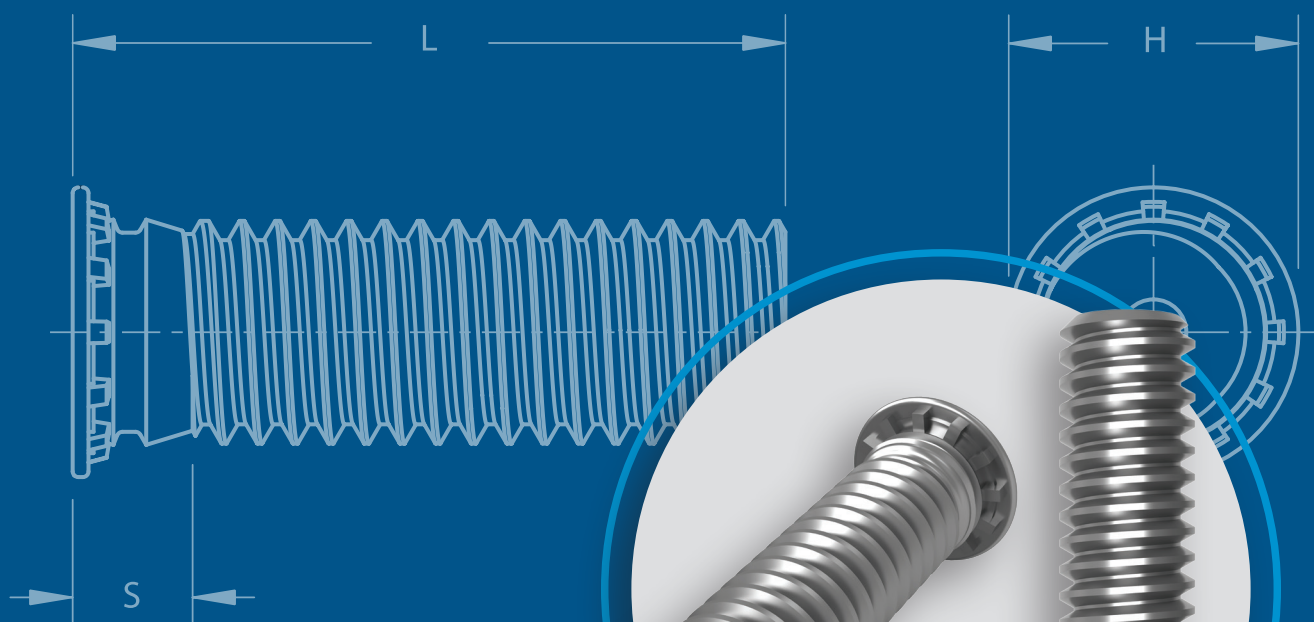




IPF™

PEM® INGRESS PROTECTION SELF-CLINCHING FASTENERS



New PEM® IFH™ ingress protection capable flush-head fastener, designed to create a sealed joint without the need for O-rings or sealants.

PEM® INGRESS PROTECTION SELF-CLINCHING, FLUSH-HEAD STUDS

Sealed joint without the need for O-rings or sealants

Introducing the PEM® IFH™ ingress protection capable flush-head fastener, designed to create a sealed joint without the need for O-rings or sealants. Unlike standard FH™ fasteners, the IFH™ features enhanced material interaction to provide ingress protection upon installation.

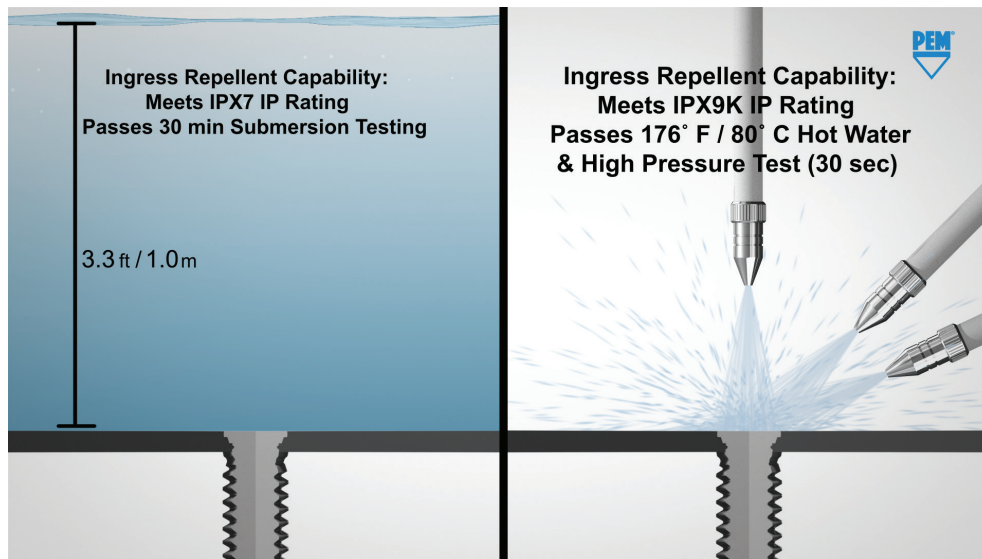
Key benefits include:

