

Miniature and Close-to-Edge Self-Clinching Standoffs

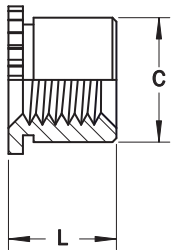
FEATURES

- Precisely stack mating panels in limited space and close-to-edge applications.
- Self-clinching design provides simple, permanent installation in aluminum, carbon steel and stainless steel sheets.
- Custom sizes available by request.

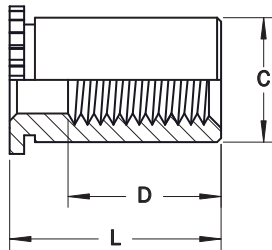


PART DESCRIPTION EXAMPLE

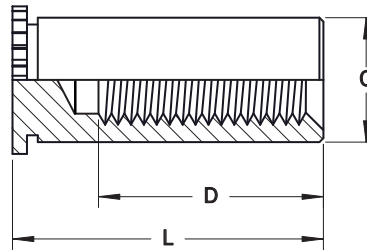
TTST — 440 — .250 — Z
 T — T — T — T
 Material Code Thread Code Length Code Finish Code



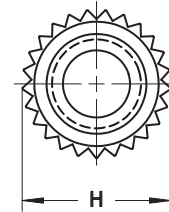
TYPE 1
(Thru)



TYPE 2
(Screw may not pass thru unthreaded end)



TYPE 3
(Blind)



See Length Table for Type Availability

GENERAL

All dimensions in inches

INCH	Thread	Thread Code	Sheet			C Max.	D Min.	H Nom.
			Minimum Thickness	Hole Size	Minimum Distance Hole Center to Edge			
0-80 ⁽¹⁾	2-56 ⁽¹⁾	080	.012	.095-.097	.090	.094	.125	.125
		4256	.037	.166-.169	.126	.165	.194	
	4-40 ⁽¹⁾	440	.037	.166-.169	.126	.165	.220	.194

(1) Unified threads per ASME B1.1, 2B.

GENERAL (CONTINUED)

All dimensions in millimeters

METRIC	Thread	Thread Code	Sheet			C Max.	D Min.	H Nom.
			Minimum Thickness	Hole Size	Minimum Distance Hole Center to Edge			
	M1 x 0.25 ⁽¹⁾	M1	0.30	2.41 - 2.46	2.3	2.39	2.0	3.18
	M1.2 x 0.25 ⁽¹⁾	M1.2	0.30	2.41 - 2.46	2.3	2.39	2.4	3.18
	M1.4 x 0.3 ⁽²⁾	M1.4	0.30	2.41 - 2.46	2.3	2.39	2.8	3.18
	M1.6 x 0.35 ⁽³⁾	M1.6	0.30	2.41 - 2.46	2.3	2.39	3.5	3.18
	M2 x 0.4 ⁽³⁾	M2	0.30	3.18 - 3.23	3.0	3.16	3.9	3.96
	M2.5 x 0.45 ⁽³⁾	3M2.5	0.94	4.22 - 4.30	3.2	4.20	5.2	4.92
	M3 x 0.5 ⁽³⁾	M3	0.94	4.22 - 4.30	3.2	4.20	6.2	4.92

- (1) Miniature threads per ISO 68-1, 5H.
- (2) Miniature threads per ISO 68-1, 6H.
- (3) Metric threads per ASME B1.13M, 6H.

LENGTH

All dimensions in inches

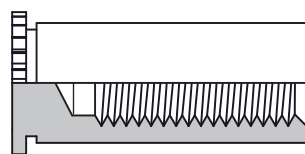
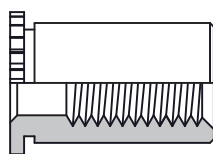
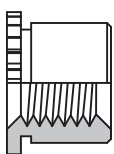
INCH	Thread Code	Length Code / Length						
		.094	.125	.187	.250	.275	.312	.375
	080	.091-.096 ⁽¹⁾	.122-.127 ⁽¹⁾	.184-.189 ⁽¹⁾	.247-.252 ⁽²⁾	.272-.277 ⁽²⁾	.309-.314 ⁽²⁾	.372-.377 ⁽³⁾
	256	.091-.096 ⁽¹⁾	.122-.127 ⁽¹⁾	.184-.189 ⁽¹⁾	.247-.252 ⁽¹⁾	.272-.277 ⁽²⁾	.309-.314 ⁽²⁾	.372-.377 ⁽²⁾
	4256	.089-.096 ⁽¹⁾	.120-.127 ⁽¹⁾	.182-.189 ⁽¹⁾	.245-.252 ⁽¹⁾	.270-.277 ⁽²⁾	.307-.314 ⁽²⁾	.370-.377 ⁽²⁾
	440	.089-.096 ⁽¹⁾	.120-.127 ⁽¹⁾	.182-.189 ⁽¹⁾	.245-.252 ⁽¹⁾	.270-.277 ⁽²⁾	.307-.314 ⁽²⁾	.370-.377 ⁽²⁾

