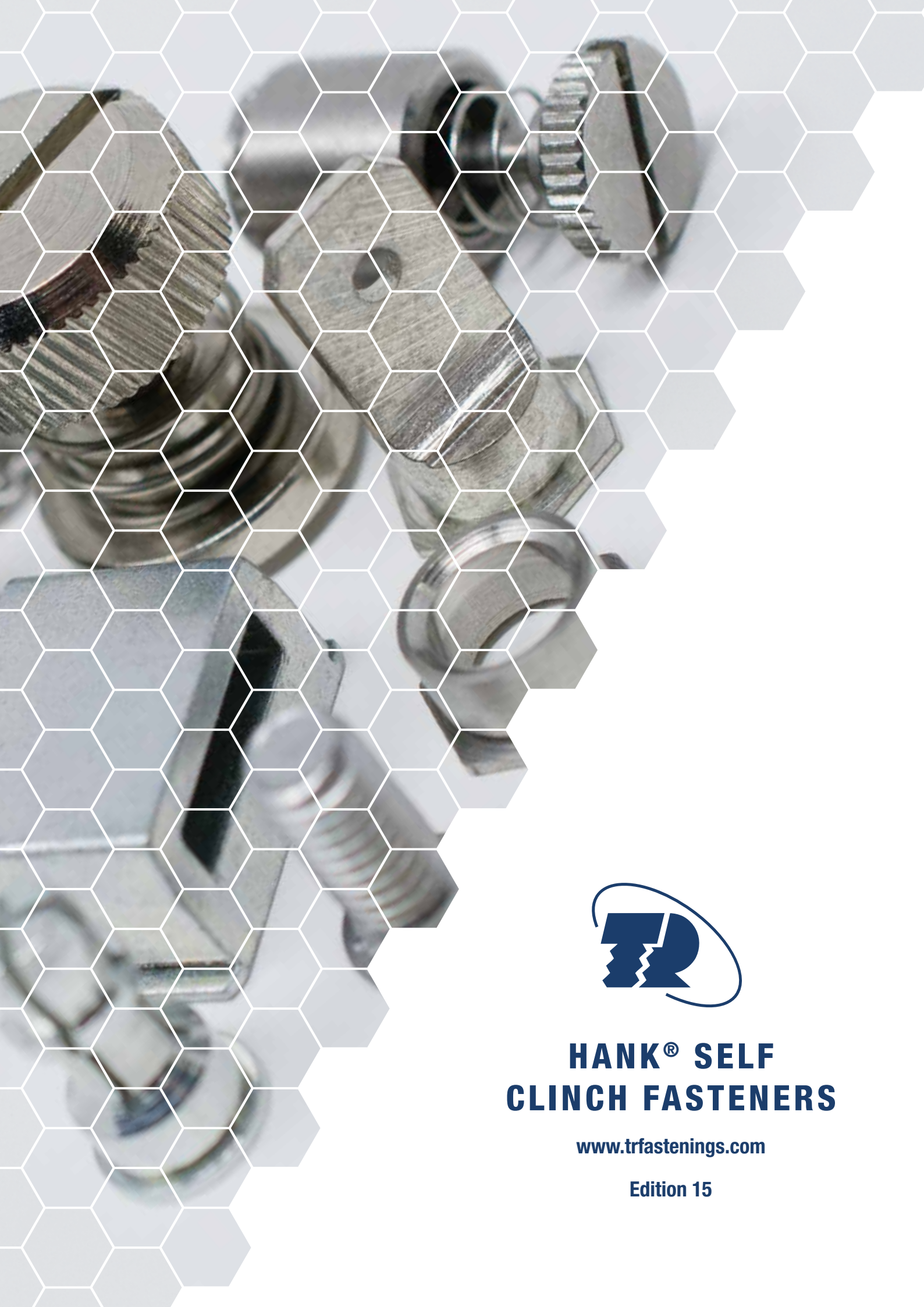

HANK® SELF CLINCH FASTENERS

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Edition 15

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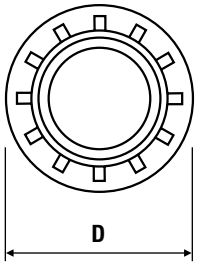
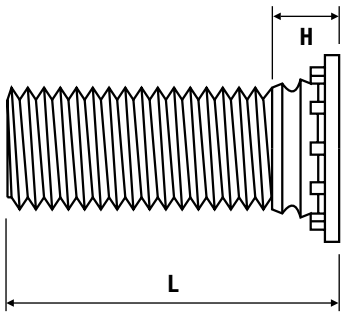




Metric Dimensions

Zinc Plated Steel: TR-FH | Stainless Steel: TR-FHS | 400 Series Stainless Steel: TR-FH4 | Aluminium: TR-FHA

Thread	M2	M2.5	M3	M3.5	M4	M5	M6	M8
D ±0.4	3.5	4.1	4.6	5.3	5.9	6.5	8.2	9.6
H max.	1.95	1.95	2.1	2.2	2.4	2.7	3.0	3.7
Min. sheet thickness	1.0	1.0	1.0	1.0	1.0	1.0	1.6	2.4
Recommended hole size +0.08	2.0	2.5	3.0	3.5	4.0	5.0	6.0	8.0
Min. distance to edge of sheet	5.2	5.4	5.6	6.4	7.2	7.2	7.9	9.6

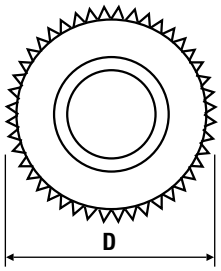
Length (L) ±0.4	5	6	8	10	12	15	16	18	20	22	25	28	30	35	38	40	45	50

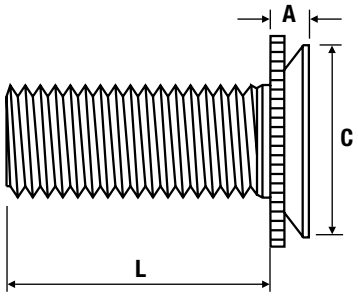
Metric Performance Data

Thread		M2	M2.5	M3	M3.5	M4	M5	M6	M8
Test sheet material	TR-FH4	Stainless steel							
	TR-FHS	Steel							
	TR-FH	Steel							
Installation (kN)	TR-FH4	-	40.0	41.0	-	51.0	54.0	71.0	73.5
	TR-FHS	13.5	13.5	14.7	-	26.0	32.0	44.0	49.9
	TR-FH	9.0	11.0	14.7	22.3	28.0	33.5	45.0	45.0
Push-out (N)	TR-FH4	-	-	2230	-	3300	3600	4210	-
	TR-FHS	700	740	820	1335	1790	2000	2500	2800
	TR-FH	700	740	820	1335	1800	2100	2600	2900
Torque-out (Nm)	TR-FH4	-	1.4	1.8	-	6.6	10.8	15.9	-
	TR-FHS	0.45	0.8	1.4	2.0	2.9	6.4	10.0	17.0
	TR-FH	0.45	1.0	1.7	2.8	4.3	6.8	12.0	19.5
Pull through (N)	TR-FH4	-	-	3300	-	8010	10020	14950	-
	TR-FHS	-	1800	2450	-	4800	6000	10600	13600
	TR-FH	1700	2700	3900	3780	5700	6300	11400	15500

TR-FH - Recommended for use in sheet hardness: HRB 80 or less
TR-FHS - Recommended for use in sheet hardness: HRB 70 or less
TR-FH4 - Recommended for use in sheet hardness: HRB 92 or less
TR-FHA - Recommended for use in sheet hardness: HRB 50 or less

Concealed Head Stud - 1.6mm Sheet TR-CHC/TR-CHA





Metric Dimensions

Stainless Steel: TR-CHC | Aluminium: TR-CHA

Thread	M3	M4	M5
D ±0.4	5.21	8.33	8.89
C max.	4.35	7.35	7.9
Blind mounting hole ±0.08	4.37	7.37	7.93
Min. distance to edge of sheet	4.0	5.6	6.4
Hole depth	1.10		
A max.	1.04		
Min. sheet thickness	1.60		

Length (L) ±0.4	6	8	10	12	20	25

Metric Performance Data (TR-CHC)

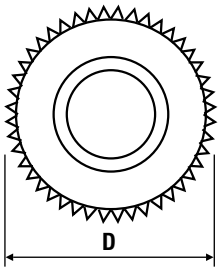
Thread	M3	M4	M5
Test sheet material	Steel		
Installation (kN)	8.0	17.8	22.2
Pull-out (N)	1065	1200	1290
Max. tightening torque (Nm)	0.5	2.0	3.6

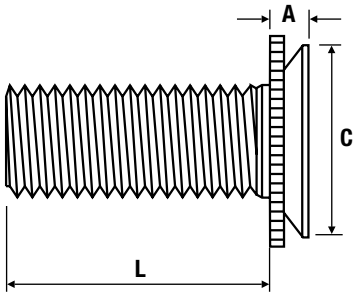
Metric Performance Data (TR-CHA)

Thread	M3	M4	M5
Test sheet material	Aluminium		
Installation (kN)	6.2	12.5	17.8
Pull-out (N)	555	645	755
Max. tightening torque (Nm)	0.3	1.2	2.2

TR-CHC - Recommended for use in sheet hardness: HRB 70 or less
TR-CHA - Recommended for use in sheet hardness: HRB 50 or less

Concealed Head Stud - 2.4mm Sheet TR-CFHC/TR-CFHA





Metric Dimensions

Stainless Steel: TR-CFHC | Aluminium: TR-CFHA

Thread	M3	M4	M5
D ±0.4	5.21	8.33	8.89
C max.	4.35	7.35	7.9
Blind mounting hole ±0.08	4.37	7.37	7.93
Min. distance to edge of sheet	4.0	5.6	6.4
Hole depth	1.91		
A max.	1.83		
Min. sheet thickness	2.40		

Length (L) ±0.4	6	8	10	12	20	25

Metric Performance Data (TR-CFHC)

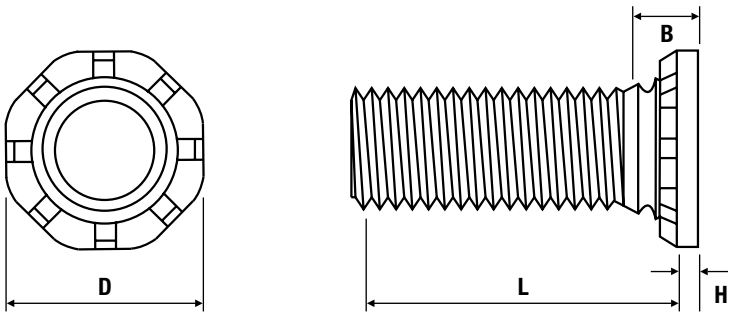
Thread	M3	M4	M5
Test sheet material	Steel		
Installation (kN)	8.9	14.7	17.8
Pull-out (N)	1065	1955	3020
Max. tightening torque (Nm)	0.5	2.0	3.6

Metric Performance Data (TR-CFHA)

Thread	M3	M4	M5
Test sheet material	Aluminium		
Installation (kN)	6.7	13.3	15.6
Pull-out (N)	845	1065	1330
Max. tightening torque (Nm)	0.3	1.2	2.2

TR-CFHC - Recommended for use in sheet hardness: HRB 70 or less
TR-CFHA - Recommended for use in sheet hardness: HRB 50 or less

