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American Association State  
Highway and Transportation Officials Standard  
AASHTO No.: T165

# Standard Test Method for Effect of Water on Compressive Strength of Compacted Bituminous Mixtures<sup>1</sup>

This standard is issued under the fixed designation D 1075; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

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

## 1. Scope

1.1 This test method covers measurement of the loss of compressive strength resulting from the action of water on compacted bituminous mixtures containing asphalt cement. A numerical index of reduced compressive strength is obtained by comparing the compressive strength of freshly molded and cured specimens with the compressive strength of duplicate specimens that have been immersed in water under prescribed conditions.

1.2 *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 670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials<sup>2</sup>

D 1074 Test Method for Compressive Strength of Bituminous Mixtures<sup>3</sup>

D 2726 Test Method for Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens<sup>3</sup>

## 3. Significance and Use

3.1 This test method is useful as an indicator of the susceptibility to moisture of compacted bitumen-aggregate mixtures.

## 4. Apparatus

4.1 One or more automatically controlled water baths shall be provided for immersing the specimens. The baths shall be of

sufficient size to permit total immersion of the test specimens. They shall be so designed and equipped as to permit accurate and uniform control of the immersion temperature within  $\pm 1^\circ\text{C}$  ( $1.8^\circ\text{F}$ ). They shall be constructed of or lined with copper, stainless steel, or other nonreactive material. The water used for the wet storage of the specimens shall be either distilled or otherwise treated to eliminate electrolytes and the bath shall be emptied, cleaned, and refilled with fresh water for each series of tests.

4.2 A manually or automatically controlled water bath also shall be provided for bringing the immersed specimens to the temperature of  $25 \pm 1^\circ\text{C}$  ( $77 \pm 1.8^\circ\text{F}$ ) for the compression test. Any convenient pan or tank may be used provided it is of sufficient size to permit total immersion of the specimens.

4.3 A balance and a water bath with suitable accessory equipment will be required for weighing the test specimens in air and in water in order to determine their densities, the amount of absorption, and any changes in specimen volume resulting from the immersion test.

4.4 A supply of flat transfer plates of glass or other non-reactive material will be required. One of these plates shall be kept under each of the specimens during the immersion period and during subsequent handling, except when weighing and testing, in order to prevent breakage or distortion of the specimens.

## 5. Test Specimens

5.1 At least six 101.6 by 101.6-mm (4 by 4-in.) cylindrical specimens shall be made for each test. The procedures described in Test Method D 1074 shall be followed in preparing the loose mixtures and in molding and curing the test specimens.

NOTE 1—This test method was developed to measure the loss of compressive strength due to water for specimens designed at approximately 6% air voids by the compaction procedures of Test Method D 1074. When used with mixtures designed by other test methods, it is possible that the specimens will be compacted to some other void level which may influence the results. Some agencies have established an air void or percent density target to which the specimens should be compacted. This is accomplished by adjusting the loading in the Molding and Curing Test Specimens Section of Test Method D 1074.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.22 on Effect of Water and Other Elements on Bituminous Coated Aggregates.

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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.