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**SEISMIC ANCHOR STUD  
WITH NUT & WASHER  
SEISMIC ANCHOR  
SELF-TAPPING,  
SEISMIC ROD ANCHOR**

# SAS, SASE, SAST & SRA

DATA SHEET DS-213

Anchorage of equipment in seismic zones is an important part of system restraint. When anchoring to concrete there are a variety of methods available. One excellent method is an Adhesive Anchor. Our type SRA anchor uses either standard A-307 Grade C or high strength A-193 Grade B7 threaded rod. The new adhesive is a two component high solids, epoxy based anchoring system. It can be used in all non-overhead applications to give you high load capacity. This adhesive will anchor the SRA for higher load capabilities. Another advantage is the lower reduction factors for closer spacings and edge distances. The SRA anchor is weather resistant and can even be installed in water filled holes.

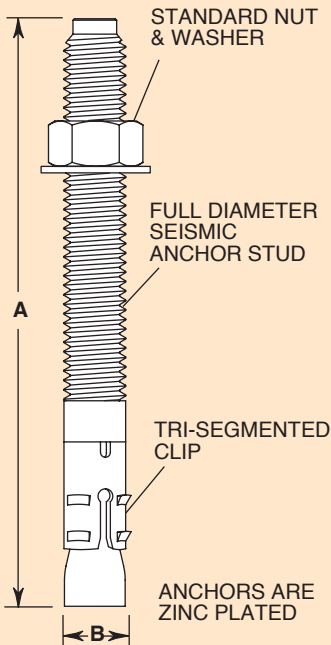
Another excellent device is the wedge type expansion anchor. Since it is load assisted, it provides excellent resistance to vibration and shock loads. Its slip potential is actually a positive feature in seismic applications, giving early warning of potential failure whereas other anchors just fail catastrophically. Mason's SAS seismic anchor stud is

a wedge anchor for suspension applications such as our SCB, seismic cable brace system, for use on piping and suspended equipment. In many parts of the country concrete filled steel decking is used for floor slabs. The new SAS anchor is approved for use attached to the underside of a concrete filled steel deck in either the upper or lower flutes of the steel deck.

The Mason SAST anchor is a concrete screw. Equipment can be moved into position and the SAST's hole can be drilled through the equipment plate and the anchor screwed in similar to a self tapping steel screw. They can be removed and re-installed in the same hole. This is useful for equipment that must be removed and inspected periodically.

All three of these anchors have been tested in accordance with ACI 355.2 and have obtained ICC Evaluation Services test reports. ACI 355.2 is a testing procedure that includes both cracked and uncracked concrete. The cracked testing is used to evaluate the anchor for seismic installations, and yields lower allowable values.

## SAS and SASE



### TYPE SAS STANDARD LENGTH ANCHOR STUD RATINGS BASED ON ALLOWABLE STRESS DESIGN (ASD) installed into 2500 psi (17.2 Mpa) Normal Weight or Sand-Lightweight Concrete\*

Type and Size	Embedment Depth (in) (mm)	Normal Weight Concrete		Lightweight Concrete	
		Tension† (lbs) (kg)	Shear (lbs) (kg)	Tension† (lbs) (kg)	Shear (lbs) (kg)
SAS-3/8	2 51	445 200	650 295	360 165	390 175
SAS-1/2	2 3/4 70	980 445	1055 480	590 270	635 290
SAS-5/8	3 3/8 86	1325 600	2845 1290	795 360	1710 775
SAS-3/4	4 1/8 105	1520 690	3870 1755	915 415	2325 1055
SAS-1	5 1/4 133	2220 1005	5960 2705	1335 605	3575 1620

### TYPE SASE EXTENDED LENGTH ANCHOR STUD RATINGS BASED ON ALLOWABLE STRESS DESIGN (ASD) installed into 2500 psi (17.2 Mpa) Normal Weight or Sand-Lightweight Concrete\*

Type and Size	Embedment Depth (in) (mm)	Normal Weight Concrete		Lightweight Concrete	
		Tension† (lbs) (kg)	Shear (lbs) (kg)	Tension† (lbs) (kg)	Shear (lbs) (kg)
SASE-3/8	2 7/8 73	950 430	820 390	690 315	820 370
SASE-1/2	3 7/8 98	1275 580	2960 1340	1080 490	2325 1055
SASE-5/8	5 1/8 130	2355 1070	4520 2050	1660 755	3580 1625
SASE-3/4	5 3/4 146	2740 1245	6980 3165	1645 745	4190 1900

### TYPE SAS & SASE ANCHOR STUD RATINGS BASED ON ALLOWABLE STRESS DESIGN (ASD) installed in the Soffit of 3000 psi (20.7 Mpa) Normal Weight or Sand-Lightweight Concrete-filled Profile Steel Deck Assemblies\*.

ANCHORS must be installed in either the lower or upper flutes of the profile deck.

