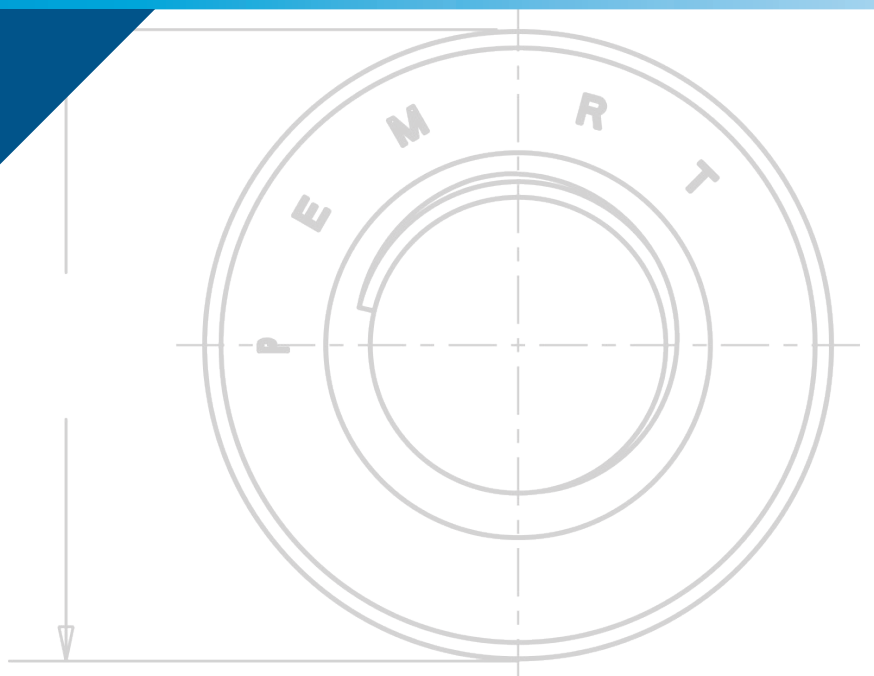
Bulletin S-RT-1017

PEM® brand RT™ free-running locknuts have a thread form that creates a lock when clamp load is applied

NEW!

S-RT™

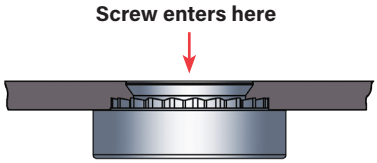
FREE-RUNNING LOCKNUTS



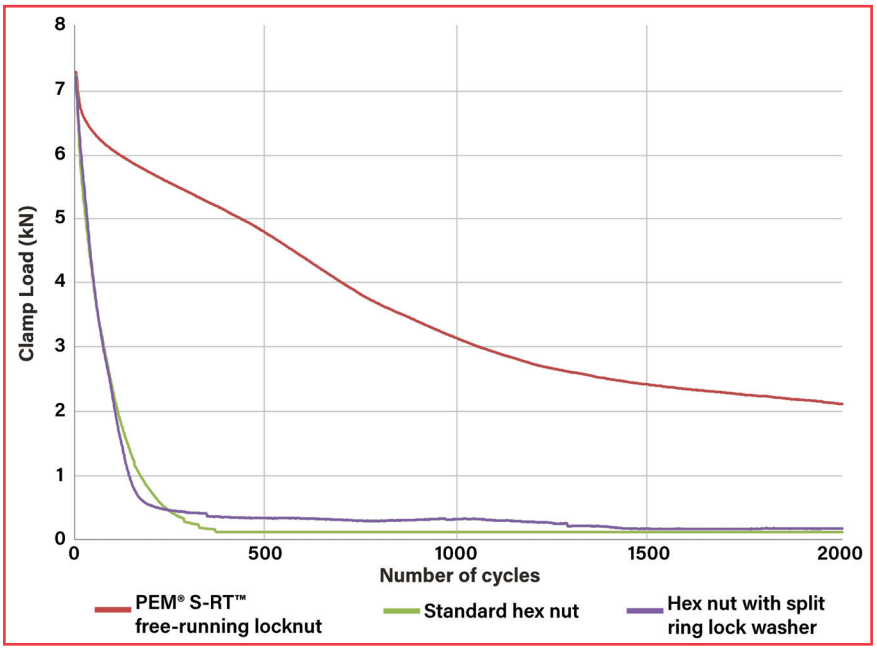
PEM® S-RT™ FREE-RUNNING LOCKNUTS

PEM® S-RT™ free-running locknuts are free-running until clamp load is induced. A modified thread angle on the loaded flank provides the vibration resistant locking feature.

