

# Self-Clinching Nuts

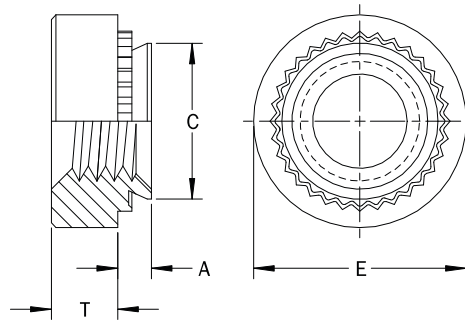
## FEATURES

- Provide load-bearing threads in thin sheets.
- Available in a broad selection of inch and metric thread sizes.
- Self-clinching design provides quick and permanent installation in a variety of aluminum and cold-rolled steel sheet thicknesses.
- Choice of RoHS-compliant materials and finishes.

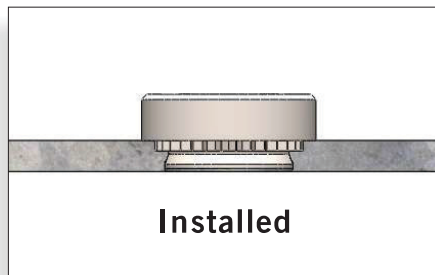


## PART DESCRIPTION EXAMPLE

NCCT	—	440	—	.030	—	Z
T		T		T		T
Material Code		Thread Code		Shank Length		Finish Code



(Dimensions are Shown on Pages 2 thru 5)



*Sheet metal displaced by the knurled band during installation flows into the undercut creating a mechanical lock with the sheet metal providing high push-out and torque-out resistance.*

**NC Self-Clinching Nuts**

**GENERAL - MATERIAL CODES CT, ST & SS**

All dimensions in inches

INCH	Thread	Thread Code	Sheet			A (Shank Length) Max.	C Max.	E ±.010	T ±.010
			Minimum Thickness	Hole Size +.003 -.000	Minimum Distance Hole Center to Edge				
	2-56	256	.030	.166	.190	.030	.165	.250	.070
			.040			.038			
			.056			.054			
	3-48	348	.030	.166	.190	.030	.165	.250	.070
			.040			.038			
			.056			.054			
	4-40	440	.030	.166	.190	.030	.165	.250	.070
			.040			.038			
			.056			.054			
			.090			.087			
	6-32	632	.030	.1875	.220	.030	.187	.280	.070
			.040			.038			
.056			.054						
.090			.087						
8-32	832	.030	.213	.270	.030	.212	.310	.090	
		.040			.038				
		.056			.054				
		.090			.087				
10-24	1024	.030	.250	.280	.030	.249	.340	.090	
		.040			.038				
		.056			.054				
		.090			.087				
10-32	1032	.030	.250	.280	.030	.249	.340	.090	
		.040			.038				
		.056			.054				
		.090			.087				

- (1) For best performance, use the maximum shank length available for the application sheet thickness.
- (2) Custom sizes available by request.

**NC Self-Clinching Nuts**

**GENERAL - MATERIAL CODES CT, ST & SS (CONTINUED)**

All dimensions in inches

INCH	Thread	Thread Code	Sheet			A (Shank Length) Max.	C Max.	E ±.010	T ±.010
			Minimum Thickness	Hole Size +.003 -.000	Minimum Distance Hole Center to Edge				
12-24	1224	.040	.277	.310	.038	.276	.370	.130	
		.056			.054				
		.090			.087				
1/4-20	2520	.047	.344	.340	.045	.343	.440	.170	
		.056			.054				
		.090			.087				
		.125			.120				
1/4-28	2528	.047	.344	.340	.045	.343	.440	.170	
		.056			.054				
		.090			.087				
		.125			.120				
5/16-18	3118	.056	.413	.380	.054	.412	.500	.230	
		.090			.087				
		.125			.120				
5/16-24	3124	.056	.413	.380	.054	.412	.500	.230	
		.090			.087				
		.125			.120				
3/8-16	3716	.090	.500	.440	.087	.499	.560	.270	
		.125			.120				
		.250			.235				
3/8-24	3724	.090	.500	.440	.087	.499	.560	.270	
		.125			.120				
		.250			.235				
7/16-20	4320	.092	.562	.562	.087	.561	.687	.311	
1/2-13	5013	.125	.656	.630	.120	.655	.810	.360	
		.250			.235				
1/2-20	5020	.125	.656	.630	.120	.655	.810	.360	
		.250			.235				

- (1) For best performance, use the maximum shank length available for the application sheet thickness.
- (2) Custom sizes available by request.

