PRODUCT GUIDE

BUILT BY AMERICA. CONNECTED WORLDWIDE.

It's a simple idea: make products as reliable and innovative as the people who use them. Today, we are the only company in the world manufacturing American-made plastic, mechanical and chemical injection anchoring systems. And we offer the best service and availability across the country. It's the MKT way.

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WE STRIVE FOR OUR
RELATIONSHIPS TO
BE AS UNBREAKABLE
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MECHANICAL

ANCHORING SYSTEMS

GENERAL INFORMATION

KEY: ● Very Suitable ○ May Be Suitable Per Application

APPLICATION AND PRODUCT SELECTION GUIDE

Anchors		Fastening Base Material								Application Criteria					Program		
Page No.	Types of Anchors	Concrete	Cracked Conc.	Hard Natural Stone	Soft Natural Stone	Solid/ Hollow	Grout Filled Block	Hollow Concrete Block	Wood/ Metal	In-place (through) Fastening	Immediate Loading	Flush Surface Removing	Dynamic Loading	Temp Resistant	Materials	Versions	Characteristics
HEAVY DUTY																	
12-13	SZ High Load Anchor	●	●	○						●	●	●	●	●	- High Strength Steel - 316 Stainless Steel	- Stud - Bolt - Flat Head	Expansion of steel sleeve by an internal cone with the matching taper.
7	Taper Bolt	●		○						●	●	●	●	●	- Grade 5 Steel Zinc Plated - Mechanically Galv. - Stainless Steel	- Hex Head Bolt - Eye Bolt	Metal expansion/ caulking anchor with large expander sleeve
MEDIUM DUTY																	
8	Sup-R-Stud TZ	●	●	○						●	●		●	●	- Zinc Plated Steel	- UNC Male Screw Thread	Expansion of stainless steel collar by tapered stud body
10	Sup-R-Stud TZ SS	●	●	○						●	●		●	●	- 304 / 316 Stainless Steel	- UNC Male Screw Thread	Expansion of stainless steel collar
14	Sup-R-Stud +	●		○			○			●	●		○	●	- Zinc Plated Steel - Mechanically Galv. - 303/304 Stainless Steel - 316 Stainless Steel - Grade 5 steel	- UNC Male Screw Thread - Tie Wire	Expansion of stainless steel collar by tapered stud body
16	Sup-R-Stud + Internal Thread	●		○			○			●	●	●	●	●	Zinc Plated Steel	- UNC Female Screw Thread	Expansion of a steel collar by a tapered stud body
17	Sup-R-Stud V	●		○			○			●	●		○	●	Zinc Plated Steel	- UNC Male Screw Thread	Expansion of a steel collar by a tapered stud body
18	Sup-R-Drop	●		○				○			●	●		●	- Zinc Plated Carbon Steel - 304 Stainless Steel - 316 Stainless Steel	- UNC Female Screw Thread	Expansion of anchor wall by internal tapered plug
19	Coil Threaded Drop	●		○							●	●		●	- Zinc Plated Carbon Steel	- Female Coil Thread	Expansion of anchor wall by internal tapered plug
19	Sup-R-Shorty Drop	●		○							●	●		●	- Zinc Plated Carbon Steel	- UNC Female Screw Thread	Expansion of anchor wall by internal tapered plug
21	Sup-R-Sleeve	●		○	○	○	●	●		●	●	○		●	- Zinc Plated Carbon Steel - 304 Stainless Steel	- Acorn Head - Hex Head - Round Head - Flat Head	Expansion of steel sleeve by tapered body
20	Forway	●		●	●	●	●	●			●	●	○	○	- Zinc Diecast Alloy	- UNC Female Screw Thread	Four way expansion of anchor wall by internal nut
LIGHT DUTY																	
20	Sup-R-Lag	●		●	○	○	○				●	●		○	- Zinc Diecast Alloy	- Female Lag Screw Threads	Body of shield separates when installinglag screw
23	Conset	●		●		●	●	●	○	●	●	●	○	○	- High Strength Steel CR10 Coating	- Hex Head - Phillips Flat Head	Hardened screw thread cuts into concrete or masonry
24	Sup-R-Split	●		●	○	○	○			●	●			●	- Zinc Plated High Strength Steel - CR Electroplate	- Flat Head - Duplex Head	Fastener exerts compressive force against wall of hole
25	Import Single & Double	●		○	○		○				●	●	○	○	- Zinc Diecast Alloy	- UNC Female Screw Threads	Expansion of anchor wall by internal nut
26	Sup-R-Caulk	●		●	●	●	○				●	●			- Lead Shield w/Zinc Expansion nut	- UNC Female Screw Threads	Outer sleeve expanded by driving over plug
26	Sup-R-Lead	●		●	●	●	●	○			●	●			- Lead Diecast Alloy	- Wood Screw	Screw forms lead to hole wall
27	Sup-R-Toggle				○			○	●		●	●	●	○	- Zinc Plated Steel Stamping	- Spring Wing Round, Flat, Mushroom or Hanger Type	Legs Expand behind wall to provide keying hold
27	Plastic Screw Anchor	●		●	●	●	●	○	●		●	●			- Polypropylene	- Wood Screw	Screw forms plastic to hole wall
28	Tap-It	●		●	●	●	●	●	●	●	●			○	- Steel and Aluminum Nail - Stainless Steel Nail (limited Availability)	- Mushroom Heads - Round Heads - Flat Heads	Expansion of body by impact on nail head
29	Uni-Tap	●		●	●	●	●	●	●	●	●		○	○	- Nylon	- Mushroom Head	Hold by reverse tension of flutes
29	Zap-It	●		●	●	●	●	●		●	●			○	- Zinc Diecast Alloy - Carbon Steel - Zinc Plated Nail - Stainless Steel Nail	- Mushroom Head	Expansion of body by impact of nail head
30	Versa Toggle	○		○		○		●	●		●	●	○	○	- Nylon	- Screw	Legs expand behind wall to provide keying hold
30	Wallboard Anchor	○			○				●		●	●	○	○	- Zinc Diecast Alloy - Nylon	- Screw	Oversized threads cut into wall board
31	Holly							○	●		●	●	●	○	- Zinc Plated Sheet Metal	- Regular and Drive	Legs expand behind wall to provide keying hold

Drill Bits meet ANSI B212.15

TAPER BOLT®

AVAILABLE MATERIALS

- Grade 5, zinc plated
- Other metals and finishes are available by special quote
- Eye bolt version available by special quote

FEATURES/ADVANTAGES

- Required hole diameter equals anchor diameter
- Variation in hole size can be accommodated by turning the expander nut
- Equipment may be removed and replaced. The bolt is simply re-inserted and torqued to obtain original holding power (the nut stays in the hole)
- Bolt can be removed and re-used with a new nut after cleaning and lubricating the threads
- Strength – the highest shear strength of any expansion anchor
- Withstands vibratory loads
- Works in a bottomless hole

CONCERNS

- Do not use in brick or block

APPROVALS/LISTINGS

- Tested by Pittsburgh Testing Laboratory PG-2170
- Contact customer service for approvals/ listings for state D.O.T.'s

Ultimate Tensile & Shear Loads in Lbs.

ORDER DETAIL

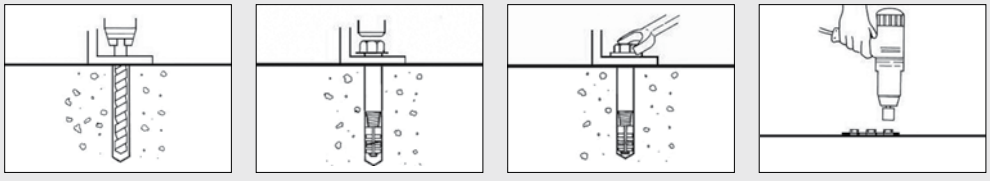
							3000 P.S.I.		5000 P.S.I.			
Order Code Grade 5 Hex Hd. Bolt	Anchor Dia. & Length	Hole Dia.	Min. Embed.	Required Torque to set	Head Size	Required Head Clearance	Tension (lbs.)	Shear (lbs.)	Tension (lbs.)	Shear (lbs.)	Box Qty.	Master Qty.
3420000	3/8" x 2-1/4"	3/8"	1-7/8"	40	9/16"	3/16"	4,030	7,177	4,987	8,567	50	400
3421000	3/8" x 2-5/8"	3/8"	1-7/8"	40	9/16"	3/16"	4,030	7,177	4,987	8,567	50	400
3422000	3/8" x 3"	3/8"	1-7/8"	40	9/16"	3/16"	4,030	7,177	4,987	8,567	50	400
3423000	3/8" x 4"	3/8"	1-7/8"	40	9/16"	3/16"	4,030	7,177	4,987	8,567	50	400
3430000	1/2" x 2-7/8"	1/2"	2-3/8"	90	3/4"	1/4"	8,165	12,177	9,346	15,217	25	200
3431000	1/2" x 4"	1/2"	2-3/8"	90	3/4"	1/4"	8,165	12,177	9,346	15,217	25	200
3432000	1/2" x 5"	1/2"	2-3/8"	90	3/4"	1/4"	8,165	12,177	9,346	15,217	20	100
3440000	5/8" x 3-1/2"	5/8"	2-7/8"	125	15/16"	5/16"	9,990	17,030	10,470	17,257	20	75
3441000	5/8" x 4-1/2"	5/8"	2-7/8"	125	15/16"	5/16"	9,990	17,030	10,470	17,257	25	75
3442000	5/8" x 6"	5/8"	2-7/8"	125	15/16"	5/16"	9,990	17,030	10,470	17,257	25	75
3443000	5/8" x 7"	5/8"	2-7/8"	125	15/16"	5/16"	9,990	17,030	10,470	17,257	25	75
3450000	3/4" x 4-1/8"	3/4"	3-3/8"	250	1-1/8"	7/16"	11,906	27,916	17,073	28,110	20	60
3451000	3/4" x 5-1/2"	3/4"	3-3/8"	250	1-1/8"	7/16"	11,906	27,916	17,073	28,110	20	60
3452000	3/4" x 7"	3/4"	3-3/8"	250	1-1/8"	7/16"	11,906	27,916	17,073	28,110	15	45
3453000	3/4" x 8"	3/4"	3-3/8"	250	1-1/8"	7/16"	11,906	27,916	17,073	28,110	15	45
3460000	1" x 5-5/8"	1"	4-5/8"	550	1-1/2"	5/8"	28,263	36,257	30,817	38,487	10	30
3461000	1" x 6-3/4"	1"	4-5/8"	550	1-1/2"	5/8	28,263	36,257	30,817	38,487	10	30
3462000	1" x 7-1/4"	1"	4-5/8"	550	1-1/2"	5/8	28,263	36,257	30,817	38,487	10	20

ADDITIONAL NUTS

Order Code	Size	Box Qty.	Master Qty.
3420200	3/8"	100	3,000
3430200	1/2"	50	600
3440200	5/8"	50	400
3450200	3/4"	50	400
3460200	1"	10	120

INSTALLATION

1. Drill hole the same diameter as the Taper-Bolt using fixture as a template.
2. Clean hole of debris.
3. Drive Taper-Bolt into place leaving recommended head clearance. If hole is oversized simply remove and pre-expand the expander nut to fit hole.
4. Tighten Taper-Bolt to recommended torque.
5. For big jobs, set Taper-Bolt with an impact wrench. This method offers speed, consistency and greater installer productivity.



SUP-F STUD® TZ

AVAILABLE MATERIALS
• Steel Zinc plated

FEATURES/ADVANTAGES
- ACI 318 category 1 anchor for cracked or uncracked concrete
- Suitable for resisting seismic design loads
- Required hole diameter equals anchor diameter
- Can be loaded immediately
- Nut and washer assembled to anchor
- Simple to install
- For medium to heavy loads

CONCERNS
- Hole diameter is critical
- Concrete only

APPROVALS/LISTINGS
- ACI 318 Category 1 for cracked concrete
- ICC ESR - 2461
- Contact customer service for approvals / listings for state DOT's

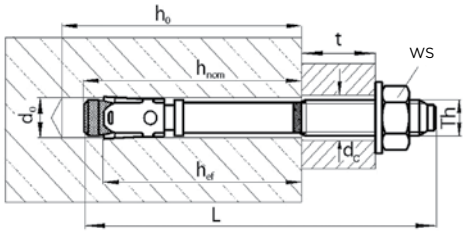
ORDER DETAIL

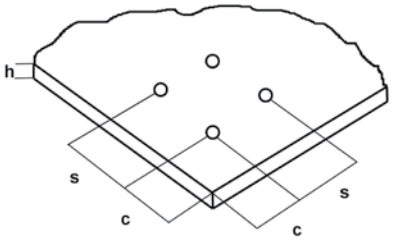
Anchor Dimensions	Order Code	Th [in]	d_o [in]	h_o [in]	h_{nom} [in]	h_{ef} [in]	L [in]	t_{max} [in]	T_{inst} [ft-lbs]	d_c [in]	$_{WS}$ [in]
											
1/2" x 3-3/4"	2112334	1/2	1/2	3-1/4	2-7/8	2-1/2	3-3/4	1/4	35	9/16	3/4
1/2" x 4-1/2"	2112412	1/2	1/2	3-1/4	2-7/8	2-1/2	4-1/2	1	35	9/16	3/4
1/2" x 5-1/2"	2112512	1/2	1/2	3-1/4	2-7/8	2-1/2	5-1/2	2	35	9/16	3/4
1/2" x 7"	2112700	1/2	1/2	3-1/4	2-7/8	2-1/2	7	3-1/2	35	9/16	3/4
5/8" x 4-3/4"	2158434	5/8	5/8	4-1/8	3-3/4	3-1/4	4-3/4	1/4	65	11/16	15/16
5/8" x 6"	2158600	5/8	5/8	4-1/8	3-3/4	3-1/4	6	1-1/2	65	11/16	15/16
5/8" x 8-1/2"	2158812	5/8	5/8	4-1/8	3-3/4	3-1/4	8-1/2	4	65	11/16	15/16
5/8" x 10"	2158100	5/8	5/8	4-1/8	3-3/4	3-1/4	10	5-1/2	65	11/16	15/16

Steel zinc plated / Approved for cracked or uncracked concrete / ACI 318, Category 1

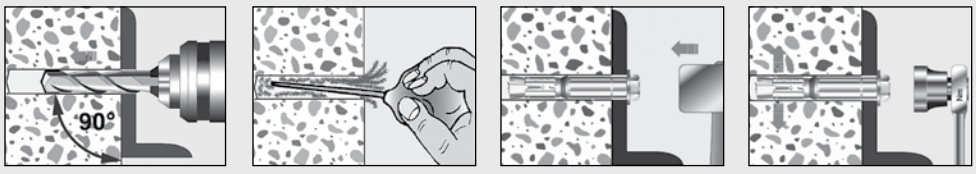
Load & Performance Data	Conc. (psi)	Symbol	Units	1/2"	5/8"
		Cracked Concrete			
Avg.ultimate load,tension	4,000	N_{pn}	lbs	4,447	9,603
Avg. ultimate load, shear	4,000	V_n	lbs	9,621	14,859
Allowable loads, tension[1]	2,500	N_{allow}	lbs	1,234	2,187
	4,000	N_{allow}	lbs	1,561	2,767
	6,000	N_{allow}	lbs	1,912	3,388
	8,500	N_{allow}	lbs	2276	4,034
		Uncracked Concrete			
Allowable loads, tension[1]	2,500	N_{allow}	lbs	1,974	3,088
	4,000	N_{allow}	lbs	2,497	3,906
	6,000	N_{allow}	lbs	3,059	4,784
	8,500	N_{allow}	lbs	3,641	5,694
		Cracked and Uncracked Concrete			
Allowable loads, shear[1]	2,500	V_{allow}	lbs	3,178	4,711
	>4,000	V_{allow}	lbs	3,259	4,839
Spacing & Edge Distance					
Effective anchorage depth		h_{ef}	in	$2^1/_2$	$3^1/_4$
Critical Spacing		S_{ac}	in	16	$19^1/_2$
Critical Edge Distance		C_{ac}	in	8	$9^3/_4$
Minimum Spacing for Edge Distance C		$S_{a,min}/C$	in	$2^1/_2$ / 5	3 / 6
Minimum Edge Distance for Spacing S		$C_{a,min}/S$	in	3 / 6	$3^1/_2$ / $9^1/_2$
Minimum thickness of concrete slab		h_{min}	in	5	$6^1/_2$
Installation Parameters					
Drilled hole diameter		d_o	in	$^1/_2$	$^5/_8$
Diameter of clearance hole		d_c	in	$^9/_{16}$	$^{11}/_{16}$
Depth of drilled hole		h_o	in	$3^1/_4$	$4^1/_8$
Installation torque		T_{inst}	ft-lbs	35	65
Wrench size		WS	in	3/4	$^{15}/_{16}$

1) A safety factor of 1.48 was used to calculate the allowable loads. This is based on a load combination of 30% dead loads and 70% live loads.





INSTALLATION



SUP-T STUD® TZ SS

AVAILABLE MATERIALS
- 304/316 Stainless Steel

FEATURES/ADVANTAGES
- ACI 318 category 1 anchor for cracked or uncracked concrete
- Suitable for resisting seismic design loads
- Required hole diameter equals anchor diameter
- Can be loaded immediately
- Nut and washer assembled to anchor
- Simple to install
- For medium to heavy loads

CONCERNS
- Hole diameter is critical
- Concrete only

APPROVALS/LISTINGS
- ACI 318 Category 1 for cracked concrete
- ICC ESR - 2461
- Contact customer service for approvals / listings for state DOT's

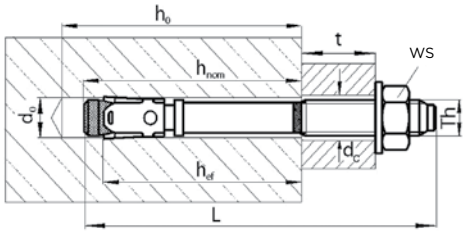
ORDER DETAIL

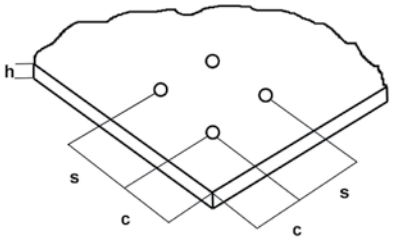
Anchor Dimensions	Order Code 304 / 316SS	Th [in]	d_o [in]	h_o [in]	h_{nom} [in]	h_{ef} [in]	L [in]	t_{max} [in]	T_{inst} [ft-lbs]	d_c [in]	ws [in]
											
1/2" x 3-3/4"	2312334 / 231233S	1/2	1/2	3-1/4	2-7/8	2-1/2	3-3/4	1/4	60	9/16	3/4
1/2" x 4-1/2"	2312412 / 231241S	1/2	1/2	3-1/4	2-7/8	2-1/2	4-1/2	1	60	9/16	3/4
1/2" x 5-1/2"	2312512 / 231251S	1/2	1/2	3-1/4	2-7/8	2-1/2	5-1/2	2	60	9/16	3/4
1/2" x 7"	2312700 / 231270S	1/2	1/2	3-1/4	2-7/8	2-1/2	7	3-1/2	60	9/16	3/4
									304/316SS		
5/8" x 4-3/4"	2358434 / 235843S	5/8	5/8	4-1/8	3-3/4	3-1/4	4-3/4	1/4	110 / 96	11/16	15/16
5/8" x 6"	2358600 / 235860S	5/8	5/8	4-1/8	3-3/4	3-1/4	6	1-1/2	110 / 96	11/16	15/16
5/8" x 8-1/2"	2358812 / 235881S	5/8	5/8	4-1/8	3-3/4	3-1/4	8-1/2	4	110 / 96	11/16	15/16
5/8" x 10"	2358100 / 235810S	5/8	5/8	4-1/8	3-3/4	3-1/4	10	5-1/2	110 / 96	11/16	15/16

304 Stainless Steel / 316 Stainless steel / Approved for cracked or uncracked concrete / ACI 318, Category 1

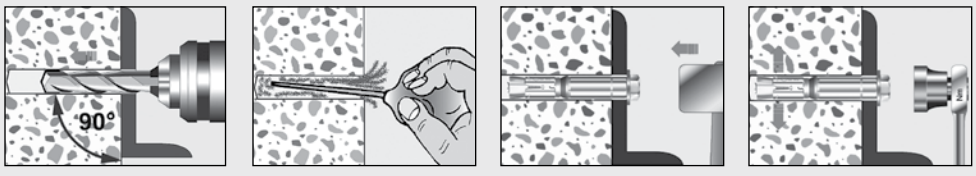
Load & Performance Data	Conc. (psi)	Symbol	Units	1/2"	5/8"
		Cracked Concrete			
Avg.ultimate load,tension	4,000	N_{pn}	lbs	4,447	9,603
Avg. ultimate load, shear	4,000	V_n	lbs	9,615	15,345
Allowable loads, tension[1]	2,500	N_{allow}	lbs	1,234	2,187
	4,000	N_{allow}	lbs	1,561	2,767
	6,000	N_{allow}	lbs	1,912	3,388
	8,500	N_{allow}	lbs	2,276	4,033
		Uncracked Concrete			
Allowable loads, tension[1]	2,500	N_{allow}	lbs	1,974	3,088
	4,000	N_{allow}	lbs	2,497	3,906
	6,000	N_{allow}	lbs	3,058	4,784
	8,500	N_{allow}	lbs	3,640	5,694
		Cracked and Uncracked Concrete			
Allowable loads, shear[1]	2,500	N_{allow}	lbs	2,824	4,711
	>4,000	N_{allow}	lbs	2,824	5,617
Spacing & Edge Distance					
Effective anchorage depth		h_{ef}	in	$2^{1}/_{2}$	$3^{1}/_{4}$
Critical spacing		S_{ac}	in	16	$19^{1}/_{2}$
Critical Edge Distance		C_{ac}	in	8	$9^{3}/_{4}$
		Cracked and Uncracked Concrete			
Minimum Spacing for Edge Distance C		$S_{a,min}/C$	in	$2^{1}/_{2}$ / 5	3 / 6
Minimum Edge Distance for Spacing S		$C_{a,min}/S$	in	3 / 6	$3^{1}/_{2}$ / $9^{1}/_{2}$
Minimum thickness of concrete slab		h_{min}	in	5	$6^{1}/_{2}$
Installation Parameters					
Drilled hole diameter		d_o	in	$^{1}/_{2}$	$^{5}/_{8}$
Diameter of clearance hole		d_c	in	$^{9}/_{16}$	$^{11}/_{16}$
Depth of drilled hole		h_o	in	$3^{1}/_{4}$	$4^{1}/_{8}$
Installation torque		T_{inst}	ft-lbs	60	110 / 96
Wrench size		WS	in	3/4	$^{15}/_{16}$

1) A safety factor of 1.48 was used to calculate the allowable loads. This is based on a load combination of 30% dead loads and 70% live loads.