Heavy Duty Stud TR-HFH/TR-HFHS



Metric Dimensions

Zinc Plated Steel: TR-HFH | Stainless Steel: TR-HFHS

Thread	M5	M6	M8	M10
D ±0.25	7.8	9.4	12.5	15.7
H max.	2.7	2.8	3.5	4.1
B max.	1.14	1.27	1.78	2.29
Min. sheet thickness	1.3	1.5	2.0	2.3
Recommended hole size +0.13	5.0	6.0	8.0	10.0
Min. distance to edge of sheet	10.7	11.5	12.7	13.7

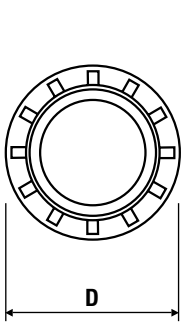
Length (L) ±0.4	10	12	15	16	18	20	25	30	35	40	50

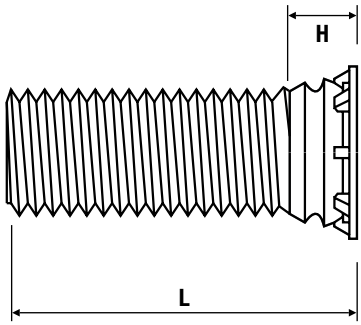
Metric Performance Data

Thread		M5	M6	M8	M10
Test sheet material		Steel			
Installation (kN)	TR-HFH	27	34	45	55
	TR-HFHS	22.5	25	38	47
Push-out (N)	TR-HFH	1550	1780	2210	3475
	TR-HFHS	1505	1780	2200	3500
Torque-out (Nm)	TR-HFH	7.7	14.5	30.1	49.5
	TR-HFHS	6.5	11.5	21	36.5

TR-HFH - Recommended for use in sheet hardness: HRB 85 or less
TR-HFHS - Recommended for use in sheet hardness: HRB 70 or less

Low Displacement Stud TR-FHL/TR-FHLS





Metric Dimensions

Zinc Plated Steel: TR-FHL | Stainless Steel: TR-FHLS

Thread	M2.5	M3	M4	M5
D ±0.4	3.15	3.65	4.65	5.9
H max.	2.1	2.1	2.4	2.7
Min. sheet thickness	1.0			
Recommended hole size +0.08	2.5	3.0	4.0	5.0
Min. distance to edge of sheet	2.8	3.3	4.3	5.6

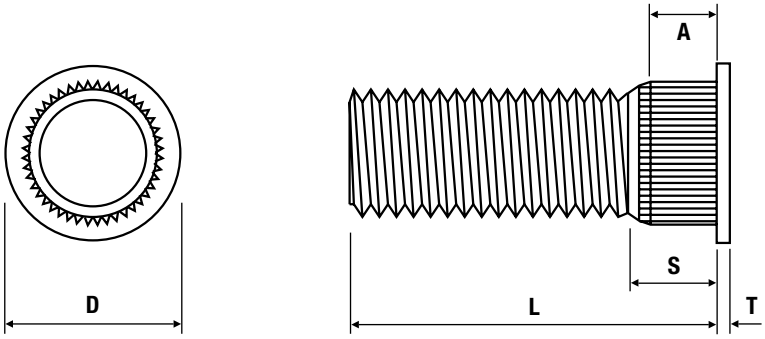
Length (L) ±0.4	6	8	10	12	15	18	20	25	30

Metric Performance Data

Thread	M2.5	M3	M4	M5
Test sheet material	Steel			
Test sheet thickness	1.1	1.1	1.1	1.1
Installation (kN)	5.4	5.4	6.7	20.1
Push-out (N)	450	475	555	1010
Torque-out (Nm)	1.2	1.3	2.2	4.5
Pull through (N)	2290	2550	3350	3760

TR-FHL- Recommended for use in sheet hardness: HRB 80 or less
TR-FHLS - Recommended for use in sheet hardness: HRB 70 or less

Broaching Stud TR-KFH



Metric Dimensions

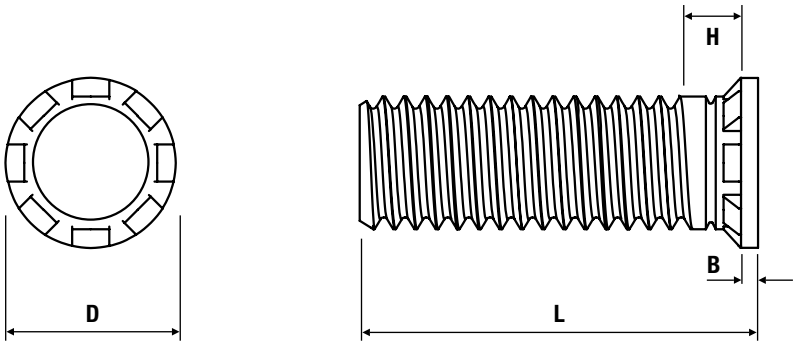
Electro-Tin Plated Phosphor Bronze: TR-KFH

Thread	M2.5	M3	M4	M5
D ±0.25	4.10	4.58	5.74	6.6
S max.	2.3	2.3	2.3	2.3
A max.	1.65	1.65	1.65	1.65
T ±0.13	0.51	0.51	0.51	0.51
Min. sheet thickness	1.53	1.53	1.53	1.53
Recommended hole size +0.08	2.6	3.0	4.2	5.0
Min. distance to edge of sheet	3.3	3.8	5.1	5.3

Length (L) ±0.4	6	8	10	12	15

TR-KFH - Recommended for use in sheet hardness: HRB 55 or less

Thin Sheet Stud TR-TFH/TR-TFHS



Metric Dimensions

Zinc Plated Steel: TR-TFH | Stainless Steel: TR-TFHS

Thread	M3	M4	M5
D ±0.25	4.5	5.8	6.4
H max.	1.8	1.8	2.3
B max.	0.64	0.64	0.64
Min. sheet thickness	0.51	0.51	0.51
Recommended hole size +0.08	3.0	4.0	5.0

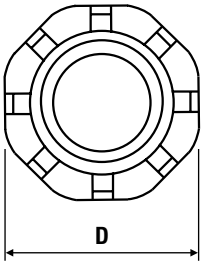
Length (L) ±0.4	6	8	10	12	15	18	20	25	30	35

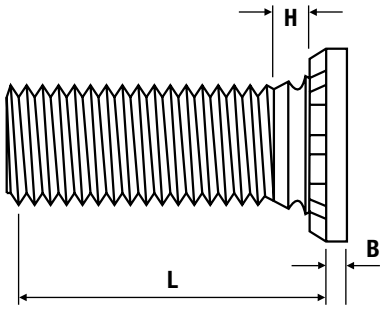
Metric Performance Data

Thread		M3	M4	M5
Test sheet material		Steel		
Installation (kN)	TR-TFH	7.9	17.8	22.1
	TR-TFHS	6.7	13.4	12.9
Push-out (N)	TR-TFH	410	450	550
	TR-TFHS	390	465	580
Torque-out (Nm)	TR-TFH	1.3	2.0	2.7
	TR-TFHS	0.8	2.5	3.0

TR-TFH - Recommended for use in sheet hardness: HRB 80 or less
TR-TFHS - Recommended for use in sheet hardness: HRB 70 or less

Heavy Duty Thin Sheet Stud TR-HFE





Metric Dimensions

Zinc Plated Steel: TR-HFE

Thread	M5	M6	M8
D ±0.25	9.60	11.35	15.30
H max.	2.60	2.80	3.30
B max.	1.35	1.52	2.13
Min. sheet thickness	1.0	1.0	1.5
Recommended hole size +0.13	5.0	6.0	8.0
Min. distance to edge of sheet	10.00	11.50	14.50

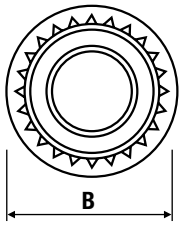
Length (L) ±0.4	8	15	18	20	25	30	35	40	50

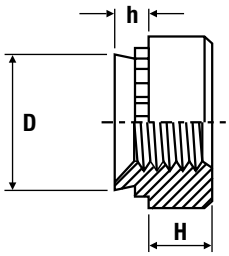
Metric Performance Data

Thread	M5	M6	M8
Test sheet material	Steel		
Max. nut tightening torque (Nm)	6.4	11.0	26.0
Installation (kN)	51.1	60.0	71.1
Push-out (N)	1350	1400	2400
Torque-out (Nm)	8.1	14.4	33.9
Tensile strength (kN)	12.8	18.1	32.9
Pull through (kN)	10.6	15.5	27.5
Bushing hole size for pull through (mm)	7.4	8.2	10.3

TR-HFE - Recommended for use in sheet hardness: HRB 85 or less

Nut TR-S/TR-CLS/TR-CLA/TR-SP4/TR-SP2





Metric Dimensions (TR-S/TR-CLS/TR-SP4/TR-SP2)

Zinc Plated Steel: TR-S | Stainless Steel: TR-CLS | 400 Series Stainless Steel: TR-SP4 | A286 Stainless Steel: TR-SP2 | Aluminium: TR-CLA

Thread	M2, M2.5, M3			M3alt			M3.5			M4			
Shank code	0	1	2	0	1	2	0	1	2	0	1	2	3
D max.	4.20			4.73			4.73			5.38			
B ±0.2	6.35			7.1			7.1			7.95			
H ±0.25	1.5			1.5			1.5			2.0			
h max.	0.77	0.97	1.38	0.77	0.97	1.38	0.77	0.97	1.38	0.77	0.97	1.38	2.21
Min. sheet thickness	0.8	1.0	1.4	0.8	1.0	1.4	0.8	1.0	1.4	0.8	1.0	1.4	2.3
Recommended hole size +0.08	4.22			4.75			4.75			5.41			
Min. distance to edge of sheet	4.8			5.6			5.6			6.9			

Thread	M5				M6					M8			M10		M12
Shank code	0	1	2	3	00	0	1	2	3	1	2	3	1	2	1
D max.	6.33				8.73					10.47			13.97		16.95
B ±0.2	8.75				11.10					12.65			17.35		20.55
H ±0.25	2.0				4.08					5.47			7.48		8.5
h max.	0.77	0.97	1.38	2.21	0.89	1.15	1.38	2.21	3.05	1.38	2.21	3.05	2.21	3.05	3.05
Min. sheet thickness	0.8	1.0	1.4	2.3	0.92	1.2	1.4	2.3	3.2	1.4	2.3	3.2	2.3	3.2	3.2
Recommended hole size +0.08	6.35				8.75					10.5			14.0		17.0
Min. distance to edge of sheet	7.1				8.6					9.7			13.5		16.0

Metric Dimensions (TR-CLA)

Thread	M2		M3		M3.5		M4		M5		M6	
Shank code	1	2	1	2	1	2	1	2	1	2	1	2
D max.	4.22		4.73		5.38		5.97		7.47		8.72	
B ±0.2	6.3		6.3		7.1		7.9		9.5		11.05	
H ±0.25	1.5		2.0		2.0		3.0		3.8		4.08	
h max.	0.98	1.38	0.98	1.38	0.98	1.38	0.98	1.38	0.98	1.38	1.38	2.21
Min. sheet thickness	1.0	1.4	1.0	1.4	1.0	1.4	1.0	1.4	1.0	1.4	1.4	2.3
Recommended hole size +0.08	4.25		4.75		5.4		6.0		7.5		8.75	
Min. distance to edge of sheet	4.8		5.6		6.9		7.1		7.9		8.6	

Nut TR-S/TR-CLS/TR-CLA/TR-SP4/TR-SP2

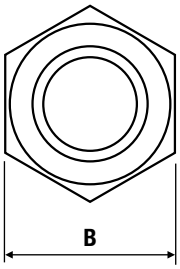
Metric Performance Data (TR-S/TR-CLS)

