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# *Standard Method of Test for*

# SCRATCH HARDNESS OF COARSE AGGREGATE PARTICLES

**ASTM Designation: C 235 – 68**

This Standard of the American Society for Testing and Materials is issued under the fixed designation C 235; 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.

## Scope

1. (*a*) This method of test covers a procedure for determining the quantity of soft particles in coarse aggregates on the basis of scratch hardness. It is intended to be used to identify materials that are soft, including those which are so poorly bonded that the separate particles in the piece are easily detached from the mass. The test is not intended to identify other types of deleterious materials in aggregates separate mention of which should be made in specifications.

(*b*) The method is intended primarily for field use in estimating the quality of a deposit of coarse aggregate. It will be helpful in the laboratory, and when used with visual inspection will afford a fast, convenient means of determining the amount of soft particles in aggregate.

(*c*) In case of question, the scratch test should be made on a freshly broken surface of the aggregate particle. If the particle contains more than one type of rock and is partly hard and partly soft, it should be classed as "soft" only if the soft portion is one third or more of the volume of the particle. Scratch hardness tests can be made on the exposed surface of a particle provided consideration is given to softening of the surface due to weathering. A particle with a thin, soft and weathered surface and a hard core should normally be classed as "soft."

## Apparatus

2. *Brass Rod*, $\frac{1}{16}$ in. in diameter, with a rounded point, mounted in a device so that a load of 2 ± 0.1 lb is applied to the specimen tested. A suitable design for this apparatus is shown in Fig. 1. The brass rod shall be of suitable hardness so that when filed to a sharp point, it will scratch a copper penny (U. S. Lincoln design) but fail to scratch a nickel (U. S. Jefferson design). For use in the field, brass rod of the specified size and hardness can be mounted into the wooden shaft of an ordinary lead pencil.

## Samples

3. (*a*) Coarse aggregate for the test

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[1] Under the standardization procedure of the Society, this method is under the jurisdiction of the ASTM Committees C-9 on Concrete and Concrete Aggregates. A list of members may be found in the ASTM Yearbook. This standard is the direct responsibility of Subcommittee III-1 on Miscellaneous Tests for Hardened Concrete.

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