

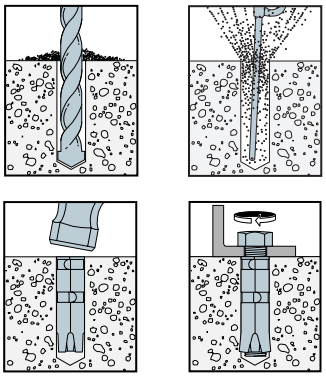
INSTALLATION:

Caution: Oversized holes will make it difficult to set the anchor and will reduce the anchor's load capacity.

- Drill a hole in the base material using the appropriate diameter carbide drill bit as specified in the table. Drill the hole to the specified embedment depth plus ⅛" for flush mounting. Blow the hole clean using compressed air. Overhead installations need not be blown clean. Alternatively, drill the hole deep enough to accommodate embedment depth and dust from drilling.
- Insert anchor into hole. Tap with hammer until flush with surface.
- Position fixture; insert screw and tighten. The bolt must engage a minimum of ⅔ of the anchor threads.

SMSA DMSA

Installation Sequence



SMSA Product Data

Bolt (dia. - threads per inch)	Model No.	Drill Bit Dia. (in.)	Embed. Depth (in.)	Quantity	
				Box	Carton
¼ - 20	SMSA25	½	1⅜	100	500
5/16 - 18	SMSA31	⅝	1⅝	100	400
⅜ - 16	SMSA37	⅝	1⅝	50	200
½ - 13	SMSA50	⅞	2½	25	100

1. Machine bolt is not included.

SMSA Tension Loads in Normal-Weight Concrete

Bolt (dia. - threads per inch)	Model No.	Drill Bit Dia. (in.)	Embed. Depth (in.)	Allowable Tension Load (lbs.)	Quantity	
				f'c ≥ 3000 psi	Box	Carton
¼ - 20	SMSA25	½	1⅜	235	100	500
5/16 - 18	SMSA31	⅝	1⅝	585	100	400
⅜ - 16	SMSA37	⅝	1⅝	585	50	200
½ - 13	SMSA50	⅞	2½	770	25	100

1. The allowable loads listed are based on a safety factor of 4.0.
2. The minimum concrete thickness is 1½ times the embedment depth.
3. Machine bolt is not included.

SMSA Tension and Shear Loads in Lightweight Hollow CMU

Bolt (dia. - threads per inch)	Model No.	Drill Bit Dia. (in.)	Embed. Depth (in.)	Allowable Tension Load (lbs.)	Allowable Shear Load (lbs.)	Quantity	
						Box	Carton
¼ - 20	SMSA25	½	1⅜	165	415	100	500
⅜ - 16	SMSA37	⅝	1⅝	250	485	50	200

1. Values for 8-inch wide CMU grade N, Type II concrete masonry units conforming to UBC Standard 21-4 or ASTM C90. Mortar is prepared in accordance with Section 2103.3 of the UBC and UBC Standard 21-15. The minimum specified compressive strength of masonry is 1,900 psi.
2. Embedment depth is measured from the outside face of the concrete masonry unit for installation through a face shell.
3. The tabulated allowable loads are based on a safety factor of 5.0 for installations under the IBC and IRC. For installations under the UBC use a safety factor of 4.0 (multiply the tabulated allowable loads by 1.25).
4. All holes are drilled with a carbide-tipped drill bit in the rotation-only mode.

DMSA Product Data and Tension and Shear Loads in Normal-Weight Concrete

Bolt (dia. - threads per inch)	Model No.	Drill Bit Dia. in.	Embed. Depth in. (mm)	Critical Edge Dist. in. (mm)	Tension Load		Shear Load	Quantity	
					f'c ≥ 3000 psi (20.7 MPa)	f'c ≥ 4000 psi (27.6 MPa)	f'c ≥ 3000 psi (20.7 MPa)		
					Allowable lbs. (kN)	Allowable lbs. (kN)	Allowable lbs. (kN)	Box	Carton
¼ - 20	DMSA25	½	1½ (38)	3 (76)	265 (1.2)	305 (1.4)	370 (1.6)	100	500
5/16 - 18	DMSA31	⅝	1¾ (44)	3½ (89)	290 (1.3)	335 (1.5)	690 (3.1)	100	400
⅜ - 16	DMSA37	¾	2¼ (57)	4½ (114)	765 (3.4)	920 (4.1)	1,300 (5.8)	50	200
½ - 13	DMSA50	⅞	2¾ (70)	5½ (140)	765 (3.4)	920 (4.1)	1,770 (7.9)	25	100

*See page 10 for an explanation of the load table icons

1. The allowable loads listed are based on a safety factor of 4.0.
2. 100% of the allowable load is permitted at critical edge distance. No reduction in edge distance is allowed.
3. The minimum concrete thickness is 1½ times the embedment depth.
4. Machine bolt is not included.