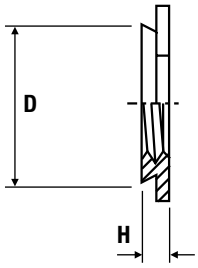
Thread	**M2, M2.5**			**M3**				**M3alt**			**M3.5**			**M4**			
Test material	Steel																
Shank code	0	1	2	0	1	2	3	0	1	2	0	1	2	0	1	2	3
Installation (kN)	11.2 - 15.6			11.2 - 15.6				13.4 - 26.7			13.4 - 26.7			18 - 27			
Torque-out (Nm)	1.5	1.75	2.0	1.5	1.75	2.0	2.1	1.8	2.4	2.4	1.8	2.4	2.4	3.0	4.0	5.0	4.2
Push-out (N)	480	560	1020	480	560	1020	1110	485	575	1200	485	575	1200	495	650	1255	1300

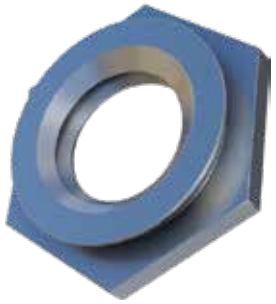
Thread	**M5**				**M6**			**M8**			**M10**		**M12**
Test material	Steel												
Shank code	0	1	2	3	1	2	3	1	2	3	1	2	1
Installation (kN)	18 - 38				27 - 36			27 - 36			32 - 50		33 - 49
Torque-out (Nm)	3.7	4.5	6.9	6.0	17.1	17.1	16.4	18.8	20.4	18.1	36.1	36.1	73.9
Push-out (N)	535	801	1115	1500	1765	1765	1755	1870	1870	1860	2021	2021	3065

TR-S - Recommended for use in sheet hardness: HRB 80 or less
TR-CLS - Recommended for use in sheet hardness: HRB 70 or less
TR-SP4/SP2 - Recommended for use in sheet hardness: HRB 90 or less
TR-CLA - Recommended for use in sheet hardness: HRB 50 or less

Flush Nut TR-F/TR-F4







Metric Dimensions

Stainless Steel: TR-F | 400 Series Stainless Steel TR-F4

Thread	M2, M2.5		M3		M3alt		M3.5		M4		M5		M6		
Shank code	1	2	1	2	1	2	1	2	1	2	1	2	3	4	5
D max.	4.35		4.35		5.35		5.35		7.35		7.90		8.72		
B nom.	4.8		4.8		6.4		6.4		7.9		8.7		9.5		
H max.	1.53	2.3	1.53	2.3	1.53	2.3	1.53	2.3	1.53	2.3	1.53	2.3	3.05	3.84	4.63
Sheet thickness	1.53 - 2.3	2.32 min.	1.53 - 2.3	2.32 min.	1.53 - 2.3	2.32 min.	1.53 - 2.3	2.32 min.	1.53 - 2.3	2.32 min.	1.53 - 2.3	2.32 min.	3.18 - 3.94	3.96 - 4.72	4.75 min.
Recommended hole size +0.08	4.37		4.37		5.4		5.4		7.37		7.92		8.74		
Min. distance to edge of sheet	6.0		6.0		6.5		6.5		7.2		8.0		8.8		

Metric Performance Data (TR-F)

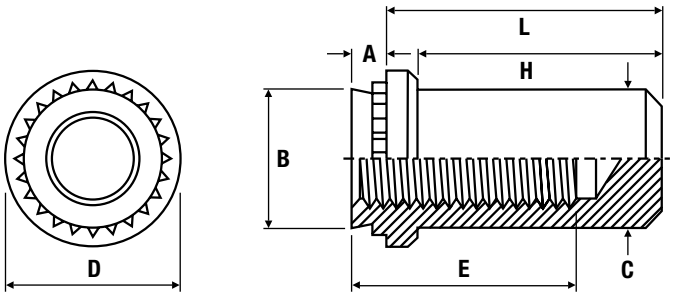
Thread	M2, M2.5		M3		M3alt		M3.5		M4		M5		M6		
Shank code	1	2	1	2	1	2	1	2	1	2	1	2	3	4	5
Test sheet material	Steel														
Test sheet thickness	1.5	2.3	1.5	2.3	1.5	2.3	1.5	2.3	1.5	2.3	1.5	2.3	3.1	3.9	4.75
Installation (kN)	13.5		13.5		13.5		13.5		18.0		22.0		26.5		
Push-out (N)	900		900		1100		1100		1060		1060		3700		

Metric Performance Data (TR-F4)

Thread	M2, M2.5		M3		M4		M5		M6		
Shank code	1	2	1	2	1	2	1	2	3	4	5
Test sheet material	300 series stainless steel										
Test sheet thickness	1.5	2.3	1.5	2.3	1.5	2.3	1.5	2.3	3.1	3.9	4.75
Installation (kN)	32		32		40		40		65		
Push-out (N)	1200		1200		2000		2000		4500		

TR-F - Recommended for use in sheet hardness: HRB 70 or less
TR-F4 - Recommended for use in sheet hardness: HRB 80 or less

Blind Nut TR-B/TR-BS



Metric Dimensions

Zinc Plated Steel: TR-B | Stainless Steel: TR-BS

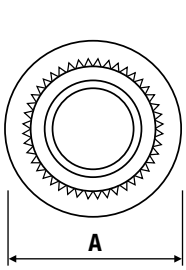
Thread	M3		M4		M5		M6	
Shank code	1	2	1	2	1	2	1	2
A max.	0.97	1.38	0.97	1.38	0.97	1.38	1.38	2.21
Min. sheet thickness	1.0	1.4	1.0	1.4	1.0	1.4	1.4	2.29
Recommended hole size +0.08	4.22		5.41		6.35		8.75	
B max.	4.20		5.38		6.33		8.73	
C max.	3.84		5.2		6.02		7.8	
D ±0.25	6.35		7.95		8.75		11.1	
E min.	5.3		7.1		7.1		7.8	
H ±0.25	9.6		11.2		11.2		14.3	
L max.	8.5		9.8		9.8		12.7	
Min. distance to edge of sheet	4.8		6.9		7.1		8.6	

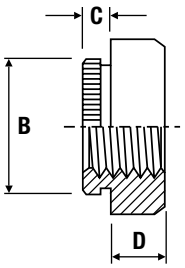
Metric Performance Data

Thread	M3		M4		M5		M6	
Shank code	1	2	1	2	1	2	1	2
Test sheet material	Steel							
Sheet thickness	1.0	1.4	1.0	1.4	1.0	1.4	1.4	2.3
Installation (kN)	11.5	14.0	16.0	21.0	18.0	25.0	26.0	26.0
Push-out (N)	572	1020	605	1256	630	1110	1782	1782
Torque-out (Nm)	1.7	2.15	3.5	5.1	4.1	6.9	11.9	11.9

TR-B - Recommended for use in sheet hardness: HRB 80 or less
TR-BS - Recommended for use in sheet hardness: HRB 70 or less

Broaching Nut TR-KF2/TR-KFS2





Metric Dimensions

Electro Tin Plated Steel: TR-KF2 | Stainless Steel: TR-KFS2

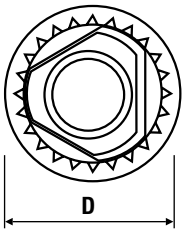
Thread	M2	M2.5	M3	M3.5	M4	M5
C max.	1.53	1.53	1.53	1.53	1.53	1.53
B ±0.08	4.19	4.68	4.68	5.88	6.86	7.37
A ±0.13	5.56	5.56	5.56	7.0	8.74	9.53
D ±0.13	1.5	1.5	1.5	1.6	2.0	3.0
Min. sheet thickness	1.53	1.53	1.53	1.53	1.53	1.53
Recommended hole size +0.08	3.73	4.22	4.22	5.5	6.40	6.90
Min. distance to edge of sheet	4.2	4.4	4.4	5.5	6.4	7.1

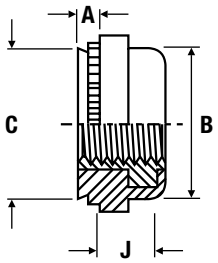
Metric Performance Data

Thread	M2	M2.5	M3	M3.5	M4	M5
Test sheet material	FR4 fibreglass					
Test sheet thickness	1.5					
Installation (kN)	2.2	2.2	2.2	2.2	2.2	2.9
Torque-out (Nm)	0.70	0.70	1.70	1.70	3.40	4.55
Push-out (N)	260	260	290	290	420	440

TR-KF2 - Recommended for use in sheet hardness: HRB 60 or less
TR-KFS2 - Recommended for use in sheet hardness: HRB 70 or less

Non-Locking Floating Nut TR-AS/TR-AC





Metric Dimensions

Zinc Plated Steel: TR-AS | Stainless Steel: TR-AC

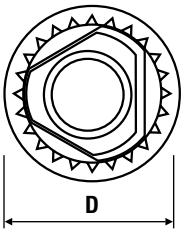
Thread	M3		M4		M5		M6
Shank code	1	2	1	2	1	2	2
A max.	0.97	1.38	0.97	1.38	0.97	1.38	1.38
Min. sheet thickness	0.97	1.38	0.97	1.38	0.97	1.38	1.38
Recommended hole size +0.08	7.37		9.35		10.31		13.08
B max.	7.35		9.33		10.29		13.06
C max.	7.37		9.28		10.29		12.96
D ±0.4	9.14		11.18		11.94		15.24
J max.	3.31		3.31		4.32		5.34
Min. distance to edge of sheet	7.62		8.64		9.14		10.67

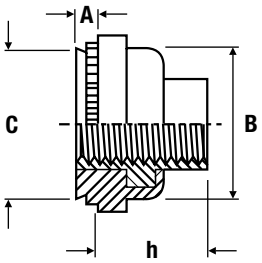
Metric Performance Data

Thread	M3		M4		M5		M6
Shank code	1	2	1	2	1	2	2
Test sheet material	Steel						
Installation (kN)	13.3	13.3	13.3	13.3	15.6	15.6	22.2
Push-out (N)	1340	1340	1340	1784	1789	2009	2226
Torque-out (Nm)	9.7	17.0	17.0	22.8	17.0	22.9	36.9

TR-AS - Recommended for use in sheet hardness: HRB 70 or less
TR-AC - Recommended for use in sheet hardness: HRB 70 or less

Locking Floating Nut TR-LAS/TR-LAC





Metric Dimensions

Zinc Plated Steel: TR-LAS | Stainless Steel: TR-LAC

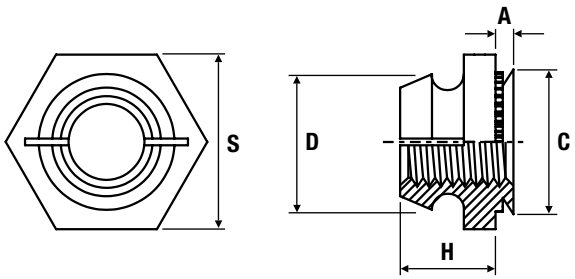
Thread	M3		M4		M5		M6
Shank code	1	2	1	2	1	2	2
A max.	0.97	1.38	0.97	1.38	0.97	1.38	1.38
Min. sheet thickness	0.97	1.38	0.97	1.38	0.97	1.38	1.38
Recommended hole size +0.08	7.37		9.35		10.31		13.08
B max.	7.35		9.33		10.29		13.06
C max.	7.37		9.28		10.29		12.96
D ±0.4	9.14		11.18		11.94		15.24
h max.	4.83		5.34		6.86		7.88
Min. distance to edge of sheet	7.62		8.64		9.14		10.67