INSTALLATION



SZ HIGH LOAD ANCHOR

AVAILABLE MATERIALS

- High strength steel
- Flat head style available by special order

FEATURES/ADVANTAGES

- ACI 318 category 1 anchor for cracked or uncracked concrete
- Required hole diameter equals anchor diameter
- Equipment can be removed. The bolt and sleeve can be removed for a flush surface. The expansion sleeve and cone remain in the hole.
- Exceptional strength coupled with the ability to resist seismic loads.
- Metric dimensions for international use.
- Collapsible sleeve allows for secure clamping force.
- Embedment depth is marked on each anchor for easy installation.
- Multiple head styles available.

SZ-S SZ-SK SZ-B

CONCERNS

- Do not use in brick or block
- Must be installed with a metric drill bit

APPROVALS/LISTINGS

- European Technical Approval ETA-02/0030
- Tested by the University of Stuttgart
- ICC ESR-3173 (M12-M28 carbon steel and M12-M24 316 stainless steel)
- ACI 318 category 1

ORDER DETAIL

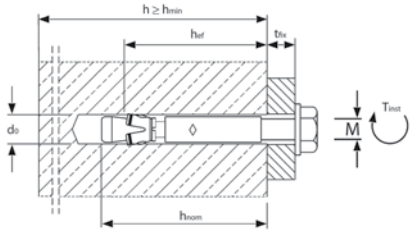
Description	SZ-S (Bolt Version)	SZ-B (Stud Version)	Drill Hole Dia. x Depth (mm)	Min. Embed.(mm)	Anchor Diameter & Length SZ-S (mm)	Anchor Diameter & Length SZ-B (mm)	Thread Diameter (mm)	Maximum Thickness Fastened (mm)	Required Torque to Set (ft. lbs.)	Box Qty.
SZ 10-0	M14005301	M16005301	10 x 65	60	10 x 65	10 x 67	M6	0	11	100
SZ 10-10	M14010301	M16010301	10 x 65	60	10 x 75	10 x 77	M6	10	11	50
SZ 10-30	M14025301	M16025301	10 x 65	60	10 x 95	10 x 97	M6	30	11	50
SZ 10-50	M14030301	M16030301	10 x 65	60	10 x 115	10 x 117	M6	50	11	50
SZ 10-100		M16045301	10 x 65	60		10 x 167	M6	100	11	25
SZ 12-0	M14105301	M16105301	12 x 80	70	12 x 77	12 x 80	M8	0	22	50
SZ 12-10	M14110301	M16110301	12 x 80	70	12 x 87	12 x 90	M8	10	22	50
SZ 12-30	M14125301	M16125301	12 x 80	70	12 x 107	12 x 110	M8	30	22	50
SZ 12-50	M14130301	M16130301	12 x 80	70	12 x 127	12 x 130	M8	50	22	25
SZ 12-100	-	M16145301	12 x 80	70		12 x 180	M8	100	22	25
SZ 15-0	M14205301	M16205301	15 x 95	85	15 x 93	15 x 96	M10	0	37	25
SZ15-15	M14215301	M16215301	15 x 95	85	15 x 108	15 x 111	M10	15	37	25
SZ 15-25	M14220301	M16220301	15 x 95	85	15 x 118	15 x 121	M10	25	37	25
SZ 15-45	M14225301	M16225301	15 x 95	85	15 x 138	15 x 141	M10	45	37	25
SZ 15-95	M14240301	M16240301	15 x 95	85	15 x 188	15 x 191	M10	95	37	25
SZ 18-0	M14305301	M16305301	18 x 105	95	18 x 107	18 x 112	M12	0	59	20
SZ 18-10	M14310301	M16310301	18 x 105	95	18 x 117	18 x 122	M12	10	59	20
SZ 18-20	M14315301	M16315301	18 x 105	95	18 x 127	18 x 132	M12	20	59	20
SZ 18-40	M14325301	M16325301	18 x 105	95	18 x 147	18 x 152	M12	40	59	20
SZ 18-70	M14335301	M16335301	18 x 105	95	18 x 177	18 x 182	M12	70	59	20
SZ 18-100		M16340301	18 x 105	95		18 x 212	M12	100	59	10
SZ 24-0	M14505301	M16505301	24 x 130	120	24 x 132	24 x 137	M16	0	118	10
SZ 24-20	M14515301	M16515301	24 x 130	120	24 x 152	24 x 157	M16	20	118	10
SZ 24- 50	M14525301	M16525301	24 x 130	120	24 x 182	24 x 187	M16	50	118	10
SZ 24-100		M16530301	24 x 130	120		24 x 237	M16	100	118	5
SZ 24-0 L	M14555301	M16555301	24 x 130	135	24 x 150	24 x 152	M16	0	118	10
SZ 24-30 L	M14565301	M16565301	24 x 130	135	24 x 180	24 x 182	M16	30	118	10
SZ 24-50 L	M14575301	M16575301	24 x 130	135	24 x 200	24 x 202	M16	50	118	10
SZ 28-10	M14610301	M16610301	28 x 160	150	28 x 172	28 x 181	M20	10	207	10
SZ 28-30	M14615301	M16615301	28 x 160	150	28 x 192	28 x 201	M20	30	207	10
SZ 28-60	M14625301	M16625301	28 x 160	150	28 x 222	28 x 231	M20	60	207	5
SZ 28-100	M14630301	M16630301	28 x 160	150	28 x 262	28 x 271	M20	100	207	5

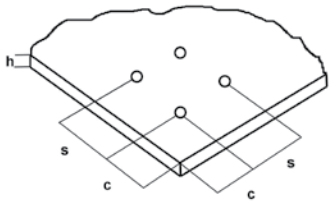
Additional sizes available upon request. To convert to inches, divide millimeters by 25.4.

Load & Performance Data

		Conc.(psi)	Symbol	Units	SZ10 M6	SZ12 M8	SZ15 M10	SZ18 M12	SZ24 M16	SZ24L M16L	SZ28 M20
			Cracked Concrete								
Avg. ultimate load, tension		4,000	N_{pn}	lbs	3,765	5,780	7,717	9,988	14,057	19,227	21,444
Avg. ultimate load, shear	SZ-S	4,000	V_n	lbs	5,620	8,497	12,510	18,849	38,920	38,920	44,623
Avg. ultimate load, shear	SZ-B	4,000	V_n	lbs	5,125	7,171	10,363	19,041	26,212	26,212	37,317
Allowable Tension Loads[1]		2,500	N_{allow}	lbs	484	1,162	1,549	2,206	3,083	3,802	4,308
		4,000	N_{allow}	lbs	612	1,469	1,959	2,790	3,900	4,809	5,450
		6,000	N_{allow}	lbs	750	1,799	2,399	3,417	4,776	5,890	6,675
		8,500	N_{allow}	lbs	892	2,142	2,856	4,068	5,685	7,010	7,944
			Uncracked Concrete								
Allowable Tension Loads[1]		2,500	N_{allow}	lbs	1,539	1,936	2,604	3,114	4,352	5,367	6,082
		4,000	N_{allow}	lbs	1,927	2,449	3,294	3,939	5,505	6,789	7,694
		6,000	N_{allow}	lbs	1,927	2,999	4,034	4,825	6,743	8,315	9,423
		8,500	N_{allow}	lbs	1,927	3,493	4,801	5,742	8,025	9,897	11,216
			Cracked and Uncracked Concrete								
Allowable Shear Loads[1]		2,500	V_{allow}	lbs	1,670	2,557	3,778	4,751	6,640	8,189	9,280
		4,000	V_{allow}	lbs	1,670	2,557	3,778	6,010	8,399	9,519	11,738
		>6,000	V_{allow}	lbs	1,670	2,557	3,778	6,597	9,519	9,519	12,734
Spacing & Edge Distance											
Effective Anchorage Depth			h_{ef}	in	1.97	2.36	2.80	3.15	3.94	4.53	4.92
				(mm)	(50)	(60)	(71)	(80)	(100)	(115)	(125)
Critical Edge Distance			C_{ac}	in	2.95	3.54	4.89	4.72	5.91	6.79	7.38
				(mm)	(75)	(90)	(107)	(120)	(150)	(173)	(188)
Minimum Spacing for Edge Distance C			S_{min}/C	in	1.97/3.15	2.36/3.94	2.76/4.72	3.15/6.30	3.94/7.09	3.94/7.09	4.92/11.81
				(mm)	(50/80)	(60/100)	(70/120)	(80/160)	(100/180)	(100/180)	(125/300)
Minimum Edge Distance for Spacing S			C_{min}/S	in	1.57/3.94	2.36/4.72	2.76/6.89	3.15/7.87	3.94/8.66	7.34/8.66	7.09/21.26
				(mm)	(50/100)	(60/120)	(70/175)	(80/200)	(100/220)	(100/220)	(180/540)
Minimum thickness of concrete slab			h_{min}	in	3.94	4.72	5.51	6.30	7.87	9.06	9.84
				(mm)	(100)	(120)	(140)	(160)	(200)	(230)	(250)
Installation Parameters											
Drilled hole diameter			d_o	in	.39	.47	.59	.71	.94	.94	1.10
				(mm)	(10)	(12)	(15)	(18)	(24)	(24)	(28)
Diameter of clearance hole			d_c	in	.47	.55	.67	.79	1.02	1.02	1.22
				(mm)	(12)	(14)	(17)	(20)	(26)	(26)	(31)
Depth of drilled hole			h_o	in	2.25	3.15	3.74	4.13	5.12	5.71	6.30
				(mm)	(65)	(80)	(95)	(105)	(130)	(145)	(160)
Installation Torque			T_{inst}	ft-lbs	11	22	37	59	118	118	207
Wrench size			WS	(mm)	(10)	(13)	(17)	(19)	(24)	(24)	(30)

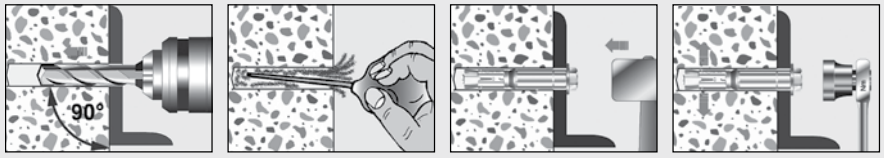
1) A safety factor of 1.48 was used to calculate the allowable loads. This is based on a load combination of 30% dead loads and 70% live loads.





INSTALLATION

1. Drill hole to recommended size and depth.
2. Remove dust, rubble from the hole with compressed air.
3. Using a hammer, tap the anchor through the material to be fastened until the anchor is firmly seated.
4. Tighten the anchor to the specified torque.



Sup-R STUD® +

AVAILABLE MATERIALS

- Carbon steel, zinc plated
- Carbon steel, mechanically galvanized Class 65
- Grade 5, yellow di-chromated
- 303/304 stainless steel
- 316 stainless steel

FEATURES/ADVANTAGES

- Required hole diameter equals anchor diameter
- Excellent for setting immediately
- Can be loaded immediately
- Can be set in a bottomless hole
- Simple installation
- Nut and washer supplied in package
- ROHS compliant except for Grade 5

CONCERNS

- Do not use in brick or block
- Not advised for use where vibratory loads are high
- Oversize holes are detrimental and will reduce load performance

APPROVALS/LISTINGS

- G.S.A. Spec FF-S-325C, Group II, Type 4, Class 1
- ICC ESR-3782 C-STL, ZP 1/4" SS
- Contact customer service for approvals / listings for state D.O.T.'s
- Metro Dade NCA No: 10-0928.01

Anchor Spacing / Edge Distance

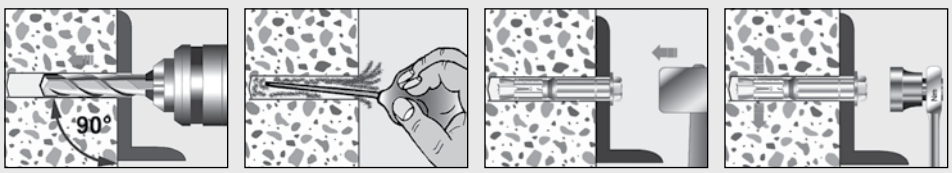
Anchor Diameter	Nominal Embedment	Min. Anchor Spacing*	Min. Edge Distance*
1/4"	1-1/2"	2-1/2"	1-1/4"
3/8"	2-7/16"	3-3/4"	1-7/8"
1/2"	2-9/16"	5"	2-1/2"
5/8"	3-3/8"	6-1/4"	3-1/8"
3/4"	4-5/8"	7-1/2"	3-3/8"
7/8"	4"	8-3/4"	4-3/8"
1"	4-1/2"	10"	5"
1-1/4"	6-1/2"	12-1/2"	6-1/4"

* To obtain 100% load

INSTALLATION

1 Select the correct diameter drill bit, drill a hole to minimum required hole depth or deeper.

2 Remove drilling debris from the bottom of the drill hole using a blowout bulb, compressed air or vacuum.



3 Assemble the nut & washer past the impact end of the SRS+. Use a hammer to tap the anchor through the part being fastened into the drilled hole until the washer is in contact with the part.

4 Using a torque wrench, apply the specified installation torque.

ORDER DETAIL

	Carbon Steel		Galvanized		303/304 Stainless		316 Stainless		Grade 5 Steel							
Anchor Diameter & Length	Order Code	Thread Length	Order Code	Thread Length	Order Code	Thread Length	Order Code	Thread Length	Order Code	Thread Length	Hole Diameter	Length ID	Max Thk Mat to be Anchored	Required Torque to Set (ft. lbs.)	Box Qty..	Master Qty..
1/4" x 1-1/2"	2614TIE	—	—	—	—	—	—	—	—	—	1/4"	—	—	—	100	800
1/4" x 1-3/4"	2614134	7/8"	2814134	7/8"	2714134	7/8"	271413S	7/8"	2514134	7/8"	1/4"	A	3/8"	8-10	100	800
1/4" x 2-1/4"	2614214	1-3/8"	2814214	1-3/8"	2714214	1-3/8"	271421S	1-3/8"	2514214	1-3/8"	1/4"	B	7/8"	8-10	100	800
1/4 "x 3-1/4"	2614314	2-1/4"	2814314	2-1/4"	2714314	2-1/4"	271431S*	2-1/4"	2514314	2-1/4"	1/4"	D	1-7/8"	8-10	100	800
3/8" x 2-1/4"	2638214	1-3/16"	2838214	1-3/16"	2738214	1-3/16"	273821S*	1-3/16"	2538214	1-3/16"	3/8"	B	1/4"	15-30	50	400
3/8" x 2-3/4"	2638234	1-5/8"	2838234	1-5/8"	2738234	1-5/8"	273823S*	1-5/8"	2538234*	1-5/8"	3/8"	C	3/4"	15-30	50	400
3/8" x 3"	2638300	1-7/8"	2838300	1-7/8"	2738300	1-7/8"	273830S	1-7/8"	2538300	1-7/8"	3/8"	D	1"	15-30	50	400
3/8" x 3-3/4"	2638334	2-5/8"	2838334	2-5/8"	2738334	2-5/8"	273833S	2-5/8"	2538334	2-5/8"	3/8"	E	1-3/4"	15-30	50	400
3/8" x 5"	2638500	4"	2838500	4"	2738500	4"	273850S*	4"	2538500	4"	3/8"	H	3"	15-30	50	250
1/2" x 2-3/4"	2612234	1-1/2"	2812234	1-1/2"	2712234	1-1/2"	271223S	1-1/2"	2512234	1-1/2"	1/2"	C	1/8"	25-50	50	150
1/2" x 3-3/4"	2612334	2-1/2"	2812334	2-1/2"	2712334	2-1/2"	271233S*	2-1/2"	2512334*	2-1/2"	1/2"	E	1"	25-50	50	150
1/2" x 4-1/4"	2612414	3"	2812414	3"	2712414	3"	271241S	3"	2512414	3"	1/2"	F	1-1/2"	25-50	50	150
1/2" x 5-1/2"	2612512	4"	2812512	4"	2712512	4"	271251S*	4"	2512512	4"	1/2"	I	2-3/4"	25-50	50	150
1/2" x 7"	2612700	4"	2812700	4"	2712700	4"	271270S*	4"	2512700	4"	1/2"	L	4-1/4"	25-50	25	75
1/2" x 8-1/2"	2612812	4"	2812812	4"	2712812*	4"	271281S*	4"	2512812	4"	1/2"	O	5-3/4"	25-50	25	75
5/8" x 3-1/2"	2658312	1-5/8"	2858312	1-5/8"	2758312	1-5/8"	275831S*	1-5/8"	2558312	1-5/8"	5/8"	E	1/8"	40-75	25	75
5/8" x 4-1/2"	2658412	2-5/8"	2858412	2-5/8"	2758412*	2-5/8"	275841S*	2-5/8"	2558412	2-5/8"	5/8"	G	1-1/8"	40-75	25	75
5/8" x 5"	2658500	3-1/4"	2858500	3-1/4"	2758500	3-1/4"	275850S	3-1/4"	2558500	3-1/4"	5/8"	H	1-5/8"	40-75	25	75
5/8" x 6"	2658600	4-1/8"	2858600	4-1/8"	2758600	4-1/8"	275860S*	4-1/8"	2558600	4-1/8"	5/8"	J	2-5/8"	40-75	25	75
5/8" x 7"	2658700	4"	2858700	4"	2758700*	4"	275870S*	4"	2558700	4"	5/8"	L	3-5/8"	40-75	20	60
5/8" x 8-1/2"	2658812	4"	2858812	4"	2758812*	4"	275881S*	4"	2558812	4"	5/8"	O	5-1/8"	40-75	20	60
5/8" x 10"	2658100	4"	2858100	4"	2758100*	4"	275810S*	4"	2558100*	4"	5/8"	R	6 5/8"	40-75	20	60
3/4" x 4-1/4"	2634414	2-3/8"	2834414	2-3/8"	2734414	2-3/8"	273441S*	2-3/8"	2534414	2-3/8"	3/4"	F	1/8"	100-200	25	75
3/4" x 4-3/4"	2634434	2-7/8"	2834434	2-7/8"	2734434	2-7/8"	273443S	2-7/8"	2534434	2-7/8"	3/4"	G	5/8"	100-200	25	75
3/4" x 5-1/2"	2634512	3-5/8"	2834512	3-5/8"	2734512	3-5/8"	273451S	3-5/8"	2534512	3-5/8"	3/4"	I	1-3/8"	100-200	20	60
3/4" x 6-1/4"	2634614	4-1/4"	2834614	4-1/4"	2734614*	4-1/4"	273461S*	4-1/4"	2534614	4-1/4"	3/4"	J	2-1/8"	100-200	20	60
3/4" x 7"	2634700	4"	2834700	4"	2734700	4"	273470S*	4"	2534700	4"	3/4"	L	2-7/8"	100-200	15	45
3/4" x 8-1/2"	2634812	4"	2834812	4"	2734812	4"	273481S*	4"	2534812	4"	3/4"	O	4-3/8"	100-200	15	45
3/4" x 10"	2634100	4"	2834100	4"	2734100	4"	273410S*	4"	2534100	4"	3/4"	R	5-7/8"	100-200	15	45
3/4" x 12"	263412T	4"	283412T	4"	2734120*	4"	273412S*	4"	2534120*	4"	3/4"	T	7-7/8"	100-200	10	30
7/8" x 6"	2678600	3-1/2"	2878600	3-1/2"	2778600*	2-1/4"	277860S*	2-1/4"	2578600	2-1/4"	7/8"	J	1-1/8"	125-225	10	30
7/8" x 8"	2678800	4"	2878800	4"	2778800*	2-1/4"	277880S*	2-1/4"	2578800	2-1/4"	7/8"	N	3-1/8"	125-225	10	30
7/8" x 10"	2678100	4"	2878100	4"	2778100*	2-1/4"	277810S*	2-1/4"	2578100	2-1/4"	7/8"	R	5-1/8"	125-225	10	30
1" x 6"	2616000	3-1/2"	2816000	3-1/2"	2716000	2-1/4"	271600S*	2-1/4"	2516000	2-1/4"	1"	J	1/2"	150-250	10	30
1" x 9"	2619000	4"	2819000	4"	2719000	2-1/4"	271900S*	2-1/4"	2519000	2-1/4"	1"	P	3-1/2"	150-250	5	15
1" x 12"	2611200	4"	2811200	4"	2711200	2-1/4"	271120S*	2-1/4"	2511200*	2-1/4"	1"	T	6-1/2"	150-250	5	15
1-1/4" x 9"	2611490	3-1/4"	2811490	3-1/4"	2711490*	3-1/4"	271149S*	3-1/4"	2511490	3-1/4"	1-1/4"	P	1-1/4"	200-350	5	15
1-1/4" x 12"	2611412	3-1/4"	2811412	3-1/4"	2711412*	3-1/4"	271141S*	3-1/4"	2511412	3-1/4"	1-1/4"	T	4-1/4"	200-350	4	12

SUP-IT STUD® + INTERNAL THREAD

AVAILABLE MATERIALS

- Carbon steel, zinc plated

FEATURES/ADVANTAGES

- Can be installed in a normally drilled hole
- The fixture is easily removed
- Closer anchor spacing and edge distance than with drop-in
- Can be set in a bottomless hole
- No unsightly stud protruding from hole

CONCERNS

- Use in solid concrete only

APPLICATIONS:

- Medium duty anchoring where the use of internal thread is required and/or anchor spacing and edge distance are closer than those needed for drop-in anchor: Suspended ceilings, fastening of flat steel structures, ducts, vent systems, railings, etc.

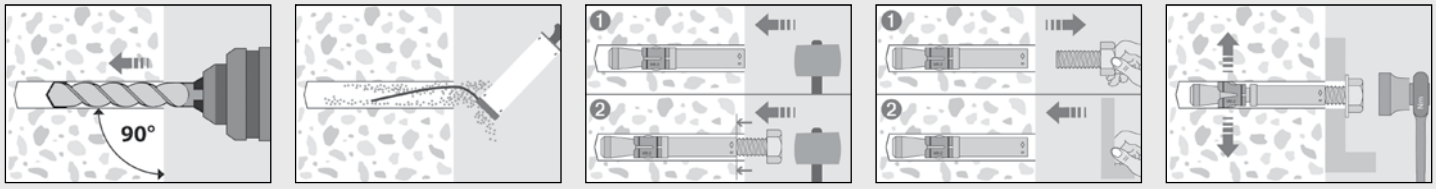
ORDER DETAIL

		Min Hole	Embed	Set	Install	Install	Drill Bit	4000 psi Concrete	
Order Code	Bolt Size	Depth (Inch)	Depth (Inch)	Depth (Inch)	Torque (ft-lbs)	Turns (-)	Diameter (inches)	Tension* (lbf)	Shear* (lbf)
263823I	3/8"	3-1/4	3	5/16	15	2.5	1/2	7,559	4,414
261231I	1/2"	4-1/4	3-5/8	3/8	35	3.5	5/8	9,719	6,105
265840I	5/8"	5	4-3/8	1/2	80	4.5	7/8	16,804	13,439
263445I	3/4"	5-3/4	5-1/4	9/16	120	4	1	21,607	18,814
261514I	1"	6-1/2	6	5/8	200	4	1-1/4	23,921	19,137

*Load values are based on using A307 bolts to complete the fastening. When installing the SRS+ IT through the item fastened, add the fixture thickness to the setting depth in the table

INSTALLATION

1. Select the correct diameter drill bit and drill the hole to the required hole depth.
2. Remove the debris from the hole using a blowout bulb, compressed air, or a vacuum.
3. Thread the setting bolt into the anchor adjusting for setting depth as per the chart.
4. Place the anchor in the hole(1) and hammer the setting bolt until the washer makes contact with the surface of the concrete(2).
5. Remove the bolt (1) and place the fixture over the hole (2), Start the bolt through the fixture into the anchor.
6. Tighten the bolt to required torque as per table, Once the appropriate torque is achieved, the anchor is set.



