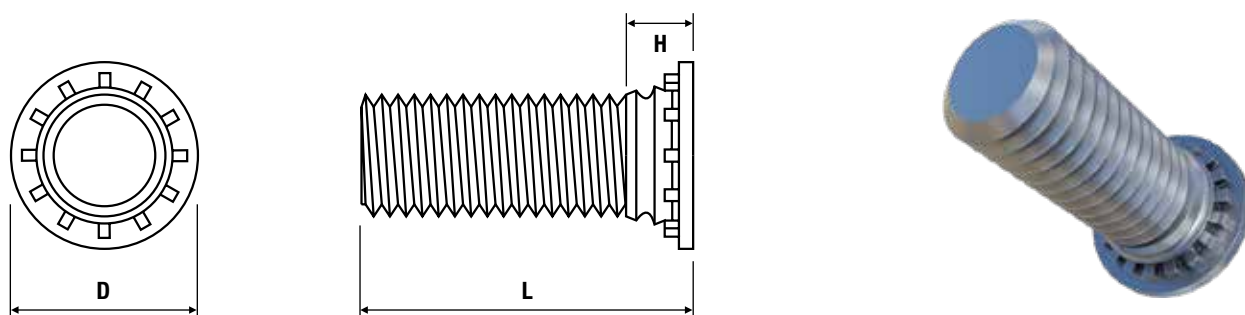


Flush Head Stud TR-FH/TR-FHS/TR-FHA/TR-FH4



Metric Dimensions

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

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

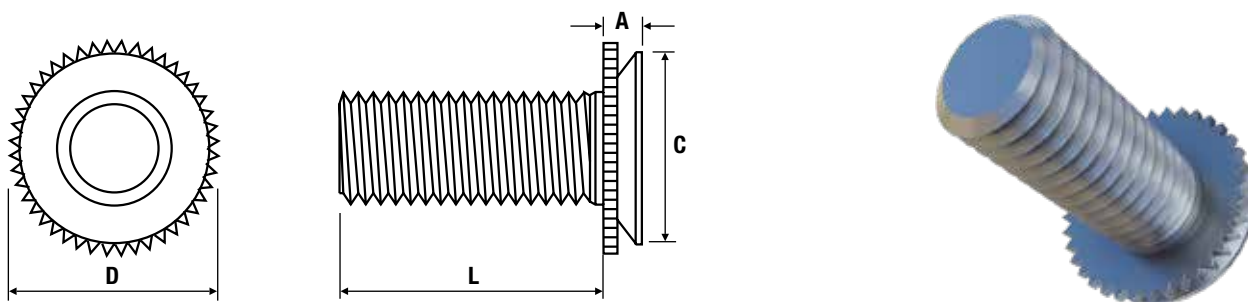
TR-FHA - Recommended for use in sheet hardness: HRB 50 or less
 TR-FH4 - Recommended for use in sheet hardness: HRB 92 or less

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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)

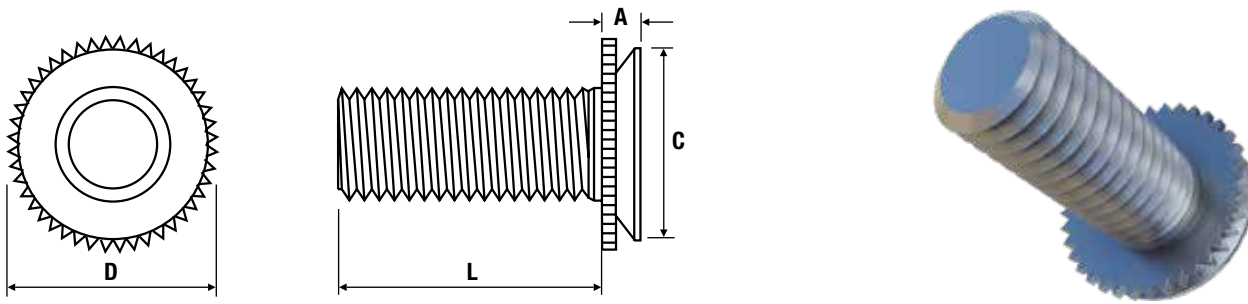
Thread	M3	M4	M5
Test sheet material	Aluminium		
Installation (kN)	6.2	12.5	17.8
Pull-out (N)	555	645	755
Max. tightening torque (Nm)	0.3	1.2	2.2

