



SLEEVE ANCHORS

ZINC PLATED - HEX NUT, ACORN NUT, FLAT PHILLIPS, ROD HANGER & TIRE WIRE.

The **AF® Sleeve Anchor** is the most versatile heavy duty anchor available. The sleeve expansion device allows this anchor to be used in cement, block, thin wall/solid concrete, brick or stone. The all-steel ribbed sleeve design ensures holding power of expansion sleeve. **The AF® Sleeve Anchor** is available in multiple head styles for varied applications and a finished look.



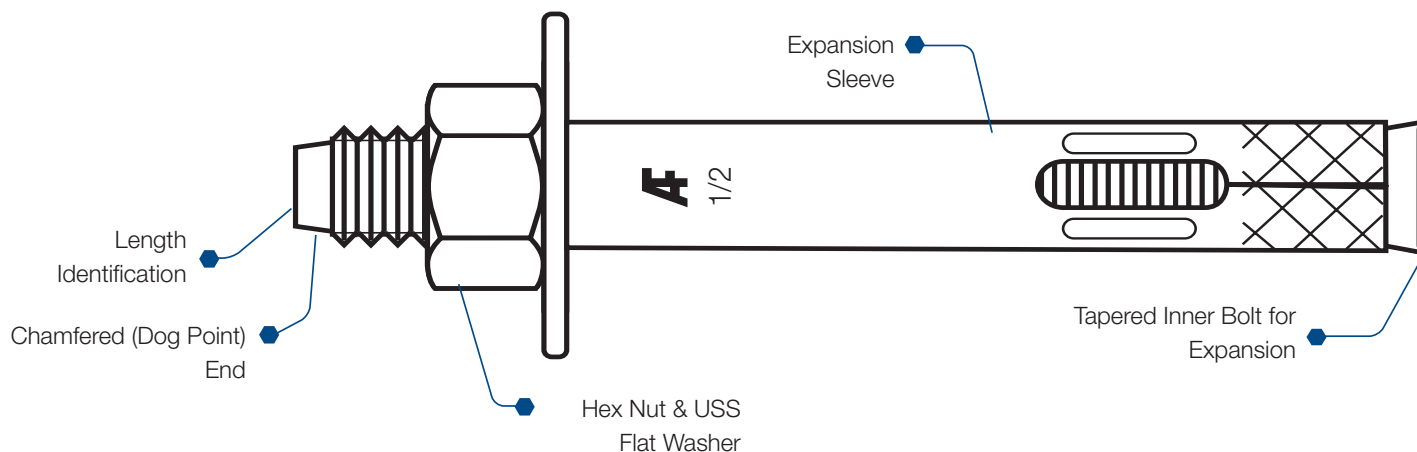
APPLICATION & USES

- Door and window frame installations
- Masonry applications
- Electrical / Mechanical applications
- Mounting fixtures on walls
- General purpose anchoring

FEATURES

- Versatile – can be used for solid and hollow concrete or masonry applications
- Length ID stamped on visible end and on sleeve of each anchor
- Multiple head styles for multiple applications
- All steel component design
- Nominal drill diameter is the same as anchor diameter, allowing anchor to be installed after setting of fixture
- Sleeve has 360° contact area for even stress distribution
- Depth of holes can be over-drilled with no loss of load capacity
- Mechanical expansion action allows immediate load application
- Sleeve design keeps anchor centered in hole
- Preassembled anchor for immediate installation

MATERIAL SPECIFICATIONS





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MATERIAL SPECIFICATIONS (CONT'D)

COMPOUNDS	CARBON STEEL	STAINLESS STEEL
Inner Bolt	C1010 Carbon Steel	Type 304 Stainless
Expansion Sleeve	C1010 Carbon Steel	Type 304 Stainless
Hex Nut	Finish Hex Nut Carbon Steel	Type 304 Stainless
Washer	Carbon Steel	Type 304 Stainless
Plating/Finish	Zinc Plated	N/A

LENGTH IDENTIFICATION CODE

Length identification indicates overall length of anchor. Stamp is visible before and after installation.

