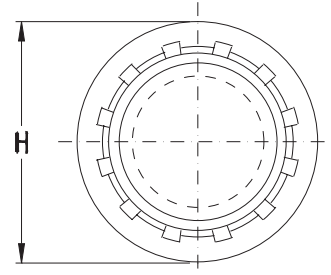
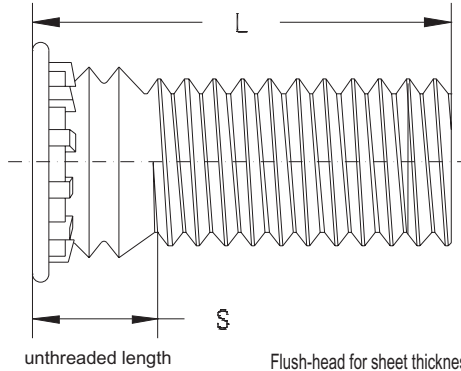
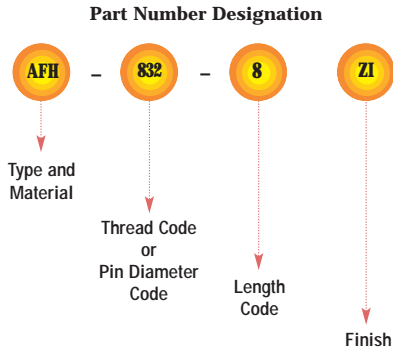


SELF-CLINCHING STUDS AND PINS



TYPE AFH/AFHS/AFHA



Flush-head for sheet thickness of .040" / 1 mm and greater.

UNIFIED (inch)	Thread Size	Type			Thread Code	Length Code "L" ±.015 (Length Code in 16ths of an inch)										Min. Sheet Thickness	Hole Size in Sheet +.003 -.000	Max. Hole in Attach. Parts	H ± .015	S Max.	Min. Dist. Hole C/L to Edge
		Steel	Stainless Steel	Aluminum		.250	.312	.375	.500	.625	.750	.875	1.00	1.25	1.50						
	.086-56 (#2-56)	AFH	AFHS	NA	256	4	5	6	8	10	12	NA	NA	NA	NA	.040	.085	.105	.144	.075	.187
.112-40 (#4-40)	AFH	AFHS	AFHA	440	4	5	6	8	10	12	14	16	NA	NA	.040	.111	.135	.176	.085	.219	
.138-32 (#6-32)	AFH	AFHS	AFHA	632	4	5	6	8	10	12	14	16	20	24	.040	.137	.160	.206	.090	.250	
.164-32 (#8-32)	AFH	AFHS	AFHA	832	4	5	6	8	10	12	14	16	20	24	.040	.163	.185	.237	.090	.281	
.190-24 (#10-24)	AFH	AFHS	AFHA	024	NA	5	6	8	10	12	14	16	20	24	.040	.189	.210	.256	.100	.281	
.190-32 (#10-32)	AFH	AFHS	AFHA	032	NA	5	6	8	10	12	14	16	20	24	.040	.189	.210	.256	.100	.281	
.250-20 (1/4-20)	AFH	AFHS	AFHA	0420	NA	NA	6	8	10	12	14	16	20	24	.062	.249	.270	.337	.135	.312	
.313-18 (5/16-18)	AFH	AFHS	NA	0518	NA	NA	NA	8	10	12	14	16	20	24	.093	.311	.333	.376	.160	.375	

