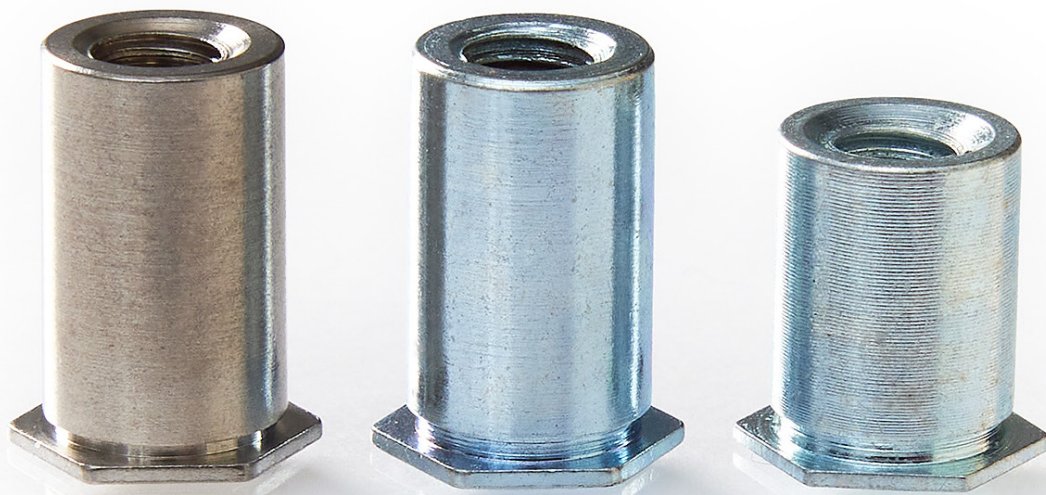


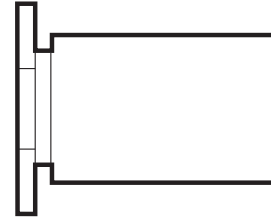
SELF CLINCHING STAND-OFFS

SELF CLINCHING STAND-OFFS ARE DESIGNED TO SERVE
AS SPACERS OR DISTANCE PIECES.



SELF CLINCHING STAND-OFFS

SELF CLINCHING STAND-OFFS are designed to serve as spacers or distance pieces. A simple squeezing action embeds the hexagonal head into the sheet causing the displaced metal to flow into the clinching groove.



ADVANTAGES

- Available in a range of spacer lengths.
- Remains mechanically clinched in sheet.
- For heavy duty applications LSS (Larger Support Surface) types are available (3.5m3 - 6440 - 8632).
- Through threaded and blind threaded Ranges.
- Plain hole versions available to special order.



DESIGN GUIDE

HOLE SIZE

Holes must be held to a tolerance of $-.000'' +.003''$ ($-0.00\text{mm} +0.08\text{mm}$).

Therefore punched holes are recommended.

Holes should not be de-burred or countersunk.

INSTALLATION

Must always be carried out using a squeeze action

- NEVER a shock load.

MAXIMUM SHEET HARDNESS

Rb80 for hardened steel fasteners (P-SO & P-BSO)

Rb70 for stainless steel fasteners (P-SOS & P-BSOS)

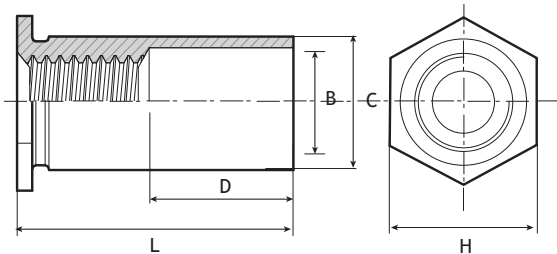
Rb50 for aluminum fasteners (P-SOA & P-BSOA)

HEAVY DUTY USE

Where heavy duty use is anticipated, P-SO and P-BSO fasteners in the smaller thread sizes may be specified in larger body sizes offering greater wall thickness. (For example: M3 in M3.5 body size would be coded 3.5M3 and 4.40UNC in 6.32UNC body size would be coded 6440, see dimension charts).

