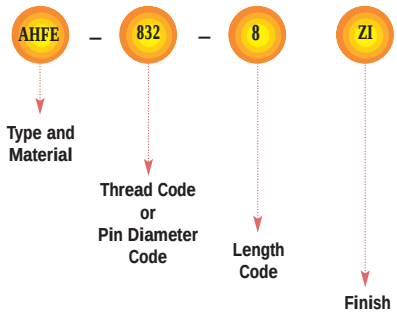
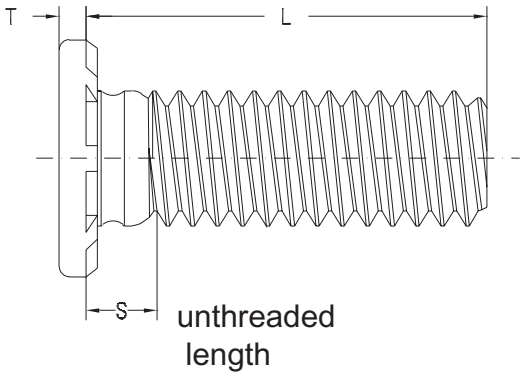
SELF-CLINCHING STUDS AND PINS

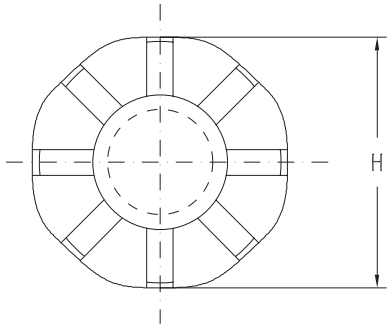
TYPE AHFE

Part Number Designation



Enlarged head diameter provides highstrength in sheets as thin as .040" / 1 mm.





	Thread Code	Type	Thread Code	Length Code "L" ±.015 (Length Code in 16ths of an inch)							Min. Sheet Thickness	Hole Size In Sheet +.005 -.000	H ±.01	S Max.	T Max.	Max. Hole In Attached Parts	Min. Dist. Hole C/L To Edge
				.500	.750	1.00	1.25	1.50	1.75	2.00							
UNIFIED (inch)	.190-32 (#10-32)	AHFE	032	8	12	16	20	24	28	32	.040	.190	.357	.102	.048	.280	.360
	.250-20 (1/4-20)	AHFE	0420	8	12	16	20	24	28	32	.040	.250	.462	.118	.060	.340	.470
	.313-18 (5/16-18)	AHFE	0518	8	12	16	20	24	28	32	.060	.312	.586	.133	.083	.402	.560

Thread strength: 120 ksi

	Thread Code x Pitch	Type	Thread Code	Length Code "L" ±.0.4 (Length Code in Millimeters)							Min. Sheet Thickness	Hole Size In Sheet +0.13	H ±0.25	S Max.	T Max.	Max. Hole In Attached Parts	Min. Dist. Hole C/L To Edge
METRIC (mm)	M5 x 0.8	AHFE	M5	15	20	25	30	35	40	50	1	5	9.6	2.6	1.35	7.3	10
	M6 x 1	AHFE	M6	15	20	25	30	35	40	50	1	6	11.35	2.8	1.52	8.3	11.5
	M8 x 1.25	AHFE	M8	15	20	25	30	35	40	50	1.5	8	15.3	3.3	2.13	10.3	14.5

Thread strength: 900 MPa

MATERIAL & FINISH SPECIFICATIONS

	Threads*	Fastener Materials					Standard Finishes			Optional Finish(1)	For use in Sheet Hardness:					
Type	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
AHFE	•	•						•		•					•	

(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 Clas s 3A/4h. Per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, paragraph 8.2.

SELF-CLINCHING STUDS AND PINS

INSTALLATION

For Types AHFE

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.

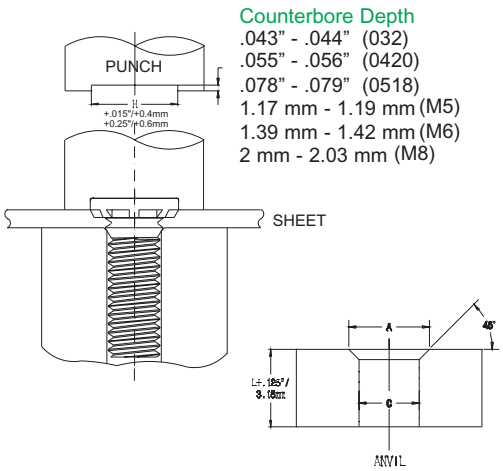
UNIFIED (inch)	Thread Code	Anvil Dimensions	
		A	C
	256	.110-.114	.087-.090
	440	.136-.140	.113-.116
	632	.162-.166	.139-.142
	832	.188-.192	.165-.168
	024 & 032	.216-.220	.191-.194
	0420	.295-.300	.250-.253
	0518	.334-.338	.3125-.3155
	0616	–	.375-.378

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

Type AHFE Studs

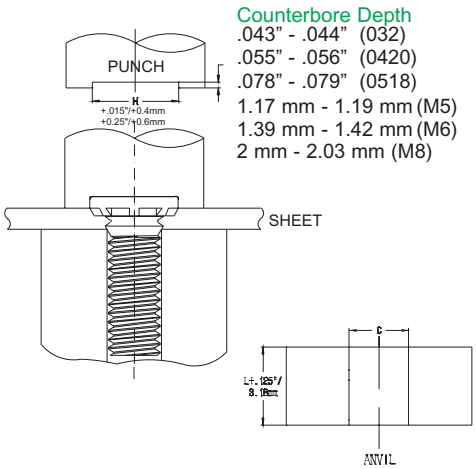
The two sketches below indicate suggested tooling for applying installation forces. Note that for sheets .060" / 1.51 mm and thicker, the anvil requires only a straight thru hole to accommodate the stud. For sheets less than .060" / 1.51 mm to less than .075" / 1.9 mm, the hole requires a countersink 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 #10 / M5 and 1/4" / M6 thread sizes and less than .075" / 1.9 mm with 5/16" / M8 threads.



