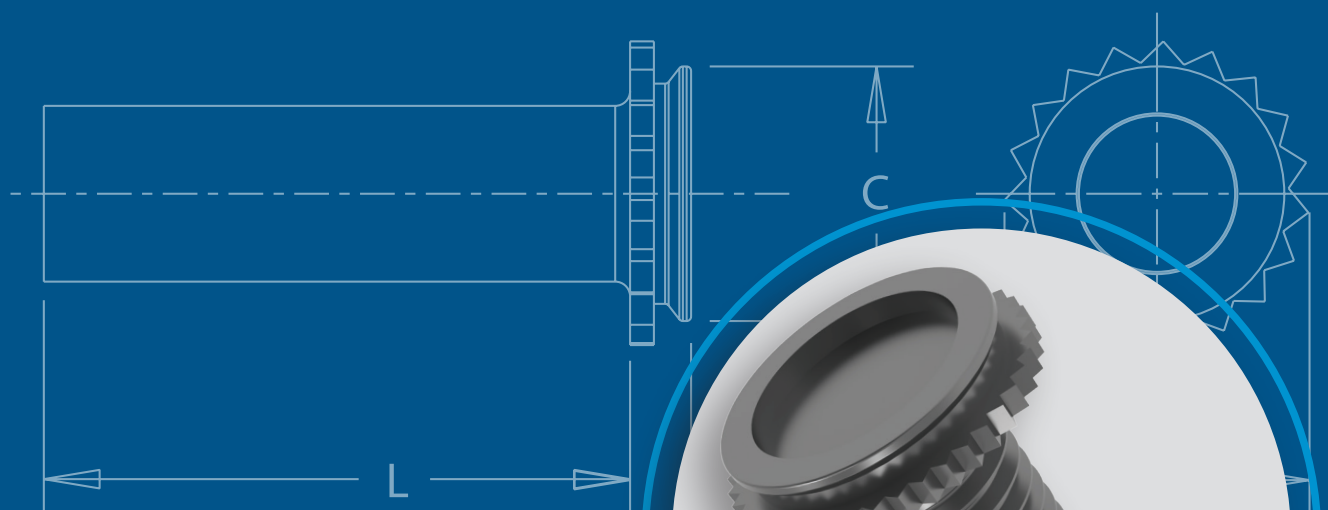




CH™

CONCEALED-HEAD SELF-CLINCHING STUDS AND STANDOFFS



PEM® concealed-head self-clinching studs and standoffs install permanently and promote smooth designs.

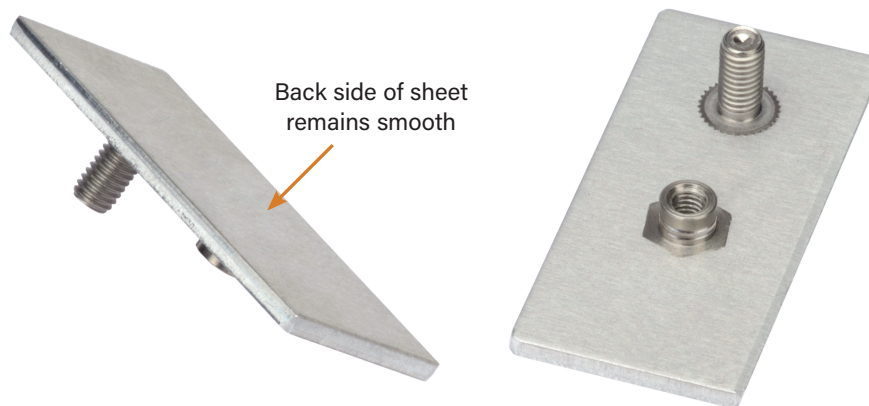
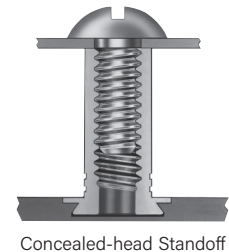
Concealed-head self-clinching studs and standoffs install permanently and promote smooth designs:

- Install permanently in steel or aluminum sheets as thin as .062" / 1.6 mm to provide strong and reusable threads for mating hardware in a wide range of assembly applications.
- Allow the side of the sheet opposite installation to remain smooth and unmarred.
- One side installation additionally serves to satisfy strict ingress protection (IP) requirements where the sheet must remain completely sealed from air, liquid, dust, gases or other potentially infiltrating elements.
- Only require a blind milled hole to the recommended size and minimum depth.
- Install using a PEMSERTER® press or other standard press.
- CFHC™ studs can be ordered to NAS63540/4 specifications.⁽¹⁾

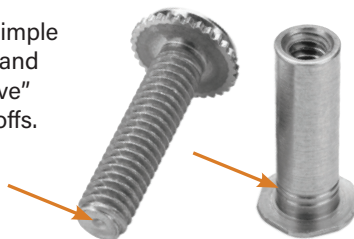
Fastener drawings and models are available at www.pemnet.com.