SELF CLINCHING STAND-OFFS

TECHNICAL DATA



P-SO THROUGH HOLE TYPE (METRIC)

MATERIAL CODES

P-SO - Hardened Steel Zinc Plated
 P-SOS - Stainless Steel
 P-SOA - Aluminum

STANDARD PLATING FINISH

Zinc & Clear Trivalent Passivation (Z)

GENERAL DIMENSIONS

All dimensions in millimetres

Thread Size / code	Min Sheet Thickness	Hole Size in Sheet +0.08 -0.00	C +0.00 -0.13	B Counter-Bore Dia +/- 0.13	H A/F Nominal	Minimum distance centre line hole to sheet edge
M2.5	1.0	4.20	4.19	3.20	4.80	6.0
M3	1.0	4.20	4.19	3.20	4.80	6.0
3.5M3	1.0	5.40	5.39	3.20	6.40	6.8
M3.5	1.0	5.40	5.39	3.90	6.40	6.8
M4	1.3	7.15	7.12	4.80	7.90	8.0
M5	1.3	7.15	7.12	5.35	7.90	8.0

THREAD & LENGTH DATA

Thread Size / code	Type			Length Code "L" +0.05 -0.13 (Length Code in millimetres)											
	Steel	Stainless Steel	Aluminum	3	4	6	8	10	12	14	16	18	N/A	N/A	N/A
M2.5	P-SO	P-SOS	P-SOA	3	4	6	8	10	12	14	16	18	N/A	N/A	N/A
M3	P-SO	P-SOS	P-SOA	3	4	6	8	10	12	14	16	18	N/A	N/A	N/A
3.5M3	P-SO	P-SOS	P-SOA	3	4	6	8	10	12	14	16	18	N/A	N/A	N/A
M3.5	P-SO	P-SOS	P-SOA	3	4	6	8	10	12	14	16	18	20	22	25
M4	P-SO	P-SOS	P-SOA	3	4	6	8	10	12	14	16	18	20	22	25
M5	P-SO	P-SOS	P-SOA	3	4	6	8	10	12	14	16	18	20	22	25
D = Counterbore Depth +/- 0.25				NONE				4.0				8.0		11.0	

HOW TO SPECIFY

P-SO (Steel Standard Sizes)

Product code	P-SO-M4-10-Z
Thread size	P-SO- M4 -10-Z
Length Code	P-SO-M4- 10 -Z
Plating Code	P-SO-M4-10- Z

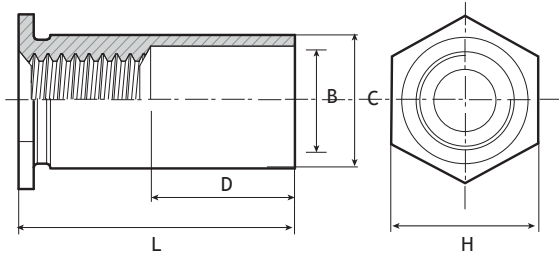
P-SOS (Stainless Steel Standard Sizes)

Product code	P-SOS-M4-10
Thread size	P-SOS- M4 -10
Length Code	P-SOS-M4- 10

Plain hole versions available to special order.

SELF CLINCHING STAND-OFFS

TECHNICAL DATA



P-SO THROUGH HOLE TYPE (UNIFIED)

MATERIAL CODES

P-SO - Hardened Steel Zinc Plated
 P-SOS - Stainless Steel
 P-SOA - Aluminum

STANDARD PLATING FINISH

Zinc & Clear Trivalent Passivation (Z)

GENERAL DIMENSIONS

All dimensions in inches

Thread Size / Code	Min Sheet Thickness	Hole Size in Sheet +.003 -.000	C +0.000 -0.005	B Counter-Bore Dia +/- 0.005	H A/F Nominal	Minimum distance centre line hole to sheet edge
440	.040	.166	.165	.125	.187	.230
6440	.040	.213	.212	.125	.250	.270
632	.040	.213	.212	.156	.250	.270
8632	.050	.281	.280	.156	.312	.310
832	.050	.281	.280	.188	.312	.310
032/024	.050	.281	.280	.203	.312	.310