Counterbore Depth
.043" - .044" (032)
.055" - .056" (0420)
.078" - .079" (0518)
1.17 mm - 1.19 mm (M5)
1.39 mm - 1.42 mm (M6)
2 mm - 2.03 mm (M8)

Tooling for sheet thicknesses .060" / 1.51 mm and greater with #10 / M5 and 1/4" / M6 thread sizes and .075" / 1.9 mm and greater with 5/16" / M8 threads.



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1.39 mm - 1.42 mm (M6)
2 mm - 2.03 mm (M8)

SELF-CLINCHING STUDS AND PINS

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
AHFE		•								

PERFORMANCE DATA (1)

Type AHFE Self-Clinching Studs

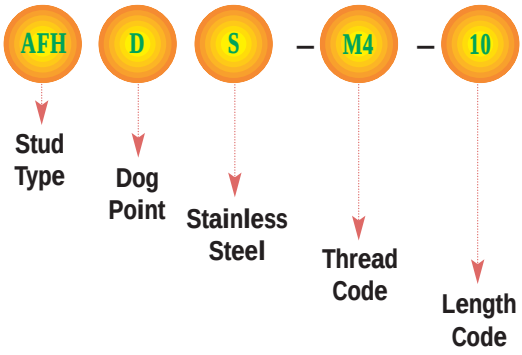
	Thread Code	Max. Nut Tightening Torque (ft. lbs.)	Test Sheet Thickness and Material (in.)	Sheet Hardness HRB	Installation (lbs.) (1)	Pushout (lbs.)	Torque-out (in. lbs.)	Pull Thru (lbs.)	Test Bushing Hole Size For Pull Thru Tests
UNIFIED(inch)	032	3.25	.040" Aluminum	27	7500	170	60	1900	.279
			.040" Cold-rolled Steel	67	9500	300	60	2200	
	0420	8	.040" Aluminum	27	8000	180	120	3200	.335
			.040" Cold-rolled Steel	67	13500	340	130	3600	
	0518	16	.060" Aluminum	22	9000	275	240	6000	.407
			.060" Cold-rolled Steel	65	15500	575	290	6400	

	Thread Code	Max. Nut Tightening Torque (N•m)	Test Sheet Thickness and Material (mm)	Sheet Hardness HRB	Installation (kN) (1)	Pushout (N)	Torque-out (N•m)	Pull Thru (kN)	Test Bushing Hole Size For Pull Thru Tests
MERTIC(mm)	M5	4.4	1 mm Aluminum	27	37.7	690	8.1	9.7	7.4
			1 mm Cold-rolled Steel	67	51.1	1350	8.1	10.6	
	M6	10	1 mm Aluminum	27	39	750	11.8	14.2	8.2
			1 mm Cold-rolled Steel	67	60	1400	14.4	15.5	
	M8	21.7	1.5 mm Aluminum	22	42	1230	23.5	25	10.3
			1.5 mm Cold-rolled Steel	65	71.1	2400	33.9	27.5	

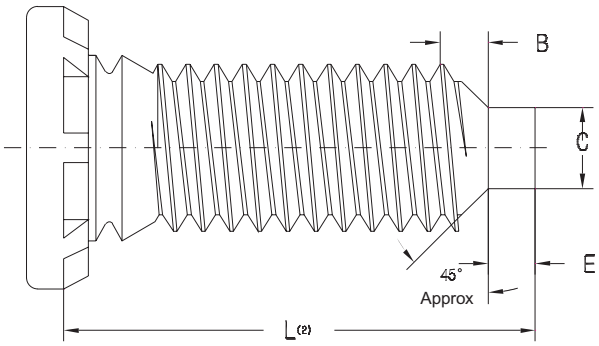
(1) Installation controlled by proper cavity depth in punch.

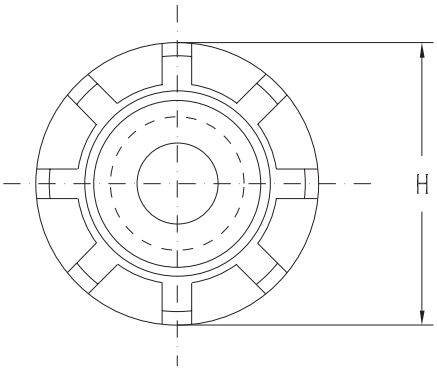
SELF-CLINCHING STUDS AND PINS

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

	Thread Size	C ±.005 (3)	E ±.010	B Nom. Transitional Length to Full Thread
UNIFIED (inch)	.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

	Thread Size x Pitch	C ±0.13 (3)	E ±0.25	B Nom. Transitional Length to Full Thread
METRIC (mm)	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.