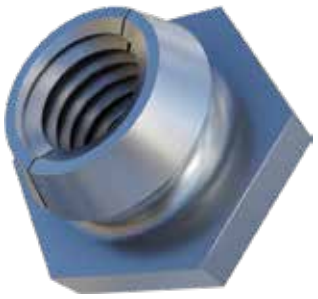
Metric Performance Data

Thread	M3		M4		M5		M6
Shank code	1	2	1	2	1	2	2
Test sheet material	Steel						
Installation (kN)	13.3	13.3	13.3	13.3	15.6	15.6	22.2
Push-out (N)	1340	1340	1340	1784	1789	2009	2226
Torque-out (Nm)	9.7	17.0	17.1	22.8	16.9	22.9	36.9

TR-LAS - Recommended for use in sheet hardness: HRB 70 or less
TR-LAC - Recommended for use in sheet hardness: HRB 70 or less

Locking Nut TR-LK/TR-LKS





Metric Dimensions

Zinc Plated Steel: TR-LK | Stainless Steel: TR-LKS

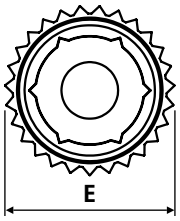
Thread	M2.5		M3		M4		M5	
Shank code	1	2	1	2	1	2	1	2
A shank max.	0.97	1.38	0.97	1.38	0.97	1.38	0.97	1.38
Min. sheet thickness	1.0	1.4	1.0	1.4	1.0	1.4	1.0	1.4
Recommended hole size +0.08	4.37		4.75		6.76		7.92	
C max.	4.35		4.73		6.73		7.90	
D max.	4.45		4.85		6.20		7.40	
S nom.	6.35		6.35		8.73		9.53	
H ±0.25	3.43		3.43		4.45		5.21	
Min. distance to edge of sheet	3.90		4.00		5.20		5.60	

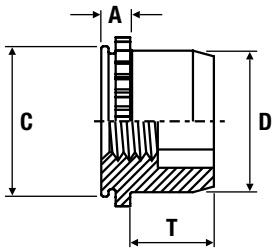
Metric Performance Data

Thread	M2.5		M3		M4		M5	
Shank code	1	2	1	2	1	2	1	2
Test sheet material	Steel							
Installation (kN)	13.3	13.3	13.3	13.3	17.8	19.1	17.8	19.1
Push-out (N)	667	711	667	1112	845	1334	1112	1334
Torque-out (Nm)	2.3	2.3	3.4	4.5	5.6	7.9	11.3	13.6

TR-LK/LKS - Recommended for use in sheet hardness: HRB 70 or less

Nylon Lock Nut TR-PL/TR-PLC





Metric Dimensions

Zinc Plated Steel: TR-PL | Stainless Steel: TR-PLC

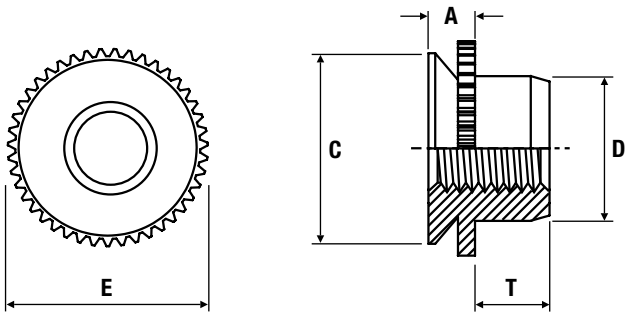
Thread	M3	M4	M5
A max.	1.53	1.53	1.53
Sheet thickness	1.0 - 1.78	1.0 - 1.78	1.0 - 1.78
Recommended hole size +0.08	6.0	7.5	8.0
C max.	5.98	7.48	7.98
D max.	5.52	7.01	7.52
E max.	7.01	8.54	9.0
T max.	3.56	4.2	4.45
Min. distance to edge of sheet	4.32	5.59	6.35
Max. hole in attached parts	3.5	4.5	5.5

Metric Performance Data

Thread	M3	M4	M5
Test sheet material	Steel		
Installation (kN)	13.34	13.34	13.34
Push-out (N)	1156	1290	1557
Torque-out (Nm)	2.25	6.77	7.90

TR-PL- Recommended for use in sheet hardness: HRB 70 or less
TR-PLC - Recommended for use in sheet hardness: HRB 70 or less

Non-Locking Mini Squeezed Nut TR-U/TR-FEX/TR-FEOX



Metric Dimensions (TR-U)

Stainless Steel: TR-U/TR-FEX/TR-FEOX

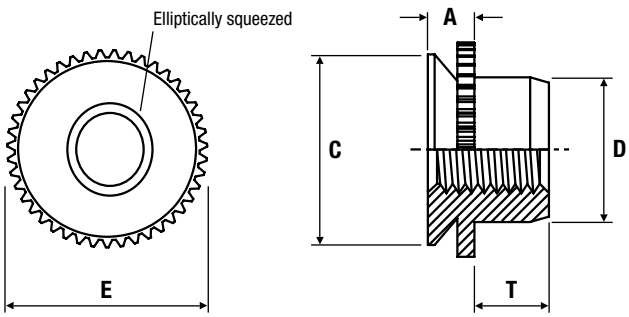
Thread	M2
E ±0.13	4.07
A (shank) max.	0.79
C -0.13	3.60
D max.	2.50
T +0.4	1.65
Sheet thickness	0.76 - 0.91
Recommended hole size +0.08	3.61
Min. distance to edge of sheet	2.80

Metric Dimensions (TR-FEX/TR-FEOX)

Thread		M3	M4	M5	M6
E ±0.13		4.88	8.17	8.17	9.74
A (shank) max.	FEX	1.53	1.53	1.53	1.53
	FEOX	1.02	1.02	1.02	1.02
C -0.13		4.37	7.37	7.37	8.72
D max.		3.96	5.23	6.48	7.72
T +0.4		1.9	2.55	3.05	3.3
Sheet thickness	FEX	1.5 - 1.78	1.5 - 1.78	1.5 - 1.78	1.5 - 1.78
	FEOX	0.99 - 1.14	0.99 - 1.14	0.99 - 1.14	0.99 - 1.14
Hole size in sheet +0.08		4.39	7.39	7.39	8.74
Min. distance to edge of sheet		3.6	5.2	5.2	7.1

TR-U/FEX/FEOX - Recommended for use in sheet hardness: HRB 70 or less

Self-Locking Mini Squeezed Nut TR-UL/TR-FE/TR-FEO



Metric Dimensions (TR-UL)

Stainless Steel: TR-UL/TR-FE/TR-FEO

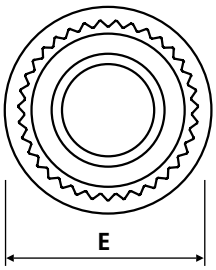
Thread	M2
E ±0.13	4.07
A (shank) max.	0.76
C -0.13	3.60
D max.	2.50
T +0.4	1.65
Sheet thickness	0.76 - 0.91
Recommended hole size +0.08	3.61
Min. distance to edge of sheet	2.80

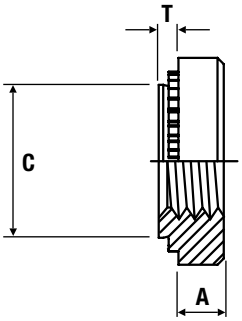
Metric Dimensions (TR-FE/TR-FEO)

Thread		M3	M4	M5	M6
E ±0.13		4.88	8.17	8.17	9.74
A (shank) max.	FE	1.53	1.53	1.53	1.53
	FEO	1.02	1.02	1.02	1.02
C -0.13		4.37	7.37	7.37	8.72
D max.		3.96	5.23	6.48	7.72
T +0.4		1.9	2.55	3.05	3.3
Sheet thickness	FE	1.5 - 1.78	1.5 - 1.78	1.5 - 1.78	1.5 - 1.78
	FEO	0.99 - 1.14	0.99 - 1.14	0.99 - 1.14	0.99 - 1.14
Hole size in sheet +0.08		4.39	7.39	7.39	8.74
Min. distance to edge of sheet		3.6	5.2	5.2	7.1

TR-UL/FE/FEO - Recommended for use in sheet hardness: HRB 70 or less

Thin Sheet Nut TR-SMPS





Metric Dimensions

Zinc Plated Steel: TR-SMPS

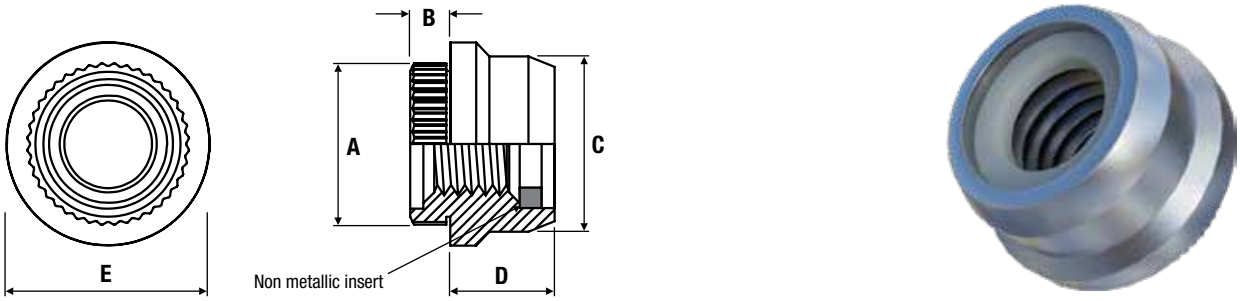
Thread	M2.5	M3	M3.5
A shank max.	0.61		
Min. sheet thickness	0.64		
Recommended hole size +0.08	3.8	4.24	4.75
C max.	3.79	4.22	4.73
E ±0.25	5.6	5.6	6.4
T ±0.25	1.4		
Min. distance to edge of sheet	3.7	4.3	5.1

Metric Performance Data

Thread	M2.5	M3	M3.5
Test sheet material	Steel		
Installation (kN)	6.7	8.0	8.8
Push-out (N)	156	267	289
Torque-out (Nm)	1.13	1.35	1.58

TR-SMPS - Recommended for use in sheet hardness: HRB 70 or less

Nylon Insert Broaching Nut TR-CFN



Metric Dimensions

Stainless Steel: TR-CFN

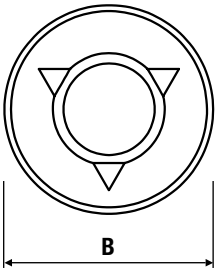
Thread	M3
A	4.11
B	1.02
C	4.45
D	2.65
E max.	5.19
Min. sheet thickness	1.1
Recommended hole size +0.08	3.8
Min. distance to edge of sheet	2.93

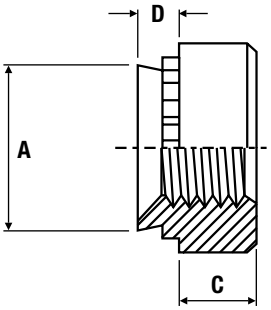
Metric Performance Data

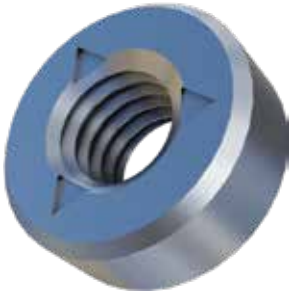
Thread	M3
Test sheet material	Steel
Installation (kN)	4.45
Push-out (N)	44.5
Torque-out (Nm)	0.45

