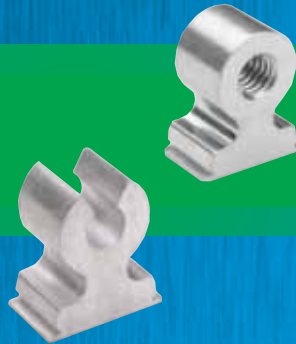


PennEngineering®

RIGHT ANGLE CLINCH FASTENERS



BULLETIN **RA**



1111  
REV. 1211

## RIGHT ANGLE CLINCH FASTENERS

Self-clinching PEM® R'ANGLE® fasteners provide you with strong right angle attachment points in sheets as thin as 1.02 mm.

R'ANGLE fasteners are cost-effective replacements for:

- bent edge tabs
- bent center tabs
- bent flanges
- angle brackets
- tack welds
- loose hardware

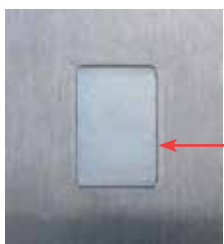
Simply press this fastener into a properly sized rectangular mounting hole. It is held permanently in the sheet using the same high-performance, self-clinching technology that our products have always employed.

Now you can securely attach another sheet or component perpendicular to the sheet in which the R'ANGLE fastener is installed. For Type RAA, attachment is easily made using thread forming screws resulting in a thread fit which resists vibration and has excellent torque resistance.\* Type RAS fasteners are threaded and simply attached using a standard screw. For either type, the holding power of the fastener is unaffected by the repeated removal and reinstallation of the screw.

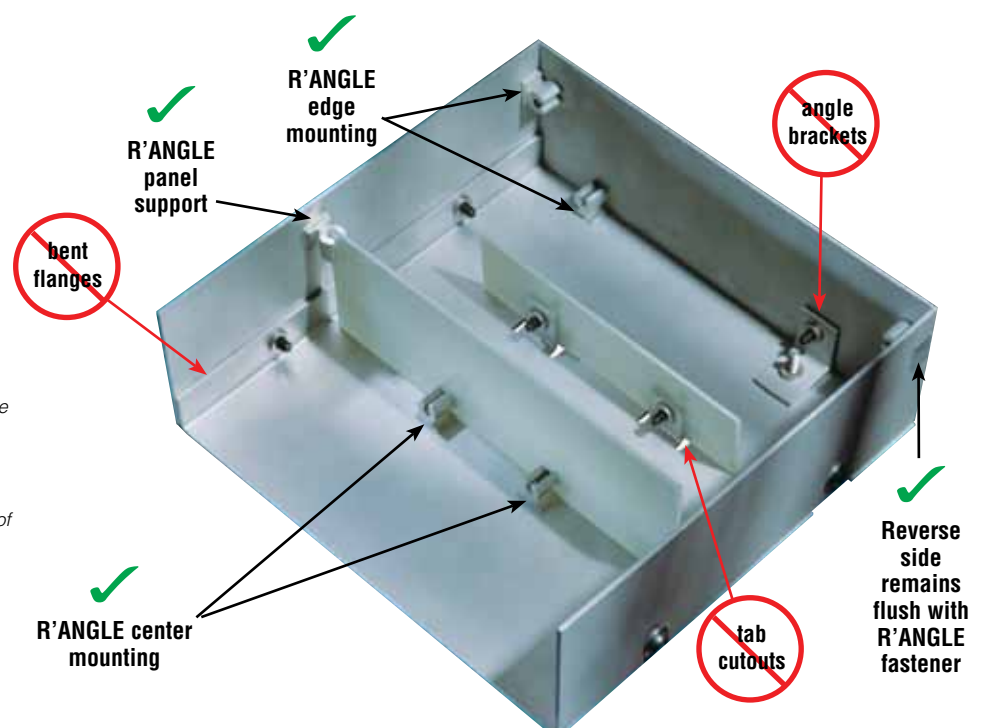
PEM® R'ANGLE fasteners provide many advantages over bent tabs and flanges, including:

- more predictable designs
- material savings
- tighter design control
- improved shielding characteristics
- reduction of loose hardware
- fewer assembly steps
- unmarred panel surfaces

*\* As thread forming screws do not generate metal residue, they are widely used in electrical and electronic assemblies.*