THREAD & LENGTH DATA

Thread Size / code	Type			Length Code "L" +.002 -.005 (Length Code in 32nds of an inch)																
	Steel	Stainless Steel	Aluminum	1/8 .125	3/16 .187	1/4 .250	5/16 .312	3/8 .375	7/16 .437	1/2 .500	9/16 .562	5/8 .625	11/16 .687	3/4 .750	13/16 .812	7/8 .875	15/16 .937	1 1.00	1.1/16 1.062	
440	P-SO	P-SOS	P-SOA	4	6	8	10	12	14	16	18	20	22	24	N/A	N/A	N/A	N/A	N/A	
6440	P-SO	P-SOS	P-SOA	4	6	8	10	12	14	16	18	20	22	24	N/A	N/A	N/A	N/A	N/A	
632	P-SO	P-SOS	P-SOA	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	
8632	P-SO	P-SOS	P-SOA	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	
832	P-SO	P-SOS	P-SOA	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	
032 / 024	P-SO	P-SOS	P-SOA	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	
D = Counterbore Depth +/- .010				NONE					.187				.312				.437			

HOW TO SPECIFY

P-SO (Steel Standard Sizes)

Product code	P-SO-832-10-Z
Thread size	P-SO-832-10-Z
Length Code	P-SO-832-10-Z
Plating Code	P-SO-832-10-Z

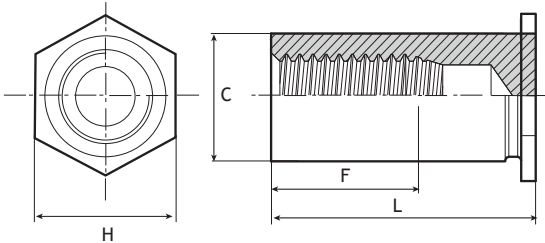
P-SOS (Stainless Steel Standard Sizes)

Product code	P-SOS-832-10
Thread size	P-SOS-832-10
Length Code	P-SOS-832-10

Plain hole versions available to special order.

SELF CLINCHING STAND-OFFS

TECHNICAL DATA



P-BSO BLIND HOLE TYPE (METRIC)

MATERIAL CODES

P-BSO - Hardened Steel Zinc Plated
 P-BSOS - Stainless Steel
 P-BSOA - Aluminum

STANDARD PLATING FINISH

Zinc & Clear Trivalent Passivation (Z)

GENERAL DIMENSIONS

All dimensions in millimetres

Thread Size / Code	Min Sheet Thickness	Hole Size in Sheet +0.08 -0.00	C +0.00 -0.13	H A/F Nominal	Minimum distance centre line hole to sheet edge
M2.5	>1.0	4.20	4.19	4.80	6.0
M3	>1.0	4.20	4.19	4.80	6.0
3.5M3	>1.0	5.40	5.39	6.40	6.8
M3.5	>1.0	5.40	5.39	6.40	6.8
M4	>1.3	7.15	7.12	7.90	8.0
M5	>1.3	7.15	7.12	7.90	8.0

THREAD & LENGTH DATA

Thread Size / Code	Type			Length Code "L" +0.05 -0.13 (Length Code in millimetres)									
	Steel	Stainless Steel	Aluminum	6	8	10	12	14	16	18	N/A	N/A	N/A
M2.5	P-BSO	P-BSOS	P-BSOA	6	8	10	12	14	16	18	N/A	N/A	N/A
M3	P-BSO	P-BSOS	P-BSOA	6	8	10	12	14	16	18	20	22	25
3.5M3	P-BSO	P-BSOS	P-BSOA	6	8	10	12	14	16	18	20	22	25
M3.5	P-BSO	P-BSOS	P-BSOA	6	8	10	12	14	16	18	20	22	25
M4	P-BSO	P-BSOS	P-BSOA	6	8	10	12	14	16	18	20	22	25
M5	P-BSO	P-BSOS	P-BSOA	6	8	10	12	14	16	18	20	22	25
F = min full threads in mm				3.2	4.0	5.0	6.5			9.5			

