



Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate¹

This standard is issued under the fixed designation D 5821; 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 covers the determination of the percentage, by mass or by count, of a coarse aggregate sample that consists of fractured particles meeting specified requirements.

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

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

2. Referenced Documents

2.1 ASTM Standards:

- C 136 Test Method for Sieve Analysis of Fine and Coarse Aggregates²
- C 702 Practice for Reducing Field Samples of Aggregate to Testing Size²
- D 8 Terminology Relating to Materials for Roads and Pavements³
- D 75 Practice for Sampling Aggregates³
- E 11 Specification for Wire-Cloth Sieves for Testing Purposes⁴

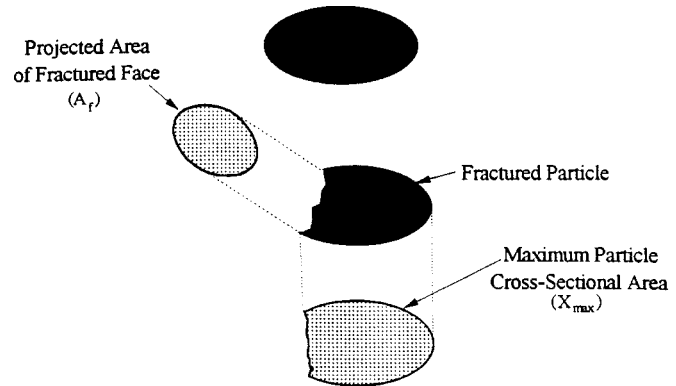
3. Terminology

3.1 Definitions:

3.1.1 *fractured face, n*—an angular, rough, or broken surface of an aggregate particle created by crushing, by other artificial means, or by nature (see Terminology D 8).

3.1.1.1 *Discussion*—for this standard, a face will be considered a “fractured face” only if it has a projected area at least as large as one quarter of the maximum projected area (maximum cross-sectional area) of the particle and the face has sharp and well defined edges; this excludes small nicks. See Fig. 1.

3.1.2 *fractured particle, n*—a particle of aggregate having at



A face will be considered a “Fractured Face” only if it has : $A_f \geq 0.25 X_{max}$

FIG. 1 Schematic of a Fractured Particle with One Fractured Face

least the minimum number of fractured faces specified (usually one or two).

4. Significance and Use

4.1 Some specifications contain requirements relating to percentage of fractured particles in coarse aggregates. One purpose of such requirements is to maximize shear strength by increasing inter-particle friction in either bound or unbound aggregate mixtures. Another purpose is to provide stability for surface treatment aggregates and to provide increased friction and texture for aggregates used in pavement surface courses. This test method provides a standard procedure for determining the acceptability of coarse aggregate with respect to such requirements.

4.2 Specifications differ as to the number of fractured faces required on a fractured particle, and they also differ as to whether percentage by mass or percentage by particle count shall be used. If the specification does not specify, use the criterion of at least one fractured face and calculate percentage by mass.

5. Apparatus

5.1 *Balance*—A balance or scale accurate and readable to within 0.1 % of the test sample mass at any point within the range of use.

5.2 *Sieves*—Sieves conforming to Specification E 11.

¹ This test method is under the jurisdiction of ASTM Committee D-4 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.51 on Aggregate Tests.

Current edition approved Nov. 10, 1995. Published January 1996.

² Annual Book of ASTM Standards, Vol 04.02.

³ Annual Book of ASTM Standards, Vol 04.03.

⁴ Annual Book of ASTM Standards, Vol 14.02.