

PEM® High Tensile Strength Studs

HFG8-1209
Rev. 1209A

Grade 8 and property class 10.9 studs meeting 150 ksi/1040 MPa minimum

PEM® Type HFG8™ and HF109™ studs are manufactured for the most demanding applications from medium carbon alloy steel, then heat-treated to high strength and hardness qualities.



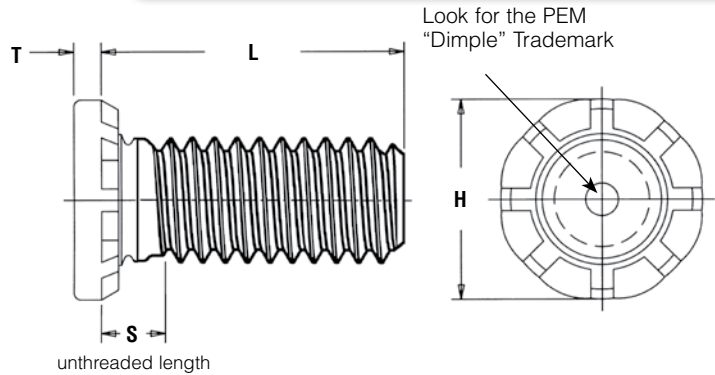
Features and Benefits

- High tensile strength.
- Recommended for use in carbon steel or HSLA steel sheets HRB 89 or less on the Rockwell "B" scale.
- Large head diameter reduces compressive stress on panel.

To be sure that you are getting genuine PEM products, look for the PEM stamp. Studs within the size range of the SAE and ISO specs are also identified with the Grade 8 and 10.9 head markings respectively.

HF109 Marking
HFG8 Marking*

* Thread size #10-32 does not have SAE head marking since it is technically not within the size range of the specification.



All dimensions are in inches.

UNIFIED	Thread Size	Type	Thread Code	Length Code "L" ±0.15 (1) (Length Code in 16ths of an inch)			Min. Sheet Thickness	Hole Size in Sheet +0.005 - .000	Max. Hole in Attached Parts	H ±.01	S Max.	T Max.	Min. Dist. Hole C/L To Edge
	Steel			.500	.750	1.00							
	.190-32 (#10-32)	HFG8	032	8	12	16	.040	.190	.280	.391	.105	.077	.469
	.250-20 (1/4-20)	HFG8	0420	8	12	16	.040	.250	.340	.507	.125	.090	.709
	.313-18 (5/16-18)	HFG8	0518	NA	12	16	.060	.312	.402	.645	.140	.126	.827

All dimensions are in millimeters.

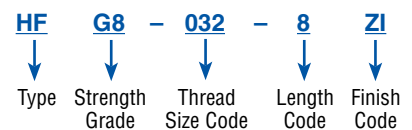
METRIC	Thread Size x Pitch	Type	Thread Code	Length Code "L" ±0.4 (1) (Length Code in millimeters)			Min. Sheet Thickness	Hole Size in Sheet +0.13	Max. Hole in Attached Parts	H ±0.25	S Max.	T Max.	Min. Dist. Hole C/L To Edge
	Steel			15	20	25							
	M5 x 0.8	HF109	M5	15	20	25	1	5	7.3	10.3	2.6	2.06	11.5
	M6 x 1	HF109	M6	15	20	25	1	6	8.3	12.1	2.7	2.29	18.0
	M8 x 1.25	HF109	M8	NA	20	25	1.5	8	10.3	16.6	3.4	3.25	21.0

NA - Not Available.

Material & Finish Specifications

Threads: External, ANSI B1.1, 2A ANSI/ASME B1.13M, 6g (2)
Fastener Material: Heat-treated Medium Carbon Alloy Steel
Finish: Zinc plated, 5µm, colorless (3)
For Use In Sheet Hardness: HRB 89 or less (Hardness Rockwell "B" Scale)
 HB 180 or less (Hardness Brinell)

PART NUMBER DESIGNATION



G8 = Grade 8 per SAE J429
 109 = Property class 10.9 per ISO 898-1/SAE J1199

- (1) Other lengths available up to a maximum of 1.5" (unified) and 40mm (metric) on special order.
- (2) As with all external plated threads, Class 2A/6g, the maximum major and pitch, 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.
- (3) See PEM Technical Support section of our web site for related plating standards and specifications (PEM FIN-C21). Other finishes available on special order.

