Ultimate Load Capacities for 3/16" & 1/4" Sure-Con® Concrete Screw Anchors in Normal-Weight Concrete[1,2]

Anchor Size	Min. Embed. Depth h_{nom} (in.)	Minimum Concrete Compressive Strength									
		f'c = 2,500 psi		f'c = 3,000 psi		f'c = 4,000 psi		f'c = 6,000 psi		f'c = 8,000 psi	
		Tension (lbs.)	Shear (lbs.)	Tension (lbs.)	Shear (lbs.)	Tension (lbs.)	Shear (lbs.)	Tension (lbs.)	Shear (lbs.)	Tension (lbs.)	Shear (lbs.)
3/16"	1.75	939	634	990	634	1076	634	1210	634	1316	634
1/4"	1.75	1590	1393	1742	1393	2011	1393	2463	1393	2844	1393

1. Tabulated load values are for anchors installed in concrete. Concrete compressive strength must be at the specified minimum at the time of installation.
2. Ultimate load capacities must be reduced by a minimum safety factor of 4.0 or greater to determine allowable working load.

Allowable Load Capacities for 3/16" & 1/4" Sure-Con® Concrete Screw Anchors in Normal-Weight Concrete[1,2,3]

Anchor Size	Embed. Depth h_{nom} (in.)	Minimum Concrete Compressive Strength									
		f'c = 2,500 psi		f'c = 3,000 psi		f'c = 4,000 psi		f'c = 6,000 psi		f'c = 8,000 psi	
		Tension (lbs.)	Shear (lbs.)	Tension (lbs.)	Shear (lbs.)	Tension (lbs.)	Shear (lbs.)	Tension (lbs.)	Shear (lbs.)	Tension (lbs.)	Shear (lbs.)
3/16"	1.75	235	159	247	159	269	159	303	159	329	159
1/4"	1.75	398	348	435	348	503	348	616	348	711	348

1. Allowable load capacities listed are calculated using and applied safety factor of 4.0. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.
2. Linear interpolation may be used to determine allowable loads for intermediate compressive strengths.
3. Allowable load capacities are multiplied by reduction factors found when anchor spacing or edge distances are less than critical distances.

Anchor Installed into Grouted Masonry Wall Face[1,2,3,4,5]

Anchor Installed into Grouted Masonry Wall Face						
Size	Min. Embed.	Min. Edge Dist.	Min. Spacing	Tension	Shear	
	h_{nom}	c_{min}	s_{min}	f'm = 1,500psi	Direction of loading	f'm = 1,500psi
	in.	in.	in.	lbs.		lbs.
3/16"	1.5	3	1.5	66	Any	109
1/4"	1.5	3	2	137	Any	220

1. The tabulated allowable loads are for anchors installed in minimum 6-inch-wide grout-filled concrete masonry units and must have reached the minimum specified masonry compressive strength at the time of installation.
2. The minimum embedment, h_{nom} is measured from the outside surface of the concrete masonry unit to the embedded end of the anchor.
3. Anchors may only be installed in the grouted cells and in cell webs and bed joints not closer than 1 3/8 inches from head joints. The minimum edge and end distance, c_{min}, must be maintained.
4. The tabulated minimum edge and end distance, c_{min}, are equal to the critical edge distance, c_{cr}, for the anchors. The tabulated minimum spacing s_{min}, is also equal to the critical spacing, s_{cr}, for the anchors.
5. The tabulated allowable loads are barded on a safety factor of 5.0.

Anchor Installed into Top of Grouted Masonry Walls[1,2,3,4,5]

Anchor Installed into Top of Grouted Masonry Walls							
Size	Min. Embed.	Min. Edge Dist.	Min. End Dist.	Min. Spacing	Tension	Shear	
	h_{nom}	$c_{min,1}$	$c_{min,2}$	s_{min}	f'm = 1,500psi	Direction of loading	f'm = 1,500psi
	in.	in.	in.	in.	lbs.		lbs.
3/16"	1.5	1.5	3	3	60	Any	126
1/4"	1.5	1.5	3	3	157	Any	173

1. The tabulated allowable loads are for anchors installed in minimum 6-inch-wide grout-filled concrete masonry units and must have reached the minimum specified masonry compressive strength at the time of installation.
2. The minimum embedment, h_{nom} is measured from the outside surface of the concrete masonry unit to the embedded end of the anchor.
3. Anchors may only be installed in the grouted cells not closer than 1 1/2 inches from head joints. The minimum edge and end distance, c_{min}, must be maintained.
4. The tabulated minimum edge and end distance, c_{min}, are equal to the critical edge distance, c_{cr}, for the anchors. The tabulated minimum spacing s_{min}, is also equal to the critical spacing, s_{cr}, for the anchors.
5. The tabulated allowable loads are barded on a safety factor of 5.0.