METRIC (mm)	Thread Size x Pitch	Type			Thread Code	Length Code "L" ±0.4 (Length Code in millimeters)										Min. Sheet Thickness	Hole Size in Sheet +0.08	Max. Hole in Attach. Parts	H ± 0.4	S Max.	Min. Dist. Hole C/L to Edge
		Steel	Stainless Steel	Aluminum		6	8	10	12	15	18	NA	NA	NA	NA						
M2.5x0.45	AFH	AFHS	AFHA	M2.5	6	8	10	12	15	18	NA	NA	NA	NA	1	2.5	3.1	4.1	1.95	5.4	
M3x0.5	AFH	AFHS	AFHA	M3	6	8	10	12	15	18	20	25	NA	NA	1	3	3.6	4.6	2.1	5.6	
M3.5x0.6	AFH	AFHS	AFHA	M3.5	6	8	10	12	15	18	20	25	30	NA	1	3.5	4.1	5.3	2.25	6.4	
M4x0.7	AFH	AFHS	AFHA	M4	6	8	10	12	15	18	20	25	30	35	1	4	4.6	5.9	2.4	7.2	
M5x0.8	AFH	AFHS	AFHA	M5	NA	8	10	12	15	18	20	25	30	35	1	5	5.6	6.5	2.7	7.2	
M6x1	AFH	AFHS	AFHA	M6	NA	NA	10	12	15	18	20	25	30	35	1.6	6	6.6	8.2	3	7.9	
M8x1.25	AFH	AFHS	NA	M8	NA	NA	NA	12	15	18	20	25	30	35	2.4	8	8.6	9.6	3.7	9.6	

NA Not Available.

SELF-CLINCHING STUDS AND PINS



MATERIAL & FINISH SPECIFICATIONS

Type	Threads*	Fastener Materials					Standard Finishes			Optional Finish ⁽¹⁾	For use in Sheet Hardness:					
	External, ANSI B1.1, 2A ANSI/ASME B1.13M, 6g	Heat-Treated Carbon Steel	300 Series Stainless Steel	2024-T4 Aluminum (Plain Finish)	CDA #510 Phosphor Bronze (2)	400 Series Stainless Steel	No Finish (3) (4)	Zinc Per ASTM B 633 SC1 (5µm) Type III, Colorless	Passivated and/or Tested Per ASTM A380	Zinc Per ASTM B 633 SC1 (5µm) Type II, Yellow	50 or less on the Rockwell "B" Scale	55 or less on the Rockwell "B" Scale	70 or less on the Rockwell "B" Scale	80 or less on the Rockwell "B" Scale	85 or less on the Rockwell "B" Scale	92 or less on the Rockwell "B" Scale
AFH	•	•					•	•		•				•		
AFHS	•		•						•				•			
AFHA	•			•			•				•					

- (1) Special order with additional charge.
 - (2) Material properties – yield strength: 50,000 psi (345 MPa), tensile strength: 63,000 psi (434 MPa).
 - (3) Part numbers for aluminum studs have no plating suffix.
 - (4) "X" suffix studs may have pitch diameters and major diameters below 2A "Basic", per ANSI B1.1, Section 7, and B1.13M, Section 8 to allow for minimum of 0.0002" of plating.
- * For plated studs, Class 2A/6g, the maximum major and pitch diameter, after plating, may equal basic sizes and be gauged to Class 3A/4h. Per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, paragraph 8.2.

INSTALLATION

For Types AFH, AFHA, ATFHS

Self-clinching studs are installed by placing them in punched or drilled holes in the sheet material and squeezing them into place with any standard press.

All that is required is a flat or recessed punch and a plain anvil having a hole to clear the thread diameter so that force is applied between the top of the stud head and underside of the sheet material. The squeezing action forces the ribs of the stud into the sheet, displacing sheet material, causing it to fill the annular groove under the head of the stud.

The following information provides specifics with regard to stud installation.

UNIFIED (inch)	Thread Code	Anvil Dimensions	
		A	C
	256	.110-.114	.087-.090
	440	.136-.140	.113-.116
	632	.162-.166	.139-.142
	832	.188-.192	.165-.168
	024 & 032	.216-.220	.191-.194
	0420	.295-.300	.250-.253
	0518	.334-.338	.3125-.3155
	0616	–	.375-.378

METRIC (mm)	Thread Code	Anvil Dimensions	
		A + 0.1	C + 0.08
	M2.5	3.1	2.53
	M3	3.6	3.03
	M3.5	4.1	3.53
	M4	4.6	4.03
	M5	5.6	5.03
	M6	6.6	6.03
	M8	8.6	8.03
	M10	–	10.03