SUP-R STUD® V

AVAILABLE MATERIALS

- Carbon steel, zinc plated
- Carbon steel clip, zinc plated

FEATURES/ADVANTAGES

- Required hole diameter equals anchor diameter
- Excellent for setting immediately
- Can be loaded immediately
- Can be set in a bottomless hole
- Nut and washer supplied in package

CONCERNS

- Do not use in brick or block
- Not advised for use where vibratory loads are high
- Oversize holes are detrimental and will reduce load performance

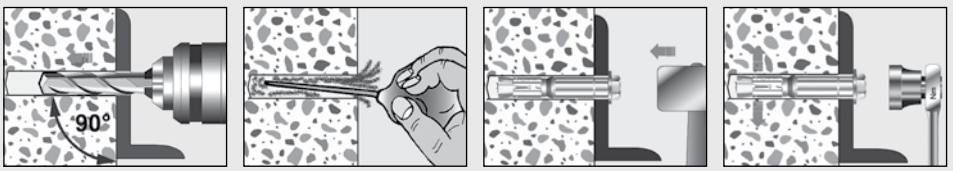
ORDER DETAIL

Order Code	Anchor Diameter & Length	Thread Length	Hole Diameter	Length ID	Max Thk Mat to be anchored	Required Torque to set (ft. lbs.)	Box Qty.	Master Qty.
2438214	3/8" x 2-1/4"	1"	3/8"	B	1/4"	30	50	400
2438234	3/8" x 2-3/4"	1-1/2"	3/8"	C	3/4"	30	50	400
2438300	3/8 " x 3"	1-3/4"	3/8"	D	1/4"	30	50	400
2438334	3/8" x 3-3/4"	2-1/2"	3/8"	E	1"	30	50	400
2438500	3/8" x 5"	3-3/4"	3/8"	H	2-1/4"	30	50	250
2412234	1/2" x 2-3/4"	1-1/8"	1/2"	C	1/8"	80	50	150
2412334	1/2" x 2-3/4"	2-1/8"	1/2"	E	3/4"	80	50	150
2412414	1/2" x 4-1/4"	2-3/8"	1/2"	F	1-1/4"	80	50	150
2412512	1/2" x 5-1/2"	3-3/4"	1/2"	I	2-1/2"	80	50	150
2412700	1/2" x 7"	4"	1/2"	L	4"	80	25	75
2412812	1/2" x 8-1/2"	4"	1/2"	O	5-1/2"	80	25	75
2458312	5/8" x 3-1/2"	1-3/4"	5/8"	E	1/8"	100	25	75
2458412	5/8" x 4-1/2"	2-1/2"	5/8"	G	1/2"	100	25	75
2458500	5/8" x 5"	3-1/4"	5/8"	H	1"	100	25	75
2458600	5/8" x 6"	4"	5/8"	J	2"	100	25	75
2458700	5/8" x 7"	4"	5/8"	L	3"	100	20	60
2458812	5/8" x 8-1/2"	4"	5/8"	O	4-1/2"	100	20	60
2458100	5/8" x 10"	4"	5/8"	R	6"	100	20	60
2434414	3/4" x 4-1/4"	2-1/8"	3/4"	F	1/8"	120	25	75
2434434	3/4" x 4-3/4"	2-5/8"	3/4"	G	5/8"	120	25	75
2434512	3/4" x 5-1/2"	3-1/4"	3/4"	I	3/4"	120	20	60
2434614	3/4" x 6-1/4"	3-1/4"	3/4"	J	1-1/2"	120	20	60
2434700	3/4" x 7"	4"	3/4"	L	2-1/4"	120	15	45
2434812	3/4" x 8-1/2"	4"	3/4"	O	3-3/4"	120	15	45
2434100	3/4" x 10"	4"	3/4"	R	5-1/4"	120	15	45

INSTALLATION

1 Select the correct diameter drill bit, drill a hole to minimum required hole depth or deeper.

2 Remove drilling debris from the bottom of the drill hole using a blowout bulb, compressed air or vacuum.



3 Assemble the nut & washer past the impact end of the SRS+. Use a hammer to tap the anchor through the part being fastened into the drilled hole until the washer is in contact with the part.

4 Using a torque wrench, apply the specified installation torque.

SUP-R DROP®

AVAILABLE MATERIALS

- Carbon steel, zinc plated
- 304 stainless steel
- 316 stainless steel

FEATURES/ADVANTAGES

- Ideal for flush-mounting applications
- Preassembled for ease of installation
- Female threads accept standard UNC bolts or threaded rods (1/4" to 3/4")
- Slotted body is precision-matched to tapered internal plug for uniform expansion
- Knurled body increases friction connection between anchor and wall of hole

CONCERNS

- Dead load only
- Hole depth must be equal to anchor length
- Do not over torque

APPROVALS/LISTINGS

- G.S.A. Spec FF-S-325C, Group VIII, Type 1
- UL listed 3/8"-3/4"
- FM 3/8" - 1/2" & 3/4"
- Contact customer service for approvals

ORDER DETAIL

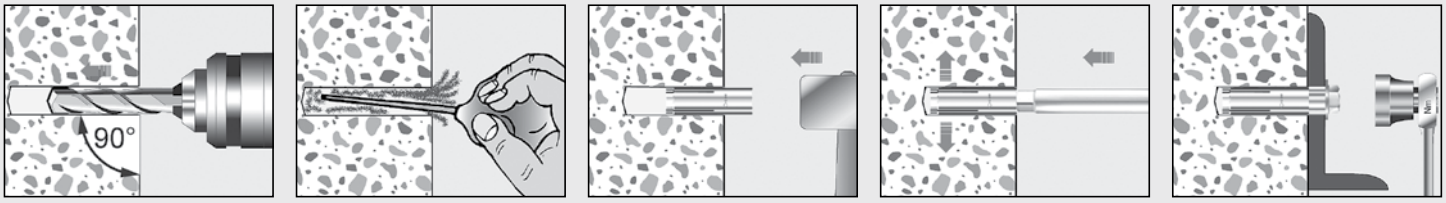
Order Code C-Steel	Order Code 304 Stainless	Order Code 316 Stainless	UNC Bolt Size	Minimum Embedment	Max Torque (ft. lbs.)	Hole	Tension (lbs.)	Tension (lbs.)	Shear (lbs.)	C-Steel 304 S.S. Box Qty.	C-Steel 304 S.S. Master Qty.	316 S.S. Box Qty.	316 S.S. Master Qty.
1314000	1314SS0	1314SS6	1/4"	1"	5	3/8"	2,050	2,104	1,321	100	1,000	25	300
1338000	1338SS0	1338SS6	3/8"	1-9/16"	10	1/2"	3,957	4,824	3,714	50	500	25	300
1312000	1312SS0	1312SS6	1/2"	2"	20	5/8"	5,312	7,398	5,854	50	250	25	300
1358000	1358SS0	1358SS6	5/8"	2-1/2"	40	7/8"	7,398	7,966	8,754	25	125	25	125
1334000	1334SS0	1334SS6	3/4"	3-3/16"	80	1"	12,300	16,019	11,627	10	50	25	75

SUP-R DROP SETTING TOOLS

Order Code C-Steel	Description
1314700	1/4" Drop-In Setting tool
1338700	3/8" Drop-In Setting tool
1312700	1/2" Drop-In Setting tool
1358700	5/8" Drop-In Setting tool
1334700	3/4" Drop-In Setting tool

INSTALLATION

1. Drill hole same length as anchor. Do not use core bits. Maintain accurate hole size.
2. Clean hole of debris.
3. Drop in anchor, slotted end first.
4. To set, drive setting tool into anchor until shoulder of tool is flush with top of anchor.
5. Select proper bolt length.



COIL THREAD SUP-R DROP®

AVAILABLE MATERIALS
- Carbon steel, zinc plated

FEATURES/ADVANTAGES
- Ideal for form work and tilt-up bracing
- Accepts 1/2" or 3/4" standard coil thread rod or coil thread bolts
- Preassembled for ease of installation
- Slotted body is precision-matched to tapered internal plug for uniform expansion
- Knurled body increases friction connection between anchor and wall of hole

CONCERNS
- Dead load only
- Hole depth must be equal to anchor length
- Do not over torque

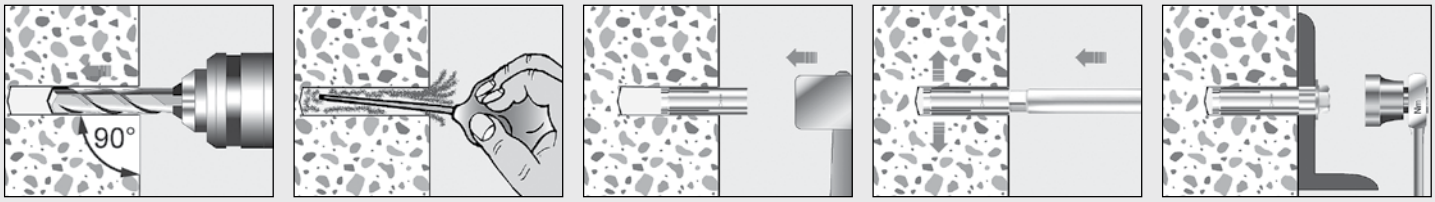
APPROVALS/LISTINGS
- G.S.A. Spec FF-S-325C, Group VIII, Type 1
- Contact customer service for approvals

ORDER DETAIL

					2000 P.S.I.		4000 P.S.I.			
Order Code	Bolt Diameter	Hole Diameter	Minimum Embedment	Max Torque (ft. lbs.)	Tension (lbs.)	Shear (lbs.)	Tension (lbs.)	Shear (lbs.)	Box Qty.	Master Qty..
1312CT0	1/2"	5/8"	2"	20	5,312	5,854	7,398	5,854	50	250
1334CT0	3/4"	1"	3-3/16"	80	12,300	11,627	16,019	11,627	10	50

INSTALLATION

1. Drill hole same length as anchor. Do not use core bits. Maintain accurate hole diameter.
2. Clean hole of debris.
3. Drop in anchor, slotted end first.
4. To set, drive setting tool into anchor until shoulder of tool is flush with top of anchor.
5. Select appropriate coil thread rod or coil bolt.



SUP-R-SHORTY & LIPPED SUP-R-DROP®

FEATURES/ADVANTAGES
- Lip ensures proper anchor setting even in hollow based material
- Female threads accept standard UNC bolts or threaded rods

ORDER DETAIL

							2000 P.S.I.	4000 P.S.I			
Order Code C-Steel	Order Code 304 Stainless	Order Code 316 Stainless	UNC Bolt Size	Minimum Embedment	Max Torque (ft. lbs.)	Hole Diameter	Tension (lbs.)	Tension (lbs.)	Shear (lbs.)	C-Steel Box Qty.	C-Steel Master Qty.
131200L	__	__	1/2"	2"	20	5/8"	5,312	7,398	5,854	50	250
133800L	—	—	3/8"	1-9/16"	10	1/2"	3,957	4,824	3,714	50	400
13380SH	—	—	3/8"	3/4"	5	1/2"	2,083	—	3,714	100	800

FORWAY®

AVAILABLE MATERIALS
- Zinc diecast alloy

FEATURES/ADVANTAGES
- Medium to heavy loads
- Can be used in dead, variable, or vibratory conditions in all types of solid or hollow masonry materials
- Four-way expansion assures positive anchoring even under adverse drilling conditions

APPROVALS/LISTINGS
- G.S.A. Spec FF-S-325C, Group II, Type 2, Class I

Ultimate Loads in Lbs.

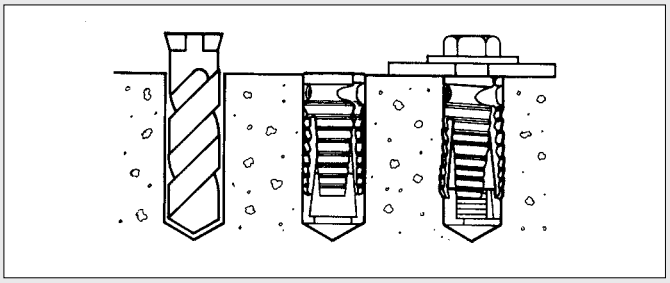
ORDER DETAIL

Order Code	Bolt Dia.	Hole Dia.	Shield Length	Tension*	Shear*	Tension Block	Box Qty.	Master Qty.
1104000	1/4"-20	1/2"	1-1/4"	2,320	2,100	1,925	100	800
1105000	5/16"-18	9/16"	1-1/2"	2,600	3,300	2,100	100	500
1106000	3/8"-16	11/16"	1-3/4"	3,640	3,850	2,440	50	400
1108000	1/2"-13	7/8"	2-1/4"	5,100	8,100	3,050	50	150
1110000	5/8"-11	1-1/8"	2-5/8"	5,820	14,170	N.A.	50	100
1112000	3/4"-10	1-1/4"	3-1/8"	9,850	15,300	N.A.	25	50

* Tested in 3000 P.S.I. Concrete

INSTALLATION
1. Drill hole to at least shield length.
2. Clean hole of debris.
3. Place the Forway in the hole.
4. Position equipment. Insert machine bolt through equipment into shield.
5. Tighten.

For hanger rod installation
1. Thread a hex nut onto the hanger rod, add a flat washer, then screw the Forway against the washer.
2. Place the Forway in the hole.
3. Expand the Forway by tightening the hex nut against the surface of the base material.



Sup-R LAG®

AVAILABLE MATERIALS
- Zinc diecast alloy

FEATURES/ADVANTAGES
- Medium to heavy loads
- Can be used in dead, variable, or vibratory conditions in all types of solid masonry
- Cannot be over-expanded, excellent near edge of slabs

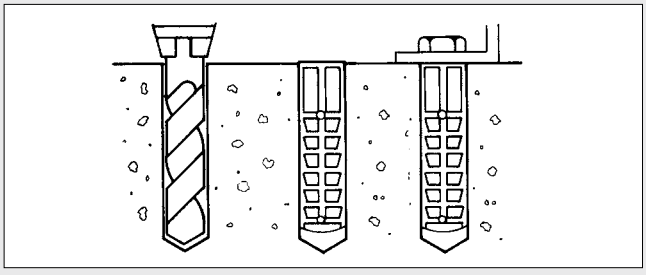
APPROVALS/LISTINGS
- G.S.A. Spec FF-S-325C, Group II, Type 1, Class 1 (Long)
- G.S.A. Spec FF-S-325C, Group II, Type 1, Class 2 (Short)

ORDER DETAIL

Order Code	Bolt Dia.	Hole Dia.	Shield Length	Box Qty.	Master Qty.
Short Shields					
3304000	1/4"	3/8"	1-7/8"	40	9/16"
3305000	5/16"	3/8"	1-7/8"	40	9/16"
3306000	3/8"	3/8"	1-7/8"	40	9/16"
3308000	1/2"	3/8"	1-7/8"	40	9/16"
Long Shields					
3314000	1/4"	1/2"	1-1/2"	100	800
3315000	5/16"	1/2"	1-3/4"	100	500
3316000	3/8"	5/8"	2-1/2"	50	250
3318000	1/2"	3/4"	3"	50	150

* Tested in 3000 P.S.I. Concrete

INSTALLATION
1. Drill recommended hole to depth of shield.
2. Clean hole of debris.
3. Insert shield in hole and tap with hammer for proper positioning.
4. Place equipment over shield. Insert lag screw into shield and tighten.



Sup-R SLEEVE®

AVAILABLE MATERIALS
- Carbon steel, zinc plated
- 304 stainless steel on select sizes

FEATURES/ADVANTAGES
- Length of sleeve makes anchor more forgiving than a wedge anchor and induces less stress on the substrate
- Can be used in solid or hollow masonry
- Works in a bottomless hole
- Required hole diameter equals anchor diameter
- Supplied assembled with 4 possible head styles

CONCERNS
- Do not over-torque

APPROVALS/LISTINGS
- G.S.A. Spec FF-S-325C, Group II, Type 3, Class 3

AVAILABLE HEAD STYLES

ACORN NUT

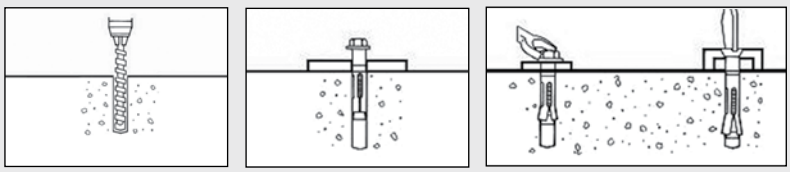
HEX NUT

FLAT HEAD

ROUND HEAD

INSTALLATION

1. Select a carbide-tip drill bit with same nominal diameter as anchor body. Drill hole depth 1/2" to 1" deeper than anchor embedment.
2. Clean hole of debris.
3. Set nut flush with top of anchor and drive anchor through material to be anchored into the work surface until nut and washer are snug with material to be attached.
4. Tighten nut until finger tight, then turn 3 to 4 full turns to set the expansion sleeve.



Sup-R SLEEVE® CONTINUED

ORDER DETAIL

Carbon Steel Order Code	304 Stainless Steel Order Code	Anchor Diameter & Length	Hole Diameter	Max. Thk. Materials to be Anchored	Min. Embedment	Diameter Thread Stud	Required Torque to Set (ft. lbs.)	2000 P.S.I. Tension (lbs.)	2000 P.S.I. Shear (lbs.)	3500 P.S.I. Tension (lbs.)	3500 P.S.I. Shear (lbs.)	5000 P.S.I. Tension (lbs.)	5000 P.S.I. Shear (lbs.)	Box Qty.	Master Qty.
Acorn Nut															
1704000	—	1/4" x 5/8"	1/4"	1/16"	—	3/16"	5-8	—	—	—	—	—	—	100	1,200
1705000	1705SS0[‡]	1/4" x 1-3/8"	1/4"	3/8"	1"	3/16"	5-8	1,356	792	1,400	920	1,640	1,148	100	800
1706000	1706SS0[‡]	1/4" x 2-1/4"	1/4"	1-1/4"	1"	3/16"	5-8	1,356	792	1,400	920	1,640	1,148	100	800
Hex Nut															
1710000	1710SS0	5/16" x 1-1/2"	5/16"	1/8"	1-1/8"	1/4"	18-22	1,840	1,376	1,900	1,600	2,040	2,000	100	800
1711000	1711SS0	5/16" x 2-1/2"	5/16"	1-3/8"	1-1/8"	1/4"	18-22	1,840	1,376	1,900	1,600	2,040	2,000	100	500
1712000	1712SS0	3/8" x 1-7/8"	3/8"	5/8"	1-1/4"	5/16"	22-26	2,840	1,736	2,960	2,020	3,256	2,524	50	400
1713000	1713SS0	3/8" x 3"	3/8"	1-3/4"	1-1/4"	5/16"	22-26	2,840	1,736	2,960	2,020	3,256	2,524	50	250
1714000	1714SS0	1/2" x 2-1/4"	1/2"	3/4"	1-1/2"	3/8"	34-38	4,664	4,952	4,860	5,760	5,334	7,200	25	200
1715000	—	1/2" x 3"	1/2"	1-1/2"	1-1/2"	3/8"	34-38	4,664	4,952	4,860	5,760	5,334	7,200	25	200
1716000	1716SS0	1/2" x 4"	1/2"	2-1/2"	1-1/2"	3/8"	34-38	4,664	4,952	4,860	5,760	5,334	7,200	25	125
1717000	—	1/2" x 6"	1/2"	4-1/2"	1-1/2"	3/8"	34-38	4,664	4,952	4,860	5,760	5,334	7,200	15	75
1718000	—	5/8" x 2-1/4"	5/8"	1/4"	2"	1/2"	52-75	5,730	6,776	5,970	7,880	6,560	9,848	25	125
1724000	—	5/8" x 3"	5/8"	1"	2"	1/2"	52-75	5,730	6,776	5,970	7,880	6,560	9,848	15	120
1719000	1719SS0	5/8" x 4-1/4"	5/8"	2-1/4"	2"	1/2"	52-75	5,730	6,776	5,970	7,880	6,560	9,848	10	50
1720000	—	5/8" x 6"	5/8"	4"	2"	1/2"	52-75	5,730	6,776	5,970	7,880	6,560	9,848	10	50
1721000	1721SS0	3/4" x 2-1/2"	3/4"	1/2"	2"	5/8"	90-110	8,428	9,992	8,780	11,620	9,656	14,524	10	80
1722000	1722SS0	3/4" x 4-1/4"	3/4"	2-1/4"	2"	5/8"	90-110	8,428	9,992	8,780	11,620	9,656	14,524	5	40
1723000	—	3/4" x 6-1/4"	3/4"	4-1/4"	2"	5/8"	90-110	8,428	9,992	8,780	11,620	9,656	14,524	5	25
Flat Head															
1764000	—	1/4" x 1-1/2"	1/4"	1/2"	1"	3/16"	5-8	1,356	792	1,400	920	1,640	1,148	100	800
1765000	—	1/4" x 2"	1/4"	1"	1"	3/16"	5-8	1,356	792	1,400	920	1,640	1,148	100	800
1766000	—	1/4" x 3"	1/4"	2"	1"	3/16"	5-8	1,356	792	1,400	920	1,640	1,148	100	800
*1772000	—	3/8" x 2-3/4"	3/8"	1-1/2"	1-1/4"	5/16"	22-26	2,840	1,736	2,960	2,020	3,256	2,524	50	250
*1773000	1773SS0	3/8" x 4"	3/8"	2-3/4"	1-1/4"	5/16"	22-26	2,840	1,736	2,960	2,020	3,256	2,524	50	250
*1774000	—	3/8" x 5"	3/8"	3-3/4"	1-1/4"	5/16"	22-26	2,840	1,736	2,960	2,020	3,256	2,524	25	125
*1775000	—	3/8" x 6"	3/8"	4-3/4"	1-1/4"	5/16"	22-26	2,840	1,736	2,960	2,020	3,256	2,524	25	125
Round Head															
1788000	—	1/4" x 1-1/4"	1/4"	1/4"	1"	3/16"	5-8	1,356	792	1,400	920	1,640	1,148	100	800
1789000	—	1/4" x 2"	1/4"	1"	1"	3/16"	5-8	1,356	792	1,400	920	1,640	1,148	100	800
1795000	—	3/8" x 2-1/2"	3/8"	1-1/4"	1-1/4"	5/16"	22-26	2,840	1,736	2,960	2,020	3,256	2,524	50	400

* Phillips Head Only [‡] Stainless Steel only available in hex nut type.

