PREVAILING-TORQUE TYPE STEEL HEX AND HEX FLANGE NUTS

How do they work . . .

The top thread section of the nuts is scientifically displaced at two or three opposing areas. This displacement or deflection ovalizes the top threads of the nut and deflects these threads out of their helical configuration. The nature of this locking element is such that it remains spring-like through repeated applications and severe shock loads. The locking element firmly grips the flank, root and crest of the mating bolt threads.

The resulting compression grip forces metal-to-metal contact between the nut and bolt threads. This friction grip assures that the nut will stay "put" anywhere on the bolt and maintain the pre-set torque-tension relationship.

The Locknut starts freely on a bolt or stud like a common nut until the deflected thread portion is reached; then, it requires wrenching to final position anywhere on the mating part.

Nut/Bolt Compatibility

There are three grades of prevailing-torque type steel hex nuts designated as Grades A, B and C, respectively. There are two grades of prevailing-torque type steel hex flange nuts designated, respectively, as Grades F and G.

Each grade of nut is suggested for use with externally threaded components having specified minimum tensile strengths within the following values:

NUT/BOLT COMPATIBILITY

Grade of Nut	Specified Min Ultimate Tensile Strength of Bolt, ksi
Grade A	not greater than 90
Grades B and F	not greater than 120
Grade C	not less than 105, nor greater than 150
Grade G	not less than 120, nor greater than 150

Grade Marking and Identification

Grade A nuts need not be marked. Grade B, C, F and G nuts are marked to identify manufacturer and grade. Markings are in the form of three (for grades B and F) or six (for grades C and G) grade marking symbols. The Locknut Technology identification shown below is used as a substitute for one of the grade marking symbols.



MECHANICAL PROPERTY REQUIREMENTS

GRADE	LOCKNUT SIZE (BOLT DIA.) IN.	PROOF LOAD STRESS PSI	ROCKWELL HARDNESS		
А	No. 4 thru 1 ¹ /2	90,000	C28 max		
	No. 4 thru 1	120,000	C28 max		
B, F -	Over 1 thru 11/2	105,000	C28 max		
	No. 4 thru ⁵ ∕8		C24/32		
С	Over ^{5/} 8 thru 1	150,000	C26/34		
	Over 1 thru 11/2		C26/36		
F	¹ /4 thru ³ /4	120,000	C28 max		
	No. 4 thru 1	150,000	C24/32		
G	3/4	150,000	C26/34		



LOCKNUT TECHNOLOGY, INC. Registered Identification Symbol

	Gra	de B Nu	ıts	Gra	de C Nu	uts	Gra	de F Nu	its	Grade G Nuts		
Nut Size and Threads per Inch	Clamp Load (1)	Nut Clamp Tightening oad (1) Torque (lb. ft.)		Clamp Load (2)	Nut Tightening Torque (lb. ft.)		Clamp Load (1)	Nut Tightening Torque (lb. ft.)		Clamp Load (2)	Nut Tightening Torque (lb. ft.)	
	ю.	Max	Min	ю.	Мах	Min	ю.	Max	Min	10.	Max	Min
	Coarse Thread Series											
1/4 - 20 5/16 - 18 3/8 - 16 7/16 - 14 1/2 - 13	2,000 3,350 4,950 6,800 9,050	7.1 12.5 20 32 50	5 9.2 14.5 23 37	2,850 4,700 6,950 9,600 12,800	10.4 15.8 28 43 62.5	7.1 10.8 20 31 45	2,000 3,350 4,950 6,800 9,050	7.9 15 26 42 57	5.4 10 16 28 38	2,850 4,700 6,950 9,600 12,800	12.5 20 32 51 85	8.3 12.9 21 34 55
9/16 - 12 5/8 - 11 3/4 - 10 7/8 - 9 1 - 8	11,600 14,500 21,300 29,500 38,700	70 95 165 250 375	50 70 125 185 275	16,400 20,300 30,100 41,600 54,600	95 122.5 210 312.5 462.5	70 90 155 225 360	11,600 14,500 21,300 —	85 112 195 —	55 75 135 —	16,400 20,300 30,100 —	120 143 240 —	80 95 160 —
					Fine T	hread Se	eries					
1/4 - 28 5/16 - 24 3/8 - 24 7/16 - 20 1/2 - 20	2,300 3,700 5,600 7,550 10,200	7.5 13.3 22 34 52.5	5.4 10 16 24 37.5	3,250 5,200 7,900 10,700 14,400	10.4 16.7 29 43 70	7.1 11.7 21 31 50	2,300 3,700 5,600 7,550 10,200	9.6 16.7 25 45 66	6.3 10.8 17 30 44	3,250 5,200 7,900 10,700 14,400	13.3 19.2 33 60 89	8.8 12.9 22 40 59
9/16 - 18 5/8 - 18 3/4 - 16 7/8 - 14 1 - 14	13,000 16,300 23,800 32,400 43,300	77.5 97.5 165 270 400	57.5 72.5 120 200 300	18,300 23,000 33,600 45,800 61,100	95 125 210 312.5 500	70 90 155 225 362.5	13,000 16,300 23,800 —	94 120 192 —	62 80 128 —	18,300 23,000 33,600 —	132 175 270 —	88 115 170 —