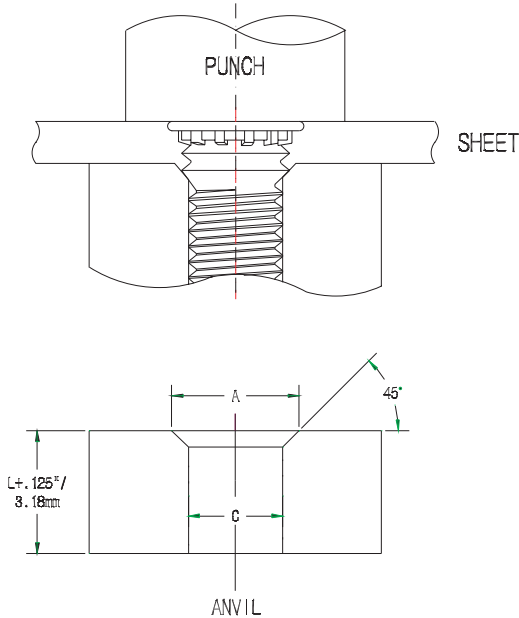
SELF-CLINCHING STUDS AND PINS



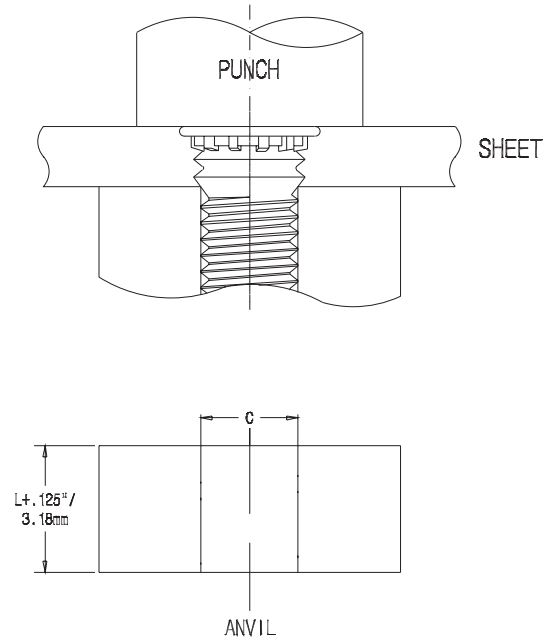
Type AFH/AFHS/AFHA (Flush) Studs

The two sketches below indicate suggested tooling for applying installation forces. Note that for sheets .060" / 1.51 mm and thicker, the anvil requires only a straight thru hole to accommodate the stud. For sheets less than .060" / 1.51 mm, the hole requires a countersink with dimension A at the top to provide for metal flow around the shank of the stud.

Tooling for sheet thicknesses less than .060" / 1.51 mm with #2 thru #10 / M3 thru M5 thread sizes and less than .093" / 2.4 mm for 1/4" / M6 threads.



Tooling for sheet thicknesses .060" / 1.51 mm and greater with #2 thru #10 / M3 thru M5 thread sizes and .093" / 2.41 mm and greater for 1/4" and 5/16" M6 and M8 threads.



SELF-CLINCHING STUD SELECTOR GUIDE

Self-Clinching Stud Type	Application Requires:									
	Flush-head	High-strength	Sheet thickness as thin as .020" / 0.51mm	High electrical conductivity	Mounting into stainless steel sheets	Compatibility with aluminum anodizing	High corrosion resistance	Reduced centerline-to-edge distance	Unthreaded	Lead-in for assembly ease
AFH	•									
AFHA	•					•	•			
AFHS	•						•			