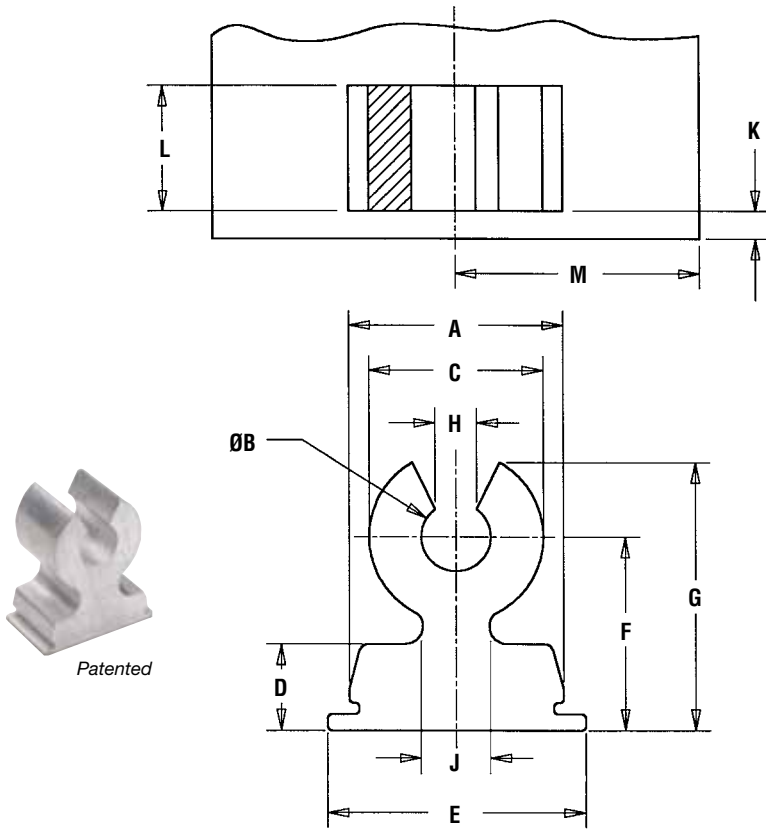
Depending on placement of the fastener within the mounting hole, a slight gap may be noticeable along the non-clinching edges of the fastener after installation.