**NC Self-Clinching Nuts**

**GENERAL - MATERIAL CODES CT, ST & SS (CONTINUED)**

All dimensions in millimeters

METRIC	Thread	Thread Code	Sheet			A (Shank Length) Max.	C Max.	E ±0.25	T ±0.25
			Minimum Thickness	Hole Size +0.08 -0.00	Minimum Distance Hole Center to Edge				
M2 x 0.4	M2	0.80	4.22	4.80	0.77	4.20	6.35	1.50	
		1.00			0.97				
		1.40			1.38				
M2.5 x 0.45	M2.5	0.80	4.22	4.80	0.77	4.20	6.35	1.50	
		1.00			0.97				
		1.40			1.38				
M3 x 0.5	M3	0.80	4.22	4.80	0.77	4.20	6.35	1.50	
		1.00			0.97				
		1.40			1.38				
M3.5 x 0.6	M3.5	0.80	4.75	5.60	0.77	4.73	7.11	1.50	
		1.00			0.97				
		1.40			1.38				
M4 x 0.7	M4	0.80	5.41	6.90	0.77	5.38	7.87	2.00	
		1.00			0.97				
		1.40			1.38				
M5 x 0.8	M5	0.80	6.35	7.10	0.77	6.33	8.64	2.00	
		1.00			0.97				
		1.40			1.38				
M6 x 1.0	M6	0.92	8.75	8.60	0.89	8.73	11.18	4.08	
		1.20			1.15				
		1.40			1.38				
		2.29			2.21				
M8 x 1.25	M8	1.40	10.50	9.70	1.38	10.47	12.70	5.47	
		2.29			2.21				
M10 x 1.5	M10	2.29	14.00	13.50	2.21	13.97	17.35	7.48	
		3.18			3.05				
M12 x 1.75	M12	3.18	17.00	16.00	3.05	16.95	20.57	8.50	

- (1) For best performance, use the maximum shank length available for the application sheet thickness.
- (2) Custom sizes available by request.

**NC Self-Clinching Nuts**

**GENERAL - MATERIAL CODE AL**

All dimensions in inches

	Thread	Thread Code	Sheet		A (Shank Length) Max.	C Max.	E ±.010	T ±.010	
			Minimum Thickness	Hole Size +.003 -.000					Minimum Distance Hole Center to Edge
<b>INCH</b>	2-56	256	.040	.166	.190	.038	.165	.250	.070
			.056			.054			
	4-40	440	.040	.1875	.220	.038	.187	.250	.090
			.056			.054			
	6-32	632	.040	.213	.270	.038	.212	.280	.090
			.056			.054			
	8-32	832	.040	.234	.280	.038	.233	.310	.130
			.056			.054			
10-24	1024	.040	.296	.310	.038	.295	.370	.160	
		.056			.054				
10-32	1032	.040	.296	.310	.038	.295	.370	.160	
		.056			.054				
1/4-20	2520	.056	.344	.340	.054	.343	.440	.170	
		.091			.087				
		.125			.120				

All dimensions in millimeters

	Thread	Thread Code	Sheet		A (Shank Length) Max.	C Max.	E ±0.25	T ±0.25	
			Minimum Thickness	Hole Size +0.08 -0.00					Minimum Distance Hole Center to Edge
<b>METRIC</b>	M2 x 0.4	M2	1.00	4.22	4.80	0.98	4.20	6.35	1.50
			1.40			1.38			
	M3 x 0.5	M3	1.00	4.75	5.60	0.98	4.73	6.35	2.00
			1.40			1.38			
	M3,5 x 0.6	M3.5	1.00	5.41	6.90	0.98	5.38	7.11	2.00
			1.40			1.38			
	M4 x 0.7	M4	1.00	5.94	7.10	0.98	5.92	7.80	3.00
			1.40			1.38			
M5 x 0.8	M5	1.00	7.52	7.90	0.98	7.49	9.40	3.80	
		1.40			1.38				
M6 x 1.0	M6	1.40	8.75	8.60	1.38	8.73	11.18	4.08	
		2.30			2.21				

(1) For best performance, use the maximum shank length available for the application sheet thickness.  
 (2) Custom sizes available by request.