Type and Size	Embedment Depth (in) (mm)	Tension (lbs) (kg)		Shear (lbs) (kg)	
		(lbs) (kg)	(lbs) (kg)	(lbs) (kg)	(lbs) (kg)
SAS-3/8	2 51	430 195	725 330		
SASE-3/8	3 3/8 86	760 345	1590 720		
SAS-1/2	2 3/4 70	695 315	970 440		
SASE-1/2	4 1/2 114	930 420	2085 945		
SAS-5/8	3 3/8 86	890 405	1200 545		
SASE-5/8	5 5/8 143	1700 770	3185 1445		

For combined allowable stress design tension and shear forces on anchors, use the following equation:

$$\frac{T_{\text{Applied}}}{T_{\text{Allowable (ASD)}}} + \frac{V_{\text{Applied}}}{V_{\text{Allowable (ASD)}}} \leq 1.2$$

### TYPE SAS & SASE ANCHOR STUD DIMENSIONS

Type and Size	A		B		Maximum Tightening Torque	
	(in)	(mm)	(in)	(mm)	(Ft-lbs)	(N-m)
SAS-3/8	3 1/2	89	3/8	10	30	41
SAS-1/2	4 1/4	108	1/2	13	50	68
SAS-5/8	5	127	5/8	16	85	116
SAS-3/4	6 1/4	159	3/4	19	180	244
SAS-1	7	178	1	25	230	312
SASE-3/8	5	127	3/8	10	30	41
SASE-1/2	5 1/2	140	1/2	13	50	68
SASE-5/8	7	178	5/8	16	85	116
SASE-3/4	8 1/2	216	3/4	19	180	245

ANCHORS have the following Code Reports:

- ICC-ES-ESR-1771 and City of Los Angeles RR25705 for cracked & uncracked concrete
- Florida Statewide Product Approval FL11506.6

\* These values are applicable when the anchors are installed with periodic special inspection as set forth in Section 1701.5.2 and Section 1704.13 of the IBC.

† The Tension values may be increased for greater compressive strength, up to 8500 psi (58.6 MPa), by multiplying the value by  $(F'_c/2500)^{0.5}$ , where  $F'_c$  is the specified strength of concrete in psi.

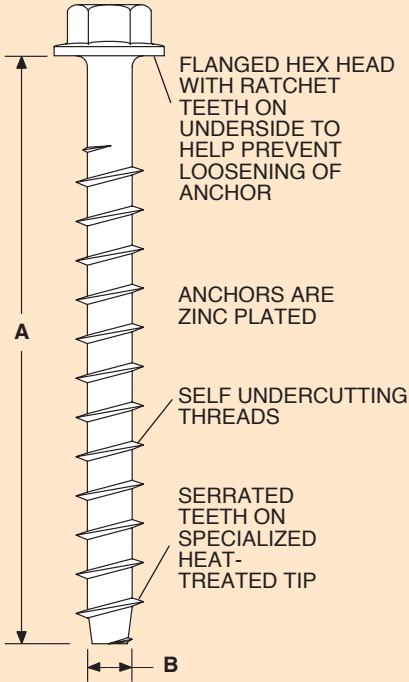
For example: SAS-1/2 in 4000 psi normal weight concrete

$$T = \left(\frac{4000}{2500}\right)^{0.5} \times 980 \text{ lbs} = 1240 \text{ lbs}$$

#### NOTES:

1. All values are for single anchors with no edge distance or spacing reduction.
2. Anchorage must be designed in accordance with ACI 318-05 Appendix D.
3. Allowable loads are for the attachment of non-structural components.
4. Allowable loads are based on 100% seismic loading in seismic design categories C-F.

## SAST SEISMIC ANCHOR SELF-TAPPING



### TYPE SAST ANCHOR BOLT RATINGS BASED ON ALLOWABLE STRESS DESIGN (ASD)

Type and Size	Embedment Depth (in) (mm)	Installed into 2500psi (17.2Mpa) Normal Weight Concrete				Installed into 2500psi (17.2Mpa) Lightweight Concrete				Maximum Tightening Torque	
		Tension† (lbs) (kg)	Shear (lbs) (kg)	Tension† (lbs) (kg)	Shear (lbs) (kg)	Tension† (lbs) (kg)	Shear (lbs) (kg)	(Ft-lbs) (N-m)	(Ft-lbs) (N-m)		
SAST-3/8	3 1/4 83	920 410	1160 525	555 250	695 315	50 68	65 88				
SAST-1/2	4 102	1500 680	2010 910	900 405	1205 545	140 190	150 205				
SAST-5/8	4 1/2 114	1810 820	3870 1755	1085 490	2325 1055						
SAST-3/4	5 1/2 140	2070 940	3925 1780	1245 565	2355 1065						

For combined allowable stress design tension and shear forces on anchors, use the following equation:

$$\frac{T_{Applied}}{T_{Allowable (ASD)}} + \frac{V_{Applied}}{V_{Allowable (ASD)}} \leq 1.2$$

\* These values are applicable when the anchors are installed with periodic special inspection as set forth in Section 1701.5.2 and Section 1704.13 of the IBC.