TR-CFN - Recommended for use in sheet hardness: HRB 60 or less

Thread Lock Feature Nut TR-SL







Metric Dimensions

Zinc Plated Steel: TR-SL

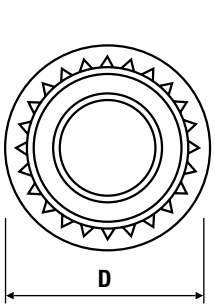
Thread	M3		M3.5		M4		M5		M6		M8	
Length code	1	2	1	2	1	2	1	2	1	2	1	2
A	4.2		4.73		5.38		6.33		8.73		10.47	
B	6.35		7.11		7.87		8.64		11.18		12.7	
C	1.5		1.5		2.0		2.0		4.08		5.47	
D	0.98	1.38	0.98	1.38	0.98	1.38	0.98	1.38	1.38	2.21	1.38	2.21
Min. sheet thickness	1.0	1.4	1.0	1.4	1.0	1.4	1.0	1.4	1.4	2.3	1.4	2.3
Recommended hole size +0.08	4.22		4.75		5.41		6.35		8.75		10.5	
Min. distance to edge of sheet	4.8		5.6		6.9		7.1		8.6		9.7	

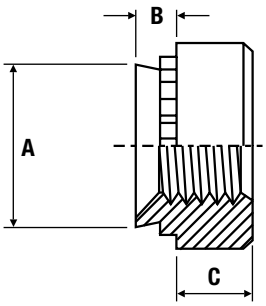
Metric Performance Data

Thread	M3		M3.5		M4		M5		M6		M8	
Length code	1	2	1	2	1	2	1	2	1	2	1	2
Test sheet material	Steel											
Installation (kN)	11.2 - 15.6		13.4 - 26.7		18.0 - 27.0		18.0 - 38.0		27.0 - 36.0		27.0 - 36.0	
Torque-out (Nm)	1.7	2.03	2.3	2.3	4.0	5.1	4.5	6.8	17.0	17.0	18.7	20.3
Push-out (N)	550	1010	570	1210	645	1250	800	1112	1760	1760	1870	1870

TR-SL - Recommended for use in sheet hardness: HRB 80 or less

Non-Locking H Nut TR-H





Metric Dimensions

Stainless Steel: TR-H

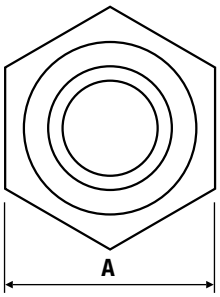
Thread	M10
A	12.67
B	1.48
C	7.9
D	16.5
Min. sheet thickness	1.48
Recommended hole size +0.08	12.7 - 12.83
Min. distance to edge of sheet	12

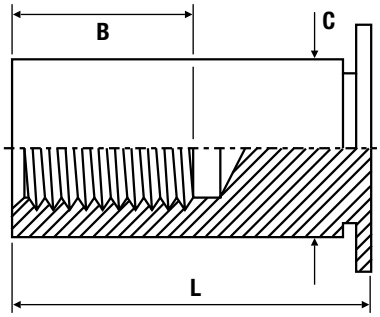
Metric Performance Data

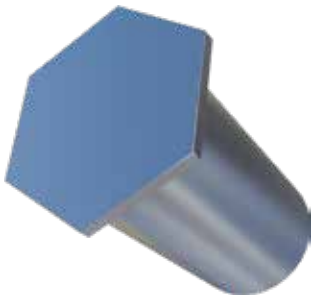
Thread	M10
Test sheet material	Steel
Installation (kN)	33
Push-out (N)	2020
Torque-out (Nm)	27.1

TR-H - Recommended for use in sheet hardness: HRB 80 or less

Blind Standoff TR-BSO/TR-BSOS/TR-BSOA/TR-BSO4







Metric Dimensions

Zinc Plated Steel: TR-BSO | Stainless Steel: TR-BSOS | Aluminium: TR-BSOA | 400 Series Stainless Steel: TR-BSO4

Thread	M2, M2.5, M3	M3alt	M4	M5
C -0.13	4.2	5.39	7.12	7.12
A nom.	4.8	6.4	7.9	7.9
Min. sheet thickness	1.0	1.0	1.27	1.27
Recommended hole size +0.08	4.22	5.41	7.14	7.14
Min. distance to edge of sheet	6.0	6.8	8.0	8.0

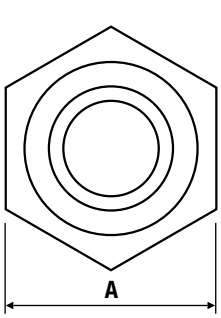
(L) Length +0.05/-0.13	5	6	7	8	9	10	12	14	15	16	18	20	22	25
(B) Thread depth - min.	2.8	3.2	3.6	4.0			5.0	6.5			9.5			

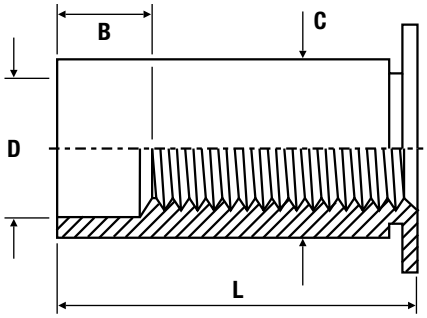
Metric Performance Data (TR-BSO/TR-BSOS)

Thread	M2, M2.5, M3	M3alt	M4	M5
Test sheet material	Steel			
Installation (kN)	9.9	14.8	17.9	17.9
Torque-out (Nm)	2.16	3.95	8.5	8.5
Push-out (N)	1050	1870	2500	2500

TR-BSO - Recommended for use in sheet hardness: HRB 80 or less
TR-BSOS - Recommended for use in sheet hardness: HRB 70 or less
TR-BSOA - Recommended for use in sheet hardness: HRB 50 or less
TR-BSO4 - Recommended for use in sheet hardness: HRB 88 or less

Through Standoff TR-SO/TR-SOS/TR-SOA/TR-SO4





Metric Dimensions

Zinc Plated Steel: TR-SO | Stainless Steel: TR-SOS | Aluminium: TR-SOA | 400 Series Stainless Steel: TR-SO4

Thread	M2, M2.5, M3	M3alt	M4	M5
C -0.13	4.2	5.39	7.12	7.12
D counter-bore diameter -0.13	3.2	3.2	4.8	5.35
A nom.	4.8	6.4	7.9	7.9
Min. sheet thickness	1.0	1.0	1.27	1.27
Recommended hole size +0.08	4.22	5.41	7.14	7.14
Min. distance to edge of sheet	6.0	6.8	8.0	8.0

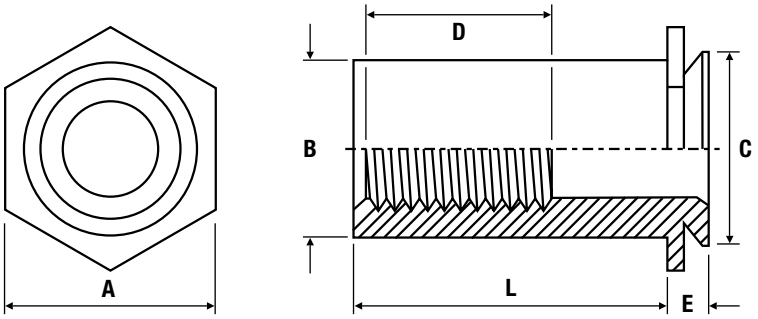
(L) Length +0.05/-0.13	3	4	5	6	7	8	9	10	12	14	15	16	18	20	22	25
(B) Thread depth - min.	N/A						4					8			11	

Metric Performance Data (TR-SO/TR-SOS)

Thread	M2, M2.5, M3	M3alt	M4	M5
Test sheet material	Steel			
Installation (kN)	9.9	14.8	17.9	17.9
Torque-out (Nm)	2.16	3.95	8.5	8.5
Push-out (N)	1050	1870	2500	2500

TR-SO - Recommended for use in sheet hardness: HRB 80 or less
TR-SOS - Recommended for use in sheet hardness: HRB 70 or less
TR-SOA - Recommended for use in sheet hardness: HRB 50 or less
TR-SO4 - Recommended for use in sheet hardness: HRB 88 or less

Concealed Head Standoff for 1.6mm Sheet TR-CSS



Metric Dimensions

Stainless Steel: TR-CSS

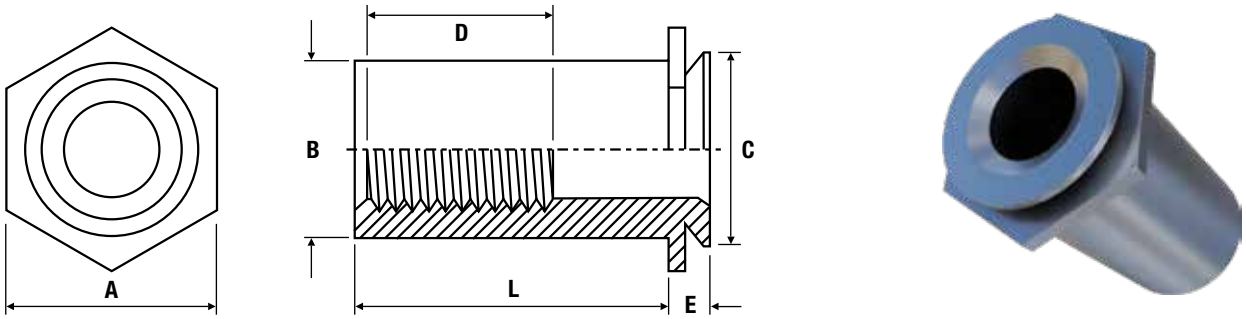
Thread	M3	M4	M5
A	6.35	8.73	9.53
B	4.2	6.23	7.37
C	5.39	7.9	8.72
D	5.0	6.5	9.6
Blind mounting hole ±0.8	5.41	7.92	8.74
Min. distance to edge of sheet	4.8	6.4	7.2
Hole depth	1.09	1.09	1.09
E min. depth of blind hole	1.04	1.04	1.04
Min. sheet thickness	1.6	1.6	1.6

Metric Performance Data

Thread	M3	M4	M5
Test sheet material	Steel		
Installation (kN)	17.8	21.3	24.5
Push-out (N)	1330	1775	2000
Max. tightening torque (Nm)	0.55	2.0	3.6

TR-CSS - Recommended for use in sheet hardness: HRB 70 or less

Concealed Head Standoff for 2.4mm Sheet TR-CSOS



Metric Dimensions

Stainless Steel: TR-CSOS

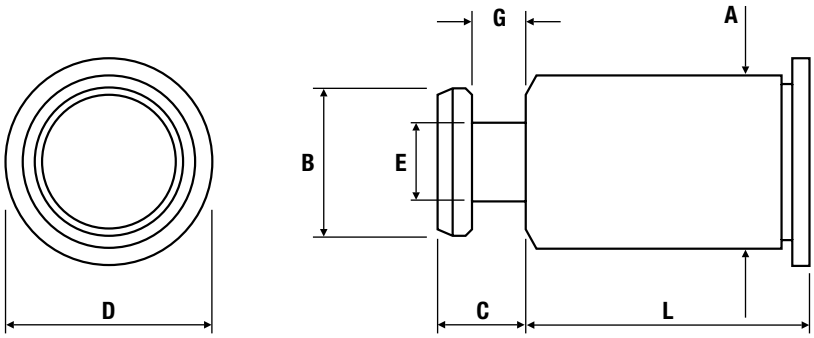
Thread	M3	M4	M5	M6
A	6.35	8.73	9.53	11.11
B	4.2	6.23	7.37	9.0
C	5.39	7.9	8.72	9.89
D	5.0	6.5	9.6	9.6
Blind mounting hole ±0.8	5.41	7.92	8.74	9.9
Min. distance to edge of sheet	4.8	6.4	7.2	9.5
Hole depth	1.91	1.91	1.91	1.91
E min. depth of blind hole	1.83	1.83	1.83	1.83
Min. sheet thickness	2.4	2.4	2.4	2.4