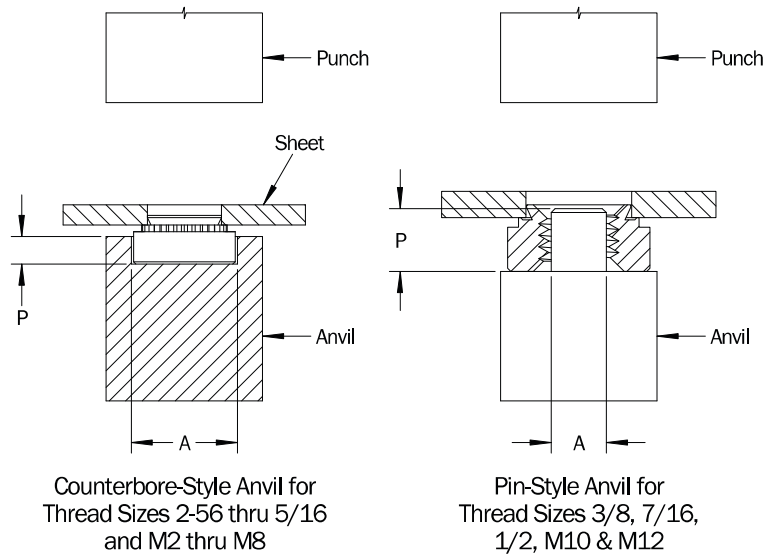
## MATERIAL AND FINISH

Material Code	Material Description	Finish Code	Finish Description	For Use in Sheet Hardness		
				HRB 80 Max.	HRB 70 Max.	HRB 50 Max.
CT <sup>(1)</sup>	Heat Treated Carbon Steel	Z	Zinc (SC1) with Type III Clear Chromate per ASTM B633	●		
ST <sup>(1)</sup>	Heat Treated Carbon Steel	Z	Zinc (SC1) with Type III Clear Chromate per ASTM B633	●		
CS <sup>(1)</sup>	300-Series Stainless Steel	P	Passivated and/or tested per ASTM A967		●	
SS <sup>(1)</sup>	300-Series Stainless Steel	P	Passivated and/or tested per ASTM A967		●	
AL	Aluminum	PLN	Plain			●

- (1) Use CT and CS material codes for nuts with (E) body diameters .250" thru .500" and 6.35mm thru 12.70mm; and ST and SS material codes for nuts with (E) body diameters .560" thru .810", 17.35mm and 20.57mm.  
 (2) Custom materials and finishes available by request.

## INSTALLATION

1. Prepare correct sized mounting hole in sheet away from bends or other highly cold-worked areas. Do not deburr hole edges.
2. Insert nut into anvil recess or over anvil pin, depending on anvil type required. Place sheet hole over the nut shank as shown with hole punch side of sheet against the nut.
3. Squeeze the sheet and nut between parallel anvil and punch surfaces. Use only enough pressure to seat the nut shoulder flush with the sheet. Anvils and punches may be ordered using the part numbers shown in the tables on pages 7 and 8; or made from hardened tool steel.
4. In the application install screw from the shank side of the fastener so that the head side of the nut is drawn toward the sheet.



Recommended Anvil Dimensions

NC Self-Clinching Nuts

### ANVIL AND PUNCH DIMENSIONS - MATERIAL CODES CT, ST & SS

INCH	Thread Code	Anvil Dimensions		Anvil Part Number	Punch Part Number
		A ±.002	P ±.005		
	256 / 348 / 440	.267	.045	TL1378	TL1695
	632	.298	.045	TL1379	TL1695
	832	.330	.070	TL1380	TL1695
	1024 / 1032	.361	.070	TL1381	TL1695
	1224	.387	.080	TL1382	TL1695
	2520 / 2528	.454	.150	TL1383	TL1695
	3118 / 3124	.517	.200	TL1384	TL1695
	3716 / 3724	.280	.250	TL1385	TL1695
	4320	.338	.295	TL1386	TL1696
	5013 / 5020	.375	.345	TL1387	TL1696

All dimensions in inches

METRIC	Thread Code	Anvil Dimensions		Anvil Part Number	Punch Part Number
		A ±0.05	P ±0.13		
	M2 / M2.5 / M3	6.78	1.14	TL1378	TL1695
	M3.5	7.57	1.14	TL1379	TL1695
	M4	8.38	1.78	TL1380	TL1695
	M5	9.17	1.78	TL1381	TL1695
	M6	11.53	3.81	TL1383	TL1695
	M8	13.13	5.08	TL1384	TL1695
	M10	7.62	6.35	TL1388	TL1696
	M12	9.53	8.76	TL1387	TL1696