† The Tension values may be increased for greater compressive strength, up to 8500 psi (58.6 MPa), by multiplying the value by  $(F'_c/2500)^{0.5}$ , where  $F'_c$  is the specified strength of concrete in psi.  
For example: SAST-1/2 in 4000 psi normal weight concrete

$$T = \left(\frac{4000}{2500}\right)^{0.5} \times 1500 \text{ lbs} = 1895 \text{ lbs}$$

### TYPE SAST ANCHOR BOLT DIMENSIONS

Type and Size	A		B	
	(in)	(mm)	(in)	(mm)
SAST-3/8	4	102	3/8	10
SAST-1/2	5	127	1/2	13
SAST-5/8	6	152	5/8	16
SAST-3/4	7	178	3/4	19

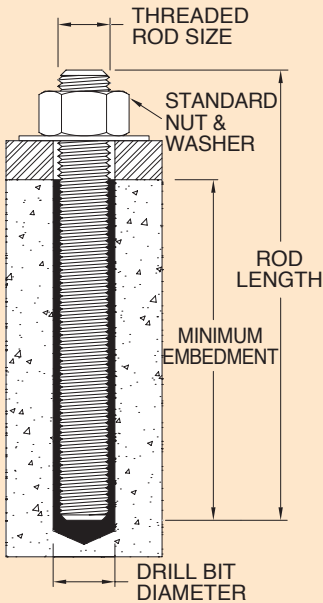
Anchors have the following Code Reports:

- ICC-ES-ESR-2713 and City of Los Angeles Report RR25741 for cracked & uncracked concrete
- ICC-ES-ESR-1056 and City of Los Angeles Report RR25560 for CMU (Concrete Masonry Units)
- Florida Statewide Approval FL11506.7
- Factory Mutual 3017082

### NOTES:

1. All values are for single anchors with no edge distance or spacing reduction.
2. Anchorage must be designed in accordance with ACI 318-05 Appendix D.
3. Allowable loads are for the attachment of non-structural components.
4. Allowable loads are based on 100% seismic loading in seismic design categories C-F.

## SRA



### TYPE SRA ANCHOR DATA

Type and Size	Threaded Rod Size	Rod Length		Embedment Depth		Drill Bit Dia (in)	Minimum Concrete Thickness		Maximum Tightening Torque After curing		Number of Anchors that can be installed per 22oz of adhesive
		(in)	(mm)	(in)	(mm)		(in)	(mm)	(Ft-lbs)	(N-m)	
SRA-1/2	1/2-13 UNC	7	178	5	127	5/8	7 1/2	190	20	27	30
SRA-5/8	5/8-11 UNC	8	203	6	152	3/4	9 1/4	235	30	41	20
SRA-3/4	3/4-10 UNC	9	229	7	178	7/8	10 3/4	273	45	61	14
SRA-1	1-8 UNC	11	280	9	229	1 1/8	14	355	80	108	7

### CURE SCHEDULE†

Concrete Temperature	Cure Time (Hrs.)	
	°F	°C
50	10	72
70	21	24
90	32	24
110	43	24

For combined allowable stress design tension and shear forces on anchors, use the following equation:

$$\frac{T_{Applied}}{T_{Allowable (ASD)}} + \frac{V_{Applied}}{V_{Allowable (ASD)}} \leq 1.2$$

†For water saturated concrete, these times should be doubled.

### NOTES:

1. All values are for single anchors with no edge distance or spacing reduction.
2. Anchorage must be designed in accordance with ACI 318-05 Appendix D.
3. Allowable loads are for the attachment of non-structural components.
4. Allowable loads are based on 100% seismic loading in seismic design categories C-F.

Anchors have the following Code Reports:

- ICC-ES-ESR-2508 and City of Los Angeles Report RR25744 for cracked & uncracked concrete
- NSF/ANSI Standard 61 (216in<sup>2</sup> / 1000 gal)

### TYPE SRA ANCHOR RATINGS BASED ON ALLOWABLE STRESS DESIGN (ASD)

installed into 2500 psi (17.2 Mpa) Normal Weight Concrete\*

Type and Size	A307 Grade C Threaded Rod		A193 Grade B7 Threaded Rod		A193 Grade B6 Stainless Steel (Type 410) Threaded Rod		A193 Grade B8 Stainless Steel (Type 18-8, 304) Threaded Rod	
	Tension (in) (mm)	Shear (lbs) (kg)	Tension (lbs) (kg)	Shear (lbs) (kg)	Tension (lbs) (kg)	Shear (lbs) (kg)	Tension (lbs) (kg)	Shear (lbs) (kg)
SRA-1/2	2360 1070	1595 720	2360 1070	3440 1560	2360 1070	3410 1545	2360 1070	2325 1055
SRA-5/8	2440 1105	2540 1150	2440 1105	5475 2480	2440 1105	5425 2460	2440 1105	3700 1680
SRA-3/4	4780 2165	3755 1700	4780 2165	8095 3670	4780 2165	8015 3635	4780 2165	5465 2480
SRA-1	7830 3552	6815 3090	7830 3552	14685 6660	7830 3552	14545 6600	7830 3552	9920 4500