Metric Performance Data

Thread	M3	M4	M5	M6
Test sheet material	Steel			
Installation (kN)	19.2	23.6	26.7	28.9
Push-out (N)	1465	1955	2665	2860
Max. tightening torque (Nm)	0.55	2.00	3.60	7.20

TR-CSOS - Recommended for use in sheet hardness: HRB 70 or less

Hole Slide Standoff TR-SKC



Metric Dimensions

Stainless Steel: TR-SKC

Body size - Sheet code	61.5
A max.	5.39
B ±0.08	4.5
C max.	2.75
D nom.	6.35
E	2.51
G ± 0.08	1.73
Recommended hole size + 0.08	5.5

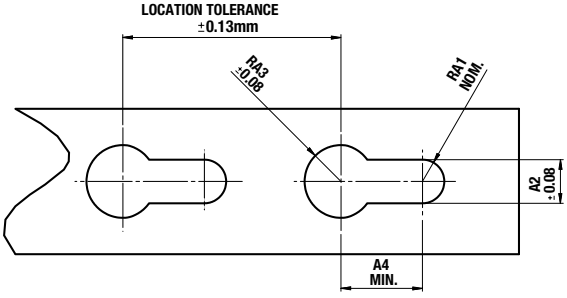
Length (L) ±0.13	2	4	6	8	10	12	14	16	18	20	22	25

Metric Performance Data

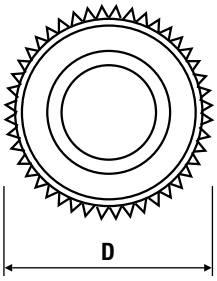
Body size - Sheet code	61.5
Test sheet material	Steel
Test sheet thickness	1.52
Installation (kN)	14.3
Push-out (N)	2650

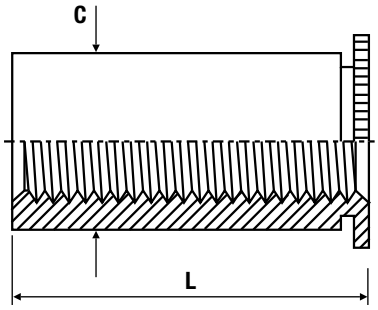
Part number	Panel 1 - Metal HRB50					Panel 2 - PC board or metal					
	Bottom mounting hole +0.08	Max. hardness	Min. thickness	Min. distance to edge of sheet	Max. location tolerance	Top mounting hole +0.08				Thickness range	Min. distance to edge of sheet
						A1 Nom.	A2 ±0.08	A3 ±0.08	A4 min.		
TR-SKC	5.4	HRB 70	1.0	6.6	±0.13	1.5	3.0	5.0	3.75	1.45 - 1.62	4.1

TR-SKC - Recommended for use in sheet hardness: HRB 70 or less



Close To Edge Standoff TR-DSO/TR-DSOS





Metric Dimensions

Zinc Plated Steel: TR-DSO | Stainless Steel: TR-DSOS

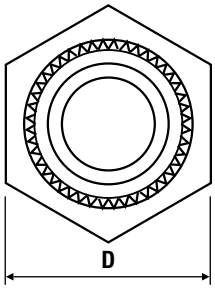
Thread	M3	
(L) Length +0.05 -0.13	6.35	7.0
C max.	4.2	
D nom.	4.92	
Sheet thickness	0.94 - 6.35	
Recommended hole size +0.08	4.2	
Min. distance to edge of sheet	3.2	

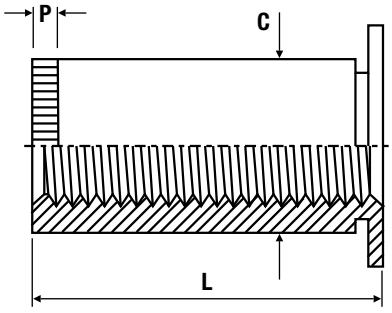
Metric Performance Data

Thread	M3
Test sheet material	Steel
Installation (kN)	5.85
Push-out (N)	334
Torque-out (Nm)	1.2

TR-DSO - Recommended for use in sheet hardness: HRB 80 or less
TR-DSOS - Recommended for use in sheet hardness: HRB 70 or less

Grounding Standoff TR-SOSG





Metric Dimensions

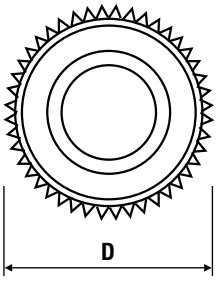
Stainless Steel: TR-SOSG

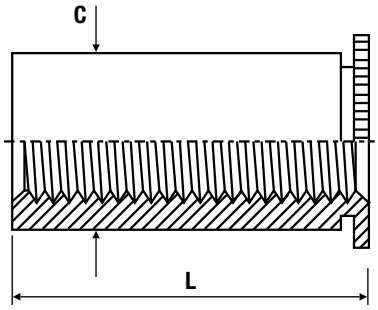
Thread	M3
C ± 0.13	5.39
D nom.	6.4
Min. sheet thickness	1.0
P knurling	0.76
Recommended hole size +0.08	5.4
Min. distance to edge of sheet	6.8

Length (L) ±0.13	3	4	6	8	10	12

TR-SOSG - Recommended for use in sheet hardness: HRB 70 or less

Clip-on Standoff TR-SSS/TR-SSC/TR-SSA





Metric Dimensions

Zinc Plated Steel: TR-SSS | Stainless Steel: TR-SSC | Aluminium: TR-SSA

Top panel mounting hole diameter	**4mm**
A max.	5.39
B ±0.13	4.78
C ±0.13	3.58
D ±0.13	6.35
Recommended hole size +0.08	5.4

Length (L) ±0.13	8	10	12	14	16	18	20	22	25

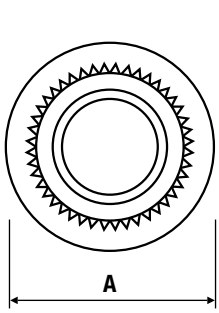
Part number	Panel 1 - Metal HRB50					Panel 2 - PCB or metal			
	Bottom mounting hole +0.08	Max. hardness	Min. thickness	Min. distance to edge of sheet	Max. location tolerance	Top mounting hole +0.08	Max. hardness	Thickness range	Min. distance to edge of sheet
TR-SSS	5.41	HRB 60	1.0	6.6	±0.13	4.0	No limit	1-1.8	2.54
TR-SSC		HRB 70							
TR-SSA		HRB 50							

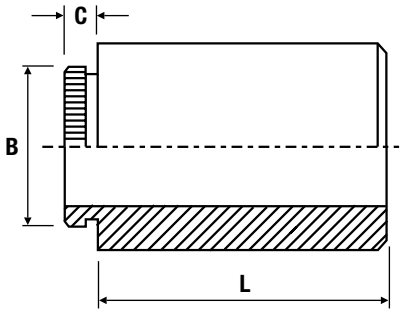
Metric Performance Data

Type	TR-SSS	TR-SSC	TR-SSA
Test sheet material	Steel	Steel	Aluminium
Installation (kN)	15.6	16.5	6.7
Push-out (N)	1785	1785	880

TR-SSS - Recommended for use in sheet hardness: HRB 60 or less
TR-SSC - Recommended for use in sheet hardness: HRB 70 or less
TR-SSA - Recommended for use in sheet hardness: HRB 50 or less

Broaching Through Hole Standoff TR-KFE/TR-KFSE





Metric Dimensions

Electro Tin Plated Steel: TR-KFE | Stainless Steel: TR-KFSE

Through hole size	3.6	4.2
A ±0.13	7.14	8.74
B ±0.08	5.87	6.86
C max.	1.53	1.53
Min. sheet thickness	1.53	1.53
Recommended hole size +0.08	5.41	6.4
Min. distance to edge of sheet	5.5	7.1

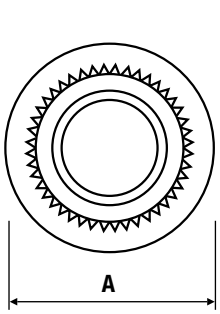
Length (L) ±0.13	3	4	5	6	8	10	12	14

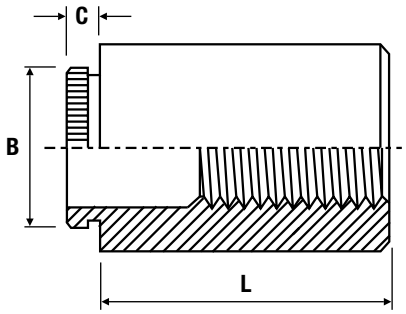
Metric Performance Data

Through hole size	3.6	4.2
Test sheet material	FR4 fibreglass	
Installation (kN)	2.2	2.2
Push-out (N)	330	420

TR-KFE - Recommended for use in sheet hardness: HRB 60 or less
TR-KFSE - Recommended for use in sheet hardness: HRB 70 or less

Broaching Threaded Standoff TR-KFE/TR-KFSE





Metric Dimensions

Electro Tin Plated Steel: TR-KFE | Stainless Steel: TR-KFSE

Thread	M3	M4
A ±0.13	5.56	8.74
B ±0.08	4.68	6.75
C max.	1.53	1.53
Min. sheet thickness	1.53	1.53
Recommended hole size +0.08	4.22	6.4
Min. distance to edge of sheet	4.4	6.4

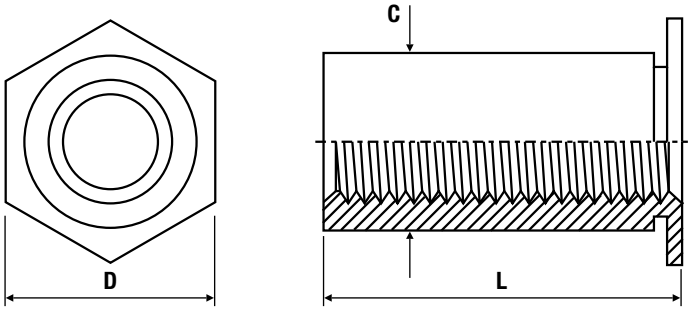
Length (L) ±0.13	3	4	5	6	8	10	12	14	16

Metric Performance Data

Thread	M3	M4
Test sheet material	FR4 fibreglass	
Installation (kN)	2.2	2.2
Torque-out (Nm)	1.4	3.0
Push-out (N)	290	400

TR-KFE - Recommended for use in sheet hardness: HRB 60 or less
TR-KFSE - Recommended for use in sheet hardness: HRB 70 or less