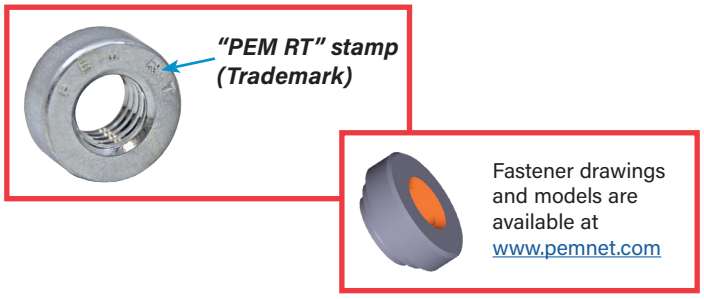
- Screw turns freely until a clamp load is applied.
- Resistant to vibrational loosening.
- Back side of panel is flush or sub-flush for screw installation.
- Locking feature reusability is not affected by number of on/off cycles.
- Uses same mounting hole and installation tooling as standard S™ nut fasteners found in PEM® Bulletin CL.

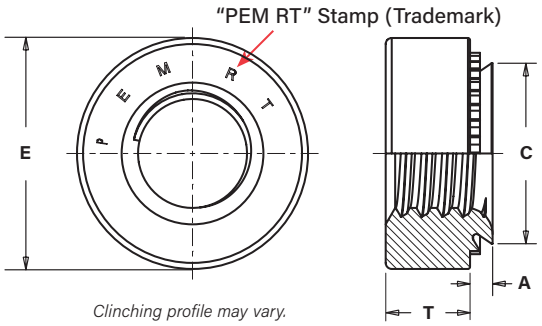


The graph below represents the clamp load of the joint versus the amount of cycles during transverse vibration testing for an S-RT™ free-running locknut, a standard hex nut and a hex nut with a split ring lock washer.



Testing conditions:
Transverse vibration testing.
M6 thread size nuts, average of 30 pieces.
Clamp load applied using metric property class 10.9 screws.
Nuts tested until loss of clamp load or 2,000 cycles is reached.





PART NUMBER DESIGNATION

S - RT632 - 1 ZI

Type | Thread Code | Shank Code | Finish

All dimensions are in inches.

	Thread Size	Type	Thread Code	Shank Code	A (Shank) Max.	Rec. Min. Sheet Thickness (1)	Hole Size In Sheet +.003 -.000	C Max.	E +.010	T +.010	Min. Dist Hole ℄ To Edge
UNIFIED	.112-40 (#4-40)	S	RT440	0	.030	.030	.166	.165	.250	.070	.19
				1	.038	.040					
				2	.054	.056					
	.138-32 (#6-32)	S	RT632	0	.030	.030	.1875	.187	.280	.070	.22
				1	.038	.040					
				2	.054	.056					
	.164-32 (#8-32)	S	RT832	0	.030	.030	.213	.212	.310	.090	.27
				1	.038	.040					
				2	.054	.056					
	.190-32 (#10-32)	SS	RT032	0	.030	.030	.250	.249	.340	.090	.28
				1	.038	.040					
				2	.054	.056					
	.250-20 (1/4-20)	S	RT0420	0	.045	.047	.344	.343	.440	.170	.34
				1	.054	.056					
				2	.087	.090					
	.313-18 (5/16-18)	S	RT0518	1	.054	.056	.413	.412	.500	.230	.38
				2	.087	.090					

All dimensions are in millimeters

	Thread Size x Pitch	Type	Thread Code	Shank Code	A (Shank) Max.	Rec. Min. Sheet Thickness (1)	Hole Size In Sheet +0.08	C Max.	E +0.25	T +0.25	Min. Dist Hole ℄ To Edge
METRIC	M3 x 0.5	S	RTM3	0	0.77	0.8	4.22	4.2	6.35	1.5	4.8
				1	0.97	1					
				2	1.38	1.4					
	M4 x 0.7	S	RTM4	0	0.77	0.8	5.41	5.38	7.87	2	6.9
				1	0.97	1					
				2	1.38	1.4					
	M5 x 0.8	SS	RTM5	0	0.77	0.8	6.35	6.33	8.64	2	7.1
				1	0.97	1					
				2	1.38	1.4					
	M6 x 1	S	RTM6	00	0.89	0.92	8.75	8.73	11.18	4.08	8.6
				0	1.15	1.2					
				1	1.38	1.4					
				2	2.21	2.29					

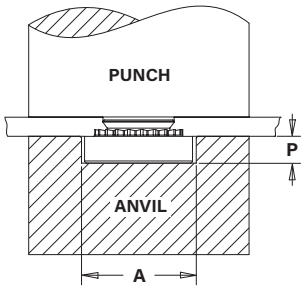
MATERIAL AND FINISH SPECIFICATIONS

THREADS: Modified thread form on loaded flank. Will accept a maximum material 6g screw
FASTENER MATERIAL: Hardened Carbon Steel
FINISH(2): Standard: ZI - Zinc plated, 5µm, colorless
Optional: ZC - Zinc plated, 5µm, yellow
FOR USE IN SHEET HARDNESS: HRB 80 (Hardness Rockwell "B" scale) / HB 150 (Hardness Brinell) or less

(1) For maximum performance, we recommend that you use the maximum shank length for your sheet thickness.
(2) See PEM Technical Support section of our website for related plating standards and specifications.

