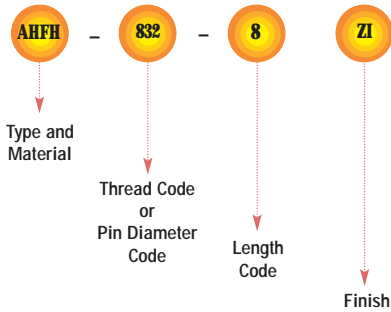


SELF-CLINCHING STUDS AND PINS

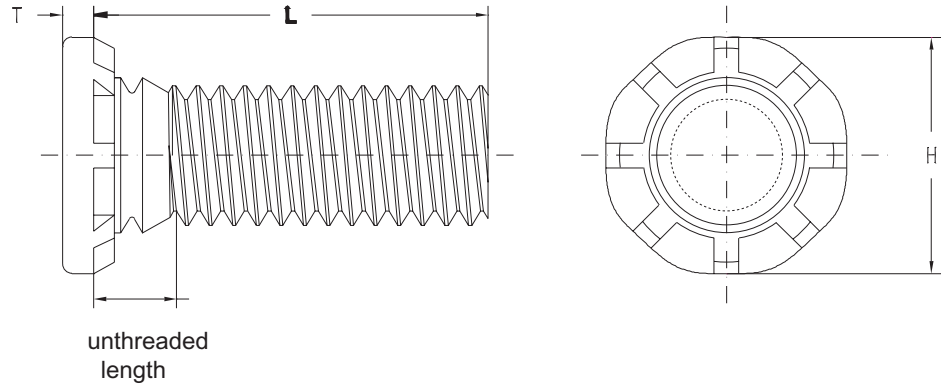


TYPE AHFH/AHFHS/AHFHB

Part Number Designation



For high-strength applications in sheets as thin as .050" / 1.3 mm.
Type AHFHB for superior electrical/ mechanical attachment in copper.



UNIFIED (inch)	Thread Size (#10-32)	Type			Thread Code	Length Code "L" ±.015 (Length Code in 16ths of an inch)						Min. Sheet Thickness	Hole Size in Sheet +.005 - .000	Max. Hole in Attach. Parts	H ±.01	S Max.	T Max.	Min. Dist. Hole C/L to Edge	
		Steel	Stainless Steel	Phosphor Bronze(1)		.500	.750	1.00	1.25	1.50	1.75								2.00
		.190-32 (#10-32)	AHFH	AHFHS	AHFHB	032	8	12	16	20	24	28	32	.050	.190	.250	.300	.105	.040
	.250-20 (1/4-20)	AHFH	AHFHS	AHFHB	0420	8	12	16	20	24	28	32	.060	.250	.312	.380	.125	.050	.460
	.313-18 (5/16-18)	AHFH	AHFHS	AHFHB	0518	8	12	16	20	24	28	32	.075	.312	.375	.480	.140	.070	.500
	.375-16 (3/8-16)	AHFH	AHFHS	AHFHB	0616	NA	12	16	20	24	28	32	.090	.375	.437	.580	.155	.085	.530

Thread strength: AHFH - 120 ksi / AHFHS - 75 ksi / AHFHB - 60 ksi

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 +0.13	Max. Hole in Attach. Parts	H ±0.25	S Max.	T Max.	Min. Dist. Hole C/L to Edge	
		Steel	Stainless Steel	Phosphor Bronze(1)		15	20	25	30	35	40								50
	M5x0.8	AHFH	AHFHS	AHFHB	M5	15	20	25	30	35	40	50	1.3	5	6.5	7.8	2.7	1.14	10.7
	M6x1	AHFH	AHFHS	AHFHB	M6	15*	20	25	30	35	40	50	1.5	6	7.5	9.4	2.8	1.27	11.5
	M8x1.25	AHFH	AHFHS	AHFHB	M8	15	20	25	30	35	40	50	2	8	9.5	12.5	3.5	1.78	12.7
	M10x1.5	AHFH	AHFHS	AHFHB	M10	15	20	25	30	35	40	50	2.3	10	11.5	15.7	4.1	2.29	13.7

Thread strength: AHFH - 900 MPa / AHFHS - 515 MPa / AHFHB - 415 MPa

NA Not Available.