CONSET®

AVAILABLE MATERIALS

- High strength steel
- Flat head and hex head

FEATURES/ADVANTAGES

- For use in all types of solid & hollow masonry, wood and stone
- Fluorocarbon coating offers high resistance to corrosion
- Cuts its own threads
- Hex head version offers 2 drive methods
- Fast, easy installation
- Drill bit included in each box
- Coating withstands 1000 hours of salt spray test

CONCERNS

- Softer base materials require undersized bits for best results

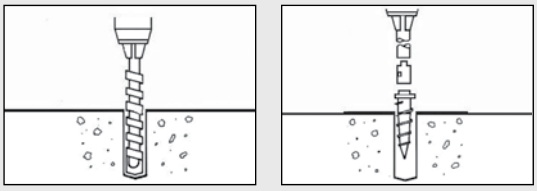
HHWF = Hex Head Washer Faced
PF = Phillips Flat
1 drill bit included in each box

ORDER DETAIL

					Ultimate Tensile & Shear Loads in lbs.						
Order Code	Head Style	Anchor Size	Bit. Dia. & Length	Maximum Thickness of Fixture	Embedment	Tension (lbs.)	Shear (lbs.)	Embed.	Tension (lbs.)	Box Qty.	Master Qty.
H3125	HHWF	3/16" x 1-1/4"	5/32" x 3-1/2"	0" - 1/4"	1"	875	1,170	1-1/4"	430	100	3,000
H3175	HHWF	3/16" x 1-3/4"	5/32" x 3-1/2"	1/4" - 3/4"	1"	875	1,170	1-1/4"	430	100	1,200
H3225	HHWF	3/16" x 2-1/4"	5/32" x 4-1/2"	3/4" - 1-1/4"	1"	875	1,170	1-1/4"	430	100	1,200
H3275	HHWF	3/16" x 2-3/4"	5/32" x 4-1/2"	1-1/4" - 1-3/4"	1"	875	1,170	1-1/4"	430	100	1,200
H3325	HHWF	3/16" x 3-1/4"	5/32" x 5-1/2"	1-3/4" - 2-1/4"	1"	875	1,170	1-1/4"	430	100	800
H3375	HHWF	3/16" x 3-3/4"	5/32" x 5-1/2"	2-1/4" - 2-3/4"	1"	875	1,170	1-1/4"	430	100	800
H3400	HHWF	3/16" x 4"	5/32" x 5-1/2"	2-1/2" - 3"	1"	875	1,170	1-1/4"	430	100	800
P3125	PF	3/16" x 1-1/4"	5/32" x 3-1/2"	0" - 1/4"	1"	875	1,170	1-1/4"	430	100	3,000
P3175	PF	3/16" x 1-3/4"	5/32" x 3-1/2"	1/4" - 3/4"	1"	875	1,170	1-1/4"	430	100	1,200
P3225	PF	3/16" x 2-1/4"	5/32" x 4-1/2"	3/4" - 1-1/4"	1"	875	1,170	1-1/4"	430	100	1,200
P3275	PF	3/16" x 2-3/4"	5/32" x 4-1/2"	1-1/4" - 1-3/4"	1"	875	1,170	1-1/4"	430	100	1,200
P3325	PF	3/16" x 3-1/4"	5/32" x 5-1/2"	1-3/4" - 2-1/4"	1"	875	1,170	1-1/4"	430	100	800
P3375	PF	3/16" x 3-3/4"	5/32" x 5-1/2"	2-1/4" - 2-3/4"	1"	875	1,170	1-1/4"	430	100	800
P3400	PF	3/16" x 4"	5/32" x 5-1/2"	2-1/2" - 3"	1"	875	1,170	1-1/4"	430	100	800
H4125	HHWF	1/4" x 1-1/4"	3/16" x 3-1/2"	0" - 1/4"	1"	1,480	1,568	1-1/4"	550	100	3,000
H4175	HHWF	1/4" x 1-3/4"	3/16" x 3-1/2"	1/4"- 3/4"	1"	1,480	1,568	1-1/4"	550	100	1,200
H4225	HHWF	1/4" x 2-1/4"	3/16" x 4-1/2"	3/4" - 1-1/4"	1"	1,480	1,568	1-1/4"	550	100	1,200
H4275	HHWF	1/4" x 2-3/4"	3/16" x 4-1/2"	1-1/4" - 1 3/4"	1"	1,480	1,568	1-1/4"	550	100	800
H4325	HHWF	1/4" x 3-1/4"	3/16" x 5-1/2"	1-3/4" - 2-1/4"	1"	1,480	1,568	1-1/4"	550	100	800
H4375	HHWF	1/4" x 3-3/4"	3/16" x 5-1/2"	2-1/4" - 2-3/4"	1"	1,480	1,568	1-1/4"	550	100	800
H4400	HHWF	1/4" x 4"	3/16" x 5-1/2"	2-1/2" - 3"	1"	1,480	1,568	1-1/4"	550	100	800
P4125	PF	1/4" x 1-1/4"	3/16" x 3-1/2"	0"- 1/4"	1"	1,480	1,568	1-1/4"	550	100	3,000
P4175	PF	1/4" x 1-3/4"	3/16" x 3-1/2"	1/4" - 3/4"	1"	1,480	1,568	1-1/4"	550	100	1,200
P4225	PF	1/4" x 2-1/4"	3/16" x 4-1/2"	3/4" - 1-1/4"	1"	1,480	1,568	1-1/4"	550	100	1,200
P4275	PF	1/4" x 2-3/4"	3/16" x 4-1/2"	1-1/4" - 1-3/4"	1"	1,480	1,568	1-1/4"	550	100	800
P4325	PF	1/4" x 3-1/4"	3/16" x 5-1/2"	1-3/4" - 2-1/4"	1"	1,480	1,568	1-1/4"	550	100	800
P4375	PF	1/4" x 3-3/4"	3/16" x 5-1/2"	2-1/4" - 2-3/4"	1"	1,480	1,568	1-1/4"	550	100	800
P4400	PF	1/4" x 4"	3/16" x 5-1/2"	2-1/2" - 3"	1"	1,480	1,568	1-1/4"	550	100	800

INSTALLATION

1. Insert the masonry drill bit in the bit holder and drill the pilot hole 1/2" deeper than fastener penetration. The driving sleeve or main body of the Conset tool is snapped into position over the drill bit.
2. Clean hole of debris.
3. Position the material being fastened, and drive the Conset anchor into the masonry, under rotation only.



SUP-R SPLIT®

AVAILABLE MATERIALS

- High strength, heat treated alloy steel, zinc plated
- Flat head
- Nickel rich electroplate for corrosive enviroments (Sup-R-Coat)

FEATURES/ADVANTAGES

- Required hole diameter equals anchor diameter
- Friction set in solid masonry or stone
- High strength, heat treated alloy steel
- Corrosion resistant (CR) for use in harsh climates or with ACQ lumber

CONCERNS

- Dead loads only

APPROVALS/LISTINGS

- G.S.A. Spec FF-S-325C, Group VI

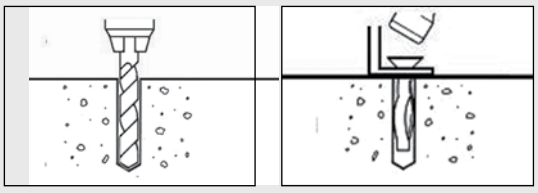
ORDER DETAIL

			Ultimate Loads in lbs.				
Order Code	Size	Hole Dia	Tension (lbs.)	Shear (lbs.)	Minimum Embedment	Box Qty.	Master Qty.
1674060	1/4" x 1-1/2"	1/4"	2,010	2,230	1-1/8"	100	800
1674080	1/4" x 2"	1/4"	2,010	2,230	1-1/8"	100	800
1674100	1/4" x 2-1/2"	1/4"	2,010	2,230	1-1/8"	100	800
1674120	1/4" x 3"	1/4"	2,010	2,230	1-1/8"	100	800
1674120CR	1/4" x 3"	1/4"	2,010	2,230	1-1/8"	100	800
1674140	1/4" x 3-1/2"	1/4"	2,010	2,230	1-1/8"	100	800
1674140CR	1/4" x 3-1/2"	1/4"	2,010	2,230	1-1/8"	100	800
1674160	1/4" x 4"	1/4"	2,010	2,230	1-1/8"	100	800

* Tested in 3000 P.S.I. Concrete

INSTALLATION

1. Using a carbide bit, drill hole at least a 1/4" deeper than the anchor embedment.
2. Clean hole of debris.
3. To set, drive anchor into hole through item to be fastened.



IMPORT® SINGLE

IMPORT® DOUBLE

APPROVALS/LISTINGS
- G.S.A. Spec FF-S-325C, Group II, Type 2, Class 2, Style 1 (Single)
- G.S.A. Spec FF-S-325C, Group II, Type 2, Class 2, Style 2 (Double)

AVAILABLE MATERIALS
- Diecast zinc alloy

FEATURES/ADVANTAGES
- Medium loads under dead, variable or vibratory conditions in all types of solid masonry
- Available in single version (1 expander nut) or double version (2 expander nuts)
- Female threads accept standard UNC bolts or threaded rods

ORDER DETAIL

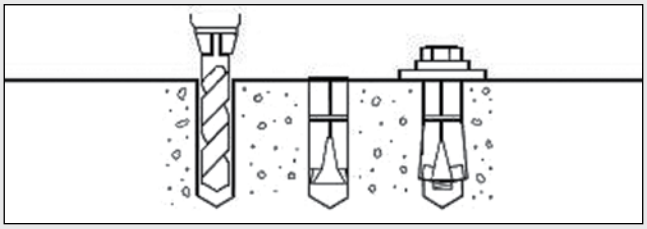
Order Code	Bolt Dia.	Hole Dia.	Shield Length	Ultimate Loads in Lbs. 3000 P.S.I. Tension	Shear	Box Qty.	Master Qty.
6104000	1/4"	1/2"	1-5/16"	2,410	1,750	100	800
6105000	5/16"	5/8"	1-1/2"	2,620	2,400	50	400
6106000	3/8"	5/8"	1-1/2"	4,950	3,180	50	400
6108000	1/2"	7/8"	2-3/16"	7,550	6,500	50	150

ORDER DETAIL

Order Code	Bolt Dia.	Hole Dia.	Shield Length	Ultimate Loads in Lbs. 3000 P.S.I. Tension	Shear	Box Qty.	Master Qty.
6204000	1/4"	1/2"	1-3/8"	2,820	2,250	100	800
6205000	5/16"	5/8"	1-3/16"	2,990	2,740	100	500
6206000	3/8"	3/4"	2-1/16"	5,995	3,610	50	250
6208000	1/2"	7/8"	2-1/2"	9,140	7,345	25	125
6210000	5/8"	1"	3"	12,050	10,700	50	100

INSTALLATION

1. Drill recommended diameter hole to depth of shield.
2. Clean hole of debris.
3. Insert shield in hole threaded end first and tap with hammer for proper positioning.
4. Place equipment over shield. Insert machine bolt through equipment into shield and tighten.



Sup-R® CAULK®

AVAILABLE MATERIALS
- Extruded lead shield with a diecast zinc expander nut

FEATURES/ADVANTAGES
- Light to medium loads under dead or variable conditions in a variety of solid masonry
- Lead flows into hole irregularities, making base material firmer than before anchoring
- Highly corrosion resistant
- Can remove or replace fixture and refasten without loss of holding power
- Setting tool included in each box

APPROVALS/LISTINGS
- G.S.A. Spec FF-S-325C, Group I, Type 1, Class 1

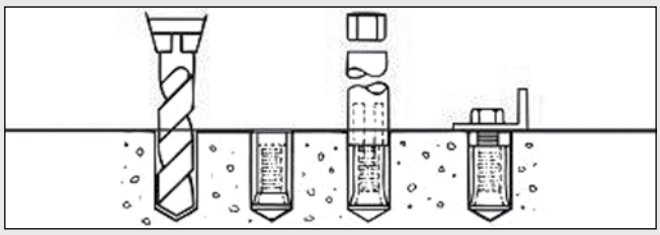
ORDER DETAIL

Ultimate Loads in Lbs.*

Order Code	Bolt Diameter	Hole Diameter	Shield Length	Tension	Shear	Box Qty.	Master Qty.
1405000	10-24	3/8"	5/8"	950	1,200	100	800
1407000	1/4"-20	1/2"	7/8"	2,120	2,070	100	800
1408000	5/16"-18	5/8"	1"	2,900	2,400	100	500
1409000	3/8"-16	3/4"	1-1/4"	5,250	4,180	50	250
1411000	1/2"-13	7/8"	1-1/2"	6,080	5,000	25	125

*Tested in 3000 P.S.I. Concrete
1 tool included with each box of anchors

INSTALLATION
1. Drill recommended diameter hole to depth of shield.
2. Clean hole of debris.
3. Insert anchor in hole threaded end first.
4. Caulk with caulking tool supplied with anchors. Deliver blows with hammer until anchor is tight.
5. Place fixture over anchor. Insert machine bolt.
6. Tighten bolt.



Sup-R® LEAD®

AVAILABLE MATERIALS
- Lead alloy, die cast

FEATURES/ADVANTAGES
- Light to medium loads in a variety of solid masonry
- Highly corrosion resistant

APPROVALS/LISTINGS
- G.S.A. Spec FF-S-325C, Group IV, Type 1

CONCERNS
- Dead loads only

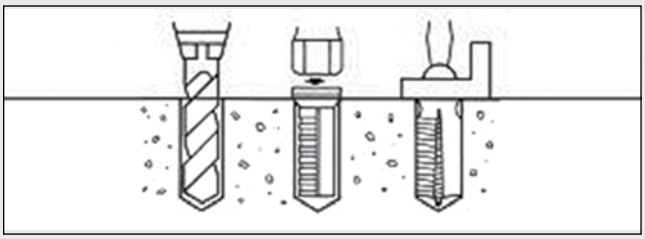
ORDER DETAIL

Ultimate Loads in Lbs.*

Order Code	Size	Hole Diameter	Tension	Box Qty.	Master Qty.
3531000	6-8 x 3/4"	1/4"	183	100	3,000
3532000	6-8 x 1"	1/4"	183	100	3,000
3533000	6-8 x 1-1/2"	1/4"	183	50	1,500
3535000	10-14 x 3/4"	5/16"	310	100	3,000
3536000	10-14 x 1"	5/16"	310	100	1,200
3537000	10-14 x 1-1/2"	5/16"	310	100	1,200
3541000	16-18 x 1"	3/8"	415	100	1,200
3542000	16-18 x 1-1/2"	3/8"	415	100	800

*Tested in 3000 P.S.I. Concrete

INSTALLATION
1. Drill recommended diameter hole to depth of shield.
2. Clean hole of debris.
3. Insert lead anchor into hole.
4. Place fixture over anchor, insert screw and tighten. Screw length must be length of anchor plus thickness of material to be fastened.



Sup-R TOGGLE

AVAILABLE MATERIALS

- The head is a formed, steel stamping with or without machine screws or hanger bolt, zinc plated
- Combo heads available on most sizes

FEATURES/ADVANTAGES

- Light to medium loads under dead or variable conditions in a variety of hollow base materials
- Wings lock quickly and positively after insertion through the wall

CONCERNS

- Hollow construction only

APPROVALS/LISTINGS

- G.S.A Spec FF-B-588D,Type 1, Class A, Style 1, for screw version
- G.S.A Spec FF-B-588D,Type 1, Class A, Style 3, for hanger version

ORDER DETAIL

Hanger Type					Heads Only			
Order Code	Screw Size	Hole Dia.	Box Qty.	Master Qty.	Order Code	Size	Box Qty.	Master Qty.
8320500	3/16" x 4"	1/2"	50	150	8307000	1/8"	100	1,200
8325500	3/16" x 5"	1/2"	50	150	8317000	3/16"	100	800
8340500	1/4" x 4"	1/4"	50	150	8337000	1/4"	100	500
8345500	1/4" x 5"	1/4"	50	100	8357000	5/16"	100	300
					8377000	3/8"	100	200
					8387000	1/2"	25	75

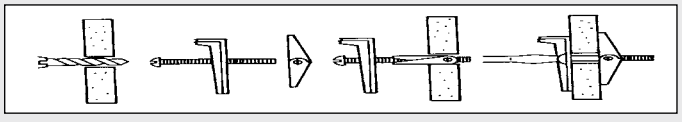
ORDER DETAIL

Order Code	Screw Size	Available Screw Type	Hole Diameter	Tension 1/2" Dry Wall	Box Qty..	Master Qty.
8303000(#6)	1/8" x 2"	RM	3/8"	120	50	1500
8305000	1/8" x 3"	FRM	3/8"	120	50	1500
8310000	1/8" x 4"	FRM	3/8"	120	50	600
8313000(#10)	3/16" x 2"	R	1/2"	135	50	600
8315000	3/16" x 3"	FRM	1/2"	135	50	400
8320000	3/16" x 4"	FRM	1/2"	135	50	400
8325000	3/16" x 5"	FR	1/2"	135	50	250
8330000	3/16" x 6"	R	1/2"	135	50	250
8335000	1/4" x 3"	FRM	11/16"	145	50	400
8340000	1/4" x4"	RM	11/16"	145	50	250
8345000	1/4" x 5"	FR	11/16"	145	50	250
8350000	1/4" x 6"	FR	11/16"	145	50	250
8355000	5/16" x 3"	R	7/8"	160	50	250
8360000	5/16" x 4"	R	7/8"	160	50	150
8362000	5/16" x 5"	R	7/8"	160	50	150
8365000	5/16" x 6"	R	7/8"	160	50	150
8370000	3/8" x 3"	R	7/8"	160	50	150
8375000	3/8" x 4"	R	7/8"	160	50	150
8378000	3/8" x 5"	R	7/8"	160	50	100
8380000	3/8" x 6"	R	7/8"	160	50	100
8385000	1/2" x 4"	R	1-1/4"	185	25	50
8390000	1/2" x 6"	R	1-1/4"	185	25	50

R = Round Head, ex. 8315000 F = Flat Head - 1 on order code, ex. 8315100
M = Mushroom Head - 2 on order code, ex. 8315200

INSTALLATION

1. Drill recommended diameter hole through base material.
2. Clean hole of debris.
3. Insert bolt through fixture to be fastened, screw wing nut onto bolt.
4. Push wing through drilled hole.
5. Tighten screw.



PLASTIC SCREW ANCHOR

AVAILABLE MATERIALS

- Polypropylene

FEATURES/ADVANTAGES

- Light loads only under dead or slightly variable conditions in all atmospheric conditions
- Accepts both wood and sheet metal screws
- Fast, easy installation

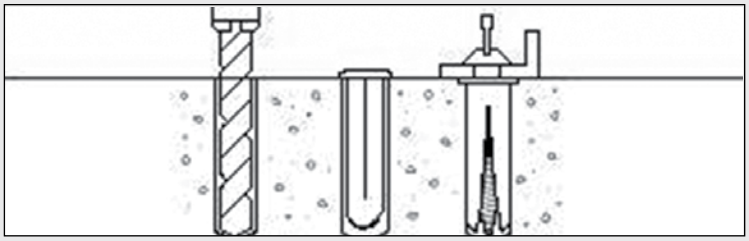
ORDER DETAIL

				Ultimate Tension in Lbs.* Screw Size Tested					
Order Code	Diameter & Length	Hole Dia.	Screw Size	8 x 1-1/4"	10 x 1-1/4"	10 x 1-1/2"	12 x 1-1/2"	Box Qty.	Master Qty.
8450000	3/16" x 7/8"	3/16"	8-10	115	385	—	—	100	3,000
8451000	3/16" x 7/8"	3/16"	8-10	115	385	—	—	1,000	5,000
8460000	1/4" x 1"	1/4"	10-12	—	—	195	543	100	3,000
8461000	1/4" x 1"	1/4"	10-12	—	—	195	543	1,000	3,000
8430000	5/16" x 1-3/8"	5/16"	14-16	n/a	n/a	n/a	n/a	100	1,200
Kits With Drill And Screws									
**8450100	3/16" x 7/8"	3/16"	8	115	385	—	—	1	12
**8460100	1/4" x 1"	1/4"	10	—	—	195	543	1	12

*Tested in concrete block.
**Includes Carbide Drill Bit and 100 Anchors and Screws

INSTALLATION

1. Drill recommended diameter hole slightly deeper than length of anchor.
2. Clean hole of debris.
3. Insert plastic anchor into hole.
4. Place fixture over anchor and insert screw through fixture and into anchor.
5. Tighten screw.



TAP-IT®

AVAILABLE MATERIALS

Nylon Tap-It body with:

- Carbon steel nail, zinc plated
- Aluminum nail, bulk only
- Zinc plated nail available in bulk pack

FEATURES/ADVANTAGES

- Light to medium loads under dead, variable, or vibratory conditions in solid or hollow base materials
- Specially tempered high strength nylon. Functions in an effective temperature range from -40°F to +170°F
- Quick and easy to install
- Exceptionally resistant to vibration

APPROVALS/LISTINGS

- G.S.A. Spec FF-S-325C, Group V, Type 2, Class 4

TAP-IT® NYLON WASHER

AVAILABLE MATERIALS

- High strength nylon

FEATURES/ADVANTAGES

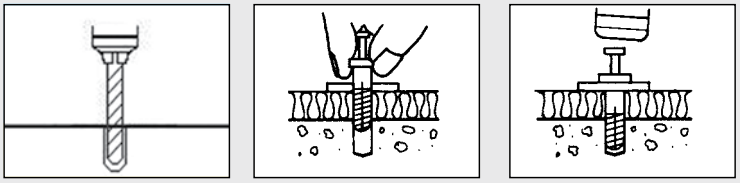
- Acts as a bearing surface when anchoring through soft material into concrete or other suitable base materials

ORDER DETAIL

Order Code	Hole I.D.	Washer O.D.	Box Qty.
5901000	1/4"	1-1/2"	100

INSTALLATION

1. Drill hole same diameter as "Tap-It" shell.
2. Clean hole of debris.
3. Insert shell through washer and into object to be fastened, then into the hole.
4. Tap nail until flush with nylon head.