All dimensions in millimeters

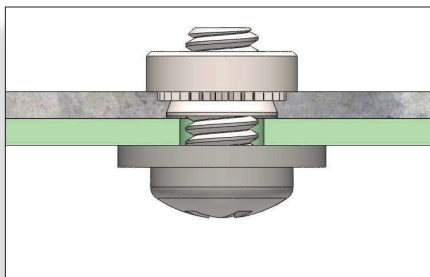
**ANVIL AND PUNCH DIMENSIONS - MATERIAL CODE AL**

INCH	Thread Code	Anvil Dimensions		Anvil Part Number	Punch Part Number
		A ±.002	P ±.005		
	256 / 440	.267	.045	TL1378	TL1695
	632	.298	.045	TL1379	TL1695
	832	.330	.070	TL1380	TL1695
	1024 / 1032	.392	.140	TL1684	TL1695
	2520	.454	.150	TL1383	TL1695

All dimensions in inches

METRIC	Thread Code	Anvil Dimensions		Anvil Part Number	Punch Part Number
		A ±0.05	P ±0.13		
	M2 / M3	6.78	1.14	TL1378	TL1695
	M3.5	7.57	1.14	TL1379	TL1695
	M4	8.38	1.78	TL1380	TL1695
	M5	9.96	3.56	TL1684	TL1695
	M6	11.53	3.81	TL1383	TL1695

All dimensions in millimeters



*PENCOM carries a wide assortment of screw and washer assemblies and components (top). Need vibration resistance? A variety of thread locking materials can be applied to the threads. Nylon (bottom), micro-encapsulated epoxy and other locking elements are recommended to prevent loosening due to vibration. Contact a PENCOM Account Manager or visit [www.pencomsf.com](http://www.pencomsf.com) for more information.*

**NC Self-Clinching Nuts**



**PERFORMANCE - MATERIAL CODES CT, ST & SS**

INCH	Thread Code	A (Shank Length) Max.	Test Sheet Material	Installation (lbs)	Push-out (lbs)	Torque-out (in-lbs)
	256 348 440	.030	5052-H34 Aluminum	1500-2000	63	8
		.038			90	10
		.054			170	13
		.087			170	13
		.030	Cold-rolled Steel	2500-3500	105	13
		.038			125	15
		.054			230	18
		.087			230	18
	632	.030	5052-H34 Aluminum	2500-3000	63	16
.038		95			17	
.054		190			22	
.087		190			22	
.030		Cold-rolled Steel	3000-6000	110	16	
.038				130	20	
.054				275	28	
.087				275	28	
832	.030	5052-H34 Aluminum	2500-3000	68	21	
	.038			105	23	
	.054			220	35	
	.087			220	35	
	.030	Cold-rolled Steel	4000-6000	110	26	
	.038			145	35	
	.054			285	45	
	.087			285	45	
1024 1032	.030	5052-H34 Aluminum	2500-3500	68	26	
	.038			110	32	
	.054			190	50	
	.087			225	50	
	.030	Cold-rolled Steel	4000-6500	120	32	
	.038			180	40	
	.054			320	60	
	.087			320	60	

**NC Self-Clinching Nuts**

(1) Performance data are reference averages based on commonly reported industry values when all installation specifications are strictly followed. Variations in panel hole size, thickness, material, and installation method will affect the loads. PENCOM strongly encourages testing in the application.

**PERFORMANCE - MATERIAL CODES CT, ST & SS (CONTINUED)**

INCH	Thread Code	A (Shank Length) Max.	Test Sheet Material	Installation (lbs)	Push-out (lbs)	Torque-out (in-lbs)
	1224	.038	5052-H34 Aluminum	2500-6500	120	63
		.054			285	70
		.087			285	70
		.038	Cold-rolled Steel	5000-6500	200	74
		.054			350	80
		.087			350	80
	2520 2528	.045	5052-H34 Aluminum	4000-7000	220	70
		.054			360	90
		.087			360	125
.120		360			125	
.045		Cold-rolled Steel	6000-8000	315	115	
.054				400	150	
.087				400	150	
.120				400	150	
3118 3124	.054	5052-H34 Aluminum	4000-7000	380	120	
	.087			380	160	
	.120			380	160	
	.054	Cold-rolled Steel	6000-8000	420	165	
	.087			420	180	
	.120			420	180	
3716 3724	.087	5052-H34 Aluminum	5000-8000	400	270	
	.120			400	270	
	.235			400	270	
	.087	Cold-rolled Steel	7000-11000	460	320	
	.120			460	320	
	.235			460	320	
4320	.087	Cold-rolled Steel	9000-13000	450	340	
5013 5020	.120	5052-H34 Aluminum	7000-9000	475	350	
	.235			475	350	
	.120	Cold-rolled Steel	10000-15000	1050	735	
	.235			1050	735	

**NC Self-Clinching Nuts**

(1) Performance data are reference averages based on commonly reported industry values when all installation specifications are strictly followed. Variations in panel hole size, thickness, material, and installation method will affect the loads. PENCOM strongly encourages testing in the application.