INCH (CONT.)	Thread Code	Length Code / Length					
		.437	.500	.562	.625	.687	.750
	080	.434-.439 ⁽³⁾	-	-	-	-	-
	256	.434-.439 ⁽³⁾	.497-.502 ⁽³⁾	.559-.564 ⁽³⁾	.622-.627 ⁽³⁾	-	-
	4256	.432-.439 ⁽³⁾	.495-.502 ⁽³⁾	.557-.564 ⁽³⁾	.620-.627 ⁽³⁾	.682-.689 ⁽³⁾	.745-.752 ⁽³⁾
	440	.432-.439 ⁽²⁾	.495-.502 ⁽³⁾	.557-.564 ⁽³⁾	.620-.627 ⁽³⁾	.682-.689 ⁽³⁾	.745-.752 ⁽³⁾

(1) Type 1

(2) Type 2

(3) Type 3



* Custom lengths and type combinations available by request.

TT Miniature and Close-to-Edge Self-Clinching Standoffs

LENGTH (CONTINUED)

All dimensions in millimeters

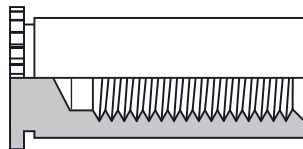
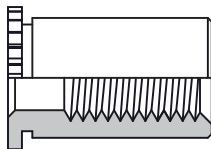
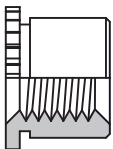
METRIC	Thread Code	Length Code / Length						
		2	3	4	5	6.35	7	8
	M1	1.92-2.05 ⁽¹⁾	2.92-3.05 ⁽¹⁾	3.92-4.05 ⁽²⁾	4.92-5.05 ⁽³⁾	6.27-6.40 ⁽³⁾	6.92-7.05 ⁽³⁾	7.92-8.05 ⁽³⁾
	M1.2	1.92-2.05 ⁽¹⁾	2.92-3.05 ⁽¹⁾	3.92-4.05 ⁽²⁾	4.92-5.05 ⁽²⁾	6.27-6.40 ⁽³⁾	6.92-7.05 ⁽³⁾	7.92-8.05 ⁽³⁾
	M1.4	1.92-2.05 ⁽¹⁾	2.92-3.05 ⁽¹⁾	3.92-4.05 ⁽¹⁾	4.92-5.05 ⁽²⁾	6.27-6.40 ⁽³⁾	6.92-7.05 ⁽³⁾	7.92-8.05 ⁽³⁾
	M1.6	1.92-2.05 ⁽¹⁾	2.92-3.05 ⁽¹⁾	3.92-4.05 ⁽¹⁾	4.92-5.05 ⁽²⁾	6.27-6.40 ⁽²⁾	6.92-7.05 ⁽²⁾	7.92-8.05 ⁽²⁾
	M2	1.92-2.05 ⁽¹⁾	2.92-3.05 ⁽¹⁾	3.92-4.05 ⁽¹⁾	4.92-5.05 ⁽¹⁾	6.27-6.40 ⁽¹⁾	6.92-7.05 ⁽²⁾	7.92-8.05 ⁽²⁾
	3M2.5	1.87-2.05 ⁽¹⁾	2.87-3.05 ⁽¹⁾	3.87-4.05 ⁽¹⁾	4.87-5.05 ⁽¹⁾	6.22-6.40 ⁽¹⁾	6.87-7.05 ⁽²⁾	7.87-8.05 ⁽²⁾
	M3	1.87-2.05 ⁽¹⁾	2.87-3.05 ⁽¹⁾	3.87-4.05 ⁽¹⁾	4.87-5.05 ⁽¹⁾	6.22-6.40 ⁽¹⁾	6.87-7.05 ⁽¹⁾	7.87-8.05 ⁽²⁾

