

**TORQUE-TENSION REQUIREMENTS
FOR PREVAILING-TORQUE TYPE
STEEL HEX LOCKNUTS**

INTRODUCTION

In some engineering applications, it is desirable to use locknuts which have a capability of developing a known tensile load in the mating externally threaded component when a specific locknut tightening torque is applied.

1.0 SCOPE

This standard covers torque-tension requirements for 0.0002/0.0004 in. thickness electro-deposited cadmium plated and lubricated Grades B and C prevailing-torque type steel locknuts in sizes 1/4 to 1 in., inclusive.

The dimensional, mechanical and other performance requirements for these locknuts are given in Standard IFI-100, Page D-32. Standard IFI-100 shall be part of this standard.

The torque-tension requirements covered in this standard apply only to the combination of laboratory conditions described in the test procedure (3.0). If other conditions are met in an actual service application, (such as different plating or coating on the locknut or on the externally threaded part, different surface against which the locknut is torqued, etc.) torque values must be adjusted in order to develop an equivalent tensile load in the mating externally threaded component.

2.0 TORQUE-TENSION REQUIREMENTS

When the locknut is tested as specified in 3.0, the locknut tightening torque shall not exceed the maximum nor be less than the minimum torque values given on Page D-40 for the applicable grade and thread series.

3.0 TORQUE-TENSION TEST

The torque-tension test shall be conducted using a load measuring device (4.3.1 of IFI-100). A test bolt (4.3.2 of IFI-100) shall be inserted in the load measuring device, a hardened washer (4.3.3 of IFI-100) placed on the bolt, and the locknut then assembled on the bolt and advanced

until it is seated against the hardened washer. The length of the test bolt shall be such that when the locknut is seated on the washer, a length equivalent to 6 to 9 thread pitches of the test bolt shall protrude through the top of the locknut. The locknut shall then be tightened manually with a torque wrench, or with an equivalent torque sensing power device, until a tensile load equal to the clamp load, as specified for the applicable grade and thread series on Page D-40, is developed in the bolt. The torque necessary to develop this load shall be recorded and shall meet the requirements specified in 2.0.

Torque wrenches shall be accurate within plus or minus 2 per cent of the maximum of the specified torque range of the wrench.

During all tests the hardened washer shall be prevented from turning during locknut tightening.

If convenient, the torque-tension test may be conducted in conjunction with the prevailing torque test (4.3 of IFI-100, Page D-33).

4.0 INSPECTION

From each lot, ten locknuts shall be selected at random and tested for conformance with the torque-tension requirements.

If all ten locknuts meet the specified requirements the lot shall be acceptable. If one locknut fails to meet the specified requirements, ten additional locknuts shall be selected at random, tested, and if all meet the specified requirements the lot shall be acceptable.

If two or more locknuts in the original ten tests or any in the additional ten retests fail to meet the specified requirements the lot shall be subject to rejection.

A lot, for purposes of selecting test specimens, shall consist of all locknuts offered for inspection at one time that are the same grade, size, and thread series, and are manufactured essentially at one time and under the same conditions.

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TORQUE-TENSION REQUIREMENTS FOR LOCKNUTS

COARSE THREAD SERIES

Locknut Size and Threads Per Inch	Grade B Locknuts			Grade C Locknuts		
	Clamp Load lb	Locknut Tightening Torque ft lb		Clamp Load lb	Locknut Tightening Torque ft lb	
		Max	Min		Max	Min
1/4 - 20	2,000	7.0	5.0	2,850	10.5	7.0
5/16 - 18	3,350	13.5	10.0	4,700	16.0	11.0
3/8 - 16	4,950	19.5	14.5	6,950	29.0	21.0
7/16 - 14	6,800	33.5	24.5	9,600	44.0	32.0
1/2 - 13	9,050	50.0	37.0	12,800	66.0	49.0
9/16 - 12	11,600	69.0	51.0	16,400	95.0	70.0
5/8 - 11	14,500	95.0	70.0	20,300	122.5	90.0
3/4 - 10	21,300	155	115	30,100	210	155
7/8 - 9	29,500	250	185	41,600	310	230
1 - 8	38,700	380	280	54,600	460	340
FINE THREAD SERIES						
1/4 - 28	2,300	7.25	5.25	3,250	10.5	7.0
5/16 - 24	3,700	13.5	10.0	5,200	17.0	12.0
3/8 - 24	5,600	22.0	16.0	7,900	30.0	22.0
7/16 - 20	7,550	33.5	24.5	10,700	45.0	33.0
1/2 - 20	10,200	52.0	38.0	14,400	69.0	51.0
9/16 - 18	13,000	75.0	55.0	18,300	100	75.0
5/8 - 18	16,300	97.5	72.5	23,000	130	95.0
3/4 - 16	23,800	165	120	33,600	210	155
7/8 - 14	32,400	270	200	45,800	310	230
1 - 14	43,300	420	310	61,100	495	365

NOTES: 1. Clamp loads for Grade B locknuts equal 75% of the proof loads specified for SAE J429 Grade 5 and ASTM A449 bolts.

2. Clamp loads for Grade C locknuts equal 75% of the proof loads specified for SAE J429 Grade 8 and ASTM A354 Grade BD bolts.