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

(1) To meet national aerospace standards and to obtain testing documentation, Type CFHC studs must be ordered using appropriate NAS63540/4 part number. Check our web site for a complete Military Specification and National Aerospace Standards Reference Guide (Bulletin NASM).



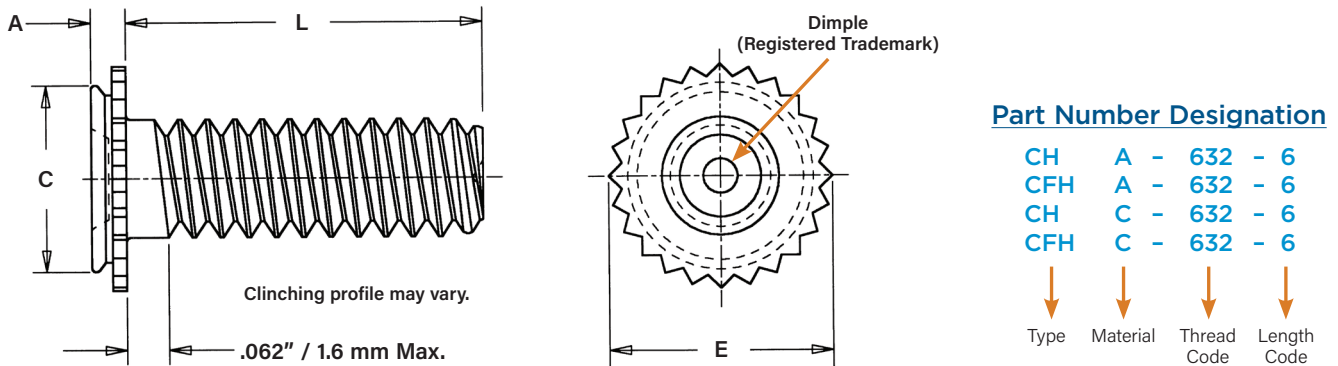
Look for the PEM® dimple trademark on studs and the PEM® "two groove" trademark on standoffs.



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

CHA™, CFHA™, CHC™ And CFHC™ Aluminum And Stainless Steel Studs

- CHA/CFHA studs are recommended for use in aluminum sheets HRB 50 / HB 89 or less.
- CHC/CFHC studs are recommended for use in steel or aluminum sheets HRB 70 / HB 125 or less.



All dimensions are in inches.

Unified	Thread Size	Type		Thread Code	Length Code "L" ±.015 (Length code is in 16ths of an inch)					Min. Sheet Thickness	Blind Mounting Hole Dia. +.003 -.000	Min. Depth of Blind Hole (1)	A (Shank) Max.	E ±.010	C Max.	Min. Dist. Hole C/L to Edge (2)	Max. Hole In Attached Parts
		Aluminum	Stainless Steel		.250	.375	.500	.625	.750								
	.112-40 (#4-40)	CHA	CHC	440	4	6	8	10	12	—	.062	.172	.043	.041	.205	.171	.156
CFHA		CFHC	.093														
.138-32 (#6-32)	CHA	CHC	632	4	6	8	10	12	16	.062	.213	.043	.041	.250	.212	.188	.160
	CFHA	CFHC															
.164-32 (#8-32)	CHA	CHC	832	4	6	8	10	12	16	.062	.290	.043	.041	.328	.289	.219	.185
	CFHA	CFHC															
.190-32 (#10-32)	CHA	CHC	032	—	6	8	10	12	16	.062	.312	.043	.041	.350	.311	.250	.210
	CFHA	CFHC															