METRIC (CONT.)	Thread Code	Length Code / Length					
		10	12	14	16	18	19
	M1	9.92-10.05 ⁽³⁾	11.92-12.05 ⁽³⁾	-	-	-	-
	M1.2	9.92-10.05 ⁽³⁾	11.92-12.05 ⁽³⁾	-	-	-	-
	M1.4	9.92-10.05 ⁽³⁾	11.92-12.05 ⁽³⁾	-	-	-	-
	M1.6	9.92-10.05 ⁽³⁾	11.92-12.05 ⁽³⁾	-	-	-	-
	M2	9.92-10.05 ⁽³⁾	11.92-12.05 ⁽³⁾	13.92-14.05 ⁽³⁾	15.92-16.05 ⁽³⁾		
	3M2.5	9.87-10.05 ⁽³⁾	11.87-12.05 ⁽³⁾	13.87-14.05 ⁽³⁾	15.87-16.05 ⁽³⁾	17.87-18.05 ⁽³⁾	18.87-19.05 ⁽³⁾
	M3	9.87-10.05 ⁽²⁾	11.87-12.05 ⁽³⁾	13.87-14.05 ⁽³⁾	15.87-16.05 ⁽³⁾	17.87-18.05 ⁽³⁾	18.87-19.05 ⁽³⁾

(1) Type 1

(2) Type 2

(3) Type 3



* Custom lengths and type combinations available by request.

MATERIAL AND FINISH

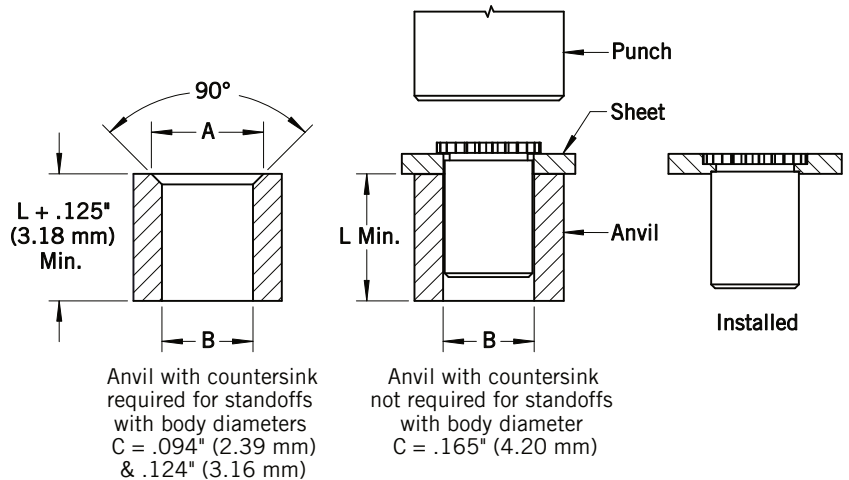
Material Code	Material Description	Finish Code	Finish Description	For Use in Sheet Hardness		
				HRB 70 Max.	HRB 80 Max.	HRB 88 Max.
ST ⁽¹⁾	Heat Treated 1215 Carbon Steel	Z	Zinc (SC1) with Type III Clear Chromate per ASTM B633		•	
SS	300-Series Stainless Steel	P	Passivated and/or Tested per ASTM A967	•		
S4 ⁽²⁾	Heat Treated 400-Series Stainless Steel	P	Passivated and/or Tested per ASTM A967			•

(1) ST material code not available for maximum standoff body diameters .094" (2.39mm) and .124" (3.16mm).

(2) S4 material code not available for maximum standoff body diameter .165" (4.20mm).

INSTALLATION

1. Prepare correct sized mounting hole in sheet. Do not deburr edges.
2. Insert standoff through hole in punch side of the sheet and into the anvil as shown.
3. Squeeze the sheet and standoff head between parallel anvil and punch surfaces. Use only enough pressure to seat the standoff head flush with the sheet.
4. Anvil with countersink is required for standoff with maximum body diameters .094", .124", 2.39mm and 3.16mm. Anvil with countersink is not required for .165" and 4.20mm body diameters. Anvils and punches may be ordered using the PENCOM part numbers shown in the tables on page 5, or made from hardened tool steel.
5. For installation in stainless steel, the sheet should be annealed and avoid standoff installation next to bends or other highly cold-worked areas. The hole punch diameter should be no greater than .001" (0.025mm) over the minimum recommended mounting hole diameter and kept sharp to minimize work hardening around the hole.



