



Designation: D8288 – 19

Standard Test Method for Comparison of Metalworking Fluids Using a Tapping Torque Test Machine¹

This standard is issued under the fixed designation D8288; 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 test method describes a laboratory technique to evaluate the relative performance of metal removal fluids using an instrumented tapping machine that measures and records torque.

1.1.1 The method is applicable to all tap types, machining speeds, and alloys that can be fabricated into a test piece. Comparison can be made between different operating conditions or various types of fluids including straight and emulsifiable oils, semi-synthetics and synthetic fluids (see Classification D2881).

1.2 The values stated in SI units are to be regarded as standard.

1.2.1 *Exception*—The units for the threads of the tap, M6, are in metric thread units.

1.3 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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

D2881 Classification for Metalworking Fluids and Related Materials

D4175 Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants

D5619 Test Method for Comparing Metal Removal Fluids Using the Tapping Torque Test Machine (Withdrawn 2016)³

D6300 Practice for Determination of Precision and Bias Data for Use in Test Methods for Petroleum Products and Lubricants

D7778 Guide for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

E1488 Guide for Statistical Procedures to Use in Developing and Applying Test Methods

3. Terminology

3.1 For definitions of terms used in this test method, refer to Terminology D4175.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *built up edge, n*—an accumulation of the material being tapped which seizes or bonds to the cutting surface of the tap.

3.2.2 *cutting tap, n*—in metal removal, a machine tool which forms a thread by cutting and removing test piece material.

3.2.2.1 *Discussion*—Cutting taps form threads by removing material as chips; less force is typically required and they are more effective than forming taps for hard materials.

3.2.3 *datum mark (D), n*—an etched indication on the corner of a machined test piece indicating that the adjoining sides are square or perpendicular.

3.2.4 *forming tap, n*—in metal removal, a machine tool that forms a thread by displacing or deforming the test piece material.

3.2.4.1 *Discussion*—A form tap is most effective in ductile materials where metal can flow; no chips are removed.

3.2.5 *tool feed rate, n*—the distance traveled by the tool at a uniform rate divided by the number of spindle revolutions during which this travel occurs.

3.2.5.1 *Discussion*—In this method the tool feed rate is the distance (mm) per second a cutting or forming tap (8.9) passes through a hole in a test piece (8.10).

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.L0.01 on Metal Removal Fluids and Lubricants.

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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.

³ The last approved version of this historical standard is referenced on www.astm.org.