Thin Sheet Standoff TR-TSO/TR-TSOS



Metric Dimensions

Zinc Plated Steel: TR-TSO | Stainless Steel: TR-TSOS

Thread	M2.5	M2.5 Alt	M3	M3 Alt	M3.5
C -0.13	4.2	5.39	4.2	5.39	5.39
D ±0.25	4.8	6.4	4.8	6.4	6.4
Min. sheet thickness	0.63				
Recommended hole size +0.08	4.22 - 4.30	5.41 - 5.49	4.22 - 4.30	5.41 - 5.49	5.41 - 5.49
Min. distance to edge of sheet	5.8	7.1	5.8	7.1	7.1

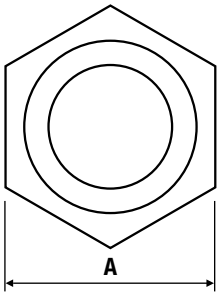
Length (L) ±0.13	2	3	4	6	8	10	12	14	16	18	19

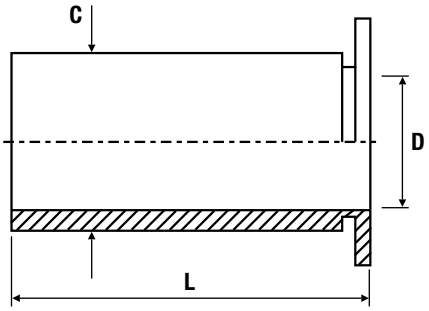
Metric Performance Data

Thread	M2.5	M2.5 Alt	M3	M3 Alt	M3.5
Test sheet material	Steel				
Installation (kN)	8.9	11.1	8.9	11.1	11.1
Torque-out (Nm)	1.0	1.7	1.0	1.7	1.7
Push-out (N)	445	667	445	667	667

TR-TSO - Recommended for use in sheet hardness: HRB 60 or less
TR-TSOS - Recommended for use in sheet hardness: HRB 70 or less

Clear Hole Standoff TR-SO





Metric Dimensions

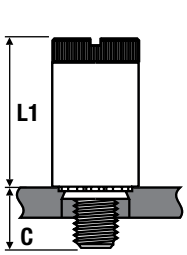
Zinc Plated Steel: TR-SO

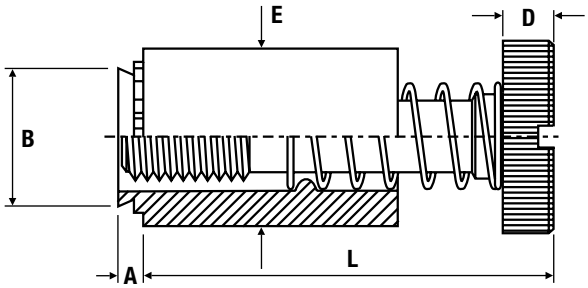
Diameter code	43.1	63.1	63.6	83.6	84.1	85.1
D counter-bore diameter -0.13	3.1	3.1	3.6	3.6	4.1	5.1
C -0.13	4.2	5.39	5.39	7.12	7.12	7.12
A nom.	4.8	6.4	6.4	7.9	7.9	7.9
Min. sheet thickness	1.0	1.0	1.0	1.27	1.27	1.27
Recommended hole size +0.08	4.22	5.41	5.41	7.14	7.14	7.14
Min. distance to edge of sheet	6.0	6.8	6.8	8.0	8.0	8.0

Length (L) +0.05/-0.13	3	4	5	6	8	10	12	14	16	18	20

TR-SO - Recommended for use in sheet hardness: HRB 80 or less

Slotted Panel Fastener TR-PFS2/TR-PFC2





Metric Dimensions

Zinc Plated Steel: TR-PFS2 | Stainless Steel: TR-PFC2

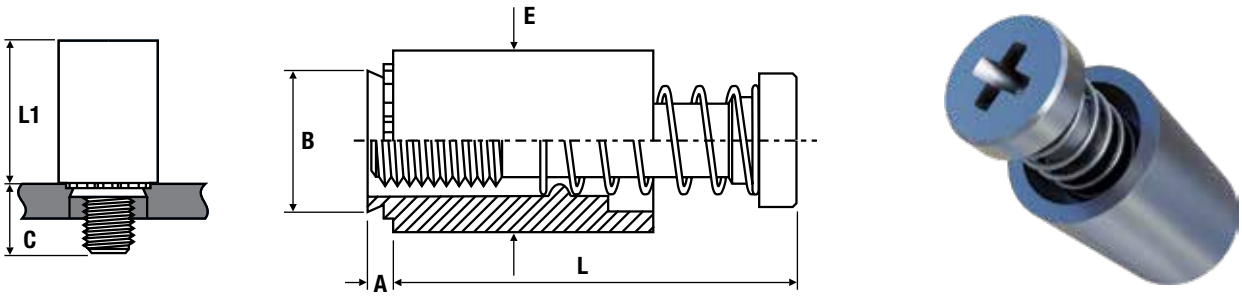
Thread	M3		M4			M5			M6		
Screw length code	40	62	50	72	94	50	72	94	60	82	04
A max.	1.53		1.53			1.53			1.53		
B max.	6.71		7.9			8.72			10.47		
C ±0.4	6.4	9.5	7.9	11.1	14.3	7.9	11.1	14.3	9.5	12.7	15.9
D ±0.13	1.83		2.08			2.08			2.46		
E ±0.25	7.92		9.53			10.31			11.89		
L nom.	13.72		17.53			17.53			22.35		
L1 max.	9.14		11.43			11.47			14.73		
Min. sheet thickness	1.53		1.53			1.53			1.53		
Recommended hole size +0.08	6.73		7.90			8.74			10.49		
Screw protrusion before installation ±0.64	0	3.2	0	3.2	6.4	0	3.2	6.4	0	3.2	6.4
Min. distance to edge of sheet	6.35		7.87			8.63			9.65		

Metric Performance Data

Thread	M3	M4	M5	M6
Test sheet material	Steel			
Installation (kN)	13.4	17.0	17.9	22.3
Push-out (N)	1335	1780	2230	2670

TR-PFS2 - Recommended for use in sheet hardness: HRB 80 or less
TR-PFC2 - Recommended for use in sheet hardness: HRB 70 or less

Cross Recess Panel Fastener TR-PFC2P



Metric Dimensions

Stainless Steel: TR-PFC2P

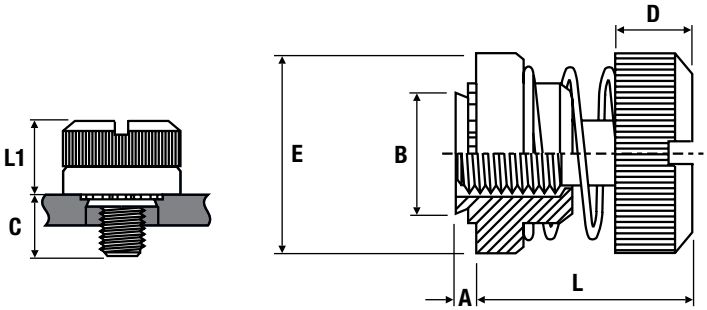
Thread	M3		M4			M5			M6		
Screw length code	40	62	50	72	94	50	72	94	60	82	04
A max.	1.53		1.53			1.53			1.53		
B max.	6.71		7.9			8.72			10.47		
C ±0.4	6.4	9.5	7.9	11.1	14.3	7.9	11.1	14.3	9.5	12.7	15.9
Driver size	PH1		PH2			PH2			PH3		
E ±0.25	7.92		9.53			10.31			11.89		
L nom.	13.72		17.91			17.91			22.99		
L1 max.	9.4		12.19			12.45			15.75		
Min. sheet thickness	1.53		1.53			1.53			1.53		
Recommended hole size +0.08	6.73		7.92			8.74			10.49		
Screw protrusion before installation ±0.64	0	3.2	0	3.2	6.4	0	3.2	6.4	0	3.2	6.4
Min. distance to edge of sheet	6.35		7.87			8.63			9.65		

Metric Performance Data

Thread	M3	M4	M5	M6
Test sheet material	Steel			
Installation (kN)	13.4	17.0	17.9	22.3
Push-out (N)	1335	1780	2230	2670

TR-PFC2P - Recommended for use in sheet hardness: HRB 70 or less

Low Profile Panel Fastener TR-PF31/TR-PF32



Metric Dimensions

Nickel Plated Steel: TR-PF31 | Nickel Plated Steel: TR-PF32

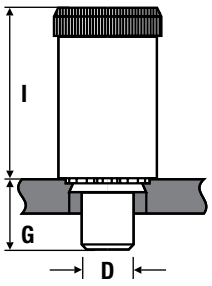
Thread	M3		M4		M5		M6
Type	TR-PF31	TR-PF32	TR-PF31	TR-PF32	TR-PF31	TR-PF32	TR-PF32
Screw length code	30		30		30		35
A max.	0.97	1.48	0.97	1.48	0.97	1.48	1.48
Min. sheet thickness	1.0	1.5	1.0	1.5	1.0	1.5	1.5
Recommended hole size +0.08	5.5		6.4		8.0		9.5
B max.	5.48		6.38		7.98		9.48
L nom.	15.11		15.24		15.37		17.15
D ±0.13	5.13		5.26		5.59		6.12
E ±0.25	10.31		11.89		13.46		15.88
C ±0.4	7.62		7.62		7.62		8.89
L1 max.	8.26		8.38		8.51		9.78
Min. distance to edge of sheet	6.6		7.37		8.38		9.65

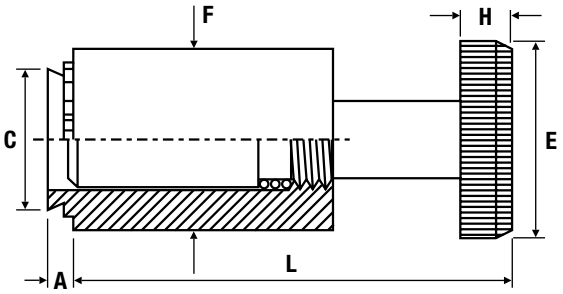
Metric Performance Data

Thread	M3	M4	M5	M6
Test sheet material	Aluminium			
Installation (kN)	9.9	12.6	15.6	19.2

TR-PF31 - Recommended for use in sheet hardness: HRB 60 or less
TR-PF32 - Recommended for use in sheet hardness: HRB 60 or less

Pin Panel Fastener TR-PTL2/TR-PSL2





Metric Dimensions

Zinc Plated Steel: TR-PTL2 | TR-PSL2

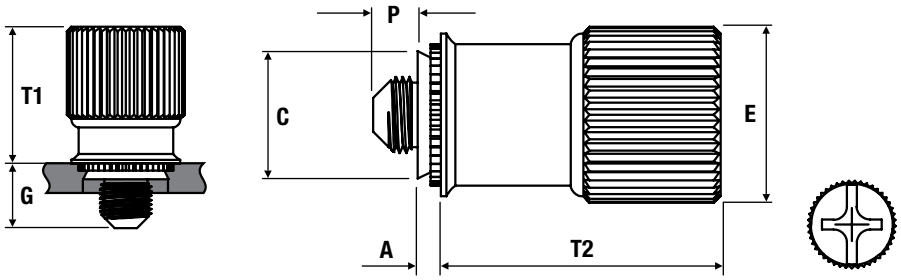
Type	TR-PTL2 (locking)	TR-PSL2 (non-locking)
Plunger diameter code	04	04
Plunger length code	4.0	4.0
A max.	1.47	1.47
Min. sheet thickness	1.53	1.53
Recommended hole size +0.08	8.33	8.33
C max.	8.31	8.31
D -0.13	6.35	6.35
E ±0.25	12.7	12.7
F ±0.25	10.3	10.3
G ±0.25	7.87	7.87
H ±0.25	4.32	4.32
I ±0.25	15.11	12.95
L nom.	22.73	19.81
Min. distance to edge of sheet	8.64	8.64

