

1.0 Scope

1.1 Scope. This standard establishes an inspection procedure to determine acceptability of thread nicks as they relate to screw thread assemblability. This procedure is intended to be used for bolts, screws and studs of carbon or alloy steel #10 thru 1¼ inch in diameter. This procedure applies to Unified coarse and fine, Class 2A and 3A plain finished threads, and Class 2A threads that have been plated or coated.

This procedure may also be used to evaluate Class 2A threads that have been undersized to allow for heavy plating/coating thickness and products made from nonferrous materials. When inspecting products in either category the gage size and maximum assembly torque value shall be by agreement between purchaser and supplier.

The use of this procedure to evaluate products having a prevailing torque feature or a plated/coated finish whose thickness, by design, may cause the thread size to exceed basic Class 3A limits, shall be by agreement between purchaser and supplier.

1.2 Definitions

1.2.1 Thread Nick – an indentation on the crest or flank of a thread profile that may cause the thread size to be nonconforming or impair its ability to assemble with a mating part.

1.2.2 Acceptance Torque – the torque value which may not be exceeded while applying the appropriate 3A GO thread ring gage on an externally threaded fastener.

1.2.3 Basic Product Diameter – is the nominal size used for general product identification.

1.2.4 Appropriate GO Thread Ring Gage - a properly calibrated Class 3A GO thread ring gage of either solid or split design shall be used to inspect all fasteners.

2.0 Referenced Standards

American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016-5990, U.S.A.

ASME B1.1 *Unified Inch Screw Threads (UN and UNR Thread Form)*

ASME B1.2 *Gages and Gaging for Unified Inch Screw Threads (UNJ Thread Form)*

ASME B1.15 *Unified Inch Screw Threads (UNJ Thread Form)*

American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959

ASTM F1470 *Guide for Fastener Sampling for Specified Mechanical Properties and Performance Inspection*

3.0 Acceptance Test Procedure

Threads on products having a plain or plated/coated finish may be lubricated with light oil prior to assembly with the Class 3A GO thread ring gage to prevent or reduce the possibility of damage to the gage.

The torque shall be measured while a fastener and a 3A GO ring gage are assembled over the complete length of the full formed thread. Either the fastener or the gage may be rotated while the other is held stationary. Caution must be exercised while performing the inspection to avoid damaging the ring gage or altering its size. The maximum assembly speed shall not exceed 30 RPM.

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4.0 Acceptance or Rejection Criteria

The lot is acceptable if none of the samples exceed the allowable assembly torque in Table 1.

5.0 Sample Size

A representative sample size shall be selected based on the detection requirements for surface discontinuities as specified in ASTM F1470, Table 1.

6.0 Disposition

Disposition of material found to be nonconforming may be conducted in accordance with the provisions specified in ASTM F1470, Manufacturer's Options, End User's Options or Distributor's Options as applicable.

**Table 1 Maximum Allowable Torque
Values for GO Thread Ring Gage
Acceptance**

Size	Nominal Diameter d	Maximum Allowable Torque T
	inches	in.lb.
10	.190	1.0
12	.212	1.5
1/4	.250	2.5
5/16	.312	4.5
3/8	.375	7.5
7/16	.437	12.0
1/2	.500	18.0
9/16	.562	26.0
5/8	0.625	35.5
3/4	.750	61.0
7/8	.875	97.0
1	1.000	145.0
1 1/8	1.125	206.5
1 1/4	1.250	283.0

The maximum allowable torque values shown in Table 1 are calculated using the expression:

$$T = 145d^3$$

where

T = torque (in.lb.)
d = nominal diameter (inches).

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