Mark	A	B	C	D	E	F	G	H	I	J	K	L	M
From	1-1/2"	2"	2-1/2"	3"	3-1/2"	4"	4-1/2"	5"	5-1/2"	6"	6-1/2"	7"	7-1/2"
Up to*	2"	2-1/2"	3"	3-1/2"	4"	4-1/2"	5"	5-1/2"	6"	6-1/2"	7"	7-1/2"	8"

Mark	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
From	8"	8-1/2"	9"	9-1/2"	10"	11"	12"	13"	14"	15"	16"	17"	18"
Up to*	8-1/2"	9"	9-1/2"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"

* Up to but not including

INSTALLATION SPECIFICATIONS

	NOMINAL ANCHOR DIAMETER, <i>d</i>					
SETTING INFORMATION	1/4	5/16	3/8	1/2	5/8	3/4
Nominal drill diameter, d_{bit}	1/4	5/16	3/8	1/2	5/8	3/4
Fixture hole diameter, d_h	5/16	3/8	7/16	9/16	11/16	15/16
Inner bolt size	10-24	1/4-20	5/16-18	3/8-16	1/2-13	5/8-11
Minimum embedment depth, h_{nom}	1-1/8	1-1/4	1-1/2	1-1/2	2	2-1/4
Minimum anchor length, l_{anch}	1-3/8	1-1/2	1-7/8	2-1/4	2-1/4	2-1/2
Torque wrench size	3/8	7/16	1/2	9/16	3/4	15/16
Installation Torque (ft-lb) (Normal weight concrete)	6	12	18	26	50	90

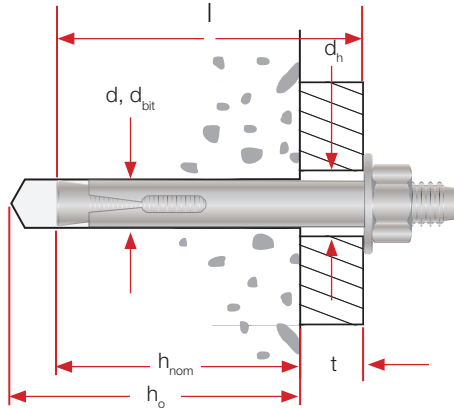


SLEEVE ANCHORS

ZINC PLATED - HEX NUT, ACORN NUT, FLAT PHILLIPS, ROD HANGER & TIRE WIRE.

INSTALLATION SPECIFICATIONS (CONT'D)

ZINC PLATED



l = minimum anchor length

d = anchor diameter

d_{bit} = drill diameter

d_h = clearance hole diameter in fixture

h_{nom} = minimum embedment depth

t = fixture thickness

The minimum base material thickness should be $1.5 h_{nom}$ or 3", whichever is greater.

For SI: 1 inch = 25.4 mm, 1 ft-lbf = 1.356 Nm.

TECHICAL DATA

Ultimate Load Capacities for Carbon Steel AF® Sleeve Anchors in Normal-Weight Concrete

Anchor Diameter (in)	Embedment Depth (in)	Minimum Concrete Compressive Strength	
		3500 psi	
		Tension lbs.	Shear lbs
1/4	1	1325	1450
	1-5/8	1325	1450
5/16	1	1790	2130
	2	1795	2130
3/8	1-1/4	2803	3010
	2-1/4	2822	3300
	3-1/4	2825	3300
1/2	1-1/2	5015	6330
	2-1/4	5058	6290
	3-1/4	5150	6295
	5-1/4	5055	6310
5/8	1-3/4	6348	10290
	2-1/4	6371	10290
	3-1/2	6353	10290
	5-1/4	6363	10320
3/4	3-1/4	9157	12995
	5-1/4	9185	13025

Allowable Load Capacities for Carbon Steel AF® Sleeve Anchors in Normal-Weight Concrete

Anchor Diameter (in)	Embedment Depth (in)	Minimum Concrete Compressive Strength	
		3500 psi	
		Tension lbs.	Shear lbs
1/4	1	331	363
	1-5/8	331	363
5/16	1	448	533
	2	449	533
	1-1/4	701	753
3/8	2-1/4	706	825
	3-1/4	706	825
	1-1/2	1254	1583
	2-1/4	1265	1573
1/2	3-1/4	1288	1574
	5-1/4	1267	1578
	1-3/4	1587	2573
	2-1/4	1593	2573
5/8	3-1/2	1588	2573
	5-1/4	1591	2580
	3-1/4	2289	3249
3/4	5-1/4	2296	3256