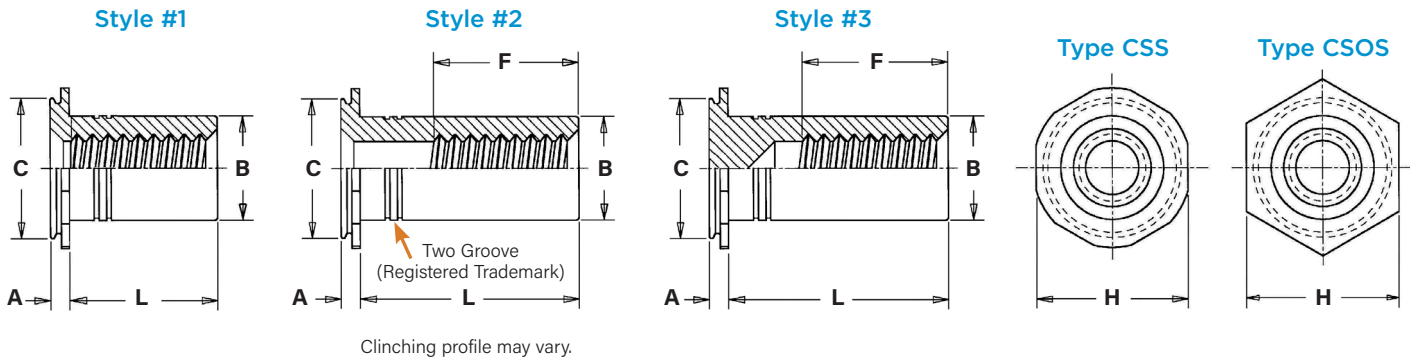
All dimensions are in inches.

Metric	Thread Size x Pitch	Type		Thread Code	Length Code "L" ±0.4 (Length code is in millimeters)					Min. Sheet Thickness	Blind Mounting Hole Dia. +0.08	Min. Depth of Blind Hole (1)	A (Shank) Max.	E ±0.25	C Max.	Min. Dist. Hole C/L to Edge (2)	Max. Hole In Attached Parts	
		Aluminum	Stainless Steel		6	8	10	12	16									20
M3 x 0.5	CHA	CHC	M3	6	8	10	12	16	20	—	1.6	4.37	1.1	1.04	5.21	4.35	4	3.6
	CFHA	CFHC																
M4 x 0.7	CHA	CHC	M4	6	8	10	12	16	20	25	1.6	7.37	1.1	1.04	8.33	7.35	5.6	4.6
	CFHA	CFHC																
M5 x 0.8	CHA	CHC	M5	—	—	10	12	16	20	25	1.6	7.93	1.1	1.04	8.89	7.9	6.4	5.6
	CFHA	CFHC																

- (1) Blind holes may be deeper than minimums except where sheet material is at or near minimum thickness. Fasteners should always be installed so the flange is flush with the surface of the sheet.
- (2) For more information on proximity to bends and distance to other clinch hardware, see [PEM® Tech Sheet C/L To Edge](#).

CSS™ And CSOS™ Stainless Steel Standoffs

- CSS/CSOS standoffs are recommended for use in steel or aluminum sheets HRB 70 / HB 125 or less.



All dimensions are in inches.

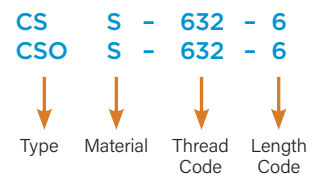
Unified	Thread Size	Type	Thread Code	Length Code "L" +.002 -.005 (Length code is in 16ths of an inch)							Min. Sheet Thickness	Blind Mounting Hole Dia. +.003 -.000	Min. Depth of Blind Hole (4)	Min. Depth Full Thread F	A (Shank) Max.	B Max. (5)	C Max.	H Nom.	Min. Dist. Hole C/L to Edge (6)
		Stainless Steel		.187	.250	.312	.375	.500	.625	.750									
	CSOS	CSS																	
.112-.40 (#4-.40)	440	CSS	3 ⁽¹⁾	4 ⁽²⁾	5 ⁽²⁾	6 ⁽²⁾	8 ⁽³⁾	10 ⁽³⁾	12 ⁽³⁾	16 ⁽³⁾	.062	.213	.043	.188	.041	.165	.212	.250	.188
		CSOS	.093	.075	.072														
.138-.32 (#6-.32)	632	CSS	3 ⁽¹⁾	4 ⁽¹⁾	5 ⁽²⁾	6 ⁽²⁾	8 ⁽³⁾	10 ⁽³⁾	12 ⁽³⁾	16 ⁽³⁾	.062	.290	.043	.250	.041	.213	.289	.312	.219
		CSOS	.093	.075	.072														
.164-.32 (#8-.32)	832	CSS	3 ⁽¹⁾	4 ⁽¹⁾	5 ⁽²⁾	6 ⁽²⁾	8 ⁽³⁾	10 ⁽³⁾	12 ⁽³⁾	16 ⁽³⁾	.062	.312	.043	.250	.041	.245	.311	.344	.250
		CSOS	.093	.075	.072														
.190-.32 (#10-.32)	032	CSS	3 ⁽¹⁾	4 ⁽¹⁾	5 ⁽¹⁾	6 ⁽¹⁾	8 ⁽²⁾	10 ⁽³⁾	12 ⁽³⁾	16 ⁽³⁾	.062	.344	.043	.375	.041	.290	.343	.375	.281
		CSOS	.093	.075	.072														
.250-.20 (1/4-.20)	0420	CSS	3 ⁽¹⁾	4 ⁽¹⁾	5 ⁽¹⁾	6 ⁽¹⁾	8 ⁽²⁾	10 ⁽²⁾	12 ⁽³⁾	16 ⁽³⁾	.062	.390	.043	.375	.041	.354	.389	.438	.375
		CSOS	.093	.075	.072														