SELF-CLINCHING STUDS AND PINS



PERFORMANCE DATA⁽¹⁾

Type AFH and AFHS Flush-Head Studs

UNIFIED (inch)	Thread Code	Max. Nut Tightening Torque (in. lbs.) ⁽¹⁾	Type	Test Sheet Thickness and Material	Sheet Hardness HRB	Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)	Pull Thru (lbs.)
	256	2.3		AFH	.062" Aluminum	29	2000	100	5
AFHS				.062" Aluminum	29	2000	100	4.5	300
AFH				.060" Steel	59	2500	180	5	425
AFHS				.060" Steel	59	2500	180	4.5	300
440	5		AFH	.064" Aluminum	29	3800	170	10	650
			AFHS	.064" Aluminum	29	3200	170	8	500
			AFH	.060" Steel	59	4300	275	10	650
			AFHS	.060" Steel	59	4700	275	8	500
632	9		AFH	.064" Aluminum	29	3800	180	17	850
			AFHS	.064" Aluminum	29	3500	180	16	775
			AFH	.060" Steel	59	4700	300	20	850
			AFHS	.060" Steel	59	5000	300	16	775
832	17		AFH	.064" Aluminum	29	4800	220	28	1000
			AFHS	.064" Aluminum	29	4500	220	28	940
			AFH	.060" Steel	59	6800	375	40	1270
			AFHS	.060" Steel	59	5500	375	28	1130
032	27		AFH	.064" Aluminum	29	5500	270	30	1220
			AFHS	.064" Aluminum	29	5500	270	30	1220
024	24		AFH	.060" Steel	59	7500	450	60	1410
			AFHS	.060" Steel	59	6800	450	50	1410
0420	58		AFH	.093" Aluminum	28	6500	310	65	2300
			AFHS	.093" Aluminum	28	6500	310	65	2100
			AFH	.088" Steel	46	9500	575	100	2550
			AFHS	.088" Steel	46	10000	575	100	2550
0518	120		AFH	.093" Aluminum	28	6500	430	100	2260
			AFHS	.093" Aluminum	28	6700	430	100	2260
			AFH	.093" Steel	46	10000	650	175	3475
			AFHS	.093" Steel	46	11200	650	175	3120

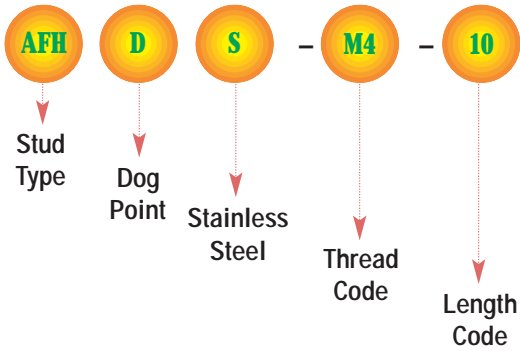
(1) Maximum recommended tightening torques for aluminum studs are 60 percent of these values.

METRIC (mm)	Thread Code	Max. Nut Tightening Torque (N•m) ⁽¹⁾	Type	Test Sheet Thickness and Material	Sheet Hardness HRB	Installation (kN)	Pushout (N)	Torque-out (N•m)	Pull Thru (N)
	M2.5	0.41		AFH	1.6 mm Aluminum	29	8.9	465	1.0
AFHS				1.6 mm Aluminum	29	11.6	465	0.8	1820
AFH				1.5 mm Steel	59	11.1	740	1.0	2800
AFHS				1.5 mm Steel	59	13.8	740	0.8	1820
M3	0.74		AFH	1.6 mm Aluminum	29	12.9	600	1.7	3150
			AFHS	1.6 mm Aluminum	29	12.9	600	1.3	2570
			AFH	1.5 mm Steel	59	14.7	820	1.7	3840
			AFHS	1.5 mm Steel	59	14.7	820	1.3	2440
M3.5	1.15		AFH	1.6 mm Aluminum	29	15.6	800	1.7	3780
			AFHS	1.6 mm Aluminum	29	15.6	800	1.7	3445
			AFH	1.5 mm Steel	59	22.3	1335	2.8	3780
			AFHS	1.5 mm Steel	59	22.3	1335	2.0	3445
M4	1.7		AFH	1.6 mm Aluminum	29	20	975	2.9	4448
			AFHS	1.6 mm Aluminum	29	22.3	975	2.9	4180
			AFH	1.5 mm Steel	59	28.9	1780	4.2	5650
			AFHS	1.5 mm Steel	59	26.7	1780	2.9	4775
M5	3.5		AFH	1.6 mm Aluminum	29	24.5	1070	3.5	5170
			AFHS	1.6 mm Aluminum	29	24.5	1070	3.5	4760
			AFH	1.5 mm Steel	59	33.4	2000	6.5	6270
			AFHS	1.5 mm Steel	59	32.5	2000	6.3	6000
M6	5.9		AFH	2.4 mm Aluminum	28	28.9	1660	7.3	10200
			AFHS	2.4 mm Aluminum	28	28.9	1660	7.3	9090
			AFH	2.2 mm Steel	46	44.5	2560	11.3	11300
			AFHS	2.2 mm Steel	46	44.5	2560	10.1	10600
M8	14.2		AFH	2.4 mm Aluminum	28	29.8	1910	11.3	10500
			AFHS	2.4 mm Aluminum	28	29.8	1910	11.3	9540
			AFH	2.4 mm Steel	46	44.5	2890	19.2	15450
			AFHS	2.4 mm Steel	46	49.8	2890	17.5	13630