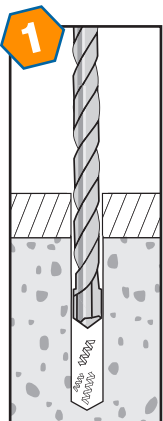


SLEEVE ANCHORS

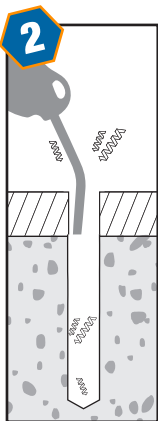
ZINC PLATED - HEX NUT, ACORN NUT, FLAT PHILLIPS, ROD HANGER & TIRE WIRE.

INSTALLATION GUIDE - ACORN NUT SLEEVE ANCHOR

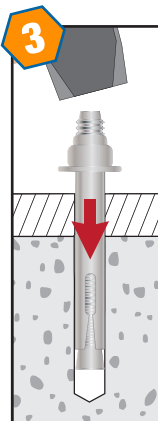
Using the proper diameter bit, drill a hole into the base material to a depth of at least 1/2" or one anchor diameter deeper than the embedment required. The tolerances of the drill bit used must meet the requirements of ANSI Standard B212.15



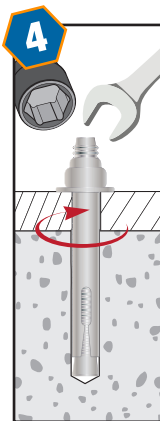
Blow the hole clean of dust and other material. Do not expand the anchor prior to installation.



Position the washer on the anchor and thread on the nut. Drive the anchor through the fixture into the anchor hole until the nut and washer are firmly seated against the fixture. Be sure the anchor is driven to the minimum required embedment depth, h_{nom} .

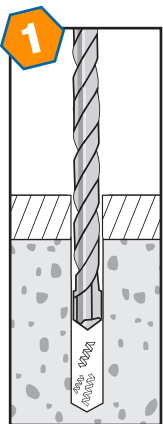


Tighten the anchor by turning the nut 3 to 5 turns past finger tight or by applying the guide installation torque from the finger tight position.

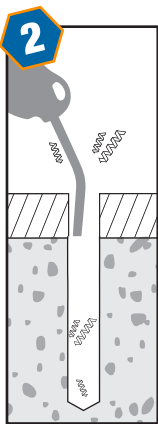


INSTALLATION GUIDE - FLATHEAD PHILLIPS SLEEVE ANCHOR

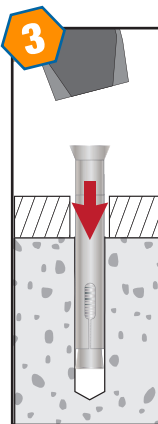
Using the proper diameter bit, drill a hole into the base material to a depth of at least 1/2" or one anchor diameter deeper than the embedment required. The tolerances of the drill bit used must meet the requirements of ANSI Standard B212.15



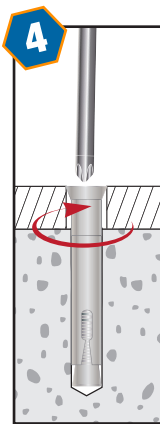
Blow the hole clean of dust and other material. Do not expand the anchor prior to installation.



Drive the anchor through the fixture into the anchor hole until the anchor is firmly seated against the fixture. Be sure the anchor is driven to the minimum required embedment depth, h_{nom} .



Tighten the anchor by turning the head 3 to 5 turns past finger tight.



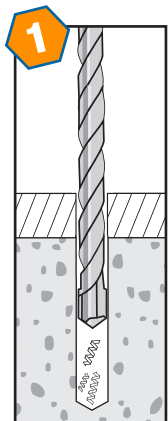


SLEEVE ANCHORS

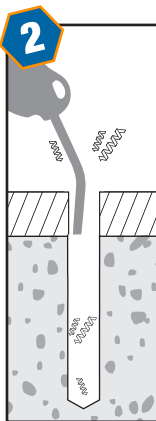
ZINC PLATED - HEX NUT, ACORN NUT, FLAT PHILLIPS, ROD HANGER & TIRE WIRE.