All dimensions are in inches.

Metric	Thread Size x Pitch	Type	Thread Code	Length Code "L" +0.05 -0.13 (Length code is in millimeters)							Min. Sheet Thickness	Blind Mounting Hole Diameter +0.08	Min. Depth of Blind Hole (4)	Min. Depth Full Thread F	A (Shank) Max.	B Max. (5)	C Max.	H Nom.	Min. Dist. Hole C/L to Edge (6)
		Stainless Steel		4 ⁽¹⁾	6 ⁽¹⁾	8 ⁽²⁾	10 ⁽³⁾	12 ⁽³⁾	16 ⁽³⁾	20 ⁽³⁾									
	CSOS	CSS																	
M3 x 0.5	M3	CSS	4 ⁽¹⁾	6 ⁽¹⁾	8 ⁽²⁾	10 ⁽³⁾	12 ⁽³⁾	16 ⁽³⁾	20 ⁽³⁾	25 ⁽³⁾	1.6	5.41	1.1	5	1.04	4.2	5.39	6.35	4.8
		CSOS	2.4	1.91	1.83														
M4 x 0.7	M4	CSS	4 ⁽¹⁾	6 ⁽¹⁾	8 ⁽²⁾	10 ⁽²⁾	12 ⁽³⁾	16 ⁽³⁾	20 ⁽³⁾	25 ⁽³⁾	1.6	7.92	1.1	6.5	1.04	6.23	7.9	8.74	6.4
		CSOS	2.4	1.91	1.83														
M5 x 0.8	M5	CSS	4 ⁽¹⁾	6 ⁽¹⁾	8 ⁽¹⁾	10 ⁽²⁾	12 ⁽²⁾	16 ⁽³⁾	20 ⁽³⁾	25 ⁽³⁾	1.6	8.74	1.1	9.6	1.04	7.37	8.72	9.53	7.2
		CSOS	2.4	1.91	1.83														
M6 x 1	CSOS	M6	4 ⁽¹⁾	6 ⁽¹⁾	8 ⁽¹⁾	10 ⁽²⁾	12 ⁽²⁾	16 ⁽³⁾	20 ⁽³⁾	25 ⁽³⁾	2.4	9.9	1.91	9.6	1.83	9	9.89	11.11	9.5

- (1) Style #1. Minimum thread length is equal to barrel length "L". Screw might not pass through shank end. Screws with lengths exceeding "L" should not be used or they may cause "jacking-out" of standoff from the sheet.
- (2) Style #2. Screw might not pass through unthreaded end. Screws with lengths exceeding "L" should not be used or they may cause "jacking-out" of standoff from the sheet.
- (3) Style #3. Blind.
- (4) Blind mounting holes may be deeper than minimums except where sheet material is at or near minimum thickness. Fasteners should always be installed so the flange is flush with the surface of the sheet.
- (5) If standoff is used as a bushing, the hole in attached part must not exceed "B" plus .020" / 0.51 mm.
- (6) For more information on proximity to bends and distance to other clinch hardware, see [PEM® Tech Sheet C/L To Edge](#).