INSTALLATION

1. Prepare properly sized mounting hole in sheet. Do not perform any secondary operations such as deburring.
2. Place fastener into the anvil hole and place the mounting hole (preferably the punch side) over the shank of the fastener as shown in diagram.
3. With installation punch and anvil surfaces parallel, apply squeezing force until the head of the nut comes into contact with the sheet material.



INSTALLATION NOTES

- For best results we recommend using a PEMSERTER® press for installation of PEM self-clinching fasteners. Please check our website for more information.
- Visit the Animation Library on our website to view the installation process for select products.

PEMSERTER® Installation Tooling

	Thread Code	Anvil Dimensions (in.) A ±.002	Anvil Dimensions (in.) P ±.005	Anvil Part Number	Punch Part Number
UNIFIED	RT440	.267	.045	975200034	975200048
	RT632	.298	.045	975200035	975200048
	RT832	.330	.070	975200036	975200048
	RT032	.361	.070	975200037	975200048
	RT0420	.454	.150	975200038	975200048
	RT0518	.517	.200	975200039	975200048

	Thread Code	Anvil Dimensions (mm) A ±0.05	Anvil Dimensions (mm) P ±0.13	Anvil Part Number	Punch Part Number
METRIC	RTM3	6.78	1.14	975200034	975200048
	RTM4	8.38	1.78	975200036	975200048
	RTM5	9.17	1.78	975200037	975200048
	RTM6	11.53	3.81	975200038	975200048

PERFORMANCE DATA(1)

	Type	Thread Code	Shank Code	Test Sheet Material	Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)
UNIFIED	S	RT440	0	5052-H34 Aluminum	1500-2000	63	8
			1			90	10
			2			170	13
			0	Cold-rolled Steel	2500-3500	105	13
			1			125	15
			2			230	18
	S	RT632	0	5052-H34 Aluminum	2500-3000	63	16
			1			95	17
			2			190	22
			0	Cold-rolled Steel	3000-6000	110	16
			1			130	20
			2			275	28
	S	RT832	0	5052-H34 Aluminum	2500-3000	68	21
			1			105	23
			2			220	35
			0	Cold-rolled Steel	4000-6000	110	26
			1			145	35
			2			285	45
	SS	RT032	0	5052-H34 Aluminum	2500-3500	68	26
			1			110	32
			2			190	50
			0	Cold-rolled Steel	4000-9000	120	32
			1			180	40
			2			320	60
	S	RT0420	0	5052-H34 Aluminum	4000-7000	220	70
			1			360	90
			2				125
			0	Cold-rolled Steel	6000-8000	315	115
			1			400	150
			2				
	S	RT0518	1	5052-H34 Aluminum	4000-7000	380	120
			2				160
			1	Cold-rolled Steel	6000-8000	420	165
			2				180

	Type	Thread Code	Shank Code	Test Sheet Material	Installation (kN)	Pushout (N)	Torque-out (N-m)
METRIC	S	RTM3	0	5052-H34 Aluminum	6.7-8.9	280	0.9
			1			400	1.13
			2			750	1.47
			0	Cold-rolled Steel	11.2-15.6	470	1.47
			1			550	1.7
			2			1010	2.03
	S	RTM4	0	5052-H34 Aluminum	11.2-13.4	300	2.37
			1			470	2.6
			2			970	4
			0	Cold-rolled Steel	18-27	490	2.95
			1			645	4
			2			1250	5.1
	SS	RTM5	0	5052-H34 Aluminum	11.2-15.6	300	3
			1			480	3.6
			2			845	5.7
			0	Cold-rolled Steel	18-38	530	3.6
			1			800	4.5
			2			1112	6.8
	S	RTM6	00	5052-H34 Aluminum	18-32	750	6.5
			0			970	7.9
			1			1580	10.2
			2				14.1
			00	Cold-rolled Steel	27-36	900	10
			0			1380	13
			1			1760	17
			2				

(1) Published installation forces are for general reference. Actual set-up and confirmation of complete installation should be made by observing proper seating of fastener as described in the installation steps. Other performance values reported are averages when all proper installation parameters and procedures are followed. Variations in mounting hole size, sheet material, and installation procedure may affect performance. Performance testing this product in your application is recommended. We will be happy to provide technical assistance and/or samples for this purpose.

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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