

INTRODUCTION

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

1.0 Scope

This standard covers torque-tension requirements for two types of plating: 0.0002/0.0004 in. thickness electrodeposited cadmium plated and lubricated Grades B and C prevailing-torque type steel hex nuts in sizes 1/4 to 1 in., inclusive, and Grades F and G prevailing-torque type steel hex flange nuts in sizes 1/4 to 3/4 in., inclusive (see Table 1) and 0.0002/0.0004 in. thickness electrodeposited zinc clear chromate and lubricated Grades B and C prevailing-torque type steel hex nuts in sizes 1/4 to 1 in., inclusive, and Grades F and G prevailing-torque type steel hex flange nuts in sizes 1/4 to 3/4 in., inclusive (see Table 2).

The dimensional, mechanical and other performance requirements for these nuts are given in IFI-100/107. IFI-101 is considered to be an extension of IFI-100/107.

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 nut or on the externally threaded part, different surface against which the nut 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 nut is tested as specified in 3.0, the nut tightening torque shall not exceed the maximum nor be less than the minimum torque values given in Tables 1 and 2 for the applicable grade, plating type and thread series.

3.0 Torque-Tension Test

3.1 The torque-tension test measuring devices, test components including replacement schedule, and test installation speed shall be as described within Section 6.3 of IFI-100/107.

3.2 A test bolt shall be inserted in the load measuring device, a hardened washer placed on the bolt, and the nut 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 nut is seated on the washer, a length equivalent to 4 to 9 thread pitches of the test bolt shall protrude through the top of the nut. The nut shall then be tightened manually with a torque wrench, or with an equivalent torque measuring power device, until a tensile load equal to the clamp load, as specified for the applicable grade, plating type and thread series in Tables 1 and 2, is developed in the bolt. The torque necessary to develop this load shall be recorded and shall meet the requirements specified in 2.0.

3.2.1 If convenient, the torque-tension test may be conducted in conjunction with the prevailing-torque test as described within Section 6.3 of IFI-100/107.

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3.2.2 When applying the elements of Section 6.3 of IFI-100/107 to zinc clear chromate and lubricated prevailing-torque type nuts, the following test modifications shall be used:

3.2.2.1 The test bolt shall conform to SAE Grade 8 mechanical and material requirements as specified in SAE J429 and have a zinc phosphate and oil finish in accordance with ASTM F1137.

3.2.2.2 The test washer shall be plain finish, clean and lubricant free.

3.2.2.3 The prevailing-torque testing requirements will be limited to first installation and first removal only per Tables 5A and 5B of IFI-100/107. Additional prevailing-torque requirements will only be performed if specifically agreed upon by the manufacturer and at the request of the purchaser.

4.0 Inspection

4.1 Inspection Procedure

Nuts shall be inspected to determine conformance with this standard. Inspection procedures may be specified by the purchaser on the inquiry, purchase order, or the engineering drawing or shall be as agreed upon between the purchaser and supplier prior to the acceptance of the order. In the absence of a defined agreement, the requirements of ASME B18.18.2 inspection level B shall apply.

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