



Designation: D2228 – 04 (Reapproved 2019)

## Standard Test Method for Rubber Property—Relative Abrasion Resistance by Pico Abrader Method<sup>1</sup>

This standard is issued under the fixed designation D2228; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the U.S. Department of Defense.*

### 1. Scope

1.1 This test method covers the determination of the abrasion resistance of vulcanized (thermoset) rubbers, thermoplastic elastomers, and elastomeric and similar materials to a standardized reference system. A standardized set of reference compounds is used to calculate relative abrasion resistance. These reference compounds are also used to determine the relative performance, within a permissible range, of the cutting knives used in performing the test.

1.2 All materials, instruments, or equipment used for the determination of mass, force, or dimension shall have traceability to the National Institute for Standards and Technology,<sup>2</sup> or other internationally recognized organization parallel in nature.

1.3 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 *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.*

1.5 *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.*

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D11 on Rubber and Rubber-like Materials and is the direct responsibility of Subcommittee D11.15 on Degradation Tests.

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<sup>2</sup> Available from National Institute of Standards and Technology (NIST), 100 Bureau Dr., Stop 3460, Gaithersburg, MD 20899-3460.

### 2. Referenced Documents

#### 2.1 ASTM Standards:<sup>3</sup>

D618 Practice for Conditioning Plastics for Testing

D3182 Practice for Rubber—Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets

D4483 Practice for Evaluating Precision for Test Method Standards in the Rubber and Carbon Black Manufacturing Industries

### 3. Summary of Test Method

3.1 In this test method, a pair of tungsten carbide cutting knives of a specified geometry and configuration are used to abrade the surface of the specimen. The knives are lowered onto a circular test specimen, or button, which is rotated under controlled conditions of speed, time, and force on the cutting knives. A dusting powder is used as an interface between the cutting knives and the specimen to engulf the abraded rubber particles and to maintain the cutting knives relatively free from oils, resins, and the like, which may be present in the specimen and may interfere with the abrasion assessment. A series of five calibration compounds are used to determine that the sharpness of the knives and hence, the calibration of the instrument, are within the specified limits, and additionally, as reference standards to which the abrasion resistance, determined by volumetric loss, of a subject material may be compared.

### 4. Significance and Use

4.1 This test method may be used to estimate the relative abrasion resistance of subject materials as described in 1.1. No correlation between this accelerated test and service performance is given or implied, due, in part, to the widely varying nature of service conditions.

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.