

Specification Guidelines: Product Specifications for Segmental Retaining Wall Units

ASTM C1262 Standard Test Method for Evaluating the Freeze-Thaw Durability of Manufactured Concrete Masonry Units and Related Concrete Units

SECTION 5

The following summarizes the contents of ASTM C1262 and key components of the test methods used to determine relative freeze thaw durability. This does not provide a comparison to field performance but a systematic approach to testing. A copy of the full standard is available upon request. This summary attempts to provide the information which is most commonly used, but Allan Block does not claim that all information contained in the standard is represented.

1. Scope

- 1.1 This test method covers the resistance to freezing and thawing manufactured concrete masonry and related concrete units. Units are tested either in water or in a saline solution depending on the intended use of the units in actual service.

Note 1 — Concrete masonry and related concrete units include units such as hollow and solid concrete masonry units, concrete brick, segmental retaining wall units, concrete pavers, and concrete roof pavers.

4. Significance and Use

- 4.1 The procedure described in this test method is intended to determine the effects of freezing and thawing on concrete units in the presence of water or saline solution.
- 4.2 The procedure is not intended to provide a quantitative measure of the length of service that may be expected from a specific type of concrete unit.

6. Sampling

- 6.1 Selection of Test Specimens — Select whole units representative of the lot from which they are selected. The units shall be free from visible cracks or structural defects.
- 6.2 Number of Specimens — Select five units for freezing and thawing tests. If compression and absorption tests are to be performed on the same set of units in accordance with Test Methods C140, select additional units as required. Specimens (coupons) used for Test Methods C140 tests shall not be used as specimens for freezing-and-thawing tests.

7. Preparation of Test Specimens

- 7.1 Freezing and Thawing Test Specimens — Test specimens shall consist of solid coupons saw-cut from full sized units. Do not saw-cut test specimens from units that have been previously oven-dried. Do not subject test specimens to oven-drying prior to completion of freezing-and-thawing testing.
- 7.1.1 One coupon shall be cut from each of the five sampled units. Using a water-cooled saw, cut the coupon from the exposed surface of the unit as the unit is used in service unless the exposed surface is a split, fluted (ribbed), or other nonplanar surface. In the case of a unit with an exposed nonplanar surface, cut the coupon from another flat molded surface. Immediately following saw-cutting, remove loose particles and residue from the coupon by rinsing in tap water and brushing with a soft bristle brush. Do not fully immerse coupons in water.

8. Procedure

- 8.1 Specimen Conditioning:
- 8.1.1 After preparation of the freezing-and-thawing test specimens in accordance with Section 7, place the specimen in the container face down on the specimen supports such that the nonsaw-cut surface of the specimen is in contact with the specimen supports. Add a sufficient amount of water at a temperature of 60 to 80°F (16 to 27°C) to the container to achieve a water depth of $1/2 \pm 1/16$ in. (13 ± 2 mm). Do not pour water directly onto the specimen. For test specimens being evaluated for freezing-and-thawing durability in saline solutions, use a 3 ± 0.1 % (by weight) sodium chloride

saline solution in lieu of water in the container. Seal the container and store on a level surface in laboratory air as defined in 7.1.2.

- 8.2 Cyclical Testing:
 - 8.2.3 One freezing-and-thawing cycle is defined as a completed freezing cycle followed by a completed thawing cycle.
 - 8.2.4 At 25 ± 5 cycle intervals, remove containers from the test chamber. Open containers to visually inspect the condition of the specimens and to adjust the water level to comply with 8.1.1.
- 8.3 Collection of Residue:
 - 8.3.1 Weigh to the nearest 0.2 g (0.0005 lb) and record as W_f a filter paper of high wet strength and smooth surface that has come to equilibrium temperature with the lab environment. Remove a single specimen from its container. Immediately rinse the specimen with water (if the specimen is tested in saline solution, use saline solution to rinse the specimen) using a squeeze bottle, being careful to collect in the specimen container the rinse water and all loose particles from the specimen. Consider any pieces that separated from the specimen as part of the residue. Pour the water (or saline solution) from the specimen container through the filter paper to collect the residue (spall) from the test specimen. Replace the specimen in the container. Using fingertips and a squeeze bottle, remove loose particles from all surfaces of the specimen, again being careful to collect all rinse water and loose particles in the specimen container. The top surface of the specimen shall not be immersed in water at anytime and the collected rinse water shall not exceed a depth of 1.2 in. (13 mm) in the container. Remove the specimen from the container, pour the rinse water through the filter paper, and rinse the specimen container until all residue (spall) in the specimen container is collected on the filter paper. Rinse the residue from specimens tested in saline solution three times with water to remove any soluble salt.

9. Calculation and Report

- 9.1 Determine and report the cumulative weight loss of each residue collection interval expressed in terms of g (lb) and as a percent of the calculated initial weight of the specimen, W_{initial} , determined in accordance with 8.3.5. Where the coupon thickness is less than 1.25 in. (32 mm), the percentage and cumulative weight loss shall be multiplied by a value equal to the actual thickness in inches (mm) divided by 1.25 in. (32 mm). Report these values for each specimen as well as the average of the specimens tested.