Part Number Designation



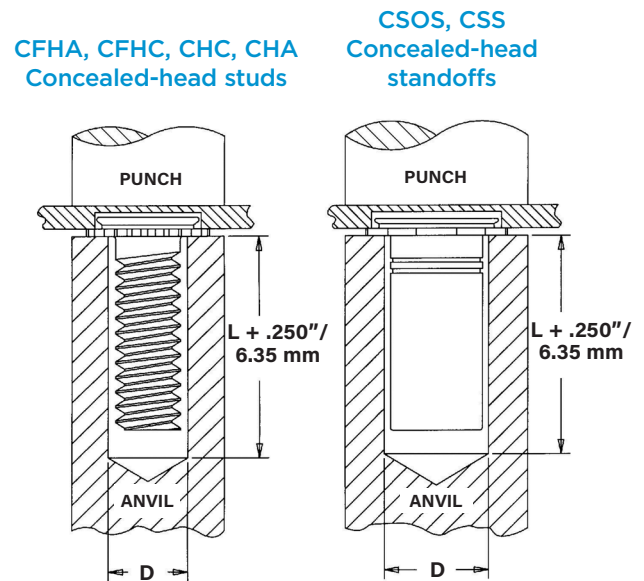
Material And Finish Specifications

Type	Threads		Fastener Materials		Finish		For Use In Sheet Hardness (1)	
	External, ASME B1.1 2A / ASME B1.13M, 6g	Internal, ASME B1.1 2B / ASME B1.13M, 6H	Aluminum	300 Series Stainless Steel	No Finish	Passivated and/or tested per ASTM A380	HRB 70 / HB 125 or Less	HRB 50 / HB 89 or Less
CHA	▪		▪		▪			▪
CFHA	▪		▪		▪			▪
CHC	▪			▪		▪	▪	
CFHC	▪			▪		▪	▪	
CSS		▪		▪		▪	▪	
CSOS		▪		▪		▪	▪	

(1) HRB - Hardness Rockwell "B" Scale. HB - Hardness Brinell.

Installation

1. Mill a round blind hole to the correct minimum depth. End mills available from PennEngineering. See chart.
2. Place fastener into anvil hole.
3. Place the mounting hole over the shank of the fastener.
4. With punch and anvil surfaces parallel, apply squeezing force until the flange is flush with the mounting sheet.



Installation Tooling

Unified	Type	Thread Code	HAEGER® Part Number		PEMSERTER® Part Number		D +.003 -.000
			Anvil	Punch	Anvil	Punch	
	CHA / CHC / CFHA / CFHC	440	H-103-4L	H-108-0020L	97020006300	975200048	.127
CHA / CHC / CFHA / CFHC	632	H-103-6L	H-108-0020L	97020007300	975200048	.139	
CHA / CHC / CFHA / CFHC	832	H-103-8L	H-108-0020L	97020008300	975200048	.179	
CHA / CHC / CFHA / CFHC	032	H-103-10	H-108-0020L	97020009300	975200048	.205	
CSS / CSOS	440	H-109-4/M3L	H-108-0020L	970200014300	975200048	.170	
CSS / CSOS	632	H-109-6/M3.5L	H-108-0020L	970200015300	975200048	.218	
CSS / CSOS	832	(1)	H-108-0020L	970200016300	975200048	.250	
CSS / CSOS	032	(1)	H-108-0020L	970200017300	975200048	.295	
CSS / CSOS	0420	—	—	970200018300	975200048	.358	

Metric	Type	Thread Code	HAEGER® Part Number		PEMSERTER® Part Number		D +.08
			Anvil	Punch	Anvil	Punch	
	CHA / CHC / CFHA / CFHC	M3	H-103-M3L	H-108-0020L	970200229300	975200048	3.4
CHA / CHC / CFHA / CFHC	M4	H-103-M4L	H-108-0020L	970200019300	975200048	4.03	
CHA / CHC / CFHA / CFHC	M5	H-103-M5L	H-108-0020L	970200020300	975200048	5.4	
CSS / CSOS	M3	H-109-4-M3L	H-108-0020L	970200014300	975200048	4.33	
CSS / CSOS	M4	(1)	H-108-0020L	970200016300	975200048	6.36	
CSS / CSOS	M5	(1)	H-108-0020L	970200017300	975200048	7.5	
CSS / CSOS	M6	—	—	970200018300	975200048	9.13	

(1) [Click here](#) for a quote on Haeger® custom installation tooling.

Installation Notes

- For best results we recommend using a HAEGER® or PEMSERTER® machine for installation of PEM® self-clinching fasteners. See our [website](#) for more information.
- Visit the [Animation Library](#) on our website to view the installation process.