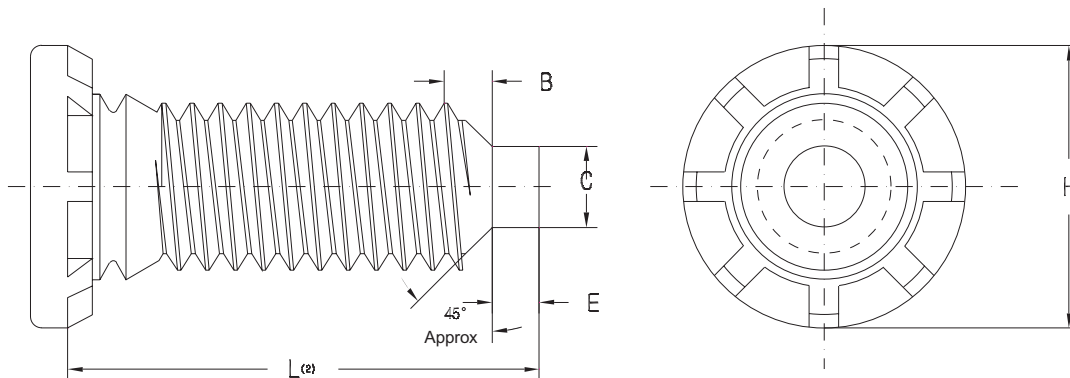
SELF-CLINCHING STUDS AND PINS



Part Number Designation



To specify a dog point stud, choose either Type AFH (flush-head), Type AHFH or AHFE (high-strength) style studs of the appropriate thread size and length, then add a "D" (for dog point) to the Type prefix. If a stainless steel stud is required, an "S" also must be added to the Type designation as shown in the example.



Dog Point Flush Head Stud

UNIFIED (inch)	Thread Size	C ±.005 (3)	E ±.010	B Nom. Transitional Length to Full Thread
	.138-32 (#6-32)	.086	.050	.098
	.164-32 (#8-32)	.111	.055	.099
	.190-24 (#10-24)	.124	.065	.127
	.190-32 (#10-32)	.138	.065	.098
	.250-20 (1/4-20)	.173	.085	.149
	.250-28 (1/4-28)	.192	.085	.110
	.313-18 (5/16-18)	.228	.105	.164
	.313-24 (5/16-24)	.246	.105	.127
	.375-16 (3/8-16)	.282	.125	.182
	.375-24 (3/8-24)	.309	.125	.126

METRIC (mm)	Thread Size x Pitch	C ±0.13 (3)	E ±0.25	B Nom. Transitional Length to Full Thread
	M3.5 x0.6	2.4	1.27	1.88
	M4 x0.7	2.79	1.4	2.26
	M5 x0.8	3.66	1.78	2.48
	M6 x1	4.37	2.03	3.05
	M8 x1.25	6.05	2.67	3.73
M10 x1.5	7.72	3.43	4.37	

- (1) Studs with dog point and MAThread features are a non-stocked standard.
- (2) For "L" refer to type AFH, AHFE, or AHFH lengths.
- (3) Maximum dog point diameter is .003" / 0.08 mm less than minimum minor diameter of 2B or 6H nut threads.