(1) The electrical resistance (tested at 10 amps DC) between phosphor bronze studs and copper busbars is below 104μ ohms and 62μ ohms for the #10-32 / M5 and 3/8-16 / M10 thread sizes respectively after repeated thermal and mechanical cycling. Consult our Marketing department for complete electrical resistance test data for type AHFHB studs installed in copper.

* Type AHFHB-M6-15 is only available on special order.

SELF-CLINCHING STUDS AND PINS



Type AHFH and AHFHS High Strength Studs and Type AHFHB Phosphor Bronze Studs

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
AHFH	•	•					•	•	•					•		
AHFHB	•				•		•				•					
AHFHS	•		•						•				•			

- (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 AHFH, AHFHB, AHFHS

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.

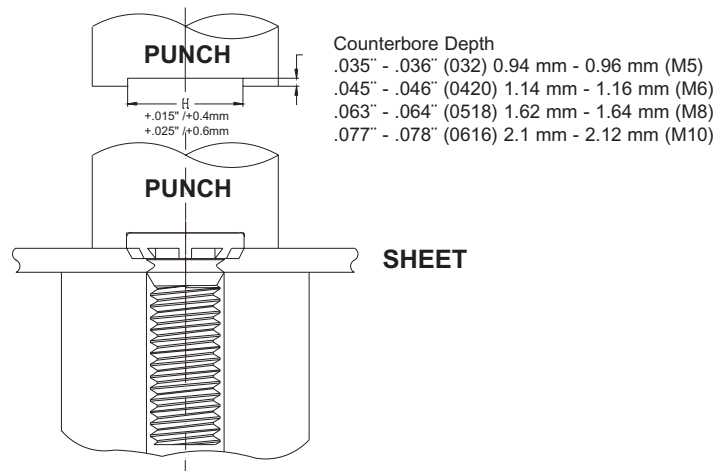
The following information provides specifics with regard to stud installation.

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 AHFH/AHFHB/AHFHS Studs

Apply squeezing force on the punch sufficient only to embed the ribs on the head of the stud into the sheet. The sketches below indicate suggested tooling for Type AHFH self-clinching studs. The standard punch design provides clearance for the stud head and reduces chances of over squeezing.



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
AHFH		•								
AHFHB				•						
AHFHD		•								•

PERFORMANCE DATA ⁽¹⁾

UNIFIED (inch)	Thread Code	Type	Max. Nut Tightening Torque (ft. lbs.)	Test Sheet Thickness and Material	Sheet Hardness HRB	(1) Installation (lbs.)	Pushout (lbs.)	Torque-out (ft. lbs.)	(2) Tensile Strength (lbs.)
	032	AHFH		3.25	.060" Aluminum	15	3000	180	4
AHFH			3.25	.060" Steel	65	6000	375	5	2400
AHFHS			3.25	.050" Aluminum	38	3000	180	4	1500
AHFHS			3.25	.058" Steel	52	4500	325	4	1500
AHFHB			2.56	.061" Copper CDA-110	28	3400	250	4.5	1200
0420	AHFH		8	.060" Aluminum	43	5500	285	11	3820
	AHFH		8	.060" Steel	59	7000	480	11	3820
	AHFHS		8	.064" Aluminum	32	4000	285	8	2385
	AHFHS		8	.072" Steel	43	6500	480	8	2385
	AHFHB		4.35	.061" Copper CDA-110	28	6000	380	5	1908
0518	AHFH		16	.091" Aluminum	39	8000	380	22	6280
	AHFH		16	.090" Steel	58	10000	590	22	6280
	AHFHS		16	.087" Aluminum	41	5500	380	15	3930
	AHFHS		16	.099" Steel	44	7500	590	15	3930
	AHFHB		10.55	.126" Copper CDA-110	32	7500	500	11	3140
0616	AHFH		27	.091" Aluminum	39	9000	550	25	9300
	AHFH		27	.090" Steel	58	12000	780	36	9300
	AHFHS		27	.123" Aluminum	44	7500	560	25	5810
	AHFHS		27	.099" Steel	44	10500	780	25	5810
	AHFHB		21	.126" Copper CDA-110	32	9500	560	18	4650