- Instant Sealing – No curing time required
- Long-Term Reliability – No perishable O-rings or additional sealing components.
- Proven Performance – Meets ISO:20653-2014 standards, including IPX7 & IPX9K ratings.
- Versatile Applications – Tested in CR4, 6082-T6, and 304 stainless materials.



PEM® IFH™ ingress protection capable flush-head studs provide a reliable and efficient solution for ingress protection, eliminating the need for additional sealing components.

PEM® ingress capable studs are available in steel (Type IFH™), stainless steel (Type IFHS™), aluminum (Type IFHA™) and A286 stainless steel (Type IFHP™).

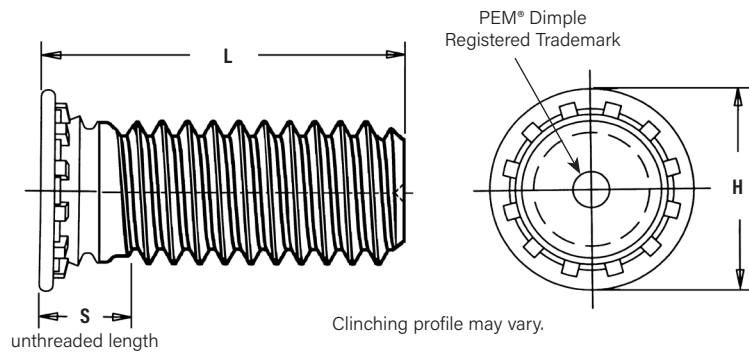


Application Details

- Sheet hardness must be consistently below maximum panel hardness published for the fastener type.
- Published minimum centerline to edge distance must be maintained on all sides.
- Secondary operations such as sheet bending after fastener installation should be avoided, as they may cause deformed material to be pulled out of the joint, leading to a leak path
- For more information on proximity to bends and distance to other clinch hardware, see [PEM® Tech Sheet C/L To Edge](#).

Fastener drawings and models are available at www.pemnet.com.

Custom sizes are available on special order. [Contact us](#) for more information.



Part Number Designation

IFH	-	M4	-	12	ZI
IFH	S	M4	-	12	
IFH	A	M4	-	12	
IFH	P	M4	-	12	
↓	↓	↓	↓	↓	
Type	Material Code	Thread Code	Length Code	Finish Code	

IFH™, IFHS™ and IFHA™ Fastener Dimensional Data

Metric	Thread Size x Pitch	Type			Thread Code	Length Code "L" ±0.4 (Length code is in millimeters)								Min. Sheet Thickness	Hole Size in Sheet +0.08	H ±0.4	S Max.	Max. Hole in Attached Parts	Min. Dist. Hole C/L to Edge
		Fastener Material																	
		Steel	Stainless Steel	Aluminum															
	M2.5 x 0.45	IFH	IFHS	IFHA	M2.5	10	12	15	18	—	—	—	—	1	2.5	4.1	1.95	3.1	5.4
	M3 x 0.5	IFH	IFHS	IFHA	M3	10	12	15	18	20	25	—	—	1	3	4.6	2.1	3.6	5.6
	M4 x 0.7	IFH	IFHS	IFHA	M4	10	12	15	18	20	25	30	35	1	4	5.9	2.4	4.6	7.2
M5 x 0.8	IFH	IFHS	IFHA	M5	10	12	15	18	20	25	30	35	1	5	6.5	2.7	5.6	7.2	
M6 x 1	IFH	IFHS	IFHA	M6	10	12	15	18	20	25	30	35	1.6	6	8.2	3	6.6	7.9	

