



Standard Specification for Autoclaved Aerated Concrete (AAC)¹

This standard is issued under the fixed designation C1693; 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 (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers autoclaved aerated concrete (AAC), a cementitious product based on calcium silicate hydrates in which low density is attained by the inclusion of an agent resulting in macroscopic voids, and in which curing is carried out using high-pressure steam.

1.2 The raw materials used in the production of autoclaved aerated concrete are portland cement or blended cements, quartz sand, water, lime, gypsum or anhydrite, and an agent resulting in macroscopic voids. The quartz sand used as a raw material may be replaced by a siliceous fine aggregate other than sand, and usually is ground to a fine powder before use. Fly ash may be used as a sand replacement. The batched raw materials are mixed thoroughly together to form a slurry. The slurry is cast into steel molds. Due to the chemical reactions that take place within the slurry, the volume expands. After setting, and before hardening, the mass is machine cut into units of various sizes. The units then are steam-cured under pressure in autoclaves where the material is transformed into a hard calcium silicate.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *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. See Section 6, 7, and 8.*

2. Referenced Documents

2.1 ASTM Standards:²

C22/C22M Specification for Gypsum

¹ This specification is under the jurisdiction of ASTM Committee C27 on Precast Concrete Products and is the direct responsibility of Subcommittee C27.60 on Precast Autoclaved Aerated Concrete.

Current edition approved July 15, 2011. Published August 2011. Originally approved in 2009. Last previous edition approved in 2009 as C1693 – 09 ^{ε1}. DOI: 10.1520/C1693-11.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

C33 Specification for Concrete Aggregates

C39/C39M Test Method for Compressive Strength of Cylindrical Concrete Specimens

C144 Specification for Aggregate for Masonry Mortar

C150 Specification for Portland Cement

C332 Specification for Lightweight Aggregates for Insulating Concrete

C595/C595M Specification for Blended Hydraulic Cements

C618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

C1692 Practice for Construction and Testing of Autoclaved Aerated Concrete (AAC) Masonry

E4 Practices for Force Verification of Testing Machines

E575 Practice for Reporting Data from Structural Tests of Building Constructions, Elements, Connections, and Assemblies

3. Classification

3.1 AAC units manufactured in accordance with this specification are classified according to their strength class.

4. Materials and Manufacture

4.1 *Raw Materials*—Materials shall conform to the following applicable specifications:

4.1.1 *Portland Cement*, Specification C150.

4.1.2 *Blended Cements*, Specification C595/C595M.

4.1.3 *Pozzolan*, Specification C618.

4.1.4 *Gypsum*, Specification C22/C22M.

4.1.5 *Aggregates*, Specifications C33, C144, or C332.

5. Physical Requirements

5.1 *Compressive Strength*—The compressive strength shall be determined according to Section 6 and shall conform to the requirements of Table 1.

5.2 *Dry Bulk Density*—The dry bulk density shall be determined according to Section 7 and shall conform to the requirements of Table 1.

5.3 *Drying Shrinkage*—The drying shrinkage shall be determined in accordance with Section 8, and shall conform to the requirements of Table 1.

5.4 *Modulus of Elasticity*—If required, the modulus of elasticity shall be determined in accordance with Section 9.