INSTALLATION GUIDE - HEX NUT SLEEVE ANCHOR

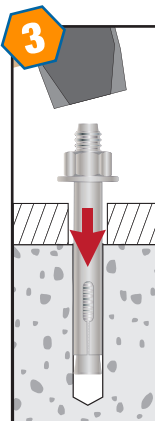
Using the proper diameter bit, drill a hole into the base material to a depth of at least 1/2" or one anchor diameter deeper than the embedment required. The tolerances of the drill bit used must meet the requirements of ANSI Standard B212.15



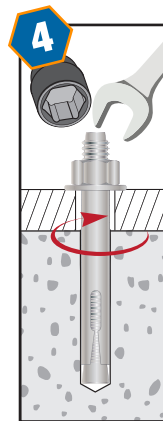
Blow the hole clean of dust and other material. Do not expand the anchor prior to installation.



Position the washer on the anchor and thread on the nut. Drive the anchor through the fixture into the anchor hole until the nut and washer are firmly seated against the fixture. Be sure the anchor is driven to the minimum required embedment depth, h_{nom} .

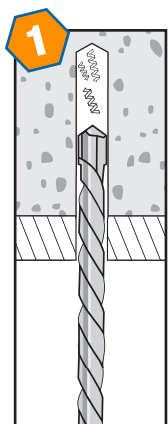


Tighten the anchor by turning the nut 3 to 5 turns past finger tight or by applying the guide installation torque from the finger tight position.

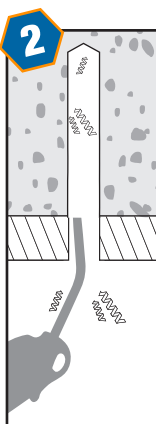


INSTALLATION GUIDE - ROD HANGER SLEEVE ANCHOR

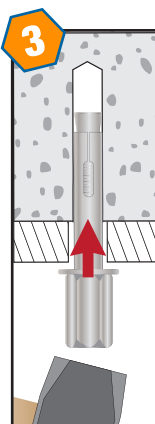
Using the proper diameter bit, drill a hole into the base material to a depth of at least 1/2" or one anchor diameter deeper than the embedment required. The tolerances of the drill bit used must meet the requirements of ANSI Standard B212.15



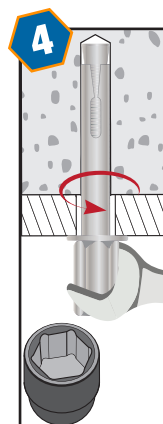
Blow the hole clean of dust and other material. Do not expand the anchor prior to installation.



Drive the anchor into the hole until the anchor is at the required embedment depth. Be sure the anchor is driven to the minimum required embedment depth, h_{nom} .



Tighten the coupler nut and washer up to the concrete surface and tighten the anchor by turning the nut 3 to 5 turns past finger tight or by applying the guide installation torque from the finger tight position.



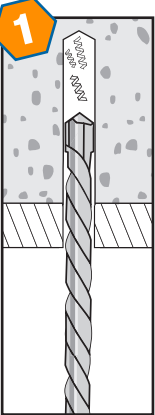


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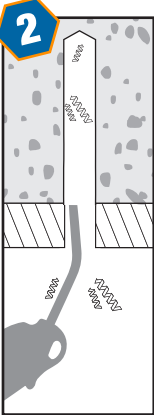
INSTALLATION GUIDE - TIE-WIRE SLEEVE ANCHOR

Using the proper diameter bit, drill a hole into the base material to a depth of at least 1/2" or one anchor diameter deeper than the embedment required. The tolerances of the drill bit used must meet the requirements of ANSI Standard B212.15



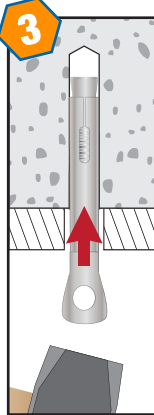
1

Blow the hole clean of dust and other material. Do not expand the anchor prior to installation.



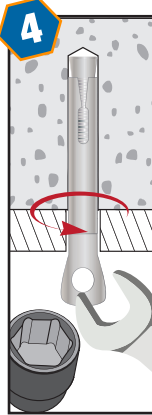
2

Drive the anchor into the hole until the head is firmly seated against the base material. Be sure the anchor is driven to the minimum required embedment depth, h_{nom} .