Reference lateral design values (Z) for wood-to-wood connections[1,2,3,4,5,6]

Reference lateral design values (Z) for wood-to-wood connections				
Size	min. side member thickness	min. main member thickness	Z for minimum specific gravities of:	
	t_s	p	0.6-0.5	0.5-0.4
	in.	in.	lbs	lbs
3/16"	0.75	1	65	40
1/4"	0.75	1	73	48

1. Tabulated reference lateral design values, Z, apply to single shear connections with wood main and side members have specific gravity as shown, in which the screw anchor is oriented perpendicular to the grain and loaded laterally at any angle with respect to the grain. For connections in which the main and side members have different specific gravities, use the lower of the two. Gaps are not permitted between the main and side memebers.
2. Values must be multiplied by all applicable adjustment factors, as applicable to dowel-type fasteners, in accordance with the NDS.
3. Sure-Con® Concrete screw anchors must be installed and used in dry in-service conditions, such that the wet service factor, CM, is 1.0 in accordance with the NDS
4. Side members with thicknesses greater than the tabulated minimum side member thickness may be used, provided the corresponding tabulated minimum main member penetration is still achieved for the given screw anchor length.
5. Minimum main member penetration is the minimum length of the screw anchor (including threaded, unthreaded and tip length) that must be embedded within the main member.
6. Specific gravity must be assigned specific gravity for sawn lumber or wood structural panels per the NDS.

Reference withdrawal design values (W)			
Size	Thread Length	W for Specific Gravities of:	
		0.42	0.55
	in.	lbs/in.	lbs/in.
3/16"	1 5/8 to 2-1/4	103	177
1/4"	1 5/8 to 2-1/4	123	210

1. Tabulated reference lateral design values, W, apply to screw anchors driven into the side grain of the main member, such that the screw anchors are orientied perpendicular to the grain and loaded in direct withdrawal.
2. Values must be multiplied by all applicable adjustment factors, as applicable to wood screws, in accordance with the NDS.
3. Sure-Con® Concrete screw anchors must be installed and used in dry in-service conditions, such that the wet service factor, CM, is 1.0 in accordance with the NDS
4. Reference withdrawal design values are to be multiplied by the length of thread penetration into the main member, but must not exceed the head pull-through design values. Main member penetration must be >= 1". Threaded length includes tapered tip.
5. Concrete screw anchors have not been evaluated for withdrawal in wood members having specific gravities less than 0.42
6. Specific gravity must be assigned specific gravity for sawn lumber or wood structural panels per the NDS.

Head pull-through design values (P)						
Size	Head Type	min. side member thickness	P for Specific Gravities of:			
		t_s	0.55	0.54	0.52	0.48
		in.	lbf	lbf	lbf	lbf
3/16"	All head type	1.00	163	134		
1/4"	All head type	1.00			182	134

1. Tabulated head pull-through design values P, must be multiplied by all applicable adjustment factors, as applicable to wood screw withdrawal, in accordance with the NDS.
2. Design values apply to connections with minimum side member thicknesses, ts, as given above.
3. Concrete screw anchors must be installed and used in dry in-service conditions, such that the wet service factor, CM, is 1.0 in accordance with the NDS.
4. Sure-Con® Concrete screw anchors have not been evaluated for head pull - through resistance in wood members having specific gravities less than 0.54 (3/16") /0.48 (1/4").
5. Specific gravity must be assigned specific gravity for sawn lumber or wood structural panels per the NDS.

Connection Geometry Requirements			
Condition		Minimum distance or spacing	
		3/16"	1/4"
		in.	in.
End Distance	Loading toward end	3	3
	Loading away from end	1.75	1.75
	Loading perpendicular to grain	1.44	1.85
Edge distance	Any load direction	0.36	0.46
Spacing between fasteners in a row	Loading parallel to grain	2.16	2.78
	Loading perpendicular to grain	1.44	1.85
Spacing between rows	In-line rows	0.72	0.93
	Staggered rows	0.36	0.46

1. End distances, edge distances and screw anchor spacing must be sufficient to prevent splitting of the wood, or as required by this table, whichever is the more restrictive.
2. Values for spacing between staggered rows apply where screw anchors in adjacent rows are offset by half of the spacing between screw anchors in a row.