(Anvil dimensions shown on page 5)

ANVIL AND PUNCH DIMENSIONS

INCH	Standoff C Max. Dimension	A	B	Anvil Part Number	Punch Part Number
	.094	.112-.114	.097-.099	TL1268	TL1287
	.124	.142-.144	.127-.129	TL1269	TL1287
	.165	-	.169-.172	TL1087	TL1287

All dimensions in inches

METRIC	Standoff C Max. Dimension	A	B	Anvil Part Number	Punch Part Number
	2.39	2.84-2.89	2.46-2.51	TL1268	TL1287
	3.16	3.60-3.65	3.22-3.27	TL1269	TL1287
	4.20	-	4.30-4.38	TL1087	TL1287

All dimensions in millimeters

PERFORMANCE

INCH	Thread Code	Stand. Matl. Code	Test Sheet Thickness	Test Sheet Material											
				5052-H34 Aluminum				Cold-rolled Steel				300-Series Stainless Steel			
				Installation (lbs)	Push-out (lbs)	Torque-out (in-lbs) ⁽²⁾	Pull-thru (lbs) ⁽²⁾	Installation (lbs)	Push-out (lbs)	Torque-out (in-lbs) ⁽²⁾	Pull-thru (lbs) ⁽²⁾	Installation (lbs)	Push-out (lbs)	Torque-out (in-lbs) ⁽²⁾	Pull-thru (lbs) ⁽²⁾
080	SS	.013	-	-	-	-	900	20	1.2	40	(3)	(3)	(3)	(3)	
		.017	600	20	1.2	40	1000	35	1.6	74	(3)	(3)	(3)	(3)	
	S4	.013	-	-	-	-	-	-	-	-	-	2500	33	1.3	78
		.017	-	-	-	-	-	-	-	-	-	2500	45	2.2	78
256	SS	.013	-	-	-	-	1000	25	2.0	45	(3)	(3)	(3)	(3)	
		.017	700	25	2.0	45	1100	40	2.5	85	(3)	(3)	(3)	(3)	
	S4	.013	-	-	-	-	-	-	-	-	-	2500	33	2.2	110
		.017	-	-	-	-	-	-	-	-	-	2500	45	2.6	110
4256 440	ST	.040	700	50	10	320	1100	75	10	357	(3)	(3)	(3)	(3)	
	SS	.040	700	50	10	320	1100	75	10	357	(3)	(3)	(3)	(3)	

(1) Performance data represents the average result 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.

(2) Torque-out and pull-thru performance may vary depending on the strength and type of screw being used.

(3) Not recommended.

PERFORMANCE (CONTINUED)

METRIC	Thread Code	Stand. Matl. Code	Test Sheet Thickness	Test Sheet Material											
				5052-H34 Aluminum				Cold-rolled Steel				300-Series Stainless Steel			
				Installation (kN)	Push-out (N)	Torque-out (N-m) ⁽²⁾	Pull-thru (N) ⁽²⁾	Installation (kN)	Push-out (N)	Torque-out (N-m) ⁽²⁾	Pull-thru (N) ⁽²⁾	Installation (kN)	Push-out (N)	Torque-out (N-m) ⁽²⁾	Pull-thru (N) ⁽²⁾
M1 M1.2 M1.4 M1.6	SS	0.30mm	-	-	-	-	4.0	89	0.14	178	(3)	(3)	(3)	(3)	
		0.43mm	2.7	89	0.14	178	4.5	156	0.18	330	(3)	(3)	(3)	(3)	
	S4	0.30mm	-	-	-	-	-	-	-	-	11.1	150	0.15	350	
		0.43mm	-	-	-	-	-	-	-	-	11.1	200	0.25	350	
	M2	SS	0.30mm	-	-	-	-	4.5	111	0.23	200	(3)	(3)	(3)	(3)
			0.43mm	3.1	111	0.23	200	4.9	178	0.28	378	(3)	(3)	(3)	(3)
		S4	0.30mm	-	-	-	-	-	-	-	-	11.1	150	0.25	500
			0.43mm	-	-	-	-	-	-	-	-	11.1	200	0.30	500
3M2.5 M3	ST	1.00mm	3.1	223	1.1	1422	4.9	334	1.1	1587	(3)	(3)	(3)	(3)	
	SS	1.00mm	3.1	223	1.1	1422	4.9	334	1.1	1587	(3)	(3)	(3)	(3)	

- (1) Performance data represents the average result 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.
- (2) Torque-out and pull-thru performance may vary depending on the strength and type of screw being used.
- (3) Not recommended.

	Thread										
	0-80	2-56	4-40	M1	M1.2	M1.4	M1.6	M2	M2.5	M3	
Max. Rec. Tightening Torque for Mating Screw	.65 in-lbs	1.3 in-lbs	3.8 in-lbs	0.019 N-m	0.036 N-m	0.057 N-m	0.084 N-m	0.175 N-m	0.28 N-m	0.44 N-m	

- (1) Tightening torques may vary depending on type of screw being used.

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