



Designation: D4791 – 19 (Reapproved 2023)

Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate¹

This standard is issued under the fixed designation D4791; 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.

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 percentages of flat particles, elongated particles, or flat and elongated particles in coarse aggregates. Two procedures, Method A and Method B, are presented in this standard. Method A is a reflection of the original procedure as developed prior to Superpave and is intended for all non-Superpave applications. Method B is a comparison of the maximum particle dimension to the minimum particle dimension and is intended for use with Superpave specifications.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.2.1 *Exception (regarding sieves, per Specification E11)*—The values stated in SI units shall be considered standard for the dimensions of the wire cloth openings and the diameter of the wires used in the wire cloth. When sieve mesh sizes are referenced, the alternate inch-pound designations are provided for information purposes and enclosed in parentheses.

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.*

¹ This test method is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.51 on Aggregate Tests.

Current edition approved Nov. 1, 2023. Published November 2023. Originally approved in 1989. Last previous edition approved in 2019 as D4791 – 19. DOI: 10.1520/D4791-19R23.

2. Referenced Documents

2.1 ASTM Standards:²

- C136/C136M Test Method for Sieve Analysis of Fine and Coarse Aggregates
- C670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials
- C702/C702M Practice for Reducing Samples of Aggregate to Testing Size
- D75/D75M Practice for Sampling Aggregates
- E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves
- E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods
- E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

3. Terminology

3.1 Definitions:

3.1.1 *elongated particles of aggregate*—those particles of aggregate having a ratio of length to width greater than a specified value.

3.1.2 *flat and elongated particles of aggregate*—those particles having a ratio of length to thickness greater than a specified value.

3.1.3 *flat particles of aggregate*—those particles of aggregate having a ratio of width to thickness greater than a specified value.

3.1.4 *length*—maximum dimension of the particle, as illustrated in Fig. 1.

3.1.5 *thickness*—minimum dimension of particle. It is the maximum dimension perpendicular to the length and width as illustrated in Fig. 1.

3.1.6 *width*—intermediate dimension of the particle. It is the maximum dimension in the plane perpendicular to the length

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.