

Type FH and FHS Flush-Head Studs (Continued)

METRIC	Thread Code	Max. Nut Tightening Torque (N•m) ⁽¹⁾	Type	Sheet Thickness and Sheet Material	Sheet Hardness HRB	Installation (kN)	Pushout (N)	Torque-out (N•m)	Pull Thru (N)
	M2.5	0.41	FH	1.6 mm Aluminum	29	8.9	625	1.1	2880
			FHS	1.6 mm Aluminum	29	11.6	625	0.9	2070
			FH	1.5 mm Steel	59	11.1	1025	1.1	2880
			FHS	1.5 mm Steel	59	13.8	1025	0.9	2070
	M3	0.74	FH	1.6 mm Aluminum	29	12.9	890	1.7	3700
			FHS	1.6 mm Aluminum	29	12.9	890	1.3	3070
			FH	1.5 mm Steel	59	14.7	1250	1.7	4200
			FHS	1.5 mm Steel	59	14.7	1250	1.3	3070
	M3.5	1.15	FH	1.6 mm Aluminum	29	15.6	980	2.1	4500
FHS			1.6 mm Aluminum	29	15.6	980	2.1	4140	
FH			1.5 mm Steel	59	22.3	1550	2.8	5560	
FHS			1.5 mm Steel	59	22.3	1550	2.1	4140	
M4	1.7	FH	1.6 mm Aluminum	29	20	1290	3.6	5340	
		FHS	1.6 mm Aluminum	29	22.3	1290	3.4	5250	
		FH	1.5 mm Steel	59	28.9	1780	5.1	6540	
		FHS	1.5 mm Steel	59	26.7	1780	3.9	5340	
M5	3.5	FH	1.6 mm Aluminum	29	24.5	1470	4.5	6230	
		FHS	1.6 mm Aluminum	29	24.5	1470	4.5	5860	
		FH	1.5 mm Steel	59	33.4	2440	7.3	7560	
		FHS	1.5 mm Steel	59	32.5	2440	7.3	7380	
M6	5.9	FH	2.4 mm Aluminum	28	28.9	2000	9	12680	
		FHS	2.4 mm Aluminum	28	28.9	2000	8.4	11200	
		FH	2.2 mm Steel	46	44.5	3110	13.6	16600	
		FHS	2.2 mm Steel	46	44.5	3110	12.4	12300	
M8	14.2	FH	2.4 mm Aluminum	28	29.8	2440	15.8	12400	
		FHS	2.4 mm Aluminum	28	29.8	2440	15.8	11800	
		FH	2.4 mm Steel	46	44.5	3780	21.5	19100	
		FHS	2.4 mm Steel	46	49.8	3780	21.5	16950	

Type TFH and TFHS Non-Flush Studs

UNIFIED	Thread Code	Max. Nut Tightening Torque (in. lbs.)	Type	Sheet Thickness and Sheet Material	Sheet Hardness HRB	(2) Installation (lbs.)	Pushout (lbs.)	Torque-out (in. lbs.)
	440	5	TFH	.020" Aluminum	28	1300	80	8
			TFHS	.020" Aluminum	28	1200	60	8
			TFH	.023" Steel	52	2800	160	8
			TFHS	.025" Steel	52	1500	125	8
	632	9	TFH	.020" Aluminum	28	2100	60	9
			TFHS	.020" Aluminum	28	1500	60	9
			TFH	.023" Steel	52	2500	130	17
			TFHS	.025" Steel	52	2500	130	17
	832	17	TFH	.020" Aluminum	28	2100	70	12
TFHS			.020" Aluminum	28	2200	70	12	
TFH			.023" Steel	52	3100	150	27	
TFHS			.025" Steel	52	2700	150	27	
024	24	TFH	.020" Aluminum	28	2300	80	15	
		TFHS	.020" Aluminum	28	2500	80	15	
032	27	TFH	.023" Steel	52	3700	160	30	
		TFHS	.025" Steel	52	3000	160	30	

METRIC	Thread Code	Max. Nut Tightening Torque (N•m)	Type	Sheet Thickness and Sheet Material	Sheet Hardness HRB	(2) Installation (kN)	Pushout (N)	Torque-out (N•m)
	M3	0.74	TFH	0.5 mm Aluminum	28	5.8	356	0.9
			TFHS	0.5 mm Aluminum	28	5.3	245	0.8
			TFH	0.6 mm Steel	52	12.5	710	0.9
			TFHS	0.6 mm Steel	52	6.7	490	1
	M4	1.7	TFH	0.5 mm Aluminum	28	12.5	490	1.4
			TFHS	0.5 mm Aluminum	28	9.8	310	1.3
			TFH	0.6 mm Steel	52	17.8	755	2.7
			TFHS	0.6 mm Steel	52	13.4	670	3
	M5	3.5	TFH	0.5 mm Aluminum	28	15.6	530	1.5
TFHS			0.5 mm Aluminum	28	13.4	350	1.7	
TFH			0.6 mm Steel	52	26.7	845	2.4	
TFHS			0.6 mm Steel	52	17.8	710	3.4	

(1) Maximum recommended tightening torques for aluminum studs are 60 percent of these values.

(2) Installation controlled by proper cavity depth in punch.