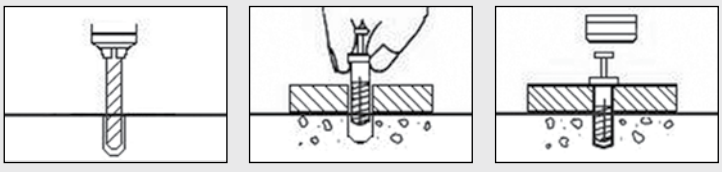
ORDER DETAIL

	Order Code	Hole/Anchor Diameter / Length	Head Style Diameter	Minimum Hole Depth	Minimum Embedment	Ultimate Tensile & Shear Loads in Lbs. Concrete Strength (P.S.I.) 3000 P.S.I. Tension	Shear	Box Qty.	Master Qty.
	Flat Head								
	5650000	1/4" x 1"	FLT-7/16"	1-1/4"	3/4"	261	884	100	1200
	5750000	1/4" x 1-1/2"	FLT-7/16"	1-3/4"	1"	320	920	100	800
	5850000	1/4" x 2"	FLT-7/16"	2-1/4"	1"	325	972	100	800
	Round Head								
	4630000	3/16" x 1"	RND-3/8"	1-1/4"	3/4"	283	713	100	1200
*	4730000	3/16" x 1-1/2"	RND-3/8"	1-3/4"	1"	335	887	100	1200
	5630000	1/4" x 1"	RND-7/16"	1-1/4"	3/4"	261	884	100	1200
	5730000	1/4" x 1-1/2"	RND-7/16"	1-3/4"	1"	320	951	100	1200
	5830000	1/4" x 2"	RND-7/16"	2-1/4"	1"	325	972	100	300
	Mushroom Head								
	4460000	3/16" x 3/4"	MUSH-9/16"	1"	5/8"	283	793	100	1200
	4660000	3/16" x 1"	MUSH-9/16"	1-1/4"	3/4"	370	687	100	1200
	5460000	1/4" x 3/4"	MUSH-9/16"	1"	5/8"	261	884	100	1200
	5660000	1/4" x 1"	MUSH-9/16"	1-1/4"	3/4"	261	884	100	1200
	5760000	1/4" x 1-1/2"	MUSH-9/16"	1-3/4"	1"	320	951	100	800
	5860000	1/4" x 2"	MUSH-9/16"	2-1/4"	1"	253	590	100	500
*	5160000	1/4" x 3"	MUSH-11/16"	3-1/4"	1-1/4"	261	884	100	500
*	5260000	1/4" x 4"	MUSH-11/16"	4-1/4"	1-1/4"	261	884	100	300

*Unassembled

INSTALLATION

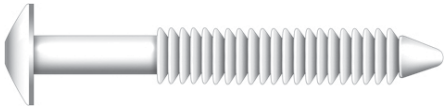
1. Drill hole same diameter as "Tap-It" shell and slightly deeper than fastener length in solid material.
2. Clean hole of debris.
3. Insert shell through object to be fastened and into the hole.
4. Tap nail until flush with nylon head.



UNI-TAP®

AVAILABLE MATERIALS
- High strength nylon
- Available in Bulk Pack

FEATURES/ADVANTAGES
- Light to medium loads under dead, variable or vibratory conditions, in solid or hollow masonry
- Impervious to moisture
- Quick and easy to install
- Can be used in a bottomless hole



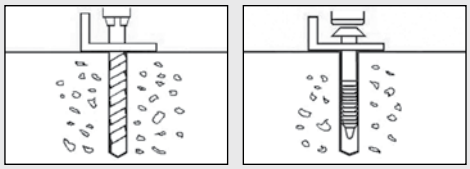
CONCERNS
- Drill recommended hole diameter

ORDER DETAIL

Order Code	Size	Masonry	Wood / Metal	Head Diameter	Grip Range	Tension Hollow Wall	Shear Hollow Material	Tension Cement Block	Head Style	Box Qty.	Master Qty.
6460000	9/32" x 1"	1/4"	9/32"	5/8"	3/16-1/2"	130	250	150	TRUSS	100	1200
6660000	9/32" x 1-5/8"	1/4"	9/32"	5/8"	3/8-1 1/8"	130	253	158	TRUSS	100	800
6760000	9/32" x 2-1/8"	1/4"	9/32"	5/8"	7/8-1 5/8"	130	274	154	TRUSS	100	800
6860000	9/32" x 2-5/8"	1/4"	9/32"	5/8"	1 3/8-2 1/8"	130	238	163	TRUSS	100	500
6960000	9/32" x 3-1/8"	1/4"	9/32"	5/8"	1 7/8-2 5/8"	130	228	150	TRUSS	100	500

INSTALLATION

1 Drill hole slightly deeper than fastener length.
2 Clean hole of debris.
3 Tap "Uni-Tap" into place through material to be fastened.



ZAP-IT®

AVAILABLE MATERIALS
Zinc Zap-It body with:
- Carbon steel nail, zinc plated
- Stainless steel nail
- Available in Bulk pack

FEATURES/ADVANTAGES
- Required hole diameter equals anchor diameter
- Fast, easy installation
- Stainless steel nail and zinc anchor body allow for fastening in outdoor applications

CONCERNS
- Dead loads only
- Not recommended for eccentric loading

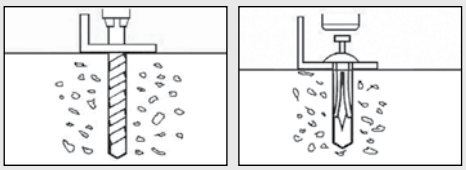
APPROVALS/LISTINGS
- G.S.A. Spec FF-S-325C, Group V, Type 2, Class 3

ORDER DETAIL

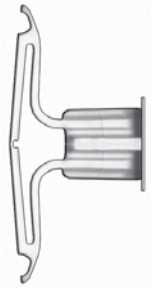
Order Code	Stainless Steel	Anchor Diameter & Length	Hole Diameter	Embedment	Tension	Shear	Box Qty.	Master Qty.
3912000	—	3/16" x 7/8"	3/16"	5/8"	—	—	100	3000
3916000	3916SSO	1/4" x 1"	1/4"	3/4"	750	1,516	100	800
3920000	3920SSO	1/4" x 1-1/4"	1/4"	1"	1,000	1,516	100	800
3924000	—	1/4" x 1-1/2"	1/4"	1-1/4"	1,100	1,516	100	800
3928000	—	1/4" x 2"	1/4"	1-3/4"	1,400	1,516	100	500
3930000	—	1/4" x 3"	1/4"	1-3/4"	1,400	1,516	100	500

INSTALLATION

1 Drill hole to length of product selected.
2 Clean hole of debris.
3 Insert "Zap-It" through material, place in hole and tap nail until flush with head.



VERSA-TOGGLE®



AVAILABLE MATERIALS
- High strength nylon

FEATURES/ADVANTAGES
- Excellent for light loads in gypsum board
- Fast, easy installation

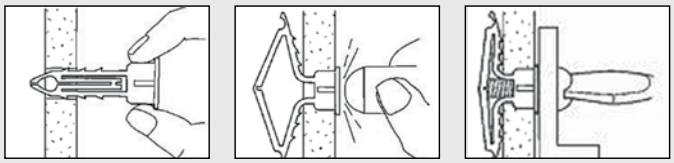
APPROVALS/LISTINGS
- G.S.A. Spec FF-B-588D, Type IV

ORDER DETAIL

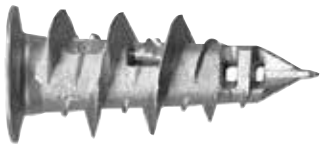
Order Code	Size	Hole Diameter	Wall Thickness	Screw Size	Box Qty.	Master Qty.
8512000	Short	5/16"	1/2"	6-8	100	800
8578000	Long	5/16"	1"	8-12	100	800

INSTALLATION

1. Drill 5/16" dia. hole, squeeze toggle wings flat and push into hole.
2. Tap flush with wall.
3. Put fixture in place, insert screw and tighten until secure.



SELF-DRILLING WALLBOARD



AVAILABLE MATERIALS
- Zinc diecast alloy
- High strength nylon

CONCERNS
- Hollow wall anchoring only

FEATURES/ADVANTAGES
- Works in any wallboard thickness
- Can be easily backed out
- Low profile head
- Fast, easy installation
- Zinc Anchor can be set with a 1/4" hex bit tip

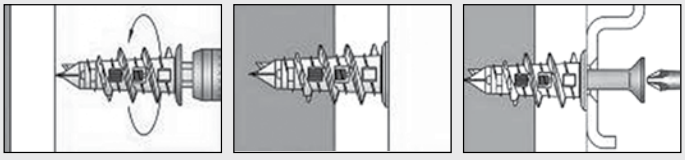
ORDER DETAIL

	Order Code	Description	Maximum Fixture Thickness	Tension	Shear	Box Qty.	Master Qty.
			1/2" Drywall				
	8561000	Plastic	3/4"	81	150	100	1200
*	8561100	Plastic Kit	3/4"	81	150	1	12
	8571000	Zinc	3/4"	90	150	100	1200
*	8571100	Zinc Kit	3/4"	90	150	1	12

*Includes 50 #8 x 1-1/4" Screws and 50 Anchors

INSTALLATION

1. Place driving tool in anchor and puncture wallboard with anchor point.
2. Screw anchor clockwise applying forward pressure until head is flush to wall.
3. Place fixture over hole and tighten #8 or #10 sheet metal screw.



HOLLY

AVAILABLE MATERIALS
- Multi-legged sheet metal shell with machine screw, zinc plated

FEATURES/ADVANTAGES
- Light to medium loads under dead or variable conditions in a variety of hollow base materials
- Expanded, the shell is permanently installed and fixtures can be exchanged by removing and replacing the screw
- Drive Holly does not require a pre-drilled hole in gypsum board

CONCERNS
- Hollow construction only

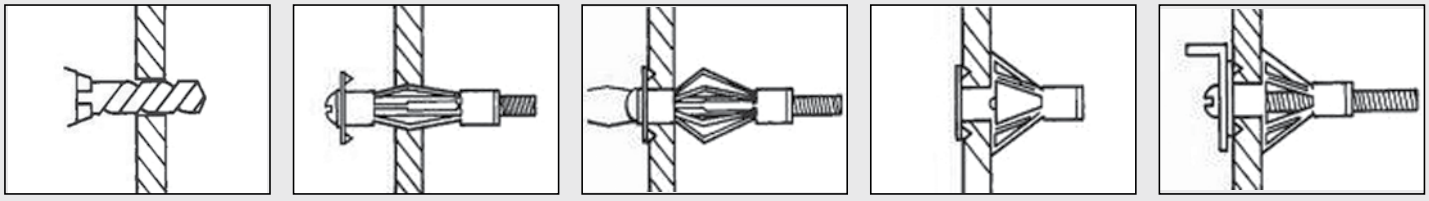
APPROVALS/LISTINGS
- G.S.A. Spec FF-B-588D, Type III, Class A (Regular)
- G.S.A. Spec FF-B-588D, Type III, Class B (Drive)

ORDER DETAIL

Order Code	Size	Hole Diameter	Grip Range	Tension	Shear	Minimum Wall Thickness	Box Qty.	Master Qty.
0120000	1/8" XS	5/16"	0" - 3/16"	—	—	1/16"	100	3,000
0121000	1/8" SR	5/16"	1/8" - 5/8"	90	165	1/8"	100	1,200
0122000	1/8" LR	5/16"	5/8" - 1-1/4"	130	205	5/8"	100	800
0123000	1/8" XLR	5/16"	1-1/4" - 1-3/4"	260	320	1-1/4"	100	800
0130000	3/16" SR	3/8"	1/8" - 3/4"	135	300	1/8"	100	500
0131000	3/16" LR	3/8"	3/4" - 1-1/4"	260	485	3/4"	100	500
0132000	3/16" XLR	3/8"	1-1/4" - 1-3/4"	300	490	1-1/4"	100	300
0140000	1/4" SR	7/16"	1/8" - 5/8"	140	300	1/8"	100	500
0141000	1/4" LR	7/16"	5/8" - 1-1/4"	165	550	5/8"	50	400
0142000	1/4" XLR	7/16"	1-1/4" - 1-3/4"	200	575	1-1/4"	50	400
Drive Holly								
0150000	1/8" XSD	DRIVE N/A	1/16" - 1/4"	—	—	1/16"	100	1,200
0151000	1/8" SD	DRIVE N/A	1/8" - 1/2"	25	90	1/8"	100	1,200
0152000	1/8" SLD	DRIVE N/A	1/8" - 3/4"	85	175	1/8"	100	1,200
Setting Tool								
0110000	Holly Setting Tool						1	—

INSTALLATION

1. Drill hole through the base material same diameter as fastener.
2. Clean hole of debris.
3. Insert the fastener through the material and tap until head is flat against the wall surface.
4. Turn screw with screwdriver until fastener is expanded. Can also be set using a Holly Setting Tool.
5. Remove screw.
6. Place fixture. Replace screw through fixture and tighten.



ADHESIVE

ANCHORING SYSTEMS

LIQUID ROC ADHESIVE COMPARISON

	LR 300 Capsule/ Hammer Capsule	LR 300 Twin Tube	LR 300 Pouch	VME Twin Tube	VMZ Internal Thread Injection	LR 500+ Single/Twin Tube	LR 700+ Single/Twin Tube
Cure Time (68°F)	10 min.	40 min.	20 min.	10 hr.	1 hr.	12 hr.	1 hr.
Cure Temperature	15-100°F+	25-100°F+	15-100°F+	41-104°F+	1 hr.	40-100°F+	1 hr.
High Temperature Service	176°F	176°F	176°F	104°F	176°F	125°F	176°F
Shelf Life	24 months	9 months	18 months	24 months	18 months	24 months	18 months
Mix Ratio	Important	Important	Important	Critical	Important	Critical	Important
Weathering	Fair	Fair	Fair	Excellent	Good	Excellent	Good
Chemical Resistance	Fair	Fair	Fair	Excellent	Good	Excellent	Good
Shrinkage	4%	4%	4%	<1/2%	1/2%	<1/2%	1/2%

APPLICATION AND PRODUCT SELECTION GUIDE

		Fastening Base Material						Application Criteria						Program		
Page No.	Types of Adhesive	Concrete	Hard Natural Stone	Soft Natural Stone	Solid/ Hollow Brick	Grout Filled Block	Hollow Concrete Block	Wood/Metal Gypsum/ Plastic Foam Ins.	In-place (through) Fastening	Immediate Loading	Flush Surface Removing	Dynamic Loading	Temp Resistant	Materials	Versions of Anchors	Characteristics
HEAVY DUTY																
34	Liquid Roc 300 Capsule	●	○			○						●	○	- Polyester Resin - Benzoyl Peroxide - Hardener - Quartz Sand	- Threaded Rod - Rebar - (Chamfer Cut)	Mixes in hole with use of rotary hammer only
35	Liquid Roc 300 Hammer Capsule	●	○			○						●	○	- Polyester Resin - Benzoyl Peroxide - Hardener - Quartz Sand	- Threaded Rod - Rebar - (Straight Cut)	Mixes in hole by driving a rod with a hammer
36	Liquid Roc 300 Pouch	●	○	○								●	○	- Polyester Resin - Benzoyl Peroxide - Hardener	- Threaded Rod - Rebar - Smooth Dowel - (Straight Cut)	Bonds to Solid Masonry
37	Liquid Roc 300 Twin Tube	●	●	●	●	●	○					●	○	- Polyester Resin - Benzoyl Peroxide - Hardener	- Threaded Rod - Rebar - Smooth Dowel - (Straight Cut)	Bonds to Hollow or Solid Masonry
38-40	VME Twin Tube	●	●	●		●						●		- Amine Base Epoxy	- Threaded Rod - Rebar	High Strength for Sesmic /Wind Loading
41	VMZ Internal Thread Injection System	●	●	●		●						●		- Vinyl Ester Resin - Styrene Free	- Threaded Rod - Rebar - InternalThread Insert	Bonds to Solid Masonry Low Odor
42	Liquid Roc 500+ Single Tube Low Odor	●	●	●	○	●						●	○	- Amine Base Epoxy	- Threaded Rod - Rebar - Smooth Dowel - (Straight Cut)	Bonds to Solid Masonry Low Odor
43	Liquid Roc 500+ Twin Tube Low Odor	●	●	●	○	●						●	○	- Amine Base Epoxy	- Threaded Rod - Rebar - Smooth Dowel - (Straight Cut)	Bonds to Solid Masonry Low Odor
44-45	Liquid Roc 700+ Single/Twin Tube	●	●	●	●	●	○					●	○	- Acrylic Base - Benzoyl Peroxide - Hardener	- Threaded Rod - Rebar - Smooth Dowel - (Straight Cut)	Bonds to Hollow or Solid Masonry

KEY ● VERY SUITABLE ○ MAY BE SUITABLE PER APPLICATION

LIQUID ROC® 300 CAPSULE

AVAILABLE MATERIALS

- Capsules – polyester resin base, quartz sand, benzoyl peroxide hardener
- Chamfer cut rods – A307 steel, zinc plated. Other sizes, materials and finishes available upon request

FEATURES/ADVANTAGES

- Pre-measured adhesive
- No expensive dispensing tools
- Sand and aggregate mixture is closest to natural concrete

CONCERNS

- Hole must be of correct diameter and depth
- Do not use overhead
- Must use chamfer cut or chisel pointed rod
- 24 month shelf life
- For short term loading only

APPROVALS/LISTINGS

- Contact customer service for approvals/listings for state D.O.T's

CAPSULE ACCESSORIES

(Capsule Setting tool for threaded rod)

Order Code	Desc.
3200020	SDS +Drill Driver
3200030	SDS MAX

NOTE: Use with Appropriate Size 1/2" Square Drive Socket

+ Not available once stock is depleted

CURE TIME

Concrete Temperature	Time
Over 68°F.	10 min.
50° to 68°F.	20 min.
32° to 50°F.	1 hr.
23° to 32°F.	5 hrs.

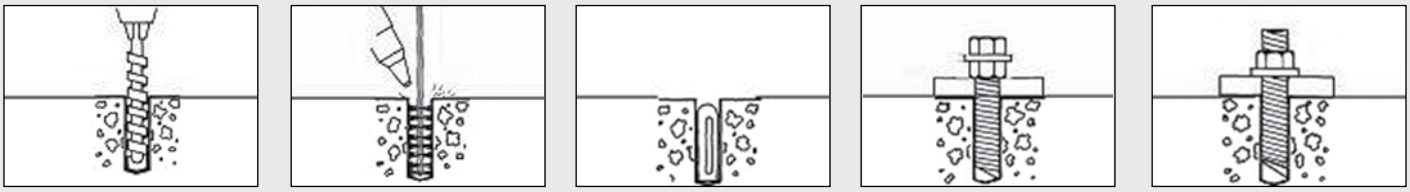
ORDER DETAIL

						Ultimate Tensile & Shear Loads in Lbs.* Concrete Strength (P.S.I.)			Capsule		Rod	
						3000 P.S.I.	5000 P.S.I.					
Capsule Order Code	Chamfer Cut Rod (2)	Anchor Size	Hole Dia.	Impact Socket Size	Min. Embedment	Tension	Tension	Shear	Box Quantity	Master Quantity	Box Quantity	Master Quantity
3206000	3206020	3/8" x 5"	7/16"	9/16"	3-1/2"	7,800	7,420	3,983	10	560	10	80
3208000	3208025	1/2" x 6-1/4"	9/16"	3/4"	4-1/2"	9,820	15,720	7,323	10	560	10	50
3210000	3210030	5/8" x 7-1/2"	11/16"	15/16"	5"	19,360	20,180	11,757	10	560	10	50
3212000	3212041	3/4" x 10-1/4"	7/8"	1-1/8"	6-1/2"	23,880	30,060	17,257	6	60	6	12
3214000	3214047	7/8" x 11-3/4"	1"	1-5/16"	7-1/2"	23,880	39,280	24,338	6	60	6	12
3216000	3216047	1" x 11-3/4"	1-1/8"	1-1/2"	8-1/2"	38,280	47,900	29,128	6	60	6	12

*Load values based on A-193, B7 Rods. (2) Rods may be cut to order Metric sizes available upon request

INSTALLATION

1. Drill hole to correct size and depth using rotary-hammer.
2. Remove dust and rubble from the hole with compressed air, a brush and water. Excess water must be removed although the hole may be damp.
3. Insert the capsule in the hole, either end first.
4. Double nut the threaded rod, and insert the chamfered stud into the hole to break the capsule. Under power, hammer drill the chamfered stud to full depth, maintaining power for two or three seconds after the chamfered stud bottoms.
5. Promptly and carefully remove the drive socket from the stud, leaving it undisturbed through the prescribed curing time consistent with onsite temperature.



LIQUID ROC® 300 HAMMER CAPSULE

AVAILABLE MATERIALS

- Capsules – polyester resin base, quartz sand, benzoyl peroxide hardener
- Square cut threaded rods steel, zinc plated. Other materials and finishes available upon request
- Square cut rebar – ASTM A615 rebar

FEATURES/ADVANTAGES

- Pre-measured adhesive
- No expensive dispensing tools
- Fast, simple installation
- Self-contained, single point fastening

CONCERNS

- Must insert resin end into the hole first
- Use double embedment for higher, more consistent load values
- Hole must be of correct diameter and depth
- 24-month shelf life
- Not for use with smooth dowels
- For short term loading only

APPROVALS/LISTINGS

- Contact customer service for approvals and listings

CURE TIME

Concrete Temperature	Time
Over 68°F.	10 minutes
50° to 68°F.	20 minutes
32° to 50°F.	1 hour
23° to 32°F.	5 hours

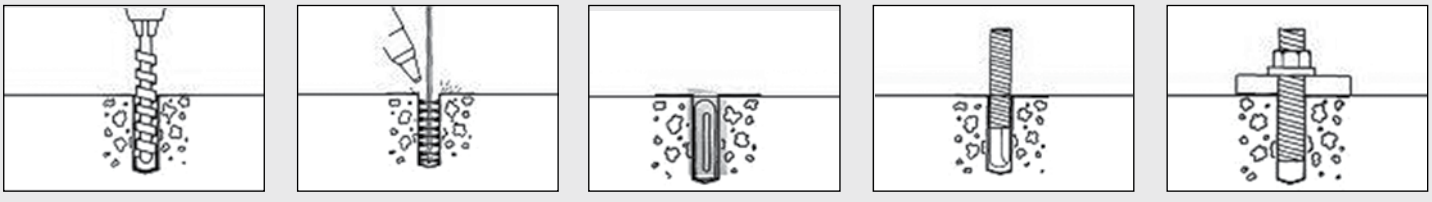
ORDER DETAIL

					For use with Square Cut Rods				For use with Rebar				
					Ultimate Tensile Shear Loads in Lbs.* Concrete Strength (P.S.I.)				Ultimate Tensile Shear Loads in Lbs.* Concrete Strength (P.S.I.)				Capsule
					2000 P.S.I	4000 P.S.I			2000 P.S.I	4000 P.S.I.			
Capsule Order Code	Anchor/Rebar Size	Minimun Embedment	Square Cut Rod Order Code	Hole Diameter	Tension	Tension	Shear	Hole Diameter	Tension	Tension	Shear	Box Quantity	Master Quantity
320600H	3/8" / #3	3-1/2"	3106032	7/16"	4,320	6,120	3,983	1/2"	4,960	7,000	3,983	10	200
320800H	1/2" / #4	4-1/4"	3108032	9/16"	7,920	11,200	7,323	5/8"	8,800	12,440	7,323	10	200
321000H	5/8" / #5	5-5/8"	3110032	11/16"	10,240	14,480	11,757	3/4"	11,160	15,800	11,757	10	200
321200H	3/4" / #6	6"	3112032	7/8"	14,240	19,960	17,257	7/8"	14,240	19,960	17,257	6	60
321600H	1" / #8	7"	3216047	1-1/8"	25,200	35,280	29,128	1-1/8"	25,200	35,280	29,128	6	60

*Load values based on A-193, B7 Rods

INSTALLATION

1. Drill hole to correct size and depth using rotary-hammer.
2. Remove dust and rubble from the hole with compressed air, a brush and water. Excess water must be removed although the hole may be damp.
3. Insert the capsule in the hole, resin end (long end) first.
4. Set anchor in hole by driving it through the capsule. Use only square cut threaded rod or rebar. Do not spin the anchor while setting it.
5. Allow the anchor to set undisturbed for the cure time specified on the product label.



