



Designation: F2437/F2437M – 17

Standard Specification for Carbon and Alloy Steel Compressible-Washer-Type Direct Tension Indicators for Use with Cap Screws, Bolts, Anchors, and Studs¹

This standard is issued under the fixed designation F2437/F2437M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This specification covers the requirements for carbon and alloy steel compressible-washer-type direct tension indicators (DTIs) capable of indicating a specified bolt tension in cap screws, bolts, anchors, and studs.

1.2 Direct tension indicators in inch sizes ¼ through 2½ in. and metric sizes M6 and M72 are covered.

1.3 Direct tension indicators have two styles and four grades for inch fasteners, Grades 5, 8, 55, and 105, and two property classes for metric fasteners, property classes 8.8 and 10.9 each of which differ in their compressive load requirements at a given gap (see [Table 1](#) and [Table 2](#)).

1.3.1 Style 1 DTIs are suitable for comparatively smaller bearing surfaces. Style 1 DTIs are available in Grades 5 and 8, which differ in the amount of tension they indicate at a prescribed gap (see [Table 1](#) and [Table 3](#)).

1.3.2 Style 2 DTIs are suitable for comparatively large bearing surfaces. Style 2 DTIs are available in Grades 55 and 105, which differ in the amount of tension they indicate at a prescribed gap (see [Table 1](#) and [Table 3](#)).

1.4 Direct tension indicators are intended for installation under a bolt or cap screw head, a hex nut, or against a hardened washer or other flat hardened surface.

1.5 *Recommended Fasteners*—Fasteners meeting the requirements of the standards referenced in [Table 3](#) are considered compatible with the DTI grade or class listed.

1.6 The values stated for Inch DTIs are expressed in inch-pound units and for Metric DTIs values are expressed in SI units. The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each

system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.7 *The following precautionary statement pertains only to the test method portions, Section 12 of this specification: This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.8 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

- A193/A193M Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
- A194/A194M Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
- A307 Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
- A354 Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners
- A449 Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use
- A563 Specification for Carbon and Alloy Steel Nuts
- B695 Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel
- F436/F436M Specification for Hardened Steel Washers Inch

¹ This specification is under the jurisdiction of ASTM Committee F16 on Fasteners and is the direct responsibility of Subcommittee F16.02 on Steel Bolts, Nuts, Rivets and Washers.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

*A Summary of Changes section appears at the end of this standard