

The **P-FH / P-FHS SELF CLINCHING STUD** is a threaded fastener which incorporates a knurled platform under the head, which when embedded in the sheet, displaces material into the clinch ring securing the fastener firmly in place.

## ADVANTAGES

- EASY TO ASSEMBLE WITH ANY SQUEEZE PRESS
- HIGH TORQUE RESISTANCE
- NO DAMAGE TO DECORATIVE FINISHES ON PANELS
- VISUAL PROOF OF SECURITY
- ALWAYS PERPENDICULAR TO PANEL
- HEAD INSTALLS FLUSH WITH SURFACE OF SHEET

## DESIGN GUIDE

### HOLE PREPARATION

It is recommended that the holes are formed using a punch operation, although drilled holes may be used. Holes should not be countersunk or de-burred.

### HOLE SIZE

Holes must be held to a tolerance of  $-0.00\text{mm} + 0.08\text{mm}$   
( $-.000'' + .003''$ )

### MINIMUM SHEET THICKNESS

See product data sheets and method of assembly.

### MAXIMUM SHEET HARDNESS

Rb80 for Steel Studs (P-FH)  
Rb70 for Stainless Steel Studs (P-FHS)

### INSTALLATION

Apply squeezing pressure sufficient only to embed the head of the stud flush with surface of the sheet. Avoid excessive pressures.

Installation forces vary with sheet hardness and thickness.

See PERFORMANCE DATA for recommended forces.

### TOOLING NOTE:

Studs are installed using a flat top punch and flat bottom anvil with a clearance hole to accept the threaded section of the stud.

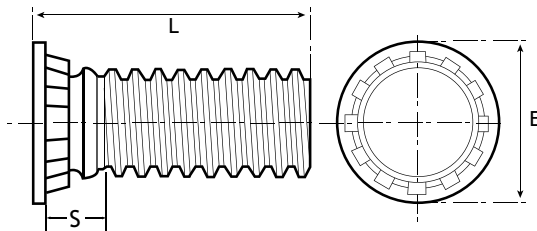
Where the sheet material is thin, a special thin sheet bottom anvil is required which includes a countersink at the top to create space for clinch ring and displaced sheet material.

See METHODS OF ASSEMBLY page for details



## TECHNICAL DATA

## P-FH & P-FHS TYPES (METRIC)



### MATERIAL CODES

P-FH - Hardened Steel Zinc Plated

P-FHS - Stainless Steel

### STANDARD PLATING FINISH

Zinc & Clear Trivalent Passivation (Z)

## GENERAL DIMENSIONS

All dimensions in mm

THREAD SIZE / CODE	Min Sheet Thickness	Hole Size in Sheet +0.08 -0.00	Max. Hole in Mating Component	S Max	Head Diameter E +/- 0.4	Minimum distance centre line hole to sheet edge
M2.5	1.0	2.5	3.1	1.95	4.1	5.4
M3	1.0	3.0	3.6	2.10	4.6	5.6
M3.5	1.0	3.5	4.1	2.25	5.3	6.4
M4	1.0	4.0	4.6	2.4	5.9	7.2
M5	1.0	5.0	5.6	2.7	6.5	7.2
M6	1.5	6.0	6.6	3.0	8.2	7.9
M8	2.4	8.0	8.6	3.7	9.6	9.6



## THREAD & LENGTH DATA

THREAD SIZE / CODE	Type		Length Code "L" +/- .04 (Length Code in millimeters)									
	Steel	Stainless Steel										
M2.5	P-FH	P-FHS	6	8	10	12	15	18	N/A	N/A	N/A	N/A
M3	P-FH	P-FHS	6	8	10	12	15	18	20	25	N/A	N/A
M3.5	P-FH	P-FHS	6	8	10	12	15	18	20	25	30	N/A
M4	P-FH	P-FHS	6	8	10	12	15	18	20	25	30	35
M5	P-FH	P-FHS	N/A	8	10	12	15	18	20	25	30	35
M6	P-FH	P-FHS	N/A	N/A	10	12	15	18	20	25	30	35
M8	P-FH	P-FHS	N/A	N/A	N/A	12	15	18	20	25	30	35

## HOW TO SPECIFY

### P-FH (Steel Standard Sizes)

Product Code **P-FH-M4-10-Z**

Thread Code **P-FH-M4-10-Z**

Length Code **P-FH-M4-10-Z**

Plating Code **P-FH-M4-10-Z**

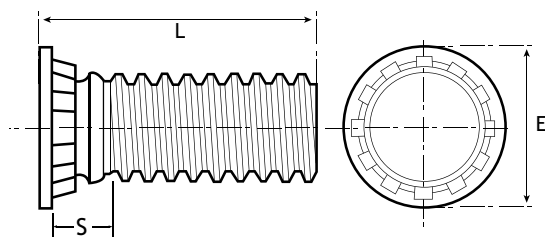
### P-FHS (Stainless Steel Standard Sizes)