LIQUID ROC® 300 POUCH

AVAILABLE MATERIALS

- Pouch – polyester resin base, benzoyl peroxide hardener
- Square-cut rods- A307 steel, zinc plated. Other sizes, materials and finishes available upon request

FEATURES/ADVANTAGES

- No dispensing tools needed
- Pre-measured adhesive
- No messy mixing
- Will cure below freezing
- Pourable consistency

CONCERNS

- Cannot be used in horizontal or overhead holes
- Must be used within 20 minutes after mixing
- 18 month shelf life
- For short term loading only

APPROVALS/LISTINGS

- Contact customer service for approvals/listings for state D.O.T.'s

CURE TIME

Concrete Temperature	Time	Concrete Temperature	Time
Over 80°F.	10-15 min.	48° to 38°F.	2 hrs.
80° to 68°F.	15-20 min.	38° to 28°F.	4 hrs.
68° to 58°F.	20-30 min.	28° to 18°F.	6 hrs.
58° to 48°F.	30-60 min.	Below 18°F.	24 hrs.

SQUARE CUT ROD

Order Code	Size	Box Quantity	Master Quantity
3106032	3/8 x 8"	10	50
3106048	3/8"x 12"	10	20
3108032	1/2"x 8"	10	50
3108048	1/2"x 12"	10	20
3110032	5/8"x 8"	10	50
3110048	5/8"x 12"	10	20
3112032	3/4"x 8"	10	50
3112048	3/4"x 12"	10	20

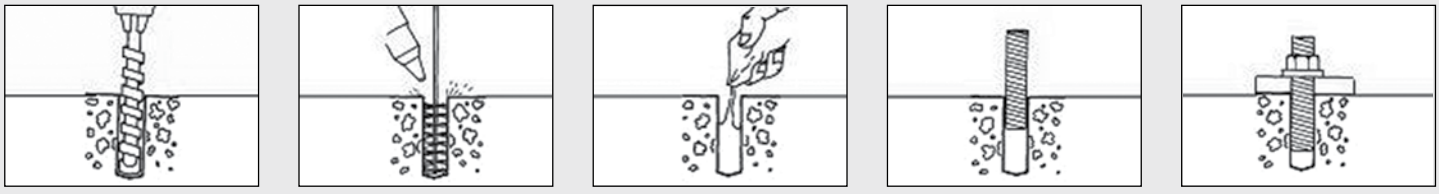
ORDER DETAIL

Pouch Order Code	Square Cut Rod Order Code	Size	Hole Diameter	Minimum Embedment	Ultimate Tensile & Shear Loads in Lbs.* Concrete Strength (P.S.I.) 3000 P.S.I. Tension	5000 P.S.I. Tension	Shear	Rod Box Quantity	Rod Master Quantity
7511008 5.5 fl. oz 5/Box	3106032	3/8" x 8"	7/16"	3-1/2"	6,925	8,008	3,780	10	50
	3106048	3/8" x 12"	7/16"	3-1/2"	6,925	8,008	3,780	10	20
	3108032	1/2" x 8"	9/16"	4-1/2"	10,650	11,319	6,840	10	50
	3108048	1/2" x 12"	9/16"	4-1/2"	10,650	11,319	6,840	10	20
	3110032	5/8" x 8"	11/16"	5-1/2"	19,225	20,125	11,570	10	50
	3110048	5/8" x 12"	11/16"	5-1/2"	19,225	20,125	11,570	10	20
	3112032	3/4" x 8"	7/8"	6-1/2"	20,975	21,940	17,860	10	50
	3112048	3/4" x 12"	7/8"	6-1/2"	20,975	21,940	17,860	10	20
	**	7/8"	1"	7-1/2"	25,300	31,156	21,670	-	-
	**	1"	1-1/8"	8-1/2"	26,425	31,454	26,730	-	-

*Load values based on A-193, B7 Rods ** Special, Made to Order

INSTALLATION

1. Drill hole to correct size and depth using rotary-hammer.
2. Remove dust and rubble from the hole with compressed air, brush and water. Excess water must be removed although hole may be damp. Hold each end of the pouch and pull firmly to remove dividers. Mix thoroughly in pouch until color is uniform. Do not use excessive pressure or puncture pouch while mixing.
3. Cut corner and fill hole 2/3 full.
4. Insert stud turning slowly by hand.
5. Leave it undisturbed through prescribed curing time consistent with the on-site temperature.



LIQUID ROC® 300 TWIN TUBE

AVAILABLE MATERIALS

- Twin Tube – polyester resin base, benzoyl peroxide hardener
- Square cut rods – A307 steel, zinc plated. Other sizes, materials and finishes available upon request

FEATURES/ADVANTAGES

- Pre-measured adhesive
- Easy to use and can be saved for re-use
- Nozzle included
- Works well in horizontal and overhead applications
- Can be used with screen tubes

CONCERNS

- 9 month shelf life
- For short term loading only

APPROVALS/LISTINGS

- Contact customer service for approvals/listings for state D.O.T.'s

Ultimate Loads in Lbs.
Unreinforced Brick Wall

Anchor Type	Drill Diameter	Embedment	Average Load (lbs)
3/4" shear	1"	8"	7056 shear
3/4" combo 22-1/2°	1"	12-1/2"	8830 tension
5/8" combo	1"/ 5/8"	8"/13"	9292 shear

7521020 - Replacement Nozzle

CURE TIME

Concrete Temperature	Time
Over 80°F.	20-30 min.
80° to 68°F.	30-40 min.
68° to 58°F.	40-50 min.
58° to 48°F.	60 min.
48° to 38°F.	2 hrs.
38° to 28°F.	4 hrs.

WIRE MESH SCREEN

Order Code	Description	O.D.
7706924	3/8"x 6"	1/2"
7706940	3/8"x 10"	1/2"
7708924	1/2"x 6"	5/8"
7708940	1/2"x 10"	5/8"
7710924	5/8"x 6"	3/4"
7710940	5/8"x 10"	3/4"
7712924	3/4"x 6"	1"
7712940	3/4"x 10"	1"

7521095
Manual Tool for 28 oz. Twin Tube

7521096
Pneumatic Gun for 28 oz. TwinTube

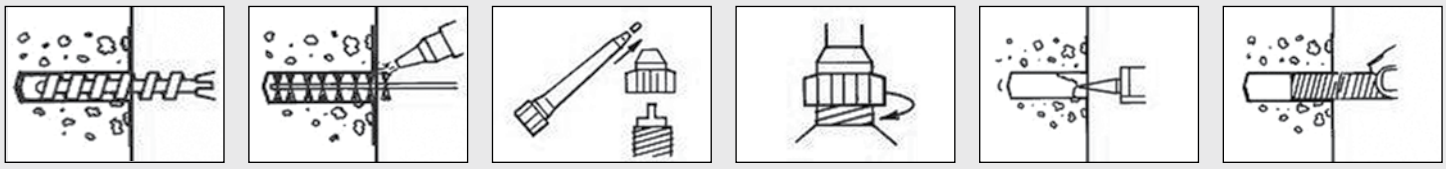
ORDER DETAIL

Twin Tube Order Code	Sq. Cut Rod Diameter	Hole Diameter	Minimum Embedment	Ultimate Tensile & Shear Loads in Lbs.* Concrete Strength (P.S.I.) 2000 P.S.I. Tension	2000 P.S.I. Shear	4000 P.S.I. Tension	4000 P.S.I. Shear	Ultimate Tensile & Shear Loads in Lbs. Grouted Masonry Block** Tension	Grouted Masonry Block** Shear	Hollow Masonry Block** Tension	Hollow Masonry Block** Shear
7521041 28 fl.oz. w/Nozzle 5/Box	3/8"	1/2"	3-1/2"	4,720	6,133	5,920	6,133	4,562	5,997	1,007	2,214
	1/2"	5/8"	4-1/2"	9,067	8,880	9,067	9,520	5,541	9,015	1,071	1,446
	5/8"	3/4"	5-1/2"	11,387	12,160	14,427	14,053	7,222	11,213	858	2,830
	3/4"	1"	6"	—	—	—	—	—	—	1,458	2,249
	3/4"	7/8 "	6-1/2"	18,213	19,360	19,973	20,000	9,561	10,993	—	—
	7/8"	1"	7-1/2"	24,107	24,640	26,507	26,827	—	—	—	—
	1"	1-1/8"	8-1/2"	24,800	28,800	30,773	34,000	—	—	—	—

*Load values based on A-193, B7 Rods ** Concrete masonry units meet ASTM C90, Grade N, Type 1

INSTALLATION

1. Drill hole to correct diameter and depth.
2. Clean dust from hole using a round nylon brush. Use pressurized air to blow dust out of hole.
3. Twist off cap on cartridge.
4. Screw static mixer nozzle over cartridge opening. Load into dispensing tool.
5. Dispense adhesive filling from bottom of hole to avoid air pockets. NOTE: Dispense and discard a bead of material to achieve proper mix, indicated by uniform color.
6. Insert anchor rod into hole using slight twisting motion.
7. In cases where you are using a screen, first fill the screen completely, then insert screen in the hole, then insert anchor into screen.



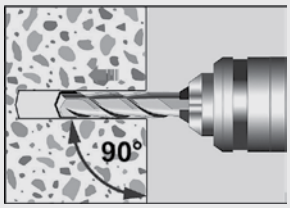
MKT VME EPOXY

The VME Epoxy Adhesive Anchor System is comprised of a two-component epoxy adhesive provided in cartridges, static mixing nozzles, manual dispensing tools, hole cleaning equipment, and adhesive injection accessories. MKT VME epoxy adhesive may be used with threaded rods or reinforcing bars.

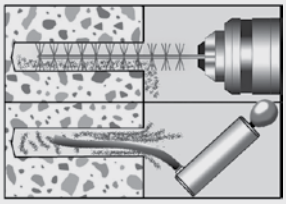
MKT VME epoxy adhesive anchors are used to resist static, wind and seismic tension and shear loads in cracked and uncracked normal weight concrete with a specified compressive strength of 2500-8500 psi.

- Used with threaded rod or rebar assemblies
- ICC listed under ICC ESR-2845
- Seismic Design Categories A and B

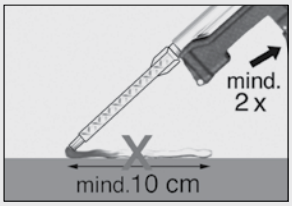
INSTALLATION



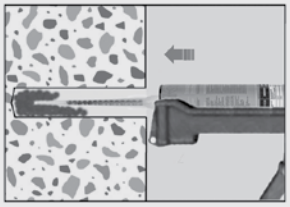
Drill hole to recommended diameter and depth



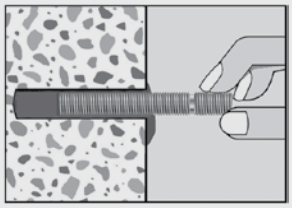
Clean dust from hole using a wire brush and pressurized air.



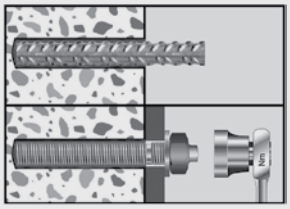
Dispense and discard a bead of epoxy to achive proper mix indicated by uniform color.



Dispense epoxy filling from bottom of the hole to avoid air pockets.



Insert anchor rod into hole with a slight twisting motion.



Anchor may be loaded after proper curing time.

Description	Part Number	Qty/Case
13 oz. Twin	7800013	12
20 oz. Twin	7800020	12
VM-X Mixing Nozzle	M28305111	1
13 oz. Manual Dispenser	M28353015	1
20 oz. Manual Dispenser	M28353201	1
Blow Out Pump	M33200101	1
SDS+ Shank Adapter	M33350101	1
VM-XLE 10/1000 EXT Tube for Nozzle	M85952101	1
VM-XLE 16/1000 EXT Tube for Nozzle	M85956101	1

Description	Part Number	Qty/Case
Brush EXT 6"	M33968101	1
3/8"(#3) Cleaning Brush	M85851134	1
1/2"(#4) Cleaning Brush	M85852134	1
5/8"(#5) Cleaning Brush	M85854134	1
3/4"(#6) Cleaning Brush	M85855134	1
7/8"(#7) Cleaning Brush	M85956134	1
1"(#8) Cleaning Brush	M85857134	1
1-1/4"(#9) Cleaning BrushH	M85858134	1
1-3/8"(#10) Cleaning Brush	M85859134	1

ICC REPORT ESR-2845

- 2006 International Residential Code (2006 IRC)
- 2006 International Building Code (2006 IBC)
- 2009 International Residential Code (2009 IRC)
- 2009 International Building Code (2009 IBC)
- 2012 International Residential Code (2012 IRC)
- 2012 International Building Code (2012 IBC)

GEL (WORKING) TIMES AND TOTAL CURING TIMES

Base material temps	Gel time	Curing time
41F/5C	3 Hours	50 Hours
50F/10C	2 Hours	30 Hours
68F/20C	30 Minutes	10 Hours
86F/30C	20 Minutes	6 Hours
104F/40C	12 Minutes	4 Hours

LOAD & PERFORMANCE DATA

Threaded Rod (inch)	3/8"	1/2"	5/8"	3/4"	7/8"	1"	-	1-1/4"
Reinforcing Steel*	#3	#4	#5	#6	#7	#8	#9	#10
Effective Embedment	2-3/8"	2-3/4"	3-1/8"	3-1/2"	3-1/2"	4"	4-1/2"	5"
Allowable Loads, Tension[1] in 2500 psi Concrete	1930	2400	2910	3450	3450	4215	5030	5890

SPACING & EDGE DISTANCE

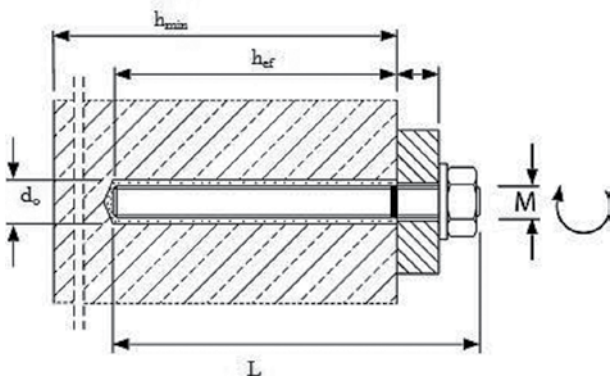
Effective anchorage depth h_{ef}								
Critical Spacing S	1-7/8"	2-1/2"	3-1/8"	3-3/4"	4-3/8"	5"	5-5/8"	6-1/4"
			3-3/8"*					
Critical Edge Distance C	1-7/8"	2-1/2"	3-3/8"*	3-3/4"	4-3/8"	5"	5-5/8"	6-1/4"
Member thickness h_{min}	h_{ef}+ 1-1/4 d_o				h_{ef}+ 2 d_o			

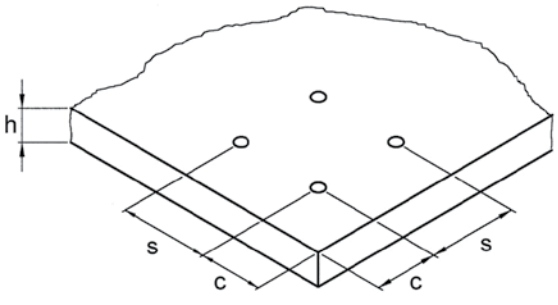
INSTALLATION PARAMETERS

Drilled hole diameter d_o	7/16"	9/16"	11/16"	7/8"	1"	1-1/8"	1-3/8"	1-3/8"
								1-1/2"*

1 A safety factor of 1.48 was used to calculate the allowable loads. This is based on a load combination of 30% dead loads and 70% live loads. Based on temperature range A (max short term temp 104F (40 C) max long term temp 75F (24C)).

* Denotes rebar qualities only





MKT VME EPOXY CONTINUED

in 4,000 psi concrete	Threaded Rod	3/8	1/2	5/8	3/4	7/8	1	1-1/4
$h_{ef,min}$	Inch	2-3/8	2-3/4	3-1/8	3-1/2	3-1/2	4	5
$h_{ef,max}$	Inch	4-1/2	6	7-1/2	9	10-1/2	12	15
appr. $N_{cr,\ hef,min}$	[lbf]	-	883	1,032	1,291	1,422	1,857	2,901
appr. $N_{cr,\ hef,max}$	[lbf]	-	1,927	2,477	3,321	4,265	5,571	8,704
appr. $N_{uncr,\ hef,min}$	[lbf]	1,259	1,825	2,481	3,196	3,608	4,572	6,825
appr. $N_{uncr,\ hef,max}$	[lbf]	2,385	3,981	5,953	8,218	10,824	13,716	20,474
appr. $V_{cr,\ hef,min}$	[lbf]	-	1,902	2,223	2,781	3,062	3,999	6,249
appr. $V_{cr,\ hef,max}$	[lbf]	-	4,150	5,335	7,152	9,186	11,998	18,747
appr. $V_{uncr,\ hef,min}$	[lbf]	1,355	3,930	5,343	6,883	7,771	9,848	14,699
appr. $V_{uncr,\ hef,max}$	[lbf]	2,128	4,673	7,444	11,017	15,207	19,950	31,920

in 4,000 psi concrete	Rebar	#3	#4	#5	#6	#7	#8	#9	#10
$h_{ef,min}$	Inch	2-3/8	2-3/4	3-1/8	3-1/2	3-1/2	4	4-1/2	5
$h_{ef,max}$	Inch	4-1/2	6	7-1/2	9	10-1/2	12	13-1/2	15
appr. $N_{cr,\ hef,min}$	[lbf]	-	883	1,032	1,291	1,422	1,857	2,350	2,901
appr. $N_{cr,\ hef,max}$	[lbf]	-	1,930	2,477	3,321	4,265	5,571	7,050	8,704
appr. $N_{uncr,\ hef,min}$	[lbf]	1,259	1,825	2,481	3,196	3,608	4,572	5,639	6,825
appr. $N_{uncr,\ hef,max}$	[lbf]	2,385	3,981	5,953	8,218	10,824	13,716	16,916	20,474
appr. $V_{cr,\ hef,min}$	[lbf]	-	1,902	2,223	2,781	3,062	3,999	5,062	6,249
appr. $V_{cr,\ hef,max}$	[lbf]	-	4,150	5,335	7,152	9,186	11,998	15,185	18,747
appr. $V_{uncr,\ hef,min}$	[lbf]	1,355	3,930	5,343	6,883	7,771	9,848	12,145	14,699
appr. $V_{uncr,\ hef,max}$	[lbf]	2,408	4,378	6,787	9,638	13,135	17,295	21,892	27,803

Calculation of weighted average for the conversion factor, a = 1.2(0.3) + 1.6(0.7) = 1.48

1 Temperature Range A: Long term service temperature = 110°F, short-term service temperature = 176°F

VMZ INTERNAL THREAD INJECTION SYSTEM

AVAILABLE MATERIALS
Carbon Steel Zinc Plated

FEATURES/ADVANTAGES
- Can be installed using a construction grade single tube tool
- The fixture is easily removed
- Closer anchor spacing and edge distance than with drop-in anchors
- Rated for cracked or un-cracked concrete
- Eliminates trip hazard by using finished head bolts
- Ultimate loads are derived from installation in un-cracked concrete

CONCERNS
- 18 mo shelf life

APPLICATIONS:
Heavy duty anchoring where the use of internal thread is required and/or anchor spacing and edge distance requirements are closer than those needed for drop-in anchor: Steel structures, brackets, railings, posts, columns, ladders, gates, etc.

M28252601
VMZ Adhesive Single Tube Only

ORDER DETAIL

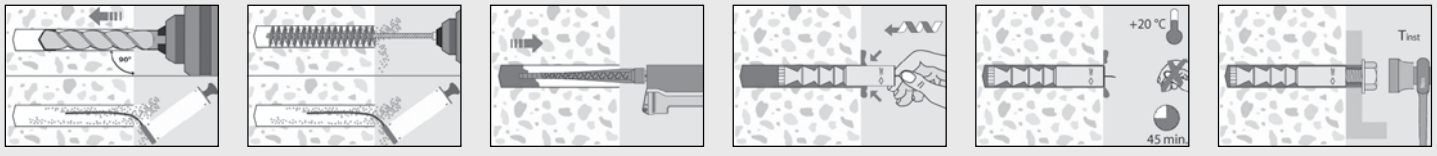
Order Code Carbon Steel	Anchor Size	Min Hole Depth (Inch)	Thread Length (Inch)	Embed Depth (Inch)	Install Torque (ft-lbs)	Drill Diameter (Inch)	4000 psi Tension* (lbf)	Concrete Shear* (lbf)	Anchors/ Cartridge
301415I	1/4"	1-5/8	1/2	1-5/8	6	3/8	3344	1810	123
305162I	5/16"	2-1/2	3/4	2-3/8	7	1/2	7424	3383	53.7
303831I	3/8"	3	1	2-3/4	11	9/16	9255	4980	42.6
301241I	1/2"	3-3/4	1	3-1/2	18	3/4	15,215	8881	20.1
305861I	5/8"	6-1/4	1-1/2	5-7/8	37	1	32,334	16,799	5.4
303471I	3/4"	6-5/8	1-1/2	6-1/8	59	1	30,100	23,780	9.5

* Ultimate load values are based on using VMZ adhesive with inserts. Be sure to use a bolt with suitable tensile strength to attain loads.

Base Material Temperature	Gel Time	Cure Dry Hole	Cure Wet Hole
-5 C/23 F	1.5 Hr	6 Hr	12 Hr
0 C/32 F	45 Min	3 Hr	6 Hr
5 C/41 F	20 Min	2 Hr	4 Hr
10 C/50 F	12 Min	1.3 Hr	2.5 Hr
20 C/68 F	6 Min	45 Min	1.5 Hr
30 C/86 F	4 Min	25 Min	50 Min
35 C/95 F	2 Min	20 Min	40 Min
40 C/104 F	1.5 Min	15 Min	30 Min

INSTALLATION

1 Select the correct diameter drill bit and drill the hole to the required hole depth.
2 Remove the debris from the hole using compressed air and a brush
3 Inject VMZ adhesive into the hole starting at the bottom and working outward to avoid air pockets.
4 Place the anchor in the hole using a twisting motion until it is flush with the concrete
5 Do not disturbe the anchor until full cure has been reached as indicated by the table above.
6 Clear excess adhesive from the hole opening using a chisel before removing rubber plug.
7 Place fixture over the hole and start the bolt until finger tight.
8 Tighten bolt to appropriate torque to complete the fastening.