METRIC (mm)	Thread Code	Type	Max. Nut Tightening Torque (N•m)	Test Sheet Thickness and Material	Sheet Hardness HRB	(1) Installation (kN)	Pushout (N)	Torque-out (N•m)	(2) Tensile Strength (kN)
	M5	AHFH		4.4	1.5 mm Aluminum	15	13	800	5.4
AHFH			4.4	1.5 mm Steel	65	26	1500	7.6	12.8
AHFHS			4.4	1.62 mm Aluminum	35	12.4	800	5.4	7.3
AHFHS			4.4	1.47 mm Steel	54	21.7	1500	6.4	7.3
AHFHB			3.47	1.5 mm Copper CDA-110	28	15.6	1115	3.4	5.9
M6	AHFH		10	1.5 mm Aluminum	43	29	1270	14	18.1
	AHFH		10	1.5 mm Steel	59	33	1750	14	18.1
	AHFHS		10	1.62 mm Aluminum	35	15.4	1270	11	10.3
	AHFHS		10	1.6 mm Steel	45	24.6	1750	11	10.3
	AHFHB		5.9	1.5 mm Copper CDA-110	28	25.3	1600	6.7	8.3
M8	AHFH		21.7	2.3 mm Aluminum	39	35.6	1700	30	32.9
	AHFH		21.7	2.3 mm Steel	58	44.5	2200	30	32.9
	AHFHS		21.7	2.23 mm Aluminum	44	24.4	1700	20	18.8
	AHFHS		21.7	2.48 mm Steel	43	37.8	2100	20	18.8
	AHFHB		14.3	3.2 mm Copper CDA-110	32	33	2250	15.3	15.1
M10	AHFH		36.6	2.3 mm Aluminum	39	40	2445	36	52.2
	AHFH		36.6	2.3 mm Steel	58	54	3470	49	52.2
	AHFHS		36.6	2.3 mm Aluminum	44	33.3	2445	36	29.9
	AHFHS		36.6	2.3 mm Steel	44	46.7	3470	36	29.9
	AHFHB		28.5	3.2 mm Copper CDA-110	32	42	2500	25	24

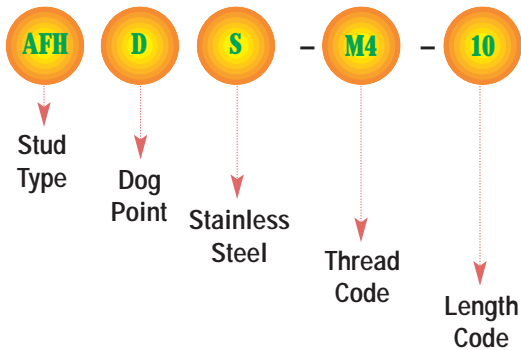
(1) Installation controlled by proper cavity depth in punch.

(2) Head size is adequate to ensure failure in threaded area.

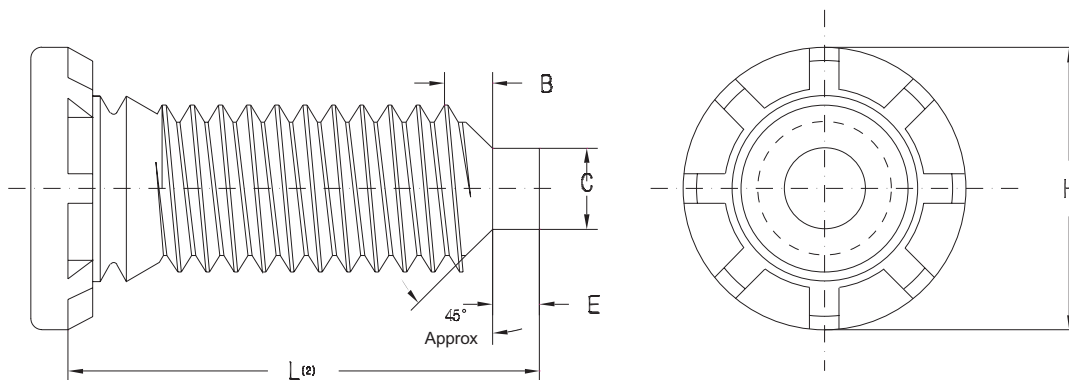
SELF-CLINCHING STUDS AND PINS



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 x 0.6	2.4	1.27	1.88
	M4 x 0.7	2.79	1.4	2.26
	M5 x 0.8	3.66	1.78	2.48
	M6 x 1	4.37	2.03	3.05
	M8 x 1.25	6.05	2.67	3.73
M10 x 1.5	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.