Product Code **P-FHS-M4-10**

Thread Code **P-FHS-M4-10**

Length Code **P-FHS-M4-10**

## TECHNICAL DATA



## MATERIAL CODES

P-FH - Hardened Steel Zinc Plated

P-FHS - Stainless Steel

## STANDARD PLATING FINISH

Zinc & Clear Trivalent Passivation (Z)

## GENERAL DIMENSIONS

All dimensions in inches

THREAD SIZE / CODE	Min Sheet Thickness	Hole Size in Sheet + .003 - .000	Max. Hole in Mating Component	S Max	Head Diameter E +/- 0.015	Minimum distance centre line hole to sheet edge
256	.040	.085	.105	.075	.144	.187
440	.040	.111	.135	.085	.176	.219
632	.040	.137	.160	.090	.206	.250
832	.040	.163	.185	.090	.237	.281
032/024	.040	.189	.210	.100	.256	.281
0420/0428	.062	.249	.270	.135	.337	.312
0518/0524	.093	.311	.333	.160	.376	.375



## THREAD & LENGTH DATA

THREAD SIZE / CODE	Type		Length Code "L" +/- .015 (Length Code in 16ths of an inch)									
	Steel	Stainless Steel	1/4 .250	5/16 .312	3/8 .375	1/2 .500	5/8 .625	3/4 .750	7/8 .875	1 1.00	1.1/4 1.25	1.1/2 1.50
256	P-FH	P-FHS	4	5	6	8	10	12	N/A	N/A	N/A	N/A
440	P-FH	P-FHS	4	5	6	8	10	12	14	16	N/A	N/A
632	P-FH	P-FHS	4	5	6	8	10	12	14	16	20	24
832	P-FH	P-FHS	4	5	6	8	10	12	14	16	20	24
032 / 024	P-FH	P-FHS	N/A	5	6	8	10	12	14	16	20	24
0420 / 0428	P-FH	P-FHS	N/A	N/A	6	8	10	12	14	16	20	24
0518 / 0524	P-FH	P-FHS	N/A	N/A	N/A	8	10	12	14	16	20	24

## HOW TO SPECIFY

### P-FH (Steel Standard Sizes)

Product Code **P-FH-832-10-Z**

Thread Code **P-FH-832-10-Z**

Length Code **P-FH-832-10-Z**

Plating Code **P-FH-832-10-Z**

### P-FHS (Stainless Steel Standard Sizes)

Product Code **P-FHS-832-10**

Thread Code **P-FHS-832-10**

Length Code **P-FHS-832-10**



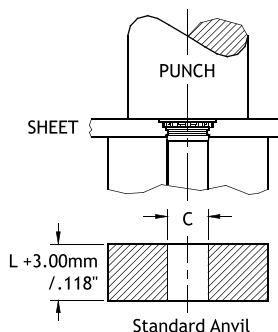
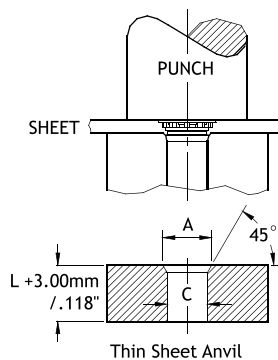
P-FH / P-FHS SELF CLINCHING STUDS are easy to install because no special tooling is necessary. However, it is very important to note that they must always be installed by a squeeze action press rather than a hammer blow.

Punched holes are recommended.

## METHOD OF ASSEMBLY

1. Punch a hole in the metal sheet to the size recommended in our technical data table. De-burring of the hole is not recommended.
2. Insert the stud through the hole in sheet and into the appropriate anvil as detailed below.
3. Apply squeezing pressure sufficient to install the head flush with top face of sheet.