Metric Performance Data

Type	TR-PTL2 (locking)	TR-PSL2 (non-locking)
Test sheet material	Steel	
Installation (kN)	17.8	17.8
Push-out (N)	2224	2224

TR-PTL2 - Recommended for use in sheet hardness: HRB 80 or less
TR-PSL2 - Recommended for use in sheet hardness: HRB 80 or less

Captive Screw Panel Fastener TR-PF11



Metric Dimensions

Nickel Plated Heat Treated Steel (Retainer), Aluminium (Knob), Stainless Steel (Screw & Spring): TR-PF11

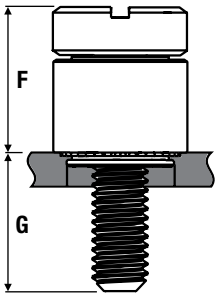
Thread	M3			M4			M5			M6
Screw length code	0	1	2	0	1	2	0	1	2	2
A max.	0.92			0.92			0.92			0.92
Min. sheet thickness	0.92			0.92			0.92			0.92
Recommended hole size +0.08	5.56			7.92			7.92			9.53
C max.	5.54			7.90			7.90			9.50
E ±0.25	10.59			13.06			13.06			14.61
G ±0.64	4.32	5.84	7.37	5.84	7.37	8.89	5.84	7.37	8.89	10.41
P ±0.64	0	1.52	3.05	0	1.52	3.05	0	1.52	3.05	3.05
T1 nom.	7.87			11.43			11.43			13.46
T2 nom.	11.43			16.26			16.26			20.07
Driver size	PH1			PH2			PH2			PH3
Min. distance to edge of sheet	7.11			8.38			8.38			11.68

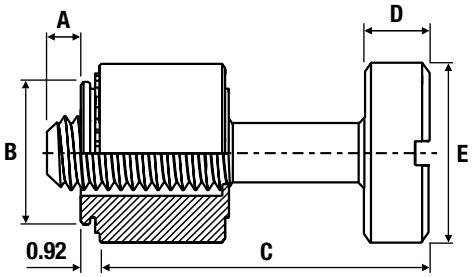
Metric Performance Data

Thread	M3	M4	M5	M6
Test sheet material	Steel			
Installation (kN)	11.1	20.0	20.0	22.2
Push-out (N)	645	710	710	865

TR-PF11 - Recommended for use in sheet hardness: HRB 80 or less

Captive Screw Panel Fastener TR-PFHV





Metric Dimensions

Zinc Plated Steel: TR-PFHV

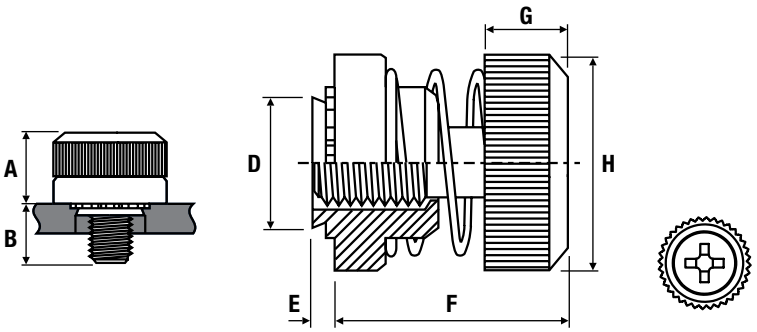
Thread	M3		M3.5		M4	
Screw code	0	1	0	1	0	1
A (shank) max.	0	1.9	0	2.30	0	2.7
B max.	5.49		5.98		6.38	
C nom.	11.25		12.47		14.1	
D ±0.13	2.03		2.34		2.79	
E ±0.25	6.95		7.45		7.85	
F nom.	6.69		7.45		8.5	
G ±0.64	5.55	7.56	6.01	8.42	6.59	9.39
Min. sheet thickness	0.92		0.92		0.92	
Recommended hole size +0.08	5.5 - 5.58		6.0 - 6.08		6.4 - 6.48	
Min. distance to edge of sheet	5.8		6.3		6.7	

Metric Performance Data

Thread	M3	M3.5	M4
Test sheet material	Steel		
Installation (kN)	10.5	11.4	12.1
Push-out (N)	564	614	656

TR-PFHV - Recommended for use in sheet hardness: HRB 60 or less

Low Profile Cross Recess Panel Fastener TR-PF50



Metric Dimensions

Zinc Plated Steel: TR-PF50

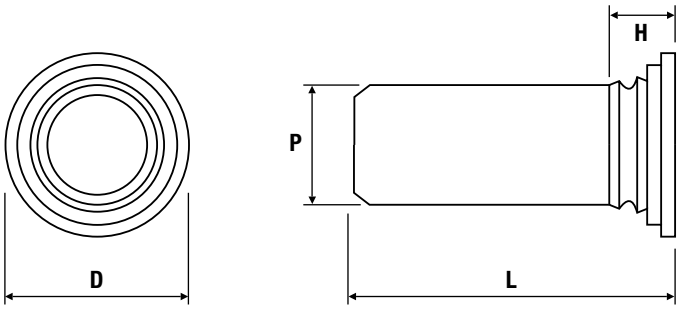
Thread	M3		M4		M5	
Screw code	0	1	0	1	0	1
A max.	8.64		8.64		9.15	
B ±0.64	5.84	7.37	5.84	7.37	5.84	7.37
C min. sheet thickness	0.8		0.8		0.8	
D max.	5.48		6.38		7.98	
E +0.4 / -0.13	0.77		0.77		0.77	
F nom.	13.21		13.46		13.46	
G ±0.2	5.26		5.51		5.72	
H +0.4 / -0.13	10.3		11.9		13.5	
Recommended hole size +0.08	5.5 - 5.58		6.4 - 6.48		8 - 8.08	
Min. distance to edge of sheet	6.6		7.4		8.4	

Metric Performance Data

Thread	M3	M4	M5
Test sheet material	Steel		
Installation (kN)	22.2	26.7	35.6
Push-out (N)	400	400	423

TR-PF50 - Recommended for use in sheet hardness: HRB 60 or less

Flush Head Pin TR-TP/TR-TPS/TR-TP4



Metric Dimensions

Zinc Plated Steel: TR-TP | Stainless Steel: TR-TPS | 400 Series Stainless Steel: TR-TP4

P pin diameter ±0.05	3	4	5	6
Min. sheet thickness	1.0			
Recommended hole size	3.5	4.5	5.5	6.5
D ±0.4	5.20	6.12	7.19	8.13
H max.	2.29	2.29	2.29	2.29
Min. distance to edge of sheet	6.4	7.1	7.61	7.9

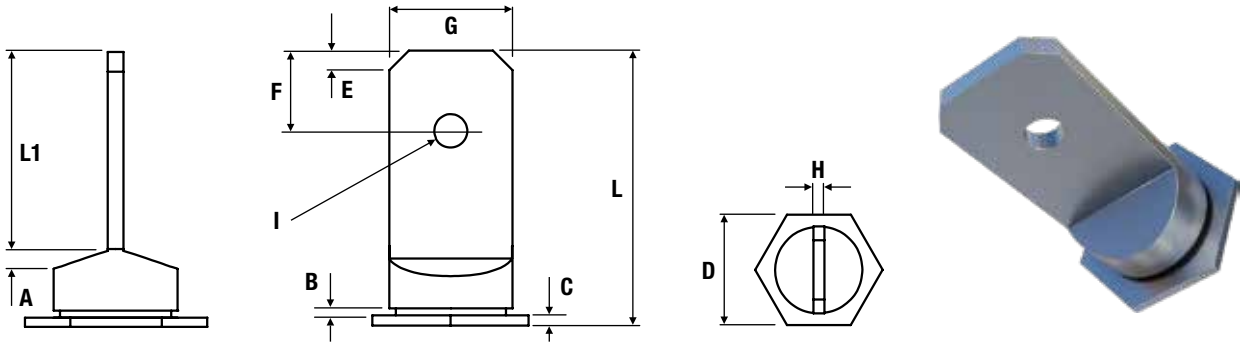
Length (L) ±0.4	3	4	6	8	10	12	16	20

Metric Performance Data

P pin diameter ±0.05	3	4	5	6
Test sheet material	Steel			
Installation (kN)	23	27	35	40
Push-out (kN)	1	1.6	1.8	2.2

TR-TP - Recommended for use in sheet hardness: HRB 80 or less
TR-TPS - Recommended for use in sheet hardness: HRB 70 or less
TR-TP4 - Recommended for use in sheet hardness: HRB 92 or less

Terminal Pin TR-TER



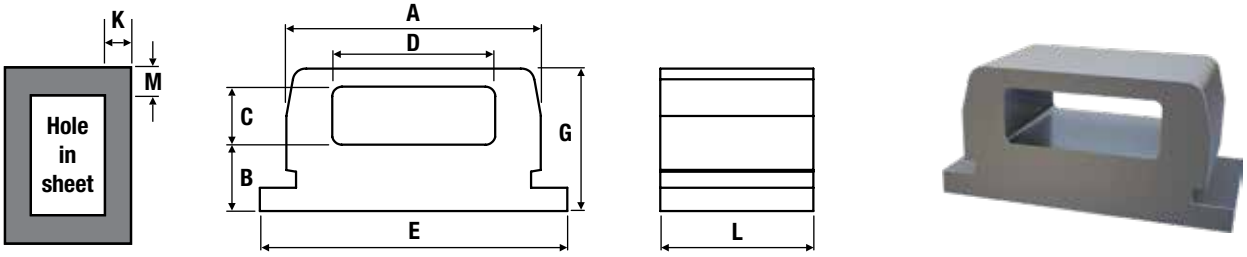
Metric Dimensions

Electro Tin Plated Steel: TR-TER

Part number	TR-TER
A	1.05
B	0.36
C	0.52
D	8.00
E	1 x 45^0
F	4.10
G	6.30
H	0.80
I	1.7 dia.
L	14.00
L1	9.00
Plate G x H	6.3 x 0.8
Recommended hole size ±0.08	6.40
Min. distance to edge of sheet	7.30
Min. sheet thickness	0.80

TR-TER - Recommended for use in sheet hardness: HRB 80 or less

Cable Tie Mount TR-TD



Metric Dimensions

Zinc Plated Steel: TR-TD

Type	TD - 40	TD - 60	TD - 175
Length code	4	6	12
L ±0.08	3.07	4.67	9.42
Sheet thickness	1.02 - 1.27	1.02 - 1.78	1.02 - 3.18
Hole size in sheet +0.05 -0.03	6.35 x 3.18	7.93 x 4.75	12.70 x 9.53
A ±0.08	6.25	7.82	12.60
B ±0.15	1.40	1.91	3.30
C ±0.15	1.65	1.65	2.40
D ±0.15	4.06	5.21	9.14
E ±0.15	7.82	9.40	14.28
Height G ±0.15	3.81	4.57	7.24
Min. hole edge - sheet edge (M)	1.02		
Min. hole edge - sheet edge (K)	3.73	4.98	6.65

Metric Performance Data

Part number	TR-TD-40-4	TR-TD-60-6	TR-TD-175-12
Test sheet material	Steel		
Installation (kN)	8	11	17.7
Push-out (kN)	780	1160	1560
Pull through (N)	445	712	780
Side load (N)	400	445	620

TR-TD - Recommended for use in sheet hardness: HRB 60 or less

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