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

SAS, SASE, SAST & SRA

DATA SHEET DS-213-1.1

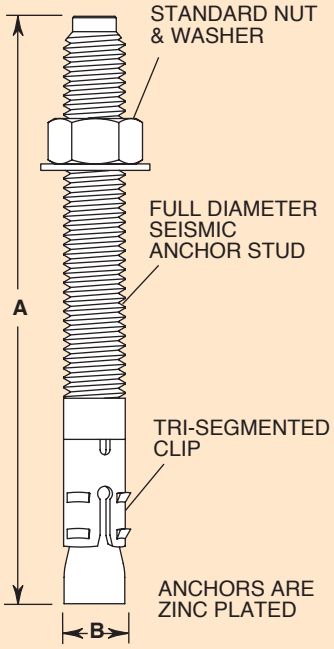
Anchorage of equipment in seismic zones is an important part of system restraint. When anchoring to concrete there are a variety of methods available. One excellent method is an Adhesive Anchor. Our type SRA anchor uses either standard A-307 Grade C or high strength A-193 Grade B7 threaded rod. The new 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 Tension† (lbs) (kg)	Normal Weight Concrete Shear (lbs) (kg)	Lightweight Concrete Tension† (lbs) (kg)	Lightweight Concrete 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 Tension† (lbs) (kg)	Normal Weight Concrete Shear (lbs) (kg)	Lightweight Concrete Tension† (lbs) (kg)	Lightweight Concrete 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)
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:

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

TYPE SAS & SASE ANCHOR STUD DIMENSIONS

Type and Size	A (in) (mm)	B (in) (mm)	Maximum Tightening Torque (Ft-lbs) (N-m)
SAS-3/8	3 1/2 89	3/8 10	30 41
SAS-1/2	4 3/4 121	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

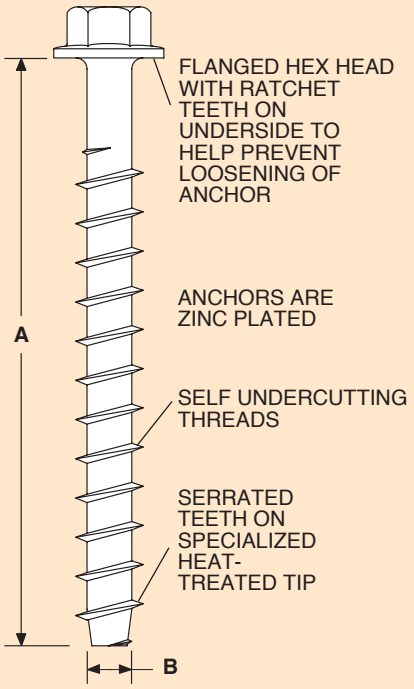
* These values are applicable when the anchors are installed with periodic special inspection as set forth in Section 1701.5.2 and Section 1704.13 of the IBC.

† 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 318-11 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 Tension† (lbs) (kg)	Shear (lbs) (kg)	Installed into 2500psi (17.2Mpa) Lightweight Concrete Tension† (lbs) (kg)	Shear (lbs) (kg)	Maximum Tightening Torque (Ft-lbs) (N-m)
SAST-3/8	3 1/4 83	920 410	1160 525	555 250	695 315	50 68
SAST-1/2	4 102	1500 680	2010 910	900 405	1205 545	65 88
SAST-5/8	4 1/2 114	1810 820	3870 1755	1085 490	2325 1055	140 190
SAST-3/4	5 1/2 140	2070 940	3925 1780	1245 565	2355 1065	150 205

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

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

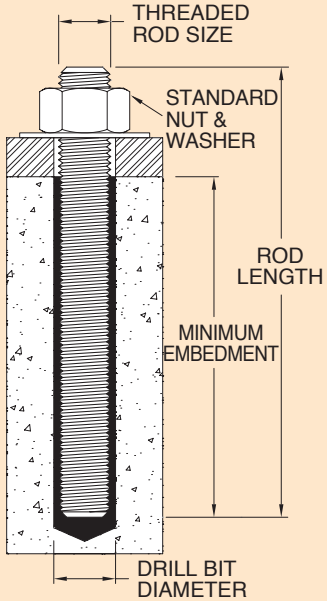
TYPE SAST ANCHOR BOLT DIMENSIONS

Type and Size	A (in) (mm)	B (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 318-11 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
SEISMIC ROD ANCHOR



TYPE SRA ANCHOR DATA

Type and Size	Threaded Rod Size	Rod Length (in) (mm)	Embedment Depth (in) (mm)	Drill Bit Dia (in)	Minimum Concrete Thickness (in) (mm)	Maximum Tightening Torque After curing (Ft-lbs) (N-m)	Number of Anchors that can be installed per 22oz of adhesive
SRA-3/8	3/8-16 UNC	6 152	4 102	1/2	5 7/8 149	10 14	40
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 °F	°C	Cure Time (Hrs.)
50	10	72
70	21	24
90	32	24
110	43	24

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

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

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

NOTES:
1. All values are for single anchors with no edge distance or spacing reduction.
2. Anchorage must be designed in accordance with ACI 318-11 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 (216in2 / 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 Tension (in) (mm)	Shear (lbs) (kg)	A193 Grade B7 Threaded Rod Tension (lbs) (kg)	Shear (lbs) (kg)	A193 Grade B6 Stainless Steel (Type 410) Threaded Rod Tension (lbs) (kg)	Shear (lbs) (kg)	A193 Grade B8 Stainless Steel (Type 18-8, 304) Threaded Rod Tension (lbs) (kg)	Shear (lbs) (kg)
SRA-3/8	1585 720	895 405	1585 720	1930 880	1585 720	1350 615	1585 720	700 320
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	3820 1730	8015 3635	3820 1730	5465 2480
SRA-1	7270 3295	6815 3090	7270 3295	14685 6660	7270 3295	14560 6610	7270 3295	9925 4500