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Standard Guide for Reduction of Efflorescence Potential in New Unit Pavement Systems¹

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1. Scope

1.1 This guide covers methods for reducing efflorescence potential in new unit pavement systems.

1.2 The values stated in inch-pound units are to be regarded as the standard. The SI units given in parentheses are 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:*

- C67 Test Methods for Sampling and Testing Brick and Structural Clay Tile
- C270 Specification for Mortar for Unit Masonry
- C1180 Terminology of Mortar and Grout for Unit Masonry
- C1232 Terminology of Masonry

3. Terminology

3.1 *Definitions:*

3.1.1 Terminology defined in Terminologies C1180 and C1232 shall apply in this guide.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *cryptoflorescence, n*—a crystalline deposit of water-soluble compounds in the pores of unit pavement system materials.

3.2.2 *efflorescence, n*—a crystalline deposit, usually white, of water-soluble compounds on the surface of a unit pavement system.

3.2.2.1 *Discussion*—While not considered to be efflorescence, stains produced by acid-soluble vanadium com-

pounds in clay masonry are usually yellow or green; and stains produced by acid-soluble manganese compounds are usually brown or gray.

3.2.3 *jointing material, n*—mortar, aggregate, or sealant used between paver units.

3.2.4 *unit pavement system, n*—a system consisting of edge restraint, wearing course of discrete clay or concrete pavers, setting bed, jointing material, base or sub-base, or combination thereof, and appropriate drainage elements.

3.2.4.1 *Discussion*—Flexible pavement is a unit pavement system whose wearing course consists of discrete clay or concrete pavers on an aggregate base, an aggregate base stabilized with asphalt or cement, or asphalt pavement.

3.2.4.2 *Discussion*—Rigid pavement is a unit pavement system whose surface wearing course consists of discrete clay or concrete units on a rigid base such as concrete.

4. Significance and Use

4.1 This guide provides information that, if implemented, will reduce efflorescence potential in new unit pavement systems. However, its implementation will not always completely prevent efflorescence.

4.2 This guide may be augmented by related information contained in the appendixes of Specification C270, the additional material listed in Appendix X1 in this standard, and other publications.

5. Principles of Efflorescence

5.1 Efflorescence is directly related to the quantity of water-soluble compounds within, or exposed to, a unit pavement system; and to the quantity of water exposed to these compounds. Water-soluble compounds or water causing efflorescence may be from adjacent surfaces or beneath the pavement system: for example, fertilizer in runoff from adjacent flower beds or lawns; ground water evaporating through the wearing course. Since neither water nor water-soluble compounds can be completely eliminated from unit pavement systems, the potential for efflorescence is reduced by reducing water-soluble compounds and water retained within the unit pavement system.

¹ This test method is under the jurisdiction of ASTM Committee C15 on Manufactured Masonry Units and is the direct responsibility of Subcommittee C15.05 on Masonry Assemblies.

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