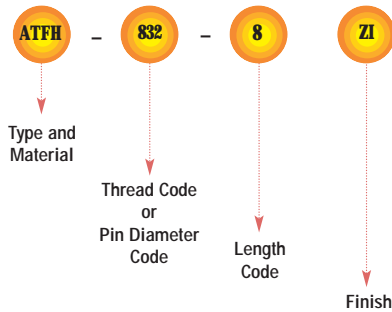


SELF-CLINCHING STUDS AND PINS

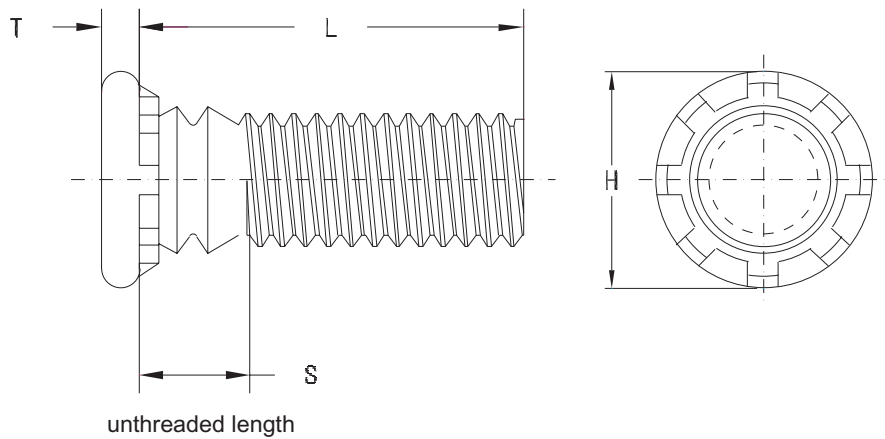


TYPE ATFH/ATFHS

Part Number Designation



Non-flush for sheets as thin as
.020" / 0.51 mm.



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.	T Max.	Min. Dist. Hole C/L to Edge
		Steel	Stainless Steel		.250	.312	.375	.500	.625	.750	.875	1.00	1.25							
	.086-56 (#2-56)	ATFH	ATFHS	256	4	5	6	8	10	12	NA	NA	NA	NA	.020	.085	.105	.141	.070	.025
.112-40 (#4-40)	ATFH	ATFHS	440	4	5	6	8	10	12	14	NA	NA	NA	.020	.111	.135	.176	.070	.025	.219
.138-32 (#6-32)	ATFH	ATFHS	632	4	5	6	8	10	12	14	16	20	24	.020	.137	.160	.203	.070	.025	.250
.164-32 (#8-32)	ATFH	ATFHS	832	4	5	6	8	10	12	14	16	20	24	.020	.163	.185	.234	.070	.025	.281
.190-24 (#10-24)	ATFH	ATFHS	024	NA	5	6	8	10	12	14	16	20	24	.020	.189	.210	.250	.090	.025	.281
.190-32 (#10-32)	ATFH	ATFHS	032	NA	5	6	8	10	12	14	16	20	24	.020	.189	.210	.250	.090	.025	.281

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.	T Max.	Min. Dist. Hole C/L to Edge
		Steel	Stainless Steel		6	8	10	12	15	18	20	25	30							
M3x0.5	ATFH	ATFHS	M3	6	8	10	12	15	18	20	25	NA	NA	0.51	3	3.6	4.5	1.8	0.64	5.6
M4x0.7	ATFH	ATFHS	M4	NA	8	10	12	15	18	20	25	30	35	0.51	4	4.6	5.8	1.8	0.64	7.2
M5x0.8	ATFH	ATFHS	M5	NA	8	10	12	15	18	20	25	30	35	0.51	5	5.6	6.4	2.3	0.64	7.2

NA Not Available.

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SELF-CLINCHING STUDS AND PINS



MATERIAL & FINISH SPECIFICATIONS

Type	Threads*	Fastener Materials					Standard Finishes			Optional Finish	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 (1)	400 Series Stainless Steel	No Finish (2) (3)	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
ATFH	•	•						•		•				•		
ATFHS	•		•						•				•			

- (1) Material properties – yield strength: 50,000 psi (345 MPa), tensile strength: 63,000 psi (434 MPa).
- (2) Part numbers for aluminum studs have no plating suffix.
- (3) "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 ATFH, 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.