3

Tighten the tie wire nut by turning the head 3 to 5 turns past finger tight or by applying the guide installation torque from the finger tight position.



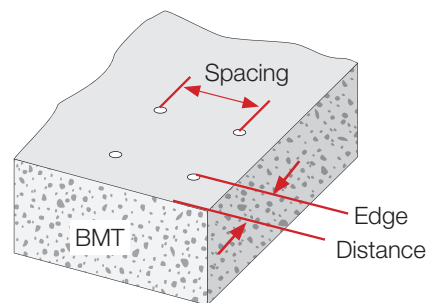
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SETTING - BASE MATERIAL THICKNESS (BMT)

There is a recommended minimum thickness of the solid base material that the anchor can be set in place. The minimum is based on 1.5 times of the calculated embedment to be used. Eg. an anchor to be installed to a depth of 4", the base material should be 6" deep.

Embedment - a pre-determined depth to obtain the required load capacity. Equal to or greater than the minimum embedment allowance.

Drill Depth - is the required embedment depth into the substrate plus a cavity allowance approximately 1.5 times the anchor diameter.



SETTING - SPACING

The anchor diameter is equal to the drill diameter which eliminates the need for hole plotting or layout. As the anchor can be spaced using the fixture the maximum load in tension or shear can be achieved by spacing anchors 10 times the selected diameter.

This spacing can be reduced but the load value should also be reduced, see table on page 8.

Anchor SPACING						
LOAD CAPACITY	10 x D	9 x D	8 x D	7 x D	6 x D	5 x D
Reduce by	100%	10%	20%	30%	40%	50%
Reduction Factor	1.00	0.90	0.80	0.70	0.60	0.50

**SLEEVE ANCHORS**

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SETTING - EDGE DISTANCE FOR TENSION

Should be determined by 12 times the selected anchor diameter to obtain the maximum load in tension. The recommended minimum spacing is 5 times the selected anchor diameter.

In tension – reducing the edge distance to the minimum, the load value will reduce by 20%.

Edge Distance in TENSION Only								
LOAD CAPACITY	12 x D	11 x D	10 x D	9 x D	8 x D	7x D	6 x D	5 x D
Reduce by	100%	3%	6%	9%	11%	14%	17%	20%
Reduction Factor	1.00	0.97	0.94	0.91	0.89	0.86	0.83	0.80

SETTING - EDGE DISTANCE FOR SHEAR

Should be determined by 12 times the selected anchor diameter to obtain the maximum load in shear. The recommended minimum spacing is 5 times the selected anchor diameter.

In shear – reducing the edge distance to the minimum, the load value will reduce by 50%.

Edge Distance in SHEAR Only								
LOAD CAPACITY	12 x D	11 x D	10 x D	9 x D	8 x D	7x D	6 x D	5 x D
Reduce by	100%	7%	14%	21%	29%	36%	43%	50%
Reduction Factor	1.00	0.93	0.86	0.79	0.71	0.64	0.57	0.50



SLEEVE ANCHORS

ZINC PLATED - HEX NUT, ACORN NUT, FLAT PHILLIPS, ROD HANGER & TIRE WIRE.

ORDERING INFORMATION - ACORN NUT SLEEVE ANCHOR

The published length is the sleeve length of the anchor. Allow for fixture thickness plus one anchor diameter for the nut and washer thickness when selecting a length.

Minimum Length Requirement must be > the minimum Embedment Depth + Fixture thickness (incl. shims & spacers) + Anchor diameter



ZINC PART #	ANCHOR* x SLEEVE ANCHOR (in)	MIN. EMBEDMENT(in)	THREAD LENGTH (in)	WASHER O.D. Ø (in)	HEX NUT A/F (in)
1ASA14138	1/4 x 1-3/8	1-1/8	1/4	5/8	3/8
1ASA14214	1/4 x 2-1/4				

*Drill diameter

ORDERING INFORMATION - HEX SLEEVE ANCHOR

The published length is the sleeve length of the anchor. Allow for fixture thickness plus one anchor diameter for the nut and washer thickness when selecting a length.