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

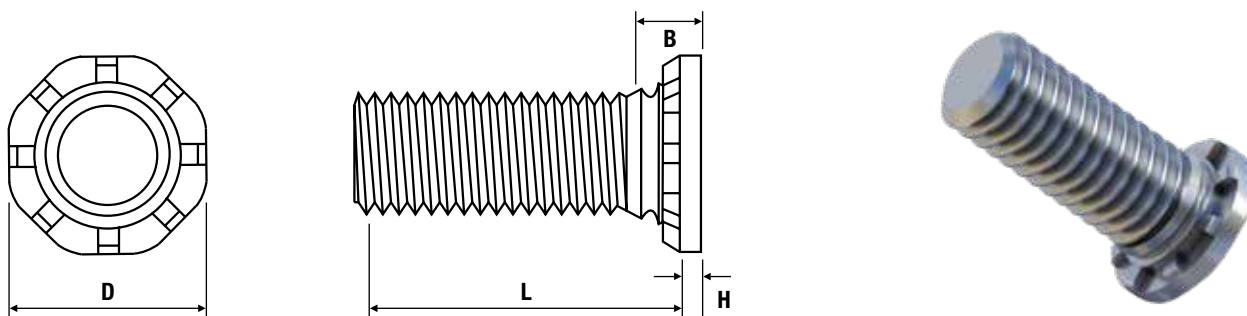
Metric Performance Data (TR-CFHA)

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

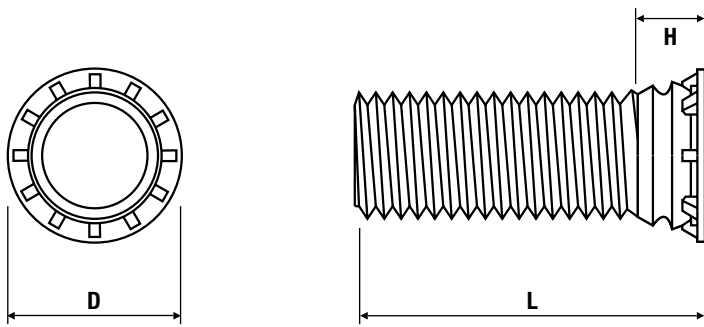
Thread	M5	M6	M8	M10	
Test sheet material	Steel				
Installation (kN)	TR-HFH	27	34	45	55
	TR-HFHS	22.5	25	38	47
Push-out (N)	TR-HFH	1550	1780	2210	3475
	TR-HFHS	1505	1780	2200	3500
Torque-out (Nm)	TR-HFH	7.7	14.5	30.1	49.5
	TR-HFHS	6.5	11.5	21	36.5

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

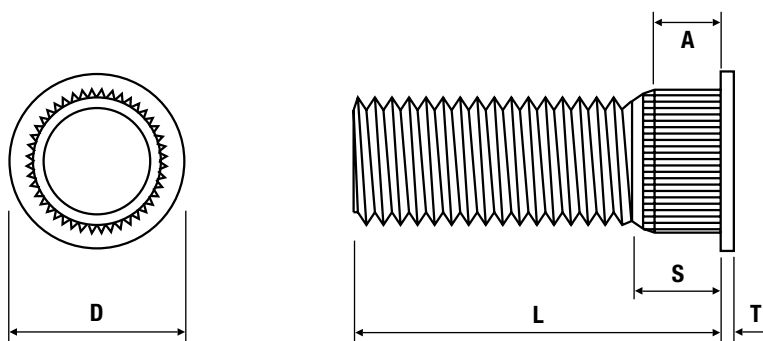
Thread	M2.5	M3	M4	M5
Test sheet material	Steel			
Test sheet thickness	1.1	1.1	1.1	1.1
Installation (kN)	5.4	5.4	6.7	20.1
Push-out (N)	450	475	555	1010
Torque-out (Nm)	1.2	1.3	2.2	4.5
Pull through (N)	2290	2550	3350	3760