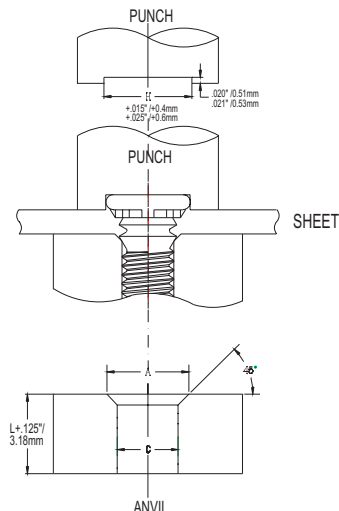
UNIFIED (in ch)	Thread Code	Anvil Dimensions	
		A	C
	256	.110-.114	.087-.090
	440	.136-.140	.113-.116
	632	.162-.166	.139-.142
	832	.188-.192	.165-.168
	024 & 032	.216-.220	.191-.194
	0420	.295-.300	.250-.253
	0518	.334-.338	.3125-.3155
	0616	—	.375-.378

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

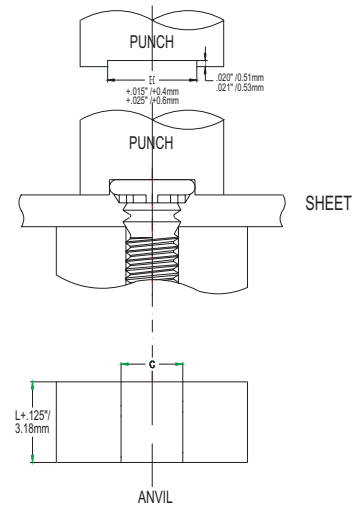
Type ATFH/ATFHS (Non-Flush) Studs

The sketches below indicate suggested tooling for type ATFH studs. Note that for sheets .030" / 0.76 mm and thicker, the anvil requires only a straight thru hole to accommodate the stud. For sheets less than .030" / 0.76 mm down to .020" / 0.51 mm, the hole requires a countersink with dimension A at the top to provide for metal flow around the shank of the stud. The standard punch design below provides clearance for the stud head and reduces chances of over squeezing the head of the stud into the sheet metal. When installed, the stud head is not flush but will protrude approximately .025" / 0.64 mm.

Tooling for sheet thicknesses less than .030" / 0.76 mm down to .020" / 0.51 mm.



Tooling for sheet thicknesses .030" / 0.76 mm and greater



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
ATFH			•							
ATFHS			•				•			

PERFORMANCE DATA (1)

Type ATFH and ATFHS Non-Flush Studs

UNIFIED (inch)	Thread Code	Max. Nut Tightening Torque (in. lbs.)	Type	Test Sheet Thickness and Material	Sheet Hardness HRB	(2) Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)
	440	5		ATFH	.020" Aluminum	28	1300	45
ATFHS				.020" Aluminum	28	1200	45	7
ATFH				.023" Steel	52	2800	100	8
ATFHS				.025" Steel	52	1500	100	8
632	9		ATFH	.020" Aluminum	28	2100	50	8
			ATFHS	.020" Aluminum	28	1500	50	8
			ATFH	.023" Steel	52	2500	110	16
			ATFHS	.025" Steel	52	2500	110	16
832	17		ATFH	.020" Aluminum	28	2100	60	10
			ATFHS	.020" Aluminum	28	2200	60	11
			ATFH	.023" Steel	52	3100	120	26
			ATFHS	.025" Steel	52	2700	120	26
024	24		ATFH	.020" Aluminum	28	2300	65	14
			ATFHS	.020" Aluminum	28	2500	65	14
032	27		ATFH	.023" Steel	52	3700	150	30
			ATFHS	.025" Steel	52	3000	130	28

METRIC (mm)	Thread Code	Max. Nut Tightening Torque (N•m)	Type	Test Sheet Thickness and Material	Sheet Hardness HRB	(2) Installation (kN)	Pushout (N)	Torque-out (N•m)
	M3	0.74		ATFH	0.5 mm Aluminum	28	5.8	195
ATFHS				0.5 mm Aluminum	28	5.3	195	0.6
ATFH				0.6 mm Steel	52	12.5	300	1
ATFHS				0.6 mm Steel	52	6.7	300	1
M4	1.7		ATFH	0.5 mm Aluminum	28	12.5	250	0.7
			ATFHS	0.5 mm Aluminum	28	9.8	250	0.7
			ATFH	0.6 mm Steel	52	17.8	500	2.5
			ATFHS	0.6 mm Steel	52	13.4	500	2.5
M5	3.5		ATFH	0.5 mm Aluminum	28	15.6	270	1.3
			ATFHS	0.5 mm Aluminum	28	13.4	270	1.3
			ATFH	0.6 mm Steel	52	26.7	670	3
			ATFHS	0.6 mm Steel	52	17.8	670	3

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

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