IFHP™ Fastener Dimensional Data

Metric	Thread Size x Pitch	Type	Thread Code	Length Code "L" ±0.4 (Length code in millimeters)								Sheet Thickness	Hole Size in Sheet +0.08	H ±0.4	S Max.	Max. Hole in Attached Parts	Min. Dist. Hole C/L to Edge
		Fastener Material															
		A286 Stainless Steel															
	M3 x 0.5	IFHP	M3	10	12	15	18	20	25	—	—	1 - 2.4	3	4.6	2.1	3.3	5.6
M4 x 0.7	IFHP	M4	10	12	15	18	20	25	30	35	1 - 2.4	4	5.9	2.4	4.7	7.2	
M5 x 0.8	IFHP	M5	10	12	15	18	20	25	30	35	1 - 2.4	5	6.5	2.7	5.3	7.2	

Material and Finish Specifications

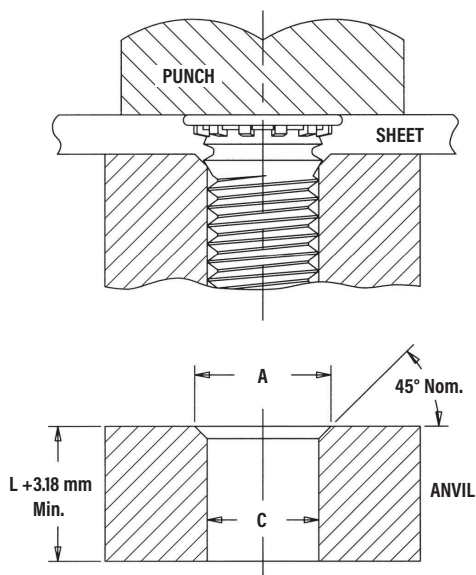
	Threads ⁽¹⁾	Fastener Materials				Standard Finishes			For Use in Sheet Hardness: ⁽²⁾			
Type	External, ASME B1.1, 2A / ASME B1.13M, 6g	Hardened Carbon Steel	300 Series Stainless Steel	Aluminum (Plain Finish)	Aged Hardened A286 Stainless Steel	No Finish	Zinc plated per ASTM B633, SC1 (5µm), Type III, Colorless ⁽³⁾	Passivated and/or Tested per ASTM A380	HRB 50 / HB 82 or less	HRB 70 / HB 125 or less	HRB 80 / HB 150 or less	HRB 92 / HB 192 or less
IFH	▪	▪					▪				▪	
IFHS	▪		▪					▪		▪		
IFHA	▪			▪		▪			▪			
IFHP	▪				▪			▪				▪
Part Number Code for Finishes							ZI	None				

- (1) 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 ASME B1.1, Section 7, Paragraph 7.2 and ASME B1.13M, Section 8, paragraph 8.2.
 (2) HRB - Hardness Rockwell "B" Scale. HB - Hardness Brinell.
 (3) See PEM Technical Support section of our web site for related plating standards and specifications.

Installation - IFH™/IFHS™/IFHA™ Threaded Studs

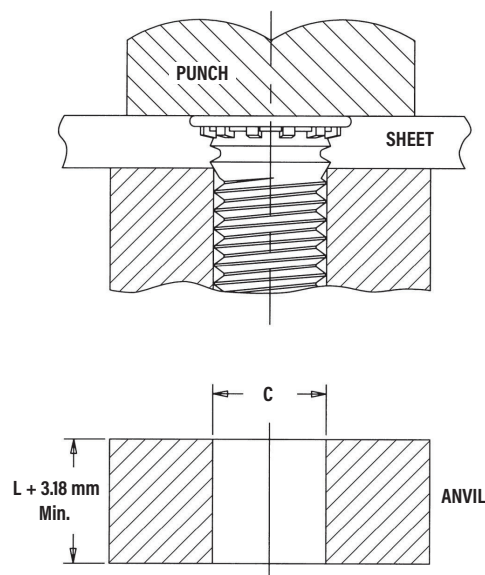
1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Insert stud through mounting hole (punch side) of sheet and into anvil hole.
3. With punch and anvil surfaces parallel, apply squeezing force to embed the head of the stud flush in the sheet.