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

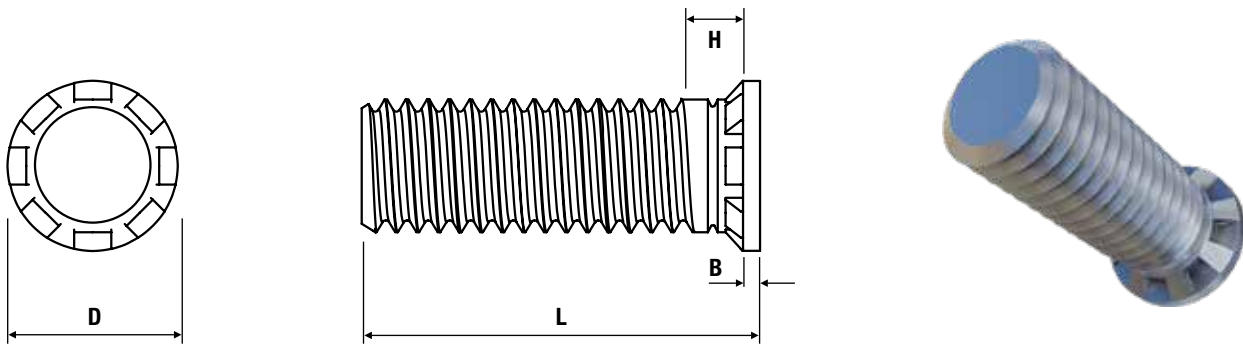
Thread	M2.5	M3	M4	M5
D ± 0.25	4.10	4.58	5.74	6.6
S max.	2.3	2.3	2.3	2.3
A max.	1.65	1.65	1.65	1.65
T ± 0.13	0.51	0.51	0.51	0.51
Min. sheet thickness	1.53	1.53	1.53	1.53
Recommended hole size +0.08	2.6	3.0	4.2	5.0
Min. distance to edge of sheet	3.3	3.8	5.1	5.3

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

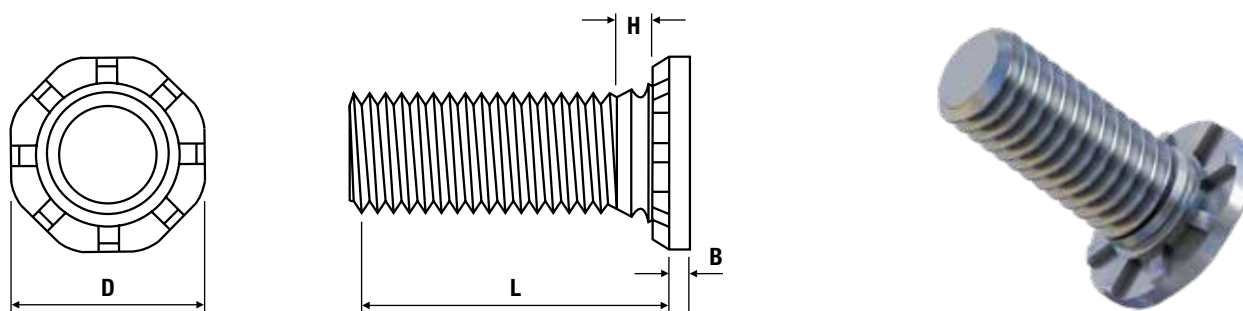
Thread		M3	M4	M5
Test sheet material		Steel		
Installation (kN)	TR-TFH	7.9	17.8	22.1
	TR-TFHS	6.7	13.4	12.9
Push-out (N)	TR-TFH	410	450	550
	TR-TFHS	390	465	580
Torque-out (Nm)	TR-TFH	1.3	2.0	2.7
	TR-TFHS	0.8	2.5	3.0

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