Torque-Tension Requirements for Electrodeposited Cadmium Plated and Lubricated Prevailing-Torque Type Nuts

Torque-Tension Requirements for Electrodeposited Zinc, Clear Chromate, and Lubricated Prevailing-Torque Type Nuts

	Gra	de B Ni	uts	Gra	de C Nu	uts	Gra	de F Nu	ıts	Grade G Nuts		
Nut Size and Threads per Inch	Clamp Load (1)	Clamp Load (1) Torque (lb. ft		Clamp Load (2)	N Tight Torque	Nut Tightening Torque (lb. ft.)		Nut Tightening Torque (lb. ft.)		Clamp Load (2)	Nut Tightening Torque (lb. ft.)	
	15.	Max	Min	10.	Max	Min	15.	Max	Min	10.	Max	Min
					Coarse	Thread	Series					
1/4 - 20 5/16 - 18 3/8 - 16 7/16 - 14 1/2 - 13	2,000 3,350 4,950 6,800 9,050	10.0 17.6 28 45 70	7.0 12.9 20 32 52	2,850 4,700 6,950 9,600 12,800	14.7 22.3 39 60 88	10.0 15.2 28 44 63	2,000 3,350 4,950 6,800 9,050	11.1 21.1 37 59 80	7.6 14.1 23 39 53	2,850 4,700 6,950 9,600 12,800	17.6 28.1 45 72 120	11.7 18.2 30 48 77
9/16 - 12 5/8 - 11 3/4 - 10 7/8 - 9 1 - 8	11,600 14,500 21,300 29,500 38,700	98 134 232 352 528	70 98 176 260 387	16,400 20,300 30,100 41,600 54,600	134 172 295 440 651	98 127 218 317 506	11,600 14,500 21,300 — —	120 158 274 —	77 106 190 —	16,400 20,300 30,100 —	169 201 338 —	113 134 225 —
			545		Fine T	hread Se	eries					
1/4 - 28 5/16 - 24 3/8 - 24 7/16 - 20 1/2 - 20	2,300 3,700 5,600 7,550 10,200	10.6 18.8 31 48 74	7.6 14.1 23 34 53	3,250 5,200 7,900 10,700 14,400	14.7 23.4 41 60 98	10.0 16.4 30 44 70	2,300 3,700 5,600 7,550 10,200	10.6 18.8 35 63 93	7.6 14.1 24 42 62	3,250 5,200 7,900 10,700 14,400	18.8 27.0 46 84 125	12.3 18.2 31 56 83
9/16 - 18 5/8 - 18 3/4 - 16 7/8 - 14 1 - 14	13,000 16,300 23,800 32,400 43,300	109 137 232 380 563	81 102 169 281 422	18,300 23,000 33,600 45,800 61,100	134 176 295 440 703	98 127 218 317 510	13,000 16,300 23,800 —	132 169 270 —	87 113 180 —	18,300 23,000 33,600 —	186 246 380 	124 162 239 —