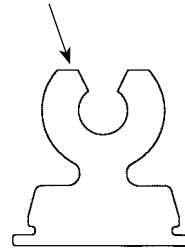
# RIGHT ANGLE CLINCH FASTENERS

## TYPE RAA - ALUMINUM RIGHT ANGLE FASTENER

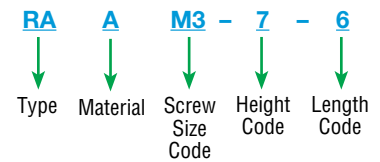
For use with thread forming screws



Metric part can be identified by flat top



### PART NUMBER DESIGNATION

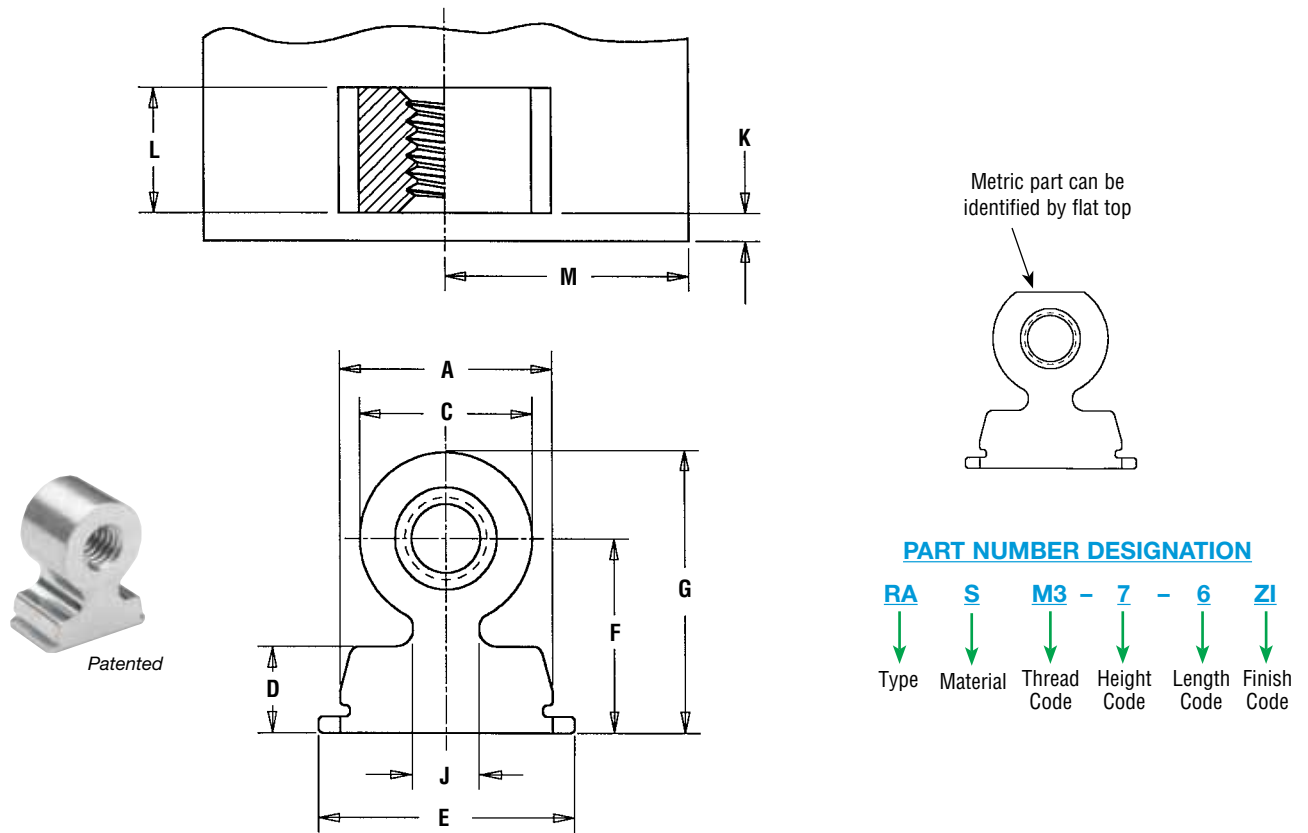


All dimensions are in millimeters.

METRIC	Thread Form Screw Size	Type	Fastener Material	Screw Size Code	Height Code	Length Code	Length L ±0.08	Min. Sheet Thickness	Hole Size In Sheet +0.05 -0.03	A ±0.08	ØB ±0.1	C Nom.	D Nom.	E ±0.15	Height F ±0.15	G Nom.	H ±0.18	J Nom.	Min. Part Face to Edge K	Min. Dist. Hole To Edge M
	M3 x 0.5	RA	A	M3	7	4	3.89	1	8 x 4	7.89	2.77	6.35	3.18	9.42	7	9.27	1.5	2.87	1.02	9.1
					6	5.89		8 x 6												10.7
M4 x 0.7	RA	A	M4	9	7	6.89	1	10 x 7	9.89	3.68	8.89	3.18	11.43	9	12.19	1.97	4.06	1.02	14.7	
					9	8.89		10 x 9												16.3

# RIGHT ANGLE CLINCH FASTENERS

## TYPE RAS - STEEL THREADED RIGHT ANGLE FASTENER



All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type	Fastener Material	Thread Code	Height Code	Length Code	Length L ±0.08	Min. Sheet Thickness	Hole Size In Sheet +0.05 -0.03	A ±0.08	C Nom.	D Nom.	E ±0.15	Height F ±0.15	G Nom.	J Nom.	Min. Part Face to Edge K	Min. Dist. Hole $\phi$ To Edge M
	M3 x 0.5	RA	S	M3	7	3	2.89			1	8 x 3	7.89	6.35	3.18	9.47	7	9.78	2.87
					4	3.89	8 x 4	9.1										
					6	5.89	8 x 6	10.7										
M4 x 0.7	RA	S	M4	9	4	3.89	1	10 x 4	9.89	8.89	3.18	11.48	9	13.21	4.06	1.02	10	
					7	6.89		10 x 7									14.7	
					9	8.89		10 x 9									16.3	

# RIGHT ANGLE CLINCH FASTENERS

## MATERIAL AND FINISH SPECIFICATIONS

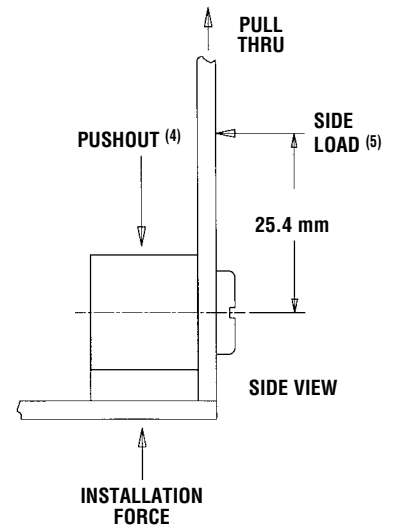
Type	Threads	Fastener Materials		Standard Finishes		For Use In Sheet Hardness:(2)	
	Internal, ASME B1.1, 2B ASME B1.13M, 6H	6061-T6 Aluminum	Sintered Steel	Zinc Plated, 5µm, Colorless (1)	Natural	HRB 45 / HB 84 or less	HRB 60 / HB 107 or less
RAA		•			•	•	
RAS	•		•	•			•
Part Number Codes for Finishes				ZI	None		

- (1) See PEM Technical Support section of our web site for related plating standards and specifications.  
 (2) HRB - Hardness Rockwell "B" Scale. HB - Hardness Brinell.

