



Designation: C 418 – 98

Standard Test Method for Abrasion Resistance of Concrete by Sandblasting¹

This standard is issued under the fixed designation C 418; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

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

1. Scope

1.1 This test method covers determination of the abrasion resistance characteristics of concrete by subjecting it to the impingement of air-driven silica sand. It is intended for use as a basis for the development of informed judgment.

1.2 The values stated in SI units are to be regarded as the standard. Inch-pound units are shown for information purposes in parentheses.

1.3 *This standard does not purport to address 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.*

NOTE 1—Users of this test method are advised that there are known safety hazards associated with the use of silica as a blasting media. Consult the silica manufacturer's MSDS to insure that the latest recommended health and safety practices are being followed.

NOTE 2—Other procedures are available for measuring abrasion resistance of concrete surfaces in addition to subjecting it to air driven silica sand. Consideration should be given to other methods of testing as outlined in ASTM C 779, ASTM C 944, and ASTM C 1138. The test method most closely representing service conditions should be used.

1.4 The text of this standard references notes and footnotes which are provided as explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of this standard.

2. Referenced Documents

2.1 ASTM Standards:

C 778 Specification for Standard Sand²

C 779 Test Method for Abrasion Resistance of Horizontal Concrete Surfaces³

C 944 Test Method for Abrasion Resistance of Concrete or Mortar Surfaces by the Rotating-Cutter Method³

C 1138 Test Method for Abrasion Resistance of Concrete (Underwater Method)³

¹ This test method is under the jurisdiction of ASTM Committee C-9 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.62 on Abrasion Testing of Concrete.

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² Annual Book of ASTM Standards, Vol 04.01.

³ Annual Book of ASTM Standards, Vol 04.02.

3. Significance and Use

3.1 This test method covers the laboratory evaluation of the relative resistance of concrete surfaces to abrasion. This procedure simulates the action of waterborne abrasives and abrasives under traffic on concrete surfaces. It performs a cutting action which tends to abrade more severely the less resistant components of the concrete. Adjustments in the pressure used and the type of abrasive permit a variation in the severity of abrasion which may be used to simulate other types of wear.

4. Apparatus

4.1 *Scales*—The scale shall have a capacity of 5000 g or more. The permissible variation at a load of 5000 g (11 lb) shall be ± 5 g (0.2 oz).

4.2 *Weights*—The permissible variations on weights used in weighing shall be as prescribed in Table 1. The permissible variations on new weights shall be one half of the values given in Table 1.

4.3 *Sand Blast Apparatus*—The sand blast apparatus shall consist of an injector-type gun. The gun shall have a high-velocity air jet fed by a suitably controlled rate of flow for the abrasive material. The nozzle shown in Fig. 1 shall consist of cold-rolled bar stock, 40 mm (1.5 in.) long, or hardened tool steel HRC 48 ± 2 as determined by Test Methods E 18, drilled to 6.40 ± 0.02 mm (0.250 ± 0.001 in.) approximately 700 kPa (100 psi) through the center. The walls of the nozzle shall have a 45° bevel on the inside at the upper end. A compressed air supply of approximately 100 psi (690 kPa) shall be available and equipped with a pressure-control device. Provision shall be made to collect the spent abrasive and dust. Suitable jigs and clamps shall be provided to hold the test specimen in a fixed position with relation to the discharge end of the nozzle. For laboratory wear testing of concrete specimens a commercial sand blast cabinet may be selected similar to that shown in Fig. 2.⁴

4.4 *Shield*—The shield shall be square or circular, 150 mm (6 in.) on a side or diameter, made from zinc-coated steel sheet or equivalent, having a thickness in the range of 0.90 to 1.90

⁴ A sand blast cabinet is available from CLEMCO Industries, 2177 Jerrold Ave., San Francisco, CA 94124.