LIQUID ROC® 500+ SINGLE

AVAILABLE MATERIALS

- Amine base epoxy
- Square cut rods - A307 steel, zinc plated. Other sizes, materials and finishes available upon request

FEATURES/ADVANTAGES

- Nozzle included
- Specifically formulated to reduce toxicity
- Pre-measured epoxy dispenses with standard caulk gun
- Non-shrink epoxy is environmentally friendly
- Excellent chemical resistance once cured
- Meets ASTM C881 standard (modified for gel time)
- This product is suitable for long term loading at room temperature or below. It is not intended for use overhead or in applications where elevated temperatures occur

CONCERNS

- Do not use below 40° F
- 24 month shelf life

APPROVALS/LISTINGS

- Contact customer service for approvals/listings for state D.O.T.'s
- ASTM C881, Type I and IV, Grade 3, Class B and C

ORDER DETAIL

LR 500+ Order Code	Square Cut Rod Order Code	Rod Box Quantity	Rod Master Quantity
7800008 8.5 fl. oz. w/nozzle 12/Box	3106032	10	50
	3106048	10	20
	3108032	10	50
	3108048	10	20
	3110032	10	50
	3110048	10	20
	3112032	10	50
	3112048	10	20
	*	-	-
	*	-	-

*Special Made to Order

CURE TIME

Concrete Temperature	Time
Over 80°F.	6 hrs
60° to 80°F.	12 hrs
40° to 60°F.	24 hrs

ACCESSORIES

7500100
Caulking Gun

7521025
Replacement Nozzle for 8.5 oz. Single Tube

LOAD AND PERFORMANCE DATA (LIQUID ROC 500+ SINGLE & TWIN TUBE)

Anchor Size	3/8"		1/2"		5/8"		3/4"		7/8"		1"		1 1/4"	
Effective emb.	2 3/8"	7 1/2"	2 3/4"	10"	3 1/8"	12 1/2"	3 1/2"	15"	3 1/2"	17 1/2"	4"	20"	5"	25"
Characteristic Tension - Cracked														
2500 psi	681 lbs	2,151 lbs	1,023 lbs	3,722 lbs	1,511 lbs	6,045 lbs	1,810 lbs	7,759 lbs	1,892 lbs	9,461 lbs	2,212 lbs	11,061 lbs	3,211 lbs	16,057 lbs
4000 psi	724 lbs	2,286 lbs	1,088 lbs	3,956 lbs	1,606 lbs	6,426 lbs	1,925 lbs	8,248 lbs	2,011 lbs	10,057 lbs	2,352 lbs	11,758 lbs	3,414 lbs	17,069 lbs
Characteristic Tension - Uncracked														
2500 psi	1,622 lbs	5,121 lbs	2,438 lbs	8,865 lbs	3,597 lbs	14,387 lbs	4,310 lbs	18,473 lbs	4,513 lbs	22,567 lbs	5,272 lbs	26,361 lbs	7,665 lbs	38,326 lbs
4000 psi	1,724 lbs	5,443 lbs	2,591 lbs	9,423 lbs	3,823 lbs	15,293 lbs	4,582 lbs	19,637 lbs	4,798 lbs	23,989 lbs	5,604 lbs	28,022 lbs	8,148 lbs	40,741 lbs

Characteristic Shear							
Effective emb.	3 1/2"	4 1/2"	5"	6 1/2"	8"	10"	11"
2500 psi	3,530 lbs	6,107 lbs	8,266 lbs	11,823 lbs	15,526 lbs	20,169 lbs	26,350 lbs
4000 psi	3,752 lbs	6,492 lbs	8,787 lbs	12,568 lbs	16,504 lbs	21,440 lbs	28,010 lbs

1) The above loads are based on a temperature range of max short term 122°F & max long term 95°F, hammer drilled holes that are dry, supplemental reinforcement present and for a single anchor design. No reductions have been taken for edge distance or anchor spacing. Verify that strength of the steel used is capable of supporting the desired load for each application.

INSTALLATION

1. Drill and clean hole to recommended diameter and depth. Excess water must be removed although hole may be damp.
2. Remove cap and divider plugs.
3. Screw on static mixing nozzle.
4. Insert into a standard caulking gun.
5. Dispense and discard a bead of material to display proper mix (indicated by uniform color change) before use.
6. Dispense adhesive into hole, filling from the bottom up.
7. Insert anchor rod into hole with a slight twisting motion.

LIQUID ROC® 500+ TWIN TUBE

AVAILABLE MATERIALS
- Amine base epoxy
- 1 to 1 ratio
- Square cut rods – A307 steel, zinc plated. Other sizes, materials and finishes available upon request

FEATURES/ADVANTAGES
- Mixes through motionless mixer nozzle
- Pre-measured adhesive
- Cartridge can be partially used and saved for future use
- Excellent chemical resistance when cured
- Non-shrink epoxy

CONCERNS
- Must be dispensed at 1 to 1 ratio
- Must be dispensed through static mixing nozzle
- Do not use below 40°F
- Do not overpump and create epoxy blowback
- 24 month shelf life
- This product is suitable for long term loading at room temperature or below. It is not intended for use overhead or in applications where elevated temperatures occur

APPROVALS/LISTINGS
- Contact customer service for approvals/listings for state D.O.T.'s
- ASTM C881, Type I and IV, Grade 3, Class B and C.

ORDER DETAIL

LR 500+ Order Code	Square Cut Rod Order Code	Rod Box Quantity	Rod Master Quantity
7800003 22 fl. oz. 10/Box	3106032	10	50
	3106048	10	20
	3108032	10	50
	3108048	10	20
	3110032	10	50
	3110048	10	20
	3112032	10	50
	3112048	10	20
	**	-	-
	**	-	-

*Load values based on A-193, B7 Rods **Special Made to Order

7521055
Pneumatic Gun for 22 oz.

7521081
Manual Gun for 22 oz.

ACCESSORIES

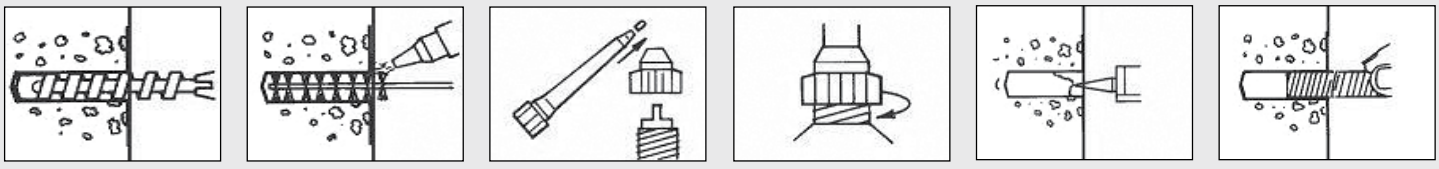
Order Code	Description
7521027	18 Element Mixer (Coarse THD)
7521032	1/2" - 18 Element Mixer

CURE TIME

Concrete Temperature	Time
Over 80°F.	6 hrs
60° to 80°F.	12 hrs
40° to 60°F.	24 hrs

INSTALLATION

1. Drill to recommended diameter and depth using rotary-hammer.
2. Remove dust and rubble from the hole with compressed air, a brush and water. Excess water must be removed although hole may be damp.
3. Cut static mixer tip to second notch making sure the opening is obstruction free. Twist off cap on cartridge. Remove divider plugs.
4. Screw on static mixing nozzle. Load into dispensing tool. Dispense and discard a bead of material to display proper mix (indicated by uniform color change) before use.
5. Dispense adhesive into hole, filling from the bottom up.
6. Insert anchor rod into hole with a slight twisting motion.



LIQUID ROC® 700+

AVAILABLE MATERIALS

- Twin/Single Tube–acrylic resin base, benzoyl peroxide hardener
- Square cut rods–A307 steel, zinc plated. Other sizes, materials and finishes available

FEATURES/ADVANTAGES

- Multi temperature formulation is suitable for use down to 14°F (-10°C)
- Fast cure time even at the coldest temperatures
- Styrene free formula is low odor and VOC free
- Ideal for bonding a wide variety of material to concrete
- Nozzle provided for dispensing

CONCERNS

- 18 month shelf life

10 Oz. Single Tube

28 Oz. Twin Tube

CURE TIME

Concrete Temperature	Gel Time	Cure Time
14° F (-10° C)	60 minutes	15 Hours
41° F (5° C)	20 minutes	2 Hours
59° F (15° C)	7 minutes	1 Hour
86° F (30° C)	2 minutes	20 Minutes

ORDER DETAIL

Order Number	Description	Size	Quantity
7620010	Single Tube	10 oz.	12
7620028	Twin Tube	28 oz.	4

LOAD AND PERFORMANCE DATA

Anchor Size	3/8"		1/2"		5/8"		3/4"		7/8"		1"		1 1/4"	
Effective emb.	2 3/8"	4 1/2"	2 3/4"	6"	3 1/8"	7 1/2"	3 1/2"	9"	3 1/2"	10 1/2"	4"	12"	5"	15"
Characteristic Tension - Cracked														
2500 psi	na	na	1,834 lbs	4,002 lbs	2,713 lbs	6,511 lbs	3,618 lbs	9,376 lbs	3,618 lbs	12,762 lbs	4,420 lbs	16,871 lbs	6,177lbs	26,361 lbs
4000 psi	na	na	1,950 lbs	4,254 lbs	2,884 lbs	6,922 lbs	3,876 lbs	9,967 lbs	4,522 lbs	13,566 lbs	5,591 lbs	17,934 lbs	7,814 lbs	28,022 lbs
Characteristic Tension - Uncracked														
2500 psi	1,978 lbs	3,747 lbs	3,053 lbs	6,662 lbs	4,309 lbs	10,410 lbs	5,107 lbs	14,990 lbs	5,107 lbs	20,403 lbs	6,240 lbs	23,984 lbs	8,721 lbs	29,578 lbs
4000 psi	2,102 lbs	3,984 lbs	3,246 lbs	7,082 lbs	4,611 lbs	11,065 lbs	6,197 lbs	15,934 lbs	6,460 lbs	21,688 lbs	7,893 lbs	25,495 lbs	10,480 lbs	31,441 lbs

Characteristic Shear							
Effective emb.	3 1/2"	4 1/2"	5"	6 1/2"	8"	10"	11"
2500 psi	3,778 lbs	6,918 lbs	9,284 lbs	14,765 lbs	20,160 lbs	28,174 lbs	32,505 lbs
4000 psi	3,778 lbs	6,918 lbs	11,018 lbs	16,282 lbs	22,522 lbs	29,542 lbs	41,115 lbs

1) The above loads are based on a temperature range of max short term 104°F & max long term 75°F, hammer drilled holes that are dry, supplemental reinforcement present and for a single anchor design. No reductions have been taken for edge distance or anchor spacing. Verify that strength of the steel used is capable of supporting the desired load for each application.

INSTALLATION

1. Drill hole to recommended diameter and depth.
2. Clean dust from hole using a round wire brush. Use pressurized air to blow dust out of hole.
3. Open cartridge by either cutting sealed tip or removing the twist-off cap and divider plug.
4. Place static mixing nozzle over cartridge opening and tighten. Load assembly into dispensing tool.
5. Dispense adhesive filling from bottom of hole to avoid air pockets NOTE: Dispense and discard a bead of material to achieve proper mix, indicated by uniform color before starting.
6. Insert anchor rod into hole with a slight twisting motion.

ACCESSORIES

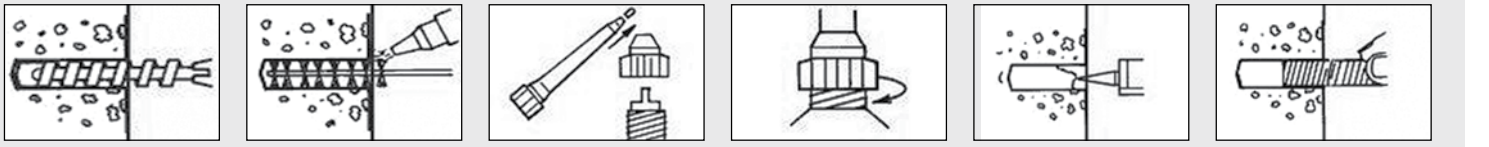
7500100
Caulking Gun for 10 oz. Single Tube

7521096
Pneumatic Dispensing Tool for 28 oz. Twin Tube

7521026
Replacement Nozzle for 10 oz.Single Tube

7521027
Replacement Nozzle for 28 oz.Twin Tube

7521095
Manual Dispensing Tool for 28 oz. Twin Tube



ADHESIVE VOLUME ESTIMATING GUIDE

Type Package	Liquid Roc 300 Pouch	Liquid Roc 300 Twin Tube	Liquid Roc 500+ Single Tube	Liquid Roc 500+ Twin Tube	VME Twin Tube		VMZ Internal Thread Injection System	Liquid Roc 700+ Single Tube	Liquid Roc 700+ Twin Tube
Net Contents	5.5 fl. oz.	28 fl. oz.	8.5 fl. oz.	22 fl. oz.	13oz.	20 oz.	10 fl. oz.	10 fl. oz.	28 fl. oz.
Useable Vol.	10 cu. in.	45 cu. in.	13 cu. in.	34 cu. in.	20 cu. in.	31 u. in.	15 cu. in.	15 cu. in.	45 cu. in.
Rod Diameter	Linear inches of embedment into solid base material								
3/8"	105	312	91	237	140	215	63	63	133
1/2"	75	225	65	169	100	153	45	45	95
5/8"	38	172	50	130	76	118	35	35	73
3/4"	30	137	40	104	61	94	28	28	58
7/8"	25	115	33	87	51	79	23	23	49
1"	21	92	27	71	42	64	19	19	40
1-1/4"	16	71	20	54	32	49	14	14	30
Rod Diameter	Linear inches of embedment using screens into hollow base material								
3/8"	—	296	—	—	—	—	—	—	—
1/2"	—	172	—	—	—	—	—	—	—
5/8"	—	112	—	—	—	—	—	—	—
3/4"	—	62	—	—	—	—	—	—	—

ENGINEERING DATA

HOW TO SPECIFY

1 Select anchor diameter based on loading requirements.

2 Determine thickness of material to be anchored (if grout or shimming is to be used between material and concrete surface, add thickness of grout/shims to thickness of material to obtain total thickness of material to be anchored.)

3 Select anchor length that will satisfy total thickness of material, head clearance and embedment of anchor diameter selected.

SPECIFICATIONS, LIQUID ROC 300, 500+, 700+

	B Nominal Diameter (in.)					
Bolt Size (in.)	Capsule or Pouch	Single or Twin Tube	E - Min Embedment (in.)	S - Anchor Spacing (in.)	M - Edge Distance (in.)	T - Maximum Tightening Torque (ft. lbs.)
3/8"	7/16"	1/2"	3-1/2"	3-1/2"	3-1/2"	13
1/2"	9/16"	5/8"	4-1/2"	4-1/2"	4-1/2"	22
5/8"	11/16"	3/4"	5-1/2"	5-1/2"	5-1/2"	55
3/4"	7/8"	7/8"	6-1/2"	6-1/2"	6-1/2"	106
7/8"	1"	1"	8"	8"	8"	135
1"	1-1/8"	1-1/8"	9"	9"	9"	184

REDUCTION FACTORS

Tension		Shear		
Spacing (S) and Edge Dist. (M)	Factor (F)	Spacing (S) and Edge Dist. (M)	Direction of load	Factor (F)
S min. = 0.50S	0.7	S min. = 0.50S	toward edge not toward edge	0.6 1.0
M min. = 0.50M	0.7	M min. = 0.50M	toward edge not toward edge	0.4 0.5

LIQUID ROC 300 CAPSULE ANCHORS

Anchor Diameter	Hole Diameter	Embedment Depth	Capsules Required
3/8"	7/16"	3-1/2"	(1) 3/8"
3/8"	7/16"	5-1/4"	(2) 3/8"
3/8"	7/16"	7"	(2) 3/8"
1/2"	9/16"	4-1/2"	(1) 1/2"
1/2"	9/16"	6-3/4"	(1) 3/8" & (1) 1/2"
1/2"	9/16"	9"	(2) 1/2"
5/8"	11/16"	5"	(1) 5/8"
5/8"	11/16"	7-1/2"	(1) 1/2" & (1) 5/8"
5/8"	11/16"	10"	(2) 5/8"
3/4"	7/8"	6-1/2"	(1) 3/4"
3/4"	7/8"	9-3/4"	(1) 5/8" & (1) 3/4"
3/4"	7/8"	13"	(2) 3/4"
7/8"	1"	7-1/2"	(1) 7/8"
7/8"	1"	11-1/4"	(2) 3/4"
7/8"	1"	15"	(2) 7/8"
1"	1-1/8"	8-1/2"	(1) 1"
1"	1-1/8"	12-3/4"	(1) 3/4" & (1) 1"
1"	1-1/8"	17"	(2) 1"
1-1/4"	1-3/8"	7-1/4"	(2) 3/4"
1-1/4"	1-3/8"	11"	(1) 3/4" & (1) 1"

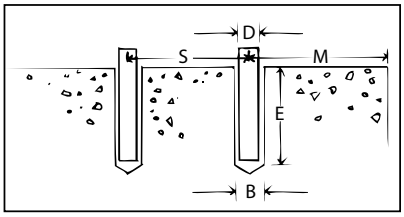
GENERAL SPECIFICATIONS

Adhesive resin anchor shall be (polyester) (epoxy) (acrylic) as manufactured by MKT Fastening, LLC, #1 Gunnebo Dr., Lonoke, AR 72086

INSTALLATION

Adhesive resin anchors shall be installed in holes drilled with carbide tipped bits conforming to ANSI specification B212.15-94. Minimum installation depth and hole preparation shall be as recommended by manufacturer.

FOR REDUCED SPACING AND EDGE DISTANCES



1 Linear interpolation is allowed for edge distances falling between 0.50M and 1.00M, and anchor spacing falling between 0.50S and 1.00S.

2 Load reduction factors should be combined where applicable. Where three or more anchors are used, spacing reduction factors must be multiplied together. Where two or more edge distances affect performance, edge reduction factors must be multiplied together. When a group of anchors is affected by both reduced spacing and reduced edge distances, the edge and spacing reduction factors must be multiplied together.

DIRECT

FASTENING SYSTEMS

HOLDING POWER

HOLDING POWER VALUES FOR FASTENERS IN CONCRETE

Ultimate Load Values in 2500 P.S.I. Concrete – Low Velocity Driven Fasteners

			Penetration into Concrete (in Inches)				
Shank Diameter (in inches)	Shank Surface	Load (lbs.)	1/2"	3/4"	1"	1-1/4"	1-1/2"
1/8" - .125	Smooth	Tension	125	275	350	670	_
		Shear	210	380	640	900	_
9/64" - .143	Smooth	Tension	150	320	380	700	_
		Shear	250	400	760	1,010	_
11/64" - .172	Smooth	Tension	160	340	410	710	610
		Shear	275	450	850	1,130	1,510

Ultimate Load Values in 3500 P.S.I. Concrete – Low Velocity Driven Fasteners

			Penetration into Concrete (in Inches)				
Shank Diameter (in inches)	Shank Surface	Load (lbs.)	1/2"	3/4"	1"	1-1/4"	1-1/2"
1/8" - .125	Smooth	Tension	130	305	360	725	_
		Shear	220	395	680	920	_
9/64" - .143	Smooth	Tension	145	315	390	775	_
		Shear	270	415	785	1,070	_
11/64" - .172	Smooth	Tension	150	325	415	810	890
		Shear	275	470	880	1,200	1,600

Ultimate Load Values in 5000 P.S.I. Concrete – Low Velocity Driven Fasteners

			Penetration into Concrete (in Inches)				
Shank Diameter (in inches)	Shank Surface	Load (lbs.)	1/2"	3/4"	1"	1-1/4"	1-1/2"
1/8" - .125	Smooth	Tension	210	410	660	810	_
		Shear	295	500	790	1,110	_
9/64" - .143	Smooth	Tension	250	460	680	860	_
		Shear	335	565	850	1,425	_
11/64" - .172	Smooth	Tension	260	510	860	900	1,200
		Shear	345	590	985	1,590	1,935

HOLDING POWER VALUES FOR FASTENERS IN STEEL

Ultimate Load Values in Steel – Low Velocity Driven Fasteners

			Penetration into steel plate thckness				
Shank Diameter (in inches)	Shank Surface	Load (lbs.)	1/8"	3/16"	1/4"	5/16"	3/8"
1/8" - .125	Smooth	Tension	350	860	1,030	1,370	1,725
		Shear	1,380	1,625	1,710	1,750	1,790
9/64" - .143	Smooth	Tension	510	1,200	1,500	1,810	1,950
		Shear	1,530	1,915	2,140	2,560	2,630
11/64" - .172	Smooth	Tension	805	1,430	1,860	2,180	2,350
		Shear	1,730	2,000	2,810	3,110	3,200

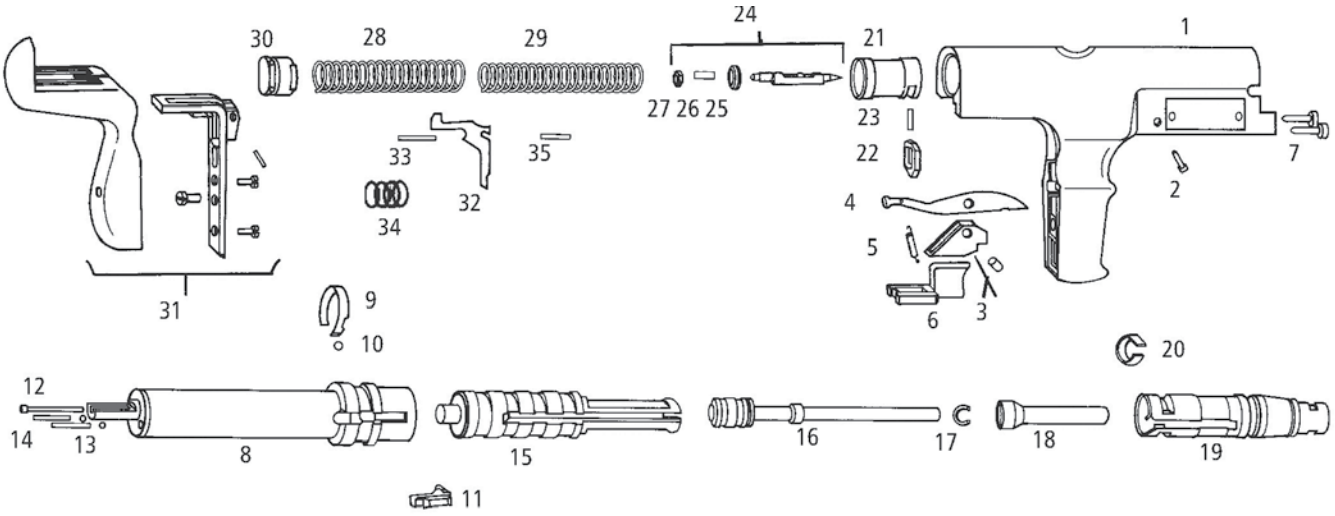
XL-300 TOOL

FEATURES
- Cast aluminum body
- Can use 8 mm or .300 headed fasteners and 1/4-20 studs
- .27 caliber 10 shot strip loads, Level 3 thru 5
- Medium duty professional tool
- Lockable carrying case

ITEMS INCLUDED
- Ear plugs
- Safety goggles
- Lubricant
- Cleaning brush
- Owner/operator manual

Length	13”
Tool Weight	5 lbs.
Capacity	2-1/2” pin - 3” washered pin
Load Size	27 caliber strip