Tooling for sheet thicknesses less than 1.51 mm with M2.5 thru M5 thread sizes and less than 2.36 mm for M6 threads.



See page 3 for "L".

Tooling for sheet thicknesses 1.51 mm and greater with M2.5 thru M5 thread sizes and 2.36 mm and greater for M6 and M8 threads.



Installation Tooling

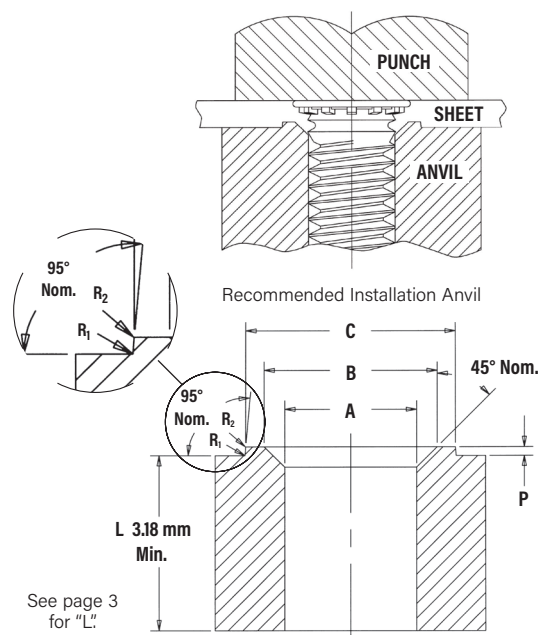
Metric	Thread Code	HAEGER® Part Number		PEMSERTER® Part Number		Anvil Dimensions (in.)	
		Anvil	Punch	Anvil	Punch	A +0.1	C ±0.08
	M2.5	H-103-M2.5L	H-108-0020L	970200300300	975200048	3.1	2.53
	M3	H-103-M3L	H-108-0020L	970200229300	975200048	3.6	3.03
	M4	H-103-M4L	H-108-0020L	970200019300	975200048	4.6	4.03
	M5	H-103-M5L	H-108-0020L	970200020300	975200048	5.6	5.03
	M6	H-103-M6L	H-108-0020L	970200230300	975200048	6.6	6.03

Installation - IFHP™ Studs For Stainless Steel Sheets

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Insert stud through mounting hole (punch side) of sheet and into anvil hole.
3. With punch and anvil surfaces parallel, apply squeezing force to embed the head of the stud flush in the sheet.

For IFHP studs, a special anvil with a raised ring is required to create a proper installation. The raised ring acts as a second displacer of the stainless sheet material, thereby ensuring that the annular groove is filled. Please see page 3 for recommended sheet thickness range.

The special anvils are available from PEM stock or can be machined from suitable tool steel. A hardness of HRC 55 / HB 547 minimum is required to provide long anvil life. We recommend measuring the "P" dimension every 5000 installations to ensure that the anvil remains within specification.



Installation Tooling

Metric	Thread Code	HAEGER® Part Number		PEMSERTER® Part Number		Anvil Dimensions (mm)					
		Anvil	Punch	Anvil	Punch	A ±0.08	B ±0.05	C ±0.05	P ±0.025	R ₁ Max.	R ₂ Max.
	M3	H-181-M3L	H-108-0020L	8001678	975200048	3.05	3.81	4.57	0.25	0.08	0.13
	M4	H-181-M4L	H-108-0020L	8001677	975200048	4.04	4.95	5.82	0.25	0.08	0.13
	M5	H-181-M5L	H-108-0020L	8001676	975200048	5.08	6.15	7.16	0.25	0.08	0.13
	M6	H-181-M6L	H-108-0020L	8002536	975200048	6.05	7.87	8.79	0.51	0.08	0.13

Installation Details

- Any contaminations of the sheet or fastener could lead to insufficient material flow movement, leading to a leak point.
- Lubricants on the panel could leave leak paths after they evaporate.
- Installation in the punch side on minimum diameter punched holes is preferred. Punch to die clearance can follow industry standards.
- Ingress protection joint is formed directly after proper installation – no secondary sealing is required.



For Additional HAEGER® and PEMSERTER® Tooling Information/Part Numbers visit our [tooling wizard](#)



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