



# Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate<sup>1</sup>

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 Aggregates<sup>2</sup>

C 702 Practice for Reducing Field Samples of Aggregate to Testing Size<sup>2</sup>

D 8 Terminology Relating to Materials for Roads and Pavements<sup>3</sup>

D 75 Practice for Sampling Aggregates<sup>3</sup>

E 11 Specification for Wire-Cloth Sieves for Testing Purposes<sup>4</sup>

## 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 (this excludes small nicks, see Fig. 1) and the face has sharp or slightly blunt edges.

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

5.3 *Splitter*—A sample splitter suitable for dividing field samples into test portion sizes in accordance with Practice C 702.

5.4 *Spatula*—A spatula or similar tool to aid in sorting aggregate particles.

## 6. Sampling

6.1 Sample the aggregate in accordance with Practice D 75.

## 7. Sample Preparation

7.1 Dry the sample sufficiently to obtain a clean separation of fine and coarse material in the sieving operation. Sieve the sample over the 4.75-mm (No. 4) sieve, or other specified sieve for retaining material for this test, in accordance with Test Method C 136 and then reduce the portion retained on the sieve using a splitter in accordance with Practice C 702 to appropriate size for test.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 04.02.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 04.03.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 14.02.