WHEN ORDERING USE PREFIX XL300



1	Tool Body	12	Push Pin	22	Sear	32	Rock Arm
2	Trigger Pin	13	Ball, Balance	23	Spring, Sear	33	Spring, Upper Rock Arm
3	Holder, Advance Bar	14	Spring, Balance	24	Firing Pin Assy. (Inc. 25, 26, 27)	34	Spring, Lower Rock Arm
4	Advance Bar	15	Piston Sleeve	25	Spring Holder, Firing Pin	35	Pin, Rock Arm
5	Spring Advance Bar	16	Piston Flat & Ring	26	Spring		
6	Trigger	16A	Piston Concave	27	Nut, Firing Pin		
7	Bolt	17	Piston Ring	28	Spring, Sear Holder	PAT8150 – Cleaning Kit	
8	Body Liner	18	Guide	29	Spring Firing Pin		
9	Annular Spring	19	Baseplate	30	Plug		
10	Ball Annular Spring	20	Shear Clip	31	Rubber Pad Assy.		
11	Stop	21	Sear Holder				

DRIVE PINS & THREADED STUDS

.300 HEAD / .145 SHANK DIAMETER

ORDER DETAIL

Order Code	Shank Length	Box Quantity	Master Quantity	U1000	XL300	PAT90A
D58K	9/16"	100	3,000	•	•	•
D63K	5/8"	100	3,000	•	•	•
D75	3/4"	100	3,000	•	•	•
D100	1"	100	3,000	•	•	
D125	1-1/4"	100	3,000	•	•	•
D150	1-1/2"	100	3,000	•	•	•
D175	1-3/4"	100	1,200	•	•	•
D200	2"	100	1,200	•	•	•
D250	2-1/2"	100	1,200	•	•	•
D300	3"	100	1,200			•
D63KBP	5/8"	1,000	5,000	•	•	•
D75BP	3/4"	1,000	3,000	•	•	•
D100BP	1"	1,000	3,000	•	•	•
D125BP	1-1/4"	1,000	3,000	•	•	•

.300 HEAD TOP HAT / .145 SHANK DIAMETER

ORDER DETAIL

Order Code	Shank Length	Box Quantity	Master Quantity	U1000	XL300	PAT90A
TH63K	5/8"	100	3,000	•	•	•
TH75	3/4"	100	3,000	•	•	•
TH100	1"	100	3,000	•	•	•

.300 HEAD WITH 1" WASHER / .145 SHANK DIAMETER

ORDER DETAIL

Order Code	Shank Length	Box Quantity	Master Quantity	U1000	XL300	PAT90A
DW75	3/4"	100	800	•	•	•
DW100	1"	100	800	•	•	•
DW125	1-1/4"	100	800	•	•	•
DW150	1-1/2"	100	800	•	•	•
DW200	2"	100	500	•	•	•
DW250	2-1/2"	100	500	•	•	•
DW300	3"	100	300	•	•	•

.300 HEAD CORROSION RESISTANT PINS FOR ACQ LUMBER

ORDER DETAIL

Order Code	Shank Length	Box Quantity	Master Quantity	U1000	XL300	PAT90A
D250CR	2-1/2"	100	1,200	•	•	•
D300CR	3"	100	1,200	•		•
DW250CR*	2-1/2"	100	500	•	•	•
DW300CR*	3"	100	500	•	•	•

* Comes with a 1" washer pre-mounted

8MM HEAD WITH 1" WASHER/ .145 SHANK DIAMETER

ORDER DETAIL

Order Code	Shank Length		Box Quantity	Master Quantity	U1000	XL300	PAT90A
DHW75	9/16"	(19mm)	100	800	•	•	•
DHW100	5/8"	(27mm)	100	800	•	•	•
DHW125	3/4"	(32mm)	100	800	•	•	•
DHW150	1"	(42mm)	100	800	•	•	•
DHW175	1-1/4"	(47mm)	100	500	•	•	•
DHW200	1-1/2"	(52mm)	100	500	•	•	•
DHW225	1-3/4"	(57mm)	100	500	•	•	•
DHW250	2"	(62mm)	100	500	•	•	•
DHW300	2-1/2"	(72mm)	100	300	•	•	•

CONCRETE FORMING PIN / .145 SHANK DIAMETER

ORDER DETAIL

Order Code	Shank Length	Box Quantity	Master Quantity	U1000	XL300	PAT90A
CFPM	2-1/2"	100	1,200	•	•	•

1/4" HEAD WITH 3/8" WASHER / .140 SHANK DIAMETER

ORDER DETAIL

Order Code	Shank Length	Box Quantity	Master Quantity
P50H	1/2"	100	3,000
P75H	3/4"	100	3,000
P100H	1"	100	3,000
P125H	1-1/4"	100	3,000
P150H	1-1/2"	100	3,000
P200H	2"	100	3,000
P250H	2-1/2"	100	1,200
P300H	3"	100	1,200

For use in XL143 Hammer Drive Tool

1/4"-20 THREADED STUD WITH PLASTIC CAP / .145 SHANK DIAMETER

ORDER DETAIL

Order Code	Thread Length	Shank Length	Box Quantity	Master Quantity	U1000	XL300	PAT90A
CS43814	1/2"	1-1/4"	100	1,200	•	•	•
CS43834	1/2"	3/4"	100	1,200	•	•	•
CS45814	3/4"	1-1/4"	100	1,200	•	•	•
CS41414	1-1/4"	1-1/4"	100	800	•	•	•
CS43810	1/2"	1"	100	1,200	•	•	•
CS45834	3/4"	3/4"	100	1,200	•	•	•
CS41458K	1-1/4"	1/2"	100	1,200	•	•	•
CS43856K	1/2"	1/2"	100	1,200	•	•	•
CS45856K	3/4"	1/2"	100	1,200	•	•	•

DRIVE PINS & ASSEMBLES

8MM DOME HEAD / .145 SHANK DIAMETER

ORDER DETAIL

Order Code	Shank Length		Box Quantity	Master Quantity	U1000	XL300	PAT90A
DH63K	5/8"	(16mm)	100	3,000	•	•	•
DH75K	3/4"	(19mm)	100	3,000	•	•	•
DH100	1"	(27mm)	100	3,000	•	•	•
DH125	1-3/16"	(32mm)	100	3,000	•	•	•
DH150	1-9/16"	(42mm)	100	1,200	•	•	•
DH175	1-3/4"	(47mm)	100	3,000	•	•	•
DH200	2"	(52mm)	100	1,200	•	•	•
DH225	2-3/16"	(57mm)	100	1,200	•	•	•
DH250	2-3/8"	(62mm)	100	1,200	•	•	•
DH300	2-3/4	(72mm)	100	1,200			•

8MM DOME HEAD WITH TOP HAT/ .145 SHANK DIAMETER

ORDER DETAIL

Order Code	Shank Length		Box Quantity	Master Quantity	U1000	XL300	PAT90A
DHT63K	5/8"	(16mm)	100	3,000	•	•	•
DHT100	1"	(27mm)	100	3,000	•	•	•
DHT125	1-3/16"	(32mm)	100	3,000	•	•	•

.300 HEAD / .145 SHANK DIAMETER CEILING CLIP ASSEMBLY

ORDER DETAIL

Order Code	Shank Length	Box Quantity	Master Quantity	U1000	XL300	PAT90A
DCL100*	1"	100	500	•	•	•
DCL125*	1-1/4"	100	500	•	•	•
DDCL100	1"	100	500	•	•	•

* Assembled with Top Hat

.300 HEAD / .145 SHANK DIAMETER CONDUIT STRAP

ORDER DETAIL

Order Code	Thread Length	Shank Length	Box Quantity	Master Quantity	U1000	XL300	PAT90A
DCC50100	1"	1/2"	100	500	•	•	•
DCC50125	1-1/4"	1/2"	100	800	•	•	•
DCC75100	1"	3/4"	50	500	•	•	•
DCC10100	1"	1/2"	50	150	•	•	•

8MM DOME HEAD / .145 SHANK DIAMETER CEILING CLIP ASSEMBLY

ORDER DETAIL

Order Code	Shank Length	Box Quantity	Master Quantity	U1000	XL300	PAT90A
DHCL100	1"	100	500	•	•	•

ACCESSORIES

CEILING CLIPS

ORDER DETAIL

Order Code	Thread Size	Box Quantity
CL1	1"	100

HAMMER DRIVE TOOL

ORDER DETAIL

Order Code	Thread Size	Box Quantity
XL143	.300 HD/"D" Pins 1/4" HD/"P"Pins	1

CONDUIT STRAPS

ORDER DETAIL

Order Code	Conduit Diameter	Box Quantity
TW50	1/2"	100
TW75	3/4"	50
TW100	1"	50

COUPLINGS

ORDER DETAIL

Order Code	Thread Size	Box Quantity
C10	1/4" - 20	100
C20	1/4"-20 to 3/8"-16	100
C30	3/8"-16	100

MAINTENANCE ITEMS

ORDER DETAIL

Order Code	Description
PAT8133	Spray Lube
PAT8134	Safety Goggles
PAT8135	3/4" Cleaning Brush
PAT8138	Ear Plugs
PAT8118	Tool Box (U1000, XL300,PAT90A)
PAT8150	Cleaning Kit
8142	Stabilizer U-1000/U-2000

EYE COUPLINGS

ORDER DETAIL

Order Code	Thread Size	Box Quantity
FM1	1/4" - 20	100

LOW VELOCITY LOADS

.22 CALIBER

ORDER DETAIL

Order Code	Description	Power Level	Box Quantity	Master Quantity
22C2	Brown	(2) Light	100	10,000
22C3	Green	(3) Medium	100	10,000
22C4	Yellow	(4) Heavy	100	10,000

.25 CALIBER DISK

ORDER DETAIL

Order Code	Description	Power Level	Box Quantity	Master Quantity
25DL2	Brown	(2) Light	100	5,000
25DL3	Green	(3) Medium	100	5,000
25DL4	Yellow	(4) Heavy	100	5,000
25DL5*	Red	(5) Extra Heavy	100	5,000

*Will not fit D60

.27 CALIBER

ORDER DETAIL

Order Code	Description	Power Level	Box Quantity	Master Quantity
27CS3	Green	(3) Light	100	10,000
27CS4	Yellow	(4) Medium	100	10,000
27CS5	Red	(5) Heavy	100	10,000
27CS6*	Purple	(6) Extra Heavy	100	10,000

*For use in DX451 Only

.25 CALIBER

ORDER DETAIL

Order Code	Description	Power Level	Box Quantity	Master Quantity
25CS3	Green	(3) Light	100	10,000
25CS4	Yellow	(4) Medium	100	10,000
25CS5	Red	(5) Heavy	100	10,000

.27 CALIBER LONG

ORDER DETAIL

Order Code	Description	Power Level	Box Quantity	Master Quantity
27CL4	Yellow (long)	(4) Medium	100	10,000
27CL5	Red (long)	(5) Heavy	100	10,000
27CL6	Purple (long)	(6) Extra Heavy	100	10,000

TECHNICAL DATA

A SIMPLE TEST TO DETERMINE BASE MATERIAL SUITABILITY

CENTER PUNCH TEST PROCEDURE

Use a fastener as a punch on the actual base material and always wear safety goggles:

- If the material shows a clear fastener point impression and the fastener point is not blunted – proceed with the first test fastening.
- If fastener point is blunted – material is too hard.
- If material cracks or shatters – material is too brittle.
- If fastener sinks into material with an average hammer blow – the material is too soft.

The same procedure to test for hardness or brittleness should be made on questionable material to be driven through and attached to the base material. Soft materials to be attached need not be tested.

Unknown or questionable base material

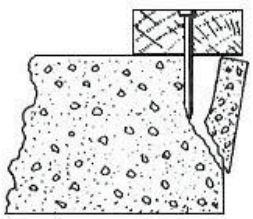
Don't guess – If in doubt, center punch test the material or consult tool manufacturer's representative before attempting to fasten

SELECTING THE PROPER FASTENER

The selection of the proper fastener depends upon the thickness and hardness of the material into which the fastener is to be driven and the intended use for the application. If a permanent, non-removable fastening is desired, a drive pin should be used. If a removable installation is desired, use a threaded stud. If in doubt as to which fastener type should be used for your special applications, consult the tool manufacturer's representative. Various diameters for each shank length are available. For a light duty application, select a small shank diameter. For a heavy duty application, select a large shank diameter.

FASTENING INTO MASONRY MATERIALS

Do not fasten closer than 3" from edge of masonry. If masonry cracks, fastener won't hold and there's a chance a chunk of masonry or the fastener could escape in an unsafe way.



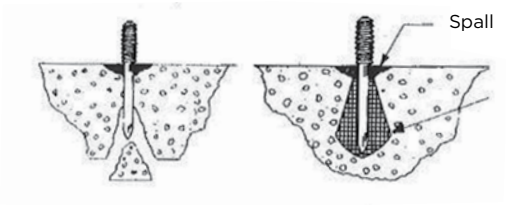
TECHNICAL DATA CONTINUED

Setting fasteners too close together can also cause masonry to crack. Recommended minimum fastener spacing based on shank diameter is as follows:

Recommended Minimum Distance

Shank Diameter	Between Fastenings
1/8 thru 5/32	3”
11/64 thru 3/16	4”
7/32 thru 1/4	6”

It is important that the masonry be at least three times as thick as the fastener penetration. If masonry is too thin, the compressive forces forming at the point can cause the far side of the masonry to break away. The result is no holding power and potential problems from flying masonry or the fastener itself.



As a general rule, when fastening into average concrete, the fastener should penetrate 7 to 8 times the shank diameter. In hard concrete, 5 to 6 times the shank diameter’s penetration would normally be sufficient for proper holding power. In soft concrete, 9 to 10 times the shank diameter would be appropriate.

Large, hard and excessive amounts of aggregate, reinforcing rod or cable may be a problem, causing “fish-hooking.”

“Fish-hooking” can occur when a partially driven fastener hits a hard object, which bends and deflects the shank. “Fish-hooking” may reduce holding power, usually increases spalling and can be a potential hazard from an escaping fastener and/or particles of masonry. Always use a shield or fixture on the tool unless the item fastened provides equal or greater protection – especially when driving threaded studs or eye pins directly into masonry.

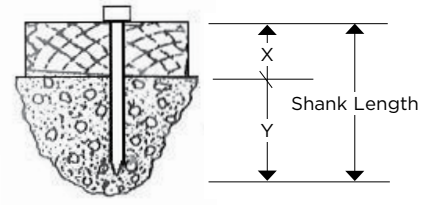
Ways to eliminate or minimize “fish-hooking:”
- Reduce shank penetration.
- Increase shank diameter.
- Check power level to be sure that fastener is not being overdriven.
- Fasten through a metal disc.

Fastening into mortar joints should only be attempted in the horizontal joint.

Usually the vertical joint is not solid mortar and thus not of sufficient thickness for proper fastening. The shank diameter is also important due to the limited width of a mortar joint. To avoid cracking of the joint, large shank diameters should be avoided.

DRIVE PINS

In selecting the proper drive pin for concrete or masonry, determine the correct shank length by allowing for the thickness of the material through which the drive pin is to be driven (X) plus the depth of penetration required (Y) utilizing the preceding shank diameter penetration rules.



THREADED STUDS

The selection of the proper threaded stud shank length is determined by using the preceding shank diameter-penetration rules. Select a thread length to allow for the thickness of the material to be attached and a nut and washer.

In selecting the proper shank lengths for special fasteners such as eye pins and utility studs, apply the same shank diameter-penetration rules.

FASTENING INTO STEEL MATERIALS

Practically all of the powder actuated fasteners driven into steel as the base material are driven into structural steel. Structural steel shapes in common usage include structural beam, angle iron, channel, tee, plate and strip.

Where fasteners are to be driven in metal materials other than structural steel, it will be necessary to determine the acceptability of that material for powder actuated fastenings either by consulting the supplier or by center punch testing for hardness. A fastener driven into steel holds in the steel by the natural tendency of the steel to return to its original undisturbed condition. As the fastener is driven into steel it pushes the steel aside, compressing and displacing the steel. The tendency of the steel to flow back to its original position exerts a gripping or clamping force on the fastener shank.

Holding power of a powder actuated fastener set in steel is directly affected by the total contact area between the fastener shank and the steel.

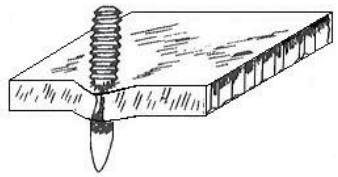
An increase in either the shank diameter or steel thickness will increase holding power. For effective holding power, shank diameter should not exceed steel thickness.

The tensile strength of the steel into which the fastener is driven affects the holding power of the fastener. The stronger the steel into which a fastener is driven, the greater the gripping power on the fastener shank and the more firmly the fastener is held by the steel.

In order to get maximum gripping force, the fastener point should completely penetrate the opposite side of the steel into which the fastener is set.

If the pointed portion of the shank does not extend through the steel, a part of the compressive force in the area of the point will act to force the fastener back out and reduce holding power.

Do not fasten too close to the edge of a steel member.
The steel between the fastener and the edge can stretch so that it will not grip the fastener shank. It may fracture and allow the fastener to escape in an unsafe manner. In neither case can maximum holding power be obtained.



Recommended Minimum Edge Distance

Fastener Shank Diameter	Fastener to Edge of Steel
1/8" through 5/32"	1/4"
1/8" through 1/4"	1/2"

Do not set fasteners too close together.
Setting fasteners too close together can disturb the compressive force holding the adjacent fastener and reduce its holding power.

Recommended Minimum Fastener Spacing

Fastener Shank Diameter	Minimum Spacing
1/8" through 5/32"	1"
11/64" through 3/16"	1-1/8"
7/32" through 1/4"	1-1/2"

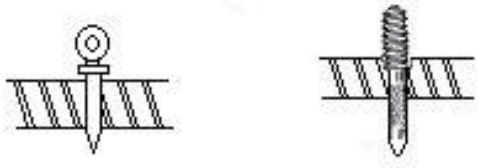
Do not fasten into steel base material thinner than the fastener shank diameter.
Holding power will be reduced and the fastener may be overdriven.

Recommended Minimum Fastener Spacing

Fastener Shank Diameter	Minimum Thickness
1/8"	1/8"
5/32" through 3/16"	3/16"
7/32" through 1/4"	1/4"

Do not use fasteners with a shank longer than required for the application.
The burnishing effect of a long shank passing through the steel enlarges the hole in the steel, reducing holding power.

Avoid overdriving the fastener.
A fastener driven with excessive force can be damaged or break. Rebound (bounce back) of an overdriven fastener will reduce holding power of the fastener. A threaded stud, in addition, may sink too far into the steel reducing its effective thickness, greatly reducing the holding power. The useful thread length is also reduced by overdriving.



Do not drive a fastener in areas that have been welded or torch cut.
Welding or torch cutting can produce hard areas. These areas may be too hard for powder actuated fastening.

For effective permanent fastening, do not use fasteners to draw bowed steel members together.

A fastener used to draw bowed members together remains under constant tension and may sooner or later fail.

Use the proper tool shield when fastening into steel which is heavily rusted, scaled or galvanized.

Dislodged surface particles can be hazardous.

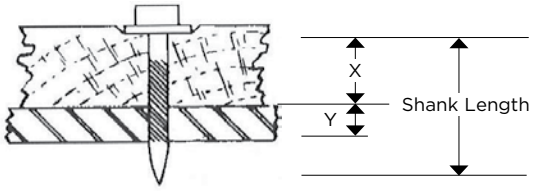
Do not fasten through existing holes unless a positive guide to center the bore of the tool over the hole is used.
Unless the fastener is centered over the hole, it can be deflected by the edge of the hole.

When fastening into long unsupported steel members, to assure uniform penetration and proper holding power, support the steel in the area of the drive to avoid any "springing" action.

Remember, as a general rule, when fastening into steel the point of the fastener should fully penetrate the opposite side. This factor should be considered when selecting shank lengths. Also remember, knurled shank fasteners hold better in steel compared to smooth shank fasteners.

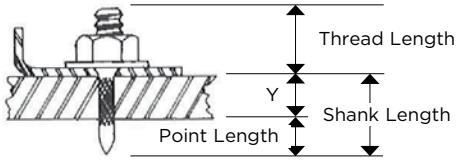
DRIVE PINS

To select the proper shank length, determine the total thickness of the material to be fastened (X), the thickness of the steel into which the pin will be driven (Y) plus the point length. A total of X, Y and the point length is the proper shank length.



THREADED STUDS

The proper shank length for threaded studs depends on the thickness of the steel (Y) plus the point length on the opposite side. Depending upon the thickness of the item to be fastened, different thread lengths are available. Generally, if the item to be fastened is sheet metal, a short thread length would be selected. If the item to be fastened is thick, a correspondingly long thread length should be chosen so that a nut, and perhaps a washer can be applied.



American National Standard Powder-actuated fastening systems – safety requirements
A10.3-2006 / 7.10: Only those types of fasteners and power loads recommended by the tool manufacturer for a particular tool, or those providing the same level of safety and performance, shall be used.
ANSI / American National Standard Institute, Inc. / 1430 Broadway, New York, NY 10018

WARNING: All Powder Actuated Tools are to be used ONLY by trained and qualified operators and in accordance with the operator's manual. Obtain certification before operating any Powder Actuated Tool. It is the operator's responsibility to obtain certification.

TERMS & CONDITIONS OF SALE

MINIMUM BILLING

Minimum billing is $500.00. Concrete Anchor Systems (USE), Adhesive Fastening Systems (Liquid Roc), and Powder Fastening Systems (UNISET) may be combined to reach minimum order value. Minimum billing on tool parts is $25.00. Labor charge for tool repair is $40.00 per hour.

FREIGHT POLICY

All freight charges are prepaid from our shipping warehouse to one destination where the total order exceeds $950.00 (Hawaii and Puerto Rico prepaid on $4000.00). Air freight shipments are F.O.B. our shipping location. We will absorb all freight costs of back orders if the original order qualified for prepaid freight. Our responsibility ceases when the carrier signs the shipping manifest. All claims for shortages and or damage must be settled by the distributor and the carrier. Please note: Powder loads, and Liquid Roc 300, 500+ and 700+ cannot be shipped parcel post, 1st class mail, air parcel post, bus, commercial air lines or UPS air from external warehouses. USE, Liquid Roc and UNISET products may be combined to meet freight minimums.

RETURNS & SHORTAGES

All returns must be preapproved by the MKT Customer Service Department at 1-800-336-1640 with appropriate R.G.A. number. Returned product must be of current production and in new and saleable condition. Adhesive materials can only be returned within 30 days from the date of original purchase. All returns are subject to a 25% restocking fee. If inspection shows that the product must be replaced, repackaged, or otherwise reworked, a reworking charge will be made. Credits for returned merchandise will be issued at the distributors purchase price or current price, whichever is lower. Credits will be issued against future orders. Notification of shipping and invoice discrepancies must be made within 30 days in writing.

Terms are net 30 days. Accounts not paid within 30 days from the net due date will be charged a 1-1/2% per month service charge or applicable state interest allowed.

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