End Mill Information

Double-ended, two-flute H.S.S. center-cutting end mills are available from stock.

PennEngineering does not manufacture center-cutting end mills, but we do keep a supply in stock for your convenience.



Thread Code	Fastener Type	Required Size End Mill	PEM Part No.
440, M3	CFHC, CHC, CFHA, CHA Studs	.172"	CHM-172
	CSOS, CSS Standoffs	.213"	CHM-213
632	CFHC, CHC, CFHA, CHA Studs	.213"	CHM-213
	CSOS, CSS Standoffs	.290"	CHM-290
832, M4	CFHC, CHC, CFHA, CHA Studs	.290"	CHM-290
	CSOS, CSS Standoffs	.312"	CHM-312
032, M5	CFHC, CHC, CFHA, CHA Studs	.312"	CHM-312
	CSOS, CSS Standoffs	.344"	CHM-344
0420, M6	CSOS Standoffs	.390"	CHM-390



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



Performance Data⁽¹⁾

Unified	Type	Thread Code	Max. Tightening Torque Ref. (in. lbs.)	Test Sheet Material			
				Cold-rolled Steel		5052-H34 Aluminum	
				Installation (lbs.)	Pullout (lbs.)	Installation (lbs.)	Pullout (lbs.)
Concealed-head Standoffs							
CSS	440	4.75	4,000	300	2,800	200	
	632	8.75	4,500	350	3,000	240	
	832	18	4,800	400	4,000	270	
	032	32	5,500	450	5,000	290	
CSOS	440	4.75	4,300	330	2,900	220	
	632	8.75	5,000	360	3,200	240	
	832	18	5,300	440	4,000	300	
	032	32	6,000	600	5,000	400	
	0420	64	6,500	650	5,500	430	
Concealed-head Studs							
CHC	440	4.75	1,800	240	1,400	130	
	632	8.75	2,500	260	1,800	160	
	832	18	4,000	270	2,800	180	
	032	32	5,000	290	4,000	210	
CFHC	440	4.75	2,000	240	1,500	200	
	632	8.75	2,700	350	2,500	260	
	832	18	3,300	440	3,000	310	
	032	32	4,000	680	3,500	360	
CHA	440	2.85	(2)	(2)	1,400	125	
	632	5.4	(2)	(2)	1,800	135	
	832	10.8	(2)	(2)	2,800	145	
	032	19.2	(2)	(2)	4,000	170	
CFHA	440	2.85	(2)	(2)	1,500	190	
	632	5.4	(2)	(2)	2,500	220	
	832	10.8	(2)	(2)	3,000	240	
	032	19.2	(2)	(2)	3,500	300	

Metric	Type	Thread Code	Max. Tightening Torque Ref. (N-m)	Test Sheet Material			
				Cold-rolled Steel		5052-H34 Aluminum	
				Installation (kN)	Pullout (N)	Installation (kN)	Pullout (N)
Concealed-head Standoffs							
CSS	M3	0.55	17.8	1330	12.5	890	
	M4	2	21.3	1775	17.8	1200	
	M5	3.6	24.5	2000	22.2	1290	
CSOS	M3	.55	19.2	1465	12.9	975	
	M4	2	23.6	1955	17.8	1335	
	M5	3.6	26.7	2665	22.2	1775	
	M6	7.2	28.9	2860	24.4	1915	
Concealed-head Studs							
CHC	M3	0.55	8	1065	6.2	575	
	M4	2	17.8	1200	12.5	800	
	M5	3.6	22.2	1290	17.8	930	
CFHC	M3	0.55	8.9	1065	6.7	890	
	M4	2	14.7	1955	13.3	1375	
	M5	3.6	17.8	3020	15.6	1600	
CHA	M3	0.3	(2)	(2)	6.2	555	
	M4	1.2	(2)	(2)	12.5	645	
	M5	2.16	(2)	(2)	17.8	755	
CFHA	M3	0.3	(2)	(2)	6.7	845	
	M4	1.2	(2)	(2)	13.3	1065	
	M5	2.16	(2)	(2)	15.6	1330	

All PEM® products meet our stringent quality standards. If you require additional industry or other specific [quality certifications](#), special procedures and/or part numbers are required. Please contact your local sales office or representative for further information.

Regulatory [compliance information](#) is available in Technical Support section of our website. Specifications subject to change without notice. See our website for the most current version of this bulletin.



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