## ASSEMBLY DETAIL



Thread Size Metric	Anvil	
	A mm	C mm
2.5	3.10 - 3.20	2.53 - 2.61
3	3.61 - 3.71	3.02 - 3.10
3.5	4.12 - 4.22	3.53 - 3.61
4	4.60 - 4.70	4.01 - 4.07
5	5.66 - 5.77	5.03 - 5.11
6	7.14 - 7.26	6.01 - 6.07
8	9.14 - 9.26	8.01 - 8.08

Thread Size Unified	Anvil	
	A inch	C inch
256	.110 - .114	.087 - .090
440	.136 - .140	.113 - .116
632	.162 - .166	.139 - .142
832	.188 - .192	.165 - .168
032	.216 - .220	.191 - .194
0420	.295 - .300	.250 - .253
0518	.334 - .338	.313 - .316

### Thin Sheet Anvil Use

M2.5 - M5 for sheet 1.0 - 1.49  
M6 for sheet 1.5 - 2.4  
M8 for sheet 2.0 - 2.4

256 - 032 for sheet .040" - .060"  
0420 for sheet .062" - .092"  
0518 for sheet .078" - .092"



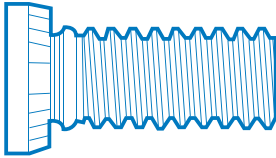
## PERFORMANCE DATA (METRIC)

Thread Code	Stud Type	Test Sheet Material						
		Max Nut Tightening Torque (Nm)	Cold Rolled Steel			Aluminum		
			Installation (kN)	Pushout (N)	Torque-out (Nm)	Installation (kN)	Pushout (N)	Torque-out (Nm)
M2.5	Steel	0.41	14	800	1.2	12	500	1.0
	Stainless Steel							
M3	Steel	0.85	17	900	1.9	14	600	1.7
	Stainless Steel							
M3.5	Steel	1.15	23	1400	2.8	16	850	2.0
	Stainless Steel							
M4	Steel	1.9	26	1800	4.0	20	1050	3.0
	Stainless Steel							
M5	Steel	3.8	30	2300	7.0	25	1300	4.0
	Stainless Steel							
M6	Steel	8.0	40	2800	12.0	30	1700	7.0
	Stainless Steel							
M8	Steel	14.0	50	3200	22.0	35	1950	12.0
	Stainless Steel							

## PERFORMANCE DATA (UNIFIED)

Thread Code	Stud Type	Test Sheet Material						
		Max Nut Tightening Torque (in/lbs)	Cold Rolled Steel			Aluminum		
			Installation (lbs)	Pushout (lbs)	Torque-out (in/lbs)	Installation (lbs)	Pushout (lbs)	Torque-out (in/lbs)
256	Steel	2.5	2800	160	7.0	2000	100	6.0
	Stainless Steel							
440	Steel	5.0	3800	240	12.0	3000	150	12.0
	Stainless Steel							
632	Steel	9.0	5000	315	23.0	3600	190	18.0
	Stainless Steel							
832	Steel	18.0	6300	400	38.0	4800	250	22.0
	Stainless Steel							
032	Steel	32	7000	500	60.0	5500	290	35.0
	Stainless Steel							
0420	Steel	70.0	9000	630	105.0	6700	380	65.0
	Stainless Steel							
0518	Steel	130.0	11200	720	190.0	7800	440	105.0
	Stainless Steel							

*Note: The above values are averages when correct installation is performed. Variations in holes size, material and installation will affect these results. For specific advice we strongly recommend consultation with your PSM Technology Centre.*



P-HFH / P-HFHS SELF CLINCHING STUDS have been designed to achieve higher levels of performance than the P-FH range of fasteners for applications that do not demand a flush finish condition.

## ADVANTAGES

- EASY TO ASSEMBLE WITH ANY SQUEEZE PRESS
- HIGH TORQUE RESISTANCE
- VISUAL PROOF OF SECURITY
- ALWAYS PERPENDICULAR TO PANEL
- MADE FROM THROUGH-HARDENED STEEL FOR HIGH THREAD STRENGTH



## DESIGN GUIDE

### HOLE PREPARATION

It is recommended that the holes are formed using a punch operation, although drilled holes may be used.

### HOLE SIZE

Holes must be held to a tolerance of  $-0.00\text{mm} + 0.13\text{mm}$  ( $-.000" +.005"$ )

### MINIMUM SHEET THICKNESS

See product data sheets and method of assembly.

### MAXIMUM SHEET HARDNESS

Rb80 for Steel Studs (P-HFH)

Rb70 for Stainless Steel Studs (P-HFHS)

### INSTALLATION

Using a squeeze action, apply sufficient force to fully embed the teeth into the host sheet metal, bringing the head in contact with the sheet. See PERFORMANCE DATA for recommended forces.

The head of the stud is not designed to be installed flush.