**PERFORMANCE - MATERIAL CODES CT, ST & SS (CONTINUED)**

METRIC	Thread Code	A (Shank Length) Max.	Test Sheet Material	Installation (kN)	Push-out (N)	Torque-out (N-m)
	M2 M2.5 M3	0.77	5052-H34 Aluminum	6.7-8.9	280	0.90
		0.97			400	1.13
		1.38			750	1.47
		0.77	Cold-rolled Steel	11.2-15.6	470	1.47
		0.97			550	1.70
		1.38			1010	2.03
	M3.5	0.77	5052-H34 Aluminum	11.2-13.5	280	1.80
		0.97			400	1.92
		1.38			840	2.50
0.77		Cold-rolled Steel	13.4-26.7	480	1.80	
0.97				570	2.30	
1.38				1210	2.30	
M4	0.77	5052-H34 Aluminum	11.2-13.4	300	2.37	
	0.97			470	2.60	
	1.38			970	4.00	
	0.77	Cold-rolled Steel	18.0-27.0	490	2.95	
	0.97			645	4.00	
	1.38			1250	5.10	
M5	0.77	5052-H34 Aluminum	11.2-15.6	300	3.00	
	0.97			480	3.60	
	1.38			845	5.70	
	0.77	Cold-rolled Steel	18.0-28.9	530	3.60	
	0.97			800	4.50	
	1.38			1112	6.80	
M6	0.89	5052-H34 Aluminum	18.0-32.0	750	6.50	
	1.15			970	7.90	
	1.38			1580	10.2	
	2.21			1580	14.1	
	0.89	Cold-rolled Steel	27.0-36.0	900	10.0	
	1.15			1380	13.0	
	1.38			1760	17.0	
	2.21			1760	17.0	

(1) Performance data are reference averages based on commonly reported industry values when all installation specifications are strictly followed. Variations in panel hole size, thickness, material, and installation method will affect the loads. PENCOM strongly encourages testing in the application.

**PERFORMANCE - MATERIAL CODES CT, ST & SS (CONTINUED)**

METRIC	Thread Code	A (Shank Length) Max.	Test Sheet Material	Installation (kN)	Push-out (N)	Torque-out (N-m)
	M8	1.38	5052-H34 Aluminum	18.0-32.0	1570	13.6
		2.21			1570	18.1
		1.38	Cold-rolled Steel		1870	18.7
		2.21			1870	20.3
	M10	2.21	5052-H34 Aluminum	22.0-36.0	1760	32.7
		3.05			1760	32.7
		2.21	Cold-rolled Steel		2020	36.2
		3.05			2020	36.2
	M12	3.05	5052-H34 Aluminum	31.0-40.0	2113	39.5
3.05		Cold-rolled Steel	44.0-67.0	4670	83.1	

(1) Performance data are reference averages based on commonly reported industry values when all installation specifications are strictly followed. Variations in panel hole size, thickness, material, and installation method will affect the loads. PENCOM strongly encourages testing in the application.

**PERFORMANCE - MATERIAL CODE AL**

INCH	Thread Code	A (Shank Length) Max.	Test Sheet Material	Installation (lbs)	Push-out (lbs)	Torque-out (in-lbs)
	440	.038	5052-H34 Aluminum	800-1500	100	6
		.054		800-1500	120	9
	632	.038	5052-H34 Aluminum	1000-1500	110	21
		.054		1200-1700	155	24
	832	.038	5052-H34 Aluminum	1000-1500	120	27
		.054		1300-1800	170	29
	1024 1032	.038	5052-H34 Aluminum	1700-2200	130	34
		.054		2600-3100	200	50

(1) Performance data are reference averages based on commonly reported industry values when all installation specifications are strictly followed. Variations in panel hole size, thickness, material, and installation method will affect the loads. PENCOM strongly encourages testing in the application.

**NC Self-Clinching Nuts**

**PERFORMANCE - MATERIAL CODE AL (CONTINUED)**

METRIC	Thread Code	A (Shank Length) Max.	Test Sheet Material	Installation (kN)	Push-out (N)	Torque-out (N-m)
	M2	1.38	5052-H34 Aluminum	3.56-6.67	500	0.40
M3	0.98	5052-H34 Aluminum	3.56-6.67	445	0.68	
	1.38		3.56-6.67	534	1.02	
M4	0.98	5052-H34 Aluminum	4.45-6.67	534	3.05	
	1.38		5.78-8.01	756	3.27	

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