HOW TO SPECIFY

P-BSO (Steel Standard Sizes)

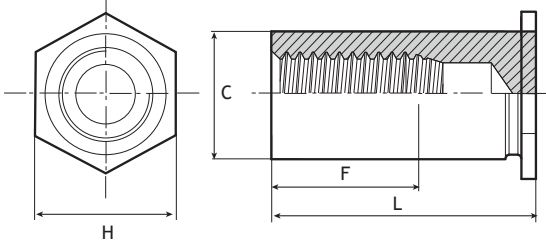
Product code	P-BSO-M4-10-Z
Thread size	P-BSO- M4 -10-Z
Length Code	P-BSO-M4- 10 -Z
Plating Code	P-BSO-M4-10- Z

P-BSOS (Stainless Steel Standard Sizes)

Product code	P-BSOS-M4-10
Thread size	P-BSOS- M4 -10
Length Code	P-BSOS-M4- 10

SELF CLINCHING STAND-OFFS

TECHNICAL DATA



P-BSO BLIND HOLE TYPE (UNIFIED)

MATERIAL CODES

P-BSO - Hardened Steel Zinc Plated

P-BSOS - Stainless Steel

P-BSOA - Aluminum

STANDARD PLATING FINISH

Zinc & Clear Trivalent Passivation (Z)

GENERAL DIMENSIONS

All dimensions in inches

Thread Size / Code	Min Sheet Thickness	Hole Size in Sheet +.003 -.000	C +0.000 -0.005	H A/F Nominal	Minimum distance centre line hole to sheet edge
440	.040	.166	.165	.187	.230
6440	.040	.213	.212	.250	.270
632	.040	.213	.212	.250	.270
8632	.050	.281	.280	.312	.310
832	.050	.281	.280	.312	.310
032 / 024	.050	.281	.280	.312	.310

THREAD & LENGTH DATA

Thread Size / Code	Type			Length Code "L" +.002 -.005 (Length Code in 32nds of an inch)												
	Steel	Stainless Steel	Aluminum	5/16 .312	3/8 .375	7/16 .437	1/2 .500	9/16 .562	5/8 .625	11/16 .687	3/4 .750	13/16 .812	7/8 .875	15/16 .937	1 1.00	1.1/16 1.062
440	P-BSO	P-BSOS	P-BSOA	10	12	14	16	18	20	22	24	26	28	30	32	34
6440	P-BSO	P-BSOS	P-BSOA	10	12	14	16	18	20	22	24	26	28	30	32	34
632	P-BSO	P-BSOS	P-BSOA	10	12	14	16	18	20	22	24	26	28	30	32	34
8632	P-BSO	P-BSOS	P-BSOA	10	12	14	16	18	20	22	24	26	28	30	32	34
832	P-BSO	P-BSOS	P-BSOA	10	12	14	16	18	20	22	24	26	28	30	32	34
032 / 024	P-BSO	P-BSOS	P-BSOA	10	12	14	16	18	20	22	24	26	28	30	32	34
F = min full threads in inches				.156		.187		.250				.375				

HOW TO SPECIFY

P-BSO (Steel Standard Sizes)

Product code **P-BSO-832-10-Z**

Thread size P-BSO-**832**-10-Z

Length Code P-BSO-832-**10**-Z

Plating Code P-BSO-832-10-**Z**

P-BSOS (Stainless Steel Standard Sizes)

Product code **P-BSOS-832-10**

Thread size P-BSOS-**832**-10

Length Code P-BSOS-832-**10**

SELF CLINCHING STAND-OFFS

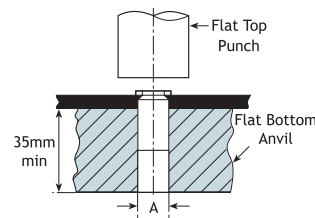
SELF CLINCHING STAND-OFFS are easy to install because no special tooling is necessary. However, it is very important to note that they must always be installed by a squeeze action press rather than a hammer blow. Punched holes are always recommended.