### TOOLING NOTE:

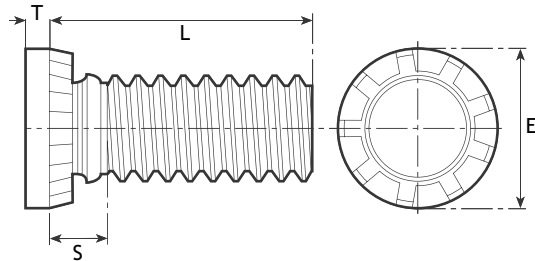
Studs are installed using a recessed top punch to control the insertion depth and a flat bottom anvil with a clearance hole to accept the threaded section of the stud.

Where the sheet material is thin, a special thin sheet bottom anvil is required which includes a countersink at the top to create space for the clinch ring and displaced sheet material.

See METHODS OF ASSEMBLY page for details

## TECHNICAL DATA

## METRIC



### MATERIAL CODES

P-HFH - Hardened Steel Zinc Plated

P-HFHS - Stainless Steel

### STANDARD PLATING FINISH

Zinc & Clear Trivalent Passivation (Z)

## GENERAL DIMENSIONS

All dimensions in millimeters

THREAD SIZE / CODE	Min Sheet Thickness	Rec Hole Size - 0.00 + 0.13	Max Hole in Mating Component	Head Diameter E +/- 0.25	Max Head Height T	Max Unthreaded Length S	Minimum distance centre line hole to sheet edge
M5	0.9	5.0	6.5	7.8	1.14	2.7	10.7
M6	1.0	6.0	7.5	9.4	1.27	2.8	11.5
M8	1.5	8.0	9.5	12.5	1.78	3.5	12.7
M10	2.3	10.0	11.5	15.7	2.29	4.1	13.7



## THREAD & LENGTH

THREAD SIZE / CODE	Type		Length Code "L" +/- 0.4 (Length Code in millimeters)						
	Steel	Stainless Steel							
M5	P-HFH	P-HFHS	15	20	25	30	35	40	50
M6	P-HFH	P-HFHS	15	20	25	30	35	40	50
M8	P-HFH	P-HFHS	15	20	25	30	35	40	50
M10	P-HFH	P-HFHS	15	20	25	30	35	40	50

## HOW TO SPECIFY

### P-HFH (Steel Standard Sizes)

Product Code	P-HFH-M6-20-Z
Thread Code	P-HFH-M6-20-Z
Length Code	P-HFH-M6-20-Z
Plating Code	P-HFH-M6-20-Z

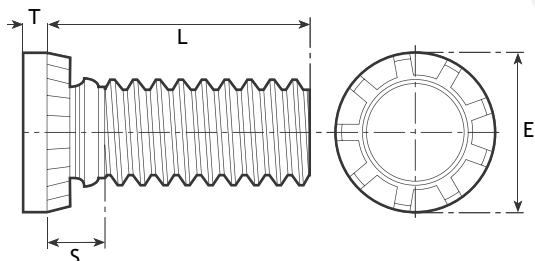
### P-HFHS (Stainless Steel Standard Sizes)

Product Code	P-HFHS-M6-20
Thread Code	P-HFHS-M6-20
Length Code	P-HFHS-M6-20



## TECHNICAL DATA

## UNIFIED



### MATERIAL CODES

P-HFH - Hardened Steel Zinc Plated

P-HFHS - Stainless Steel

### STANDARD PLATING FINISH

Zinc & Clear Trivalent Passivation (Z)

## GENERAL DIMENSIONS

All dimensions in inches

THREAD SIZE / CODE	Min Sheet Thickness	Rec Hole Size - .000 + .005	Max Hole in Mating Component	Head Diameter E +/- 0.010	Max Head Height T	Max Unthreaded Length S	Minimum distance centre line hole to sheet edge
032 / 024	.050	.190	.250	.300	.040	.105	.415
0420 / 0428	.060	.250	.312	.380	.050	.125	.460
0518 / 0524	.075	.312	.375	.480	.070	.140	.500
0616 / 0624	.090	.375	.437	.580	.085	.155	.530



## THREAD & LENGTH DATA

THREAD SIZE / CODE	Type		Length Code "L" +/- .015 (Length Code in 16ths of an inch)						
	Steel	Stainless Steel	1/2 .500	3/4 .750	1 1.00	1.1/4 1.25	1.1/2 1.50	1.3/4 1.75	2 2.00
032 / 024	P-HFH	P-HFHS	8	12	16	20	24	28	32
0420 / 0428	P-HFH	P-HFHS	8	12	16	20	24	28	32
0518 / 0524	P-HFH	P-HFHS	8	12	16	20	24	28	32
0616 / 0624	P-HFH	P-HFHS	N/A	12	16	20	24	28	32