## PERFORMANCE DATA<sup>(3)</sup>

### TYPE RAA

METRIC	Screw Size Code	Height Code	Length Code	Thread Forming Torque (N•m)	Max. Rec. Tightening Torque (N•m)	Test Sheet Material	Installation (kN)	Pushout (IN) (4)	Side Load (N) (5)	Pull Thru (N)
	M3	7	4	4	.17	.56	5052-H34	7.1	556	27
6				.23	1.02	Aluminum	7.1	756	44	356
M4	9	7	7	.56	2.26	5052-H34	13.3	890	76	423
			9	.56	2.83	Aluminum	13.3	1045	107	423



### TYPE RAS

METRIC	Thread Code	Height Code	Length Code	Test Sheet Material									
				5052-H34 Aluminum					Cold-rolled Steel				
				Max. Rec. Tightening Torque (N•m)	Installation (kN)	Pushout (N) (4)	Side Load (N) (5)	Pull Thru (N)	Max. Rec. Tightening Torque (N•m)	Installation (kN)	Pushout (N) (4)	Side Load (N) (5)	Pull Thru (N)
M3	7	4	3	1.47	8	423	36	356	2.26	10.7	778	40	356
			4	1.92	8	534	36	356	2.71	10.7	1001	40	356
			6	2.15	9.3	756	58	356	2.71	13.3	1312	67	356
M4	9	4	4	2.15	8.9	556	53	423	3.28	11.6	956	44	423
			7	2.6	13.3	890	76	423	4.07	16	1512	80	423
			9	2.83	13.3	1112	93	423	4.52	18.7	1846	116	423

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

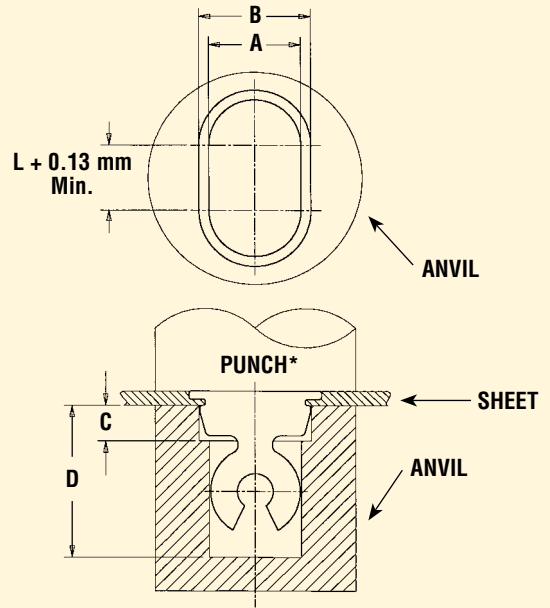
(4) Pushout test is conducted without side panel attached to R'ANGLE fastener.

(5) 25.4 mm from screw centerline.

# RIGHT ANGLE CLINCH FASTENERS

## INSTALLATION

1. Prepare a properly sized rectangular mounting hole in the sheet. Do not perform any secondary operations such as deburring.
2. Place the fastener through the mounting hole (preferably the punch side) and into the anvil as shown in the drawing to the right.
3. With the punch and anvil surfaces parallel, apply a squeezing force until the bottom of the fastener becomes flush with the sheet.

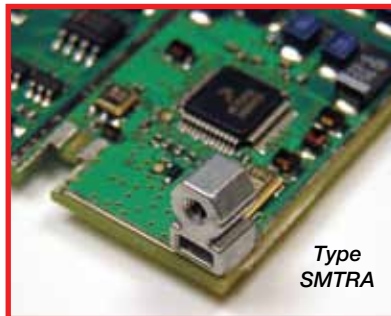


**\* NOTE:** The punch must be large enough to cover the entire base of the fastener to ensure proper installation.

Installation tooling is available from PennEngineering.

## ANVIL DIMENSIONS

METRIC	Screw or Thread Size Code	Anvil Dimensions (mm)				Anvil Part Number
		A ±0.03	B ±0.03	C ±0.1	D Min.	
	M3	6.53	8.02	2.54	10.8	8002713
	M4	9.07	10.03	2.54	12.7	8002714



Type  
SMTRA

For mounting to P.C. Boards using conventional surface mount techniques, see ReelFast® SMT R'ANGLE® fasteners in PEM® Bulletin K.

RoHS compliance information can be found on our website.  
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**PennEngineering®**



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