Minimum Length Requirement must be > the minimum Embedment Depth + Fixture thickness (incl. shims & spacers) + Anchor diameter



ZINC PART #	304 STAINLESS STEEL PART #	ANCHOR* x SLEEVE ANCHOR (in)	MIN. EMBEDMENT(in)	THREAD LENGTH (in)	WASHER O.D. Ø (in)	HEX NUT A/F (in)
1HSA56112	1HSAS256112	5/16 x 1-1/2	1-1/4	5/16	5/8	7/16
1HSA56212	1HSAS256212	5/16 x 2-1/2				
1HSA38178	1HSAS238178	3/8 x 1-7/8	1-1/2	3/8	7/8	1/2
1HSA38300	1HSAS238300	3/8 x 3				
1HSA38400	1HSAS238400	3/8 x 4				
1HSA12214	1HSAS212214	1/2 x 2-1/4				
1HSA12300	1HSAS212300	1/2 x 3	1-1/2	1/2	1-1/16	9/16
1HSA12400	1HSAS212400	1/2 x 4				
1HSA12514	-	1/2 x 5-1/4				
1HSA12600	1HSAS212600	1/2 x 6				
1HSA58214	1HSAS258214	5/8 x 2-1/4	2	5/8	1-3/8	3/4
1HSA58300	-	5/8 x 3				
1HSA58414	1HSAS258414	5/8 x 4-1/4				
1HSA58600	-	5/8 x 6				
1HSA34212	-	3/4 x 2-1/2	2-1/4	3/4	1-3/4	15/16
1HSA34414	-	3/4 x 4-1/4				
1HSA34614	-	3/4 x 6-1/4				

*Drill Diameter

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ZINC PLATED - HEX NUT, ACORN NUT, FLAT PHILLIPS, ROD HANGER & TIRE WIRE.

ORDERING INFORMATION - FLATHEAD PHILLIPS SLEEVE ANCHOR

The published length is the sleeve length of the anchor. Allow for fixture thickness plus one anchor diameter for the nut and washer thickness when selecting a length.

Minimum Length Requirement must be > the minimum Embedment Depth + Fixture thickness (incl. shims & spacers) + Anchor diameter



ZINC PART #	304 STAINLESS STEEL PART #	ANCHOR* x O.A.L. (in)	MIN. EMBEDMENT(in)	THREAD LENGTH (in)	WASHER O.D. Ø (in)	HEX NUT A/F (in)
1FSAP14214	1FSAPS214200	1/4 x 2-1/4				
1FSAP14300	-	1/4 x 3	1-1/8	1/4		
1FSAP14400	-	1/4 x 4				
1FSAP38300	-	3/8 x 3				
1FSAP38400	1FSAPS238400	3/8 x 4	1-1/2	3/8		
1FSAP38500	1FSAPS238500	3/8 x 5				
1FSAP38600	1FSAPS238600	3/8 x 6				

*Drill Diameter

O.A.L. is Overall Length

ORDERING INFORMATION - ROD HANGER SLEEVE ANCHOR

The published length is the sleeve length of the anchor. Allow for fixture thickness plus one anchor diameter for the nut and washer thickness when selecting a length.

Minimum Length Requirement must be > the minimum Embedment Depth + Fixture thickness (incl. shims & spacers) + Anchor diameter



ZINC PART #	ANCHOR* x SLEEVE ANCHOR (in)	MIN. EMBEDMENT(in)	THREAD LENGTH (in)	WASHER O.D. Ø (in)	HEX NUT A/F (in)
1RHS14112	1/4-20 Rod x 1-1/2	1-1/4	5/16	5/8	7/16
1RHS38178	3/8-16 Rod x 1-7/8	1-1/2	3/8	7/8	1/2
1RHS12214	1/2 Rod x 2-1/4	1-1/2	1/2	1-1/16	9/16

*Drill Diameter

ORDERING INFORMATION - TIE-WIRE SLEEVE ANCHOR

The published length is the sleeve length of the anchor. Allow for fixture thickness plus one anchor diameter for the nut and washer thickness when selecting a length.

Minimum Length Requirement must be > the minimum Embedment Depth + Fixture thickness (incl. shims & spacers) + Anchor diameter



ZINC PART #	ANCHOR* x SLEEVE ANCHOR (in)	MIN. EMBEDMENT(in)	THREAD LENGTH (in)	TIE WIRE HOLE Ø (in)	HEX NUT A/F (in)
1TWS56112	5/16 x 1-1/2	1-1/4	5/16	1/4	-

*Drill Diameter