## HOW TO SPECIFY

### P-HFH (Steel Standard Sizes)

Product Code	P-HFH-0420-20-Z
Thread Code	P-HFH-0420-20-Z
Length Code	P-HFH-0420-20-Z
Plating Code	P-HFH-0420-20-Z

### P-HFHS (Stainless Steel Standard Sizes)

Product Code	P-HFHS-0420-20
Thread Code	P-HFHS-0420-20
Length Code	P-HFHS-0420-20





## PERFORMANCE DATA (METRIC)

Thread Code	Stud Type	Max Nut Tightening Torque (Nm)	Test Sheet Material					
			Cold Rolled Steel			Aluminum		
			Installation (kN)	Pushout (N)	Torque-out (Nm)	Installation (kN)	Pushout (N)	Torque-out (Nm)
M5	Steel	4.5	25	1600	9	15	1000	6
	Stainless Steel				7			
M6	Steel	10	30	2200	15	20	1500	13
	Stainless Steel				11			11
M8	Steel	22	45	3500	35	30	2000	28
	Stainless Steel				20			20
M10	Steel	37	55	5000	55	40	3000	35
	Stainless Steel				35			

## PERFORMANCE DATA (UNIFIED)

Thread Code	Stud Type	Max Nut Tightening Torque (ft/lbs)	Test Sheet Material					
			Cold Rolled Steel			Aluminum		
			Installation (lbs)	Pushout (lbs)	Torque-out (ft/lbs)	Installation (lbs)	Pushout (lbs)	Torque-out (ft/lbs)
10	Steel	3.5	5500	350	6	3300	200	4
	Stainless Steel				4			
1/4	Steel	10	7000	520	11	4500	320	10
	Stainless Steel				8			8
5/16	Steel	17	10000	700	23	7000	450	22
	Stainless Steel				16			16
3/8	Steel	26	12000	900	35	8300	600	25
	Stainless Steel				24			

*Note: The above values are averages when correct installation is performed. Variations in holes size, material and installation will affect these results. For specific advice we strongly recommend consultation with your PSM Technology Centre.*



P-HFH / P-HFHS SELF CLINCHING STUDS are easy to install because only simple tooling is required. However, it is very important to note that they must always be installed by a squeeze action press rather than a hammer blow.

Punched holes are recommended.

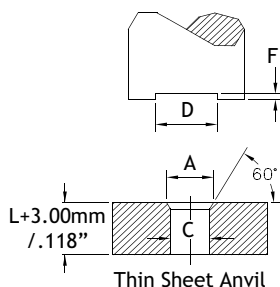
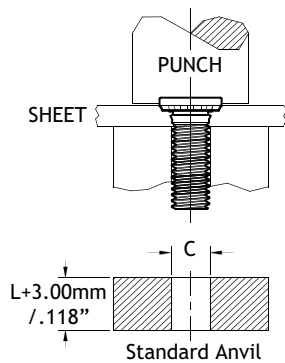
## METHOD OF ASSEMBLY

Punch a hole in the metal sheet to the size recommended in our technical data table. De-burring of the hole is not recommended.

Insert the stud through the hole in sheet and into the appropriate anvil as detailed below.

Apply squeezing pressure sufficient to fully embed the teeth, bringing the head into contact with the sheet.

## METHOD OF ASSEMBLY



Thread Size	Punch		Anvil			
	Recess Width D	Recess Depth F	Min Die Length	Bore Diameter C	Thin Sheet	
Metric	mm	mm		mm	C/sink Dia A mm	Sheet Thickness mm
M5	8.2 - 8.4	0.99 - 1.04	L	5.1 - 5.15	5.8 - 5.9	0.90 - 1.29
M6	9.8 - 10.0	1.12 - 1.17	L	6.1 - 6.15	7.0 - 7.1	1.00 - 1.49
M8	12.9 - 13.1	1.63 - 1.68	L	8.1 - 8.15	9.0 - 9.1	1.50 - 1.99
M10	16.1 - 16.3	2.10 - 2.12	L	10.1 - 10.15	-	-

Thread Size	Punch		Anvil			
	Recess Width D	Recess Depth F	Min Die Length	Bore Diameter C	Thin Sheet	
Unified	inch	inch		inch	C/sink Dia A inch	Sheet Thickness inch
10	.315 - .325	.035 - .036	L	.191 - .194	.216 - .220	.036 - .049
1/4	.395 - .405	.045 - .046	L	.250 - .253	.286 - .296	.040 - .059
5/6	.495 - .505	.063 - .064	L	.313 - .316	.350 - .354	.060 - .074
3/8	.595 - .605	.077 - .078	L	.376 - .379	-	-