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Performance Data⁽¹⁾

UNIFIED	Thread Code	Max. Nut Tightening Torque (ft. lbs.)	Pull Thru (lbs.)	Test Sheet Material	Sheet Hardness HRB	Installation (lbs.) (2)	Pushout (lbs.)	Torque-out (ft. lbs.)	Test Sheet Material	Sheet Hardness HRB	Installation (lbs.) (2)	Pushout (lbs.)	Torque-out (ft. lbs.)
	.032	5.0	3000	.047" HSLA Steel	85.5	14005	483	6.2	.040" Cold-rolled Steel	45.0	9914	249	5.9
.0420	10.4	4750	.047" HSLA Steel	85.7	21356	592	11.5	.040" Cold-rolled Steel	45.0	14095	248	11.5	
.0518	21.5	7850	.060" HSLA Steel	84.9	32596	667	25.6	.060" Cold-rolled Steel	55.2	19108	447	25.2	

Tensile strength greater than or equal to 150 ksi.

METRIC	Thread Code	Max. Nut Tightening Torque (N•m)	Pull Thru (kN)	Test Sheet Material	Sheet Hardness HRB	Installation (kN) (2)	Pushout (N)	Torque-out (N•m)	Test Sheet Material	Sheet Hardness HRB	Installation (kN) (2)	Pushout (N)	Torque-out (N•m)
	M5	7.8	13.3	1.2 mm HSLA Steel	86.1	60.1	2084	9	1.0 mm Cold-rolled Steel	45.3	43.2	978	9
M6	13.2	21.1	1.2 mm HSLA Steel	85.6	90.0	2454	15.6	1.0 mm Cold-rolled Steel	45.5	60.0	1072	14.4	
M8	32.0	34.9	1.5 mm HSLA Steel	84.0	145.0	3026	38.4	1.5 mm Cold-rolled Steel	55.0	85.0	1992	37.7	

Tensile strength greater than or equal to 1040 MPa.

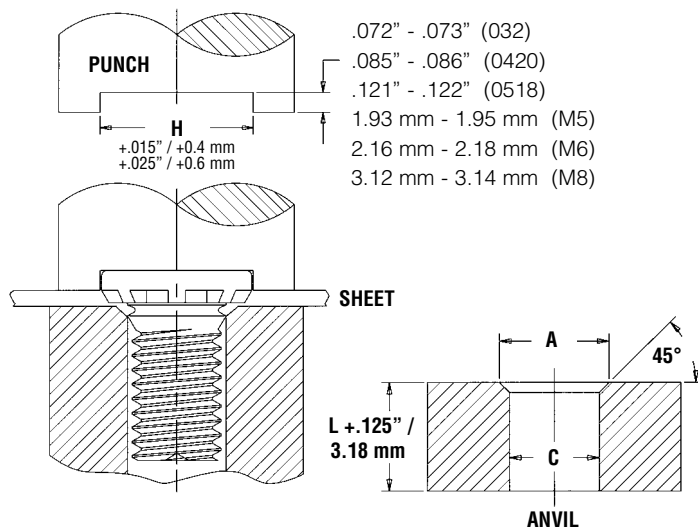
(1) Performance values reported are averages when all installation specifications and procedures are followed. Variations in mounting hole size, sheet material and installation force will affect this data. Performance testing of this product in your application is recommended. We will be happy to provide samples for this purpose.

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

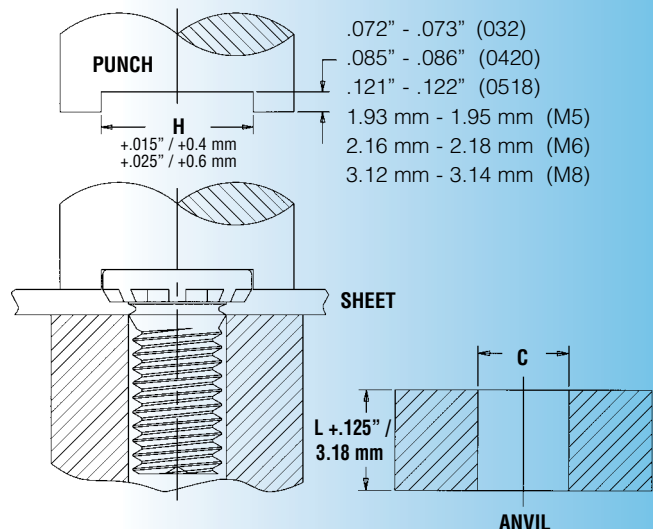
Installation

The illustrations 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.



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.



UNIFIED	Thread Code	Anvil Dimensions (inches)	
		A	C
	032	.216 - .220	.191 - .194
	0420	.273 - .278	.250 - .253
	0518	.334 - .338	.3125 - .3155

METRIC	Thread Code	Anvil Dimensions (millimeters)	
		A +0.1	C +0.08
	M5	5.6	5.03
	M6	6.6	6.03
	M8	8.6	8.03

RoHS compliance information can be found on our website.
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