METHOD OF ASSEMBLY

- Punch a hole in the metal sheet to the size recommended in our technical data table. Deburring of the hole is not recommended.
- Insert the stand off through the hole in sheet and into the “anvil” as shown in the drawing.
- Apply squeezing pressure sufficient to embed hexagonal head flush in sheet.

Thread Size		A' = Hole in Anvil	
Metric	Unified	mm	inches
2.5/3	440	4.3 - 4.4	.169 - .173
3.5M3	6440	5.5 - 5.6	.217 - .220
3.5	632	5.5 - 5.6	.217 - .220
4	832	7.2 - 7.3	.283 - .287
5	1032	7.2 - 7.3	.283 - .287



SELF CLINCHING STAND-OFFS

PERFORMANCE DATA (METRIC)

Thread Code	Stand Off Type	Test Sheet Material					
		1.5 mm Cold Rolled Steel			1.5 mm 5052-H34 Aluminum		
		Installation (kN)	Pushout (N)	Torque-out (Nm)	Installation (kN)	Pushout (N)	Torque-out (Nm)
M2.5	Steel	10	1200	2.0	5.5	820	1.40
	Stainless Steel	10	1200	2.0	5.5	820	1.40
	Aluminum	NA	NA	NA	5.5	820	1.40
M3	Steel	10	1200	2.2	5.5	820	1.40
	Stainless Steel	10	1200	2.2	5.5	820	1.40
	Aluminum	NA	NA	NA	5.5	820	1.40
3.5M3	Steel	15	1700	2.2	8.5	1260	1.80
	Stainless Steel	15	1700	2.2	8.5	1260	1.80
	Aluminum	NA	NA	NA	8.5	1260	1.80
M3.5	Steel	15	1700	3.9	8.5	1260	2.65
	Stainless Steel	15	1700	3.9	8.5	1260	2.65
	Aluminum	NA	NA	NA	8.5	1260	2.65
M4	Steel	18	2550	8.8	11	1850	5.65
	Stainless Steel	18	2550	8.8	11	1850	5.65
	Aluminum	NA	NA	NA	11	1850	5.65
M5	Steel	18	2550	8.8	11	1850	5.65
	Stainless Steel	18	2550	8.8	11	1850	5.65
	Aluminum	NA	NA	NA	11	1850	5.65

PERFORMANCE DATA (UNIFIED)

Thread Code	Stand Off Type	Test Sheet Material					
		.060" Cold Rolled Steel			.060" 5052-H34 Aluminum		
		Installation (lbs)	Pushout (lbs)	Torque-out (in/lbs)	Installation (lbs)	Pushout (lbs)	Torque-out (in/lbs)
440	Steel	2200	270	20	1200	185	13
	Stainless Steel	2200	270	20	1200	185	13
	Aluminum	NA	NA	NA	1200	185	13
6440	Steel	3300	380	20	1900	285	13
	Stainless Steel	3300	380	20	1900	285	13
	Aluminum	NA	NA	NA	1900	285	13
632	Steel	3400	380	35	1900	285	24
	Stainless Steel	3400	380	35	1900	285	24
	Aluminum	NA	NA	NA	1900	285	24
8632	Steel	4000	575	35	2500	415	30
	Stainless Steel	4000	575	35	2500	415	30
	Aluminum	NA	NA	NA	2500	415	30
832	Steel	4000	575	78	2500	415	50
	Stainless Steel	4000	575	78	2500	415	50
	Aluminum	NA	NA	NA	2500	415	50
032	Steel	4000	575	78	2500	415	50
	Stainless Steel	4000	575	78	2500	415	50
	Aluminum	NA	NA	NA	2500	415	50

Note: The above values are averages when correct installation is performed. Variations in holes size, material and installation will affect these results. For specific advice we strongly recommend consultation with your Bulten Technology Centre.