NOTES:

Clamp loads for Grades B and F nuts equal 75% of the proof loads specified for SAE J429 Grade 5 and ASTM A449 bolts.
Clamp loads for Grades C and G nuts equal 75% of the proof loads specified for SAE J429 Grade 8 and ASTM A354 Grade BD bolts.

SPECIFICATIONS PER IFI-100/107 2002

Grade A Nuts			Grade	B Nuts	Grade C Nuts		Prevailing-Torque			Grade	F Nuts	Grade G Nuts	
and Threads per Inch	Proof Load Ib	Clamp Load Ib	Proof Load Ib	Clamp Load Ib	Proof Load Ib	Clamp Load Ib	First Install max Ib. in	First Removal min Ib. in	Third Removal min Ib. in	Proof Load Ib	Clamp Load Ib	Proof Load Ib	Clamp Load Ib
Coarse Thread Series													
No. 4 - 40	540	250	720	380	910	550	4.0	1.0	0.2				
6 - 32	820	370	1,100	580	1,350	810	8.0	1.5	0.5				
8 - 32	1,250	580	1,700	900	2,100	1,250	12.0	2.0	0.5				
10 - 24	1,550	720	2,100	1,100	2,600	1,550	17	2.5	1.0				
12 - 24	2,200	1,000	2,900	1,550	3,650	2,200	27	3.5	1.0				
1/4 - 20	2,900	1,300	3,800	2,000	4,750	2,850	40	5.0	1.5	3,800	2,000	4,750	2,850
5/16 - 18	4,700	2,150	6,300	3,350	7,850	4,700	80	8.0	2.5	6,300	3,350	7,850	4,700
3/8 - 16	7,000	3,200	9,300	4,950	11,600	6,950	110	12.0	4.0	9,300	4,950	11,600	6,950
7/16 - 14	9,550	4,400	12,800	6,800	15,900	9,600	135	17	5.0	12,800	6,800	15,900	9,600
1/2 - 13	12,800	5,850	17,000	9,050	21,300	12,800	204	22	7.5	17,000	9,050	21,300	12,800
9/16 - 12	16,400	7,550	21,800	11,600	27,300	16,400	300	30	10.0	21,800	11,600	27,300	16,400
5/8 - 11	20,300	9,300	27,200	14,500	33,900	20,300	420	. 39	12.5	27,200	14,500	33,900	20,300
3/4 - 10	30,000	13,800	40,100	21,300	50,100	30,100	540	58	20	40,100	21,300	50,100	30,100
7/8 - 9	41,600	12,400	55,400	29,500	69,300	41,600	840	88	30				
1 - 8	54,500	15,000	72,700	38,700	90,900	54,600	1080	120	40				
1-1/8 - 7	68,700	18,900	80,100	42,100	115,000	69,000	1200	150	50				
1-1/4 - 7	87,200	24,000	101,700	53,500	145,000	87,000	1320	188	60				
1-3/8 - 6	104,000	28,700	121,300	63,800	173,000	104,000	1620	220	70				
1-1/2 - 6	126,000	34,800	147,500	77,600	211,000	127,000	1800	260	90				

Proof Loads, Clamp Loads, and Prevailing-Torques for Coarse Thread Series Grades A, B, and C Hex Nuts and Grades F and G Hex Flange Nuts

NOTE:

