



Designation: ~~C1692—11~~ **C1692 – 18**

# Standard Practice for Construction and Testing of Autoclaved Aerated Concrete (AAC) Masonry<sup>1</sup>

This standard is issued under the fixed designation C1692; 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.

## INTRODUCTION

Masonry units of autoclaved aerated concrete (AAC) can be produced with dimensional tolerances as small as 0.06 in. (1.5 mm). As a consequence, AAC masonry units can be laid with mortar joints approximately 0.38 in. (10 mm) thick, and also with thinner joints. The exterior face of the resulting AAC masonry wall is then protected from the elements using an exterior wythe of masonry, a cladding system, or a breathable coating resistant to penetration by liquid water. The interior face can be plastered, furred, or painted.

### 1. Scope\*

1.1 This practice applies to construction and testing of masonry made of AAC units. It includes or references terminology, material specifications, and methods of test. It references specifications and test methods.

1.2 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.

1.3 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

### 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

[C270 Specification for Mortar for Unit Masonry](#)

[C476 Specification for Grout for Masonry](#)

[C1072 Test Methods for Measurement of Masonry Flexural Bond Strength](#)

[C1232 Terminology for Masonry](#)

[C1660 Specification for Thin-bed Mortar for Autoclaved Aerated Concrete \(AAC\) Masonry](#)

[C1691 Specification for Unreinforced Autoclaved Aerated Concrete \(AAC\) Masonry Units](#)

[C1693 Specification for Autoclaved Aerated Concrete \(AAC\)](#)

[C1717 Test Methods for Conducting Strength Tests of Masonry Wall Panels](#)

[E96/E96M Test Methods for Water Vapor Transmission of Materials](#)

[E514/E514M Test Method for Water Penetration and Leakage Through Masonry](#)

[E518/E518M Test Methods for Flexural Bond Strength of Masonry](#)

[E519/E519M Test Method for Diagonal Tension \(Shear\) in Masonry Assemblages](#)

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee C15 on Manufactured Masonry Units and is the direct responsibility of Subcommittee C15.10 on Autoclaved Aerated Concrete Masonry Units.

Current edition approved Dec. 1, 2018. Published December 2018. Originally approved in 2009. Last previous edition approved in 2011 as C1692—10; C1692—11. DOI: 10.1520/C1692-11; 10.1520/C1692-18.

<sup>2</sup> 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.

\*A Summary of Changes section appears at the end of this standard

## 2.2 Other Standards:

~~TMS 402-08 / ACI 530-09 / ASCE 5-08~~ [402 Building Code Requirements for Masonry Structures](#)<sup>3</sup>  
~~TMS 602-08 / ACI 530.1-08 / ASCE 6-08~~ [602 Specification for Masonry Structures](#)<sup>3</sup>

## 3. Terminology

3.1 *Definitions*—Terms defined in Terminology [C1232](#) shall apply in this practice.

## 4. Significance and Use

4.1 This practice applies to the materials and methods used in the construction of AAC masonry. It directly references the AAC materials standards under the jurisdiction of ASTM Committee C27 and the workmanship requirements of ~~TMS 602-08 / ACI 530.1-08 / ASCE 6-08~~ [602](#) and supplements those workmanship requirements with additional requirements particular to AAC masonry.

## 5. Materials

5.1 AAC masonry units shall conform to Specification [C1691](#).

5.2 Mortar for thick-bed AAC masonry shall meet the performance standards prescribed by the AAC manufacturer.

5.3 Mortar for thin-bed AAC masonry shall comply with Specification [C1660](#).

NOTE 1—In general, AAC manufacturers' performance standards for mortar for AAC masonry address minimum dry compressive strength, minimum wet compressive strength, minimum bond strength, minimum open time, and minimum working time. They also require that the mortar provide sufficient bond to the AAC masonry unit so that flexural tensile strength is controlled by the flexural tensile strength of the units rather than by the bond between units and mortar.

5.4 Grout shall conform to Specification [C476](#).

## 6. Methods of Test

6.1 *Compressive Strength Test for AAC Masonry*—Report the compressive strength of the AAC masonry as the strength of the AAC material determined in accordance with Specification [C1693](#).

NOTE 2—Bond-strength requirements for AAC masonry mortar ([Note 1](#)) result in AAC masonry assemblages that behave monolithically. The compressive strength of an AAC prism depends on the prism's aspect ratio only, and not on the presence, number, or orientation of joints. Any reasonable aspect ratio can be used to verify compressive strength, provided that the same aspect ratio is used to calibrate design equations. Design equations for AAC masonry are calibrated using compressive strengths determined in accordance with Specification [C1693](#). It is therefore appropriate to report those same strengths, which Specification [C1693](#) requires AAC manufacturers to determine and report.

NOTE 3—The tests noted in subsections [6.2](#) through [6.4](#) are not required by ~~TMS 402-08 / ACI 530-09 / ASCE 5-08~~ or ~~TMS 602-08 / ACI 530.1-08 / ASCE 6-08~~ [402](#) or [TMS 602](#). They may be required for research purposes or other reasons.

6.2 *Flexural Strength Test for AAC Masonry Assemblages*—If required, conduct flexural strength tests in accordance with Test Methods [C1717](#), ~~E518~~[E518/E518M](#), or [C1072](#).

6.2.1 If conducting flexural strength tests in accordance with Test Methods ~~E518~~[E518/E518M](#), construct at least five test specimens as stack-bonded prisms at least 32 in. (0.81 m) high. Use mortar meeting the performance requirements of the AAC manufacturer. Conduct the flexural strength test in accordance with Test Methods ~~E518~~[E518/E518M](#), Test Method A (Simply Supported Beam with Third-point Loading).

6.2.2 If conducting flexural strength tests in accordance with Test Method [C1072](#), construct test specimens as stack-bonded prisms comprising at least three bed joints. Test a total of at least five joints. Use mortar complying with [5.2](#) or [5.3](#) as appropriate.

6.3 *Shear Strength Test for AAC Masonry Assemblages*—*Assemblages*—If required, conduct shear strength tests in accordance with Test Method ~~E519~~[E519/E519M](#). Cure the gypsum capping material for at least six hours prior to testing. Use mortar complying with [5.2](#) or [5.3](#) as appropriate.

6.4 *Modulus of Elasticity of AAC Units*—If required, determine the modulus of elasticity in accordance with Specification [C1693](#).

## 7. Workmanship for Thick-bed AAC Masonry

7.1 Workmanship shall be in accordance with ~~TMS 602-08 / ACI 530.1-08 / ASCE 6-08~~ [602](#) (Part 3—Execution), and with the additional requirements of this practice.

7.2 Install the first course in a full bed of mortar conforming to Specification [C270](#), Type M, S or N.

7.3 Use thick-bed mortar complying with [5.2](#).

7.4 Mix thick-bed mortar as prescribed by the AAC manufacturer.

<sup>3</sup> Available from The Masonry Society, 3970 Broadway, Suite 201-D Boulder, CO 80304-1135, 105 South Sunset Street, Suite Q, Longmont, CO 80501-6172, <http://www.masonrysociety.org>.