NOTE: Clamp loads for Grades A, B, and C prevailing-torque nuts respectively equal 75 percent of the proof loads specified for Grades 2, 5 and 8 bolts in SAE J429. Clamp loads for Grades B and C prevailing-torque nuts also respectively equal 75 percent of the proof loads specified for ASTM A449 and ASTM A354 Grade BD bolts. Clamp loads for Grades F and G prevailing-torque nuts respectively equal 75 percent of the proof loads specified for Grades 5 and 8 bolts in SAE J429 and are also respectively equal to 75 percent of the proof loads specified for ASTM A449 and ASTM A354 Grade BD bolts. Clamp loads for Grades F and G prevailing-torque nuts respectively equal 75 percent of the proof loads specified for Grades 5 and 8 bolts in SAE J429 and are also respectively equal to 75 percent of the proof loads specified for ASTM A449 and ASTM A354 Grade BD bolts.

Nut Olar	Grade A Nuts		Grade B Nuts Grade C Nuts			C Nuts	P	revailing-To	rque	Grade F Nuts		Grade G Nuts	
and Threads per Inch	Proof Load Ib	Clamp Load Ib	Proof Load Ib	Clamp Load Ib	Proof Load Ib	Clamp Load Ib	First Install max Ib. in	First Removal min Ib. in	Third Removal min Ib. in	Proof Load Ib	Clamp Load Ib	Proof Load Ib	Clamp Load Ib
					F	ine Threa	ad Series	5					
No. 4 - 48	600	270	790	420	990	600	4.0	1.0	0.2				
6 - 40	900	420	1,200	640	1,500	900	8.0	1.5	0.5				
8 - 36	1,350	610	1,750	930	2,200	1,300	12.0	2.0	0.5				
10 - 32	1,800	840	2,400	1,300	3,000	1,800	17	2.5	1.0				
12 - 28	2,300	1,050	3,100	1,650	3,900	2,350	27	3.5	1.0	1.1.1.2.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		÷	
1/4 - 28	3,300	1,500	4,350	2,300	5,450	3,250	40	5.0	1.5	4,350	2,300	5,450	3,250
5/16 - 24	5,200	2,400	6,950	3,700	8,700	5,200	80	8.0	2.5	6,950	3,700	8,700	5,200
3/8 - 24	7,900	3,600	10,500	5,600	13,200	7,900	110	12.0	4.0	10,500	5,600	13,200	7,900
7/16 - 20	10,700	4,900	14,200	7,550	17,800	10,700	135	17	5.0	14,200	7,550	17,800	10,700
1/2 - 20	14,400	6,550	19,200	10,200	24,000	14,400	204	22	7.5	19,200	10,200	24,000	14,400
9/16 - 18	18,300	8,350	24,400	13,000	30,400	18,300	300	30	10.0	24,400	13,000	30,400	18,300
5/8 - 18	22,900	10,500	30,700	16,300	38,400	23,000	420	39	12.5	30,700	16,300	38,400	23,000
3/4 - 16	33,600	15,400	44,800	23,800	56,000	33,600	540	58	20	44,800	23,800	56,000	33,600
7/8 - 14	45,800	12,600	61,100	32,400	76,400	45,800	840	88	30				
1 - 14	61,100	16,800	81,500	43,300	101,900	61,100	1080	120	40				
1 - 12	59,700	16,400	79,600	42,300	99,500	59,700	1080	120	40				
1-1/8 - 12	76,900	21,200	89,900	47,500	128,000	76,800	1200	150	50				
1-1/4 - 12	96,600	26,600	113,000	59,700	161,000	96,600	1320	188	60				1.11
1-3/8 - 12	118,000	32,500	138,000	72,900	197,000	118,000	1620	220	70				
1-1/2 - 12	142,000	39,100	166,000	87,700	237,000	142,000	1800	260	90	Compress R			

Proof Loads, Clamp Loads, and Prevailing-Torques for Fine Thread Series Grades A, B, and C Hex Nuts and Grades F and G Hex Flange Nuts

NOTE:

Proof loads for Grades F and G flange prevailing-torque nuts are based on 120,000 psi and 150,000 psi, respectively.