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Standard Guide for Developing Specifications for Masonry Units[1]

This standard is issued under the fixed designation C1825; 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.

ε[1] NOTE—Changes were editorially made throughout the standard in December 2018.

1. Scope

1.1 This guide provides general guidance for developing ASTM unit specification for masonry units manufactured with constituent materials, manufacturing methods, and combinations thereof, that are not included in a current ASTM standard. This guide shall not be construed as permitting the use of a product conflicting with requirements of the governing building code.

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

1.3 *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:*[2]

C1072 Test Methods for Measurement of Masonry Flexural Bond Strength

C1180 Terminology of Mortar and Grout for Unit Masonry

C1232 Terminology for Masonry

C1314 Test Method for Compressive Strength of Masonry Prisms

C1363 Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus

C1601 Test Method for Field Determination of Water Penetration of Masonry Wall Surfaces

D3273 Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber

D3345 Test Method for Laboratory Evaluation of Solid Wood for Resistance to Termites

E84 Test Method for Surface Burning Characteristics of Building Materials

E90 Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

E119 Test Methods for Fire Tests of Building Construction and Materials

E136 Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C

E514 Test Method for Water Penetration and Leakage Through Masonry

G154 Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

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 *non-traditional masonry units, n*—masonry units manufactured from constituent materials, methods, or combination thereof, that are not included in current ASTM masonry unit specifications.

4. Background of Guide

4.1 Traditional masonry units, such as brick, structural clay tile and concrete masonry units, have a long history of use as well as broad applications in masonry assemblies. Unit specifications and test methods for these masonry units are well established and based on historical performance, empirical evidence, research, and testing. Applying existing unit specifications to non-traditional masonry units may not address all pertinent properties necessary to ensure performance in real world applications.

4.2 As manufacturers continue to innovate, opportunities are created for units manufactured from non-traditional

[1] This test method is under the jurisdiction of ASTM Committee C15 on Manufactured Masonry Units and is the direct responsibility of Subcommittee C15.12 on Alternative Masonry Materials and Related Units.

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[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.

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materials, methods, or combination thereof, not currently covered by any existing ASTM masonry unit specification.

4.3 Non-traditional masonry units may require additional evaluation and assessment, in addition to those required of traditional units, to ensure that the product is suitable for its intended use.

5. Significance and Use

5.1 This guide is intended to provide guidance for developing ASTM unit specifications for nontraditional masonry units. The user of this guide is encouraged to review the *Form and Style for ASTM Standards* as well as the referenced unit specifications and test methods. Note that not all items presented in this guide are necessarily applicable or appropriate in all cases.

5.2 ASTM specifications are not intended for proprietary products, but rather for a class of products that multiple manufacturers can produce, and are intended to ensure performance using those constituent materials or processes. Therefore, specific attributes that only relate to a specific brand should be avoided.

5.3 This guide does not identify the complete range of considerations that may be required for a masonry unit manufactured using a non-traditional material. Traditional masonry units possess intrinsic properties that are commonly associated with masonry including but not limited to strength, fire resistance, durability, thermal and acoustical attributes.

5.4 Non-traditional masonry unit products may meet all the physical property requirements of an existing ASTM standard unit specification, when tested using ASTM standard test methods. Nevertheless, performance of non-traditional masonry units is not assured since the intrinsic properties that are associated with traditional masonry units and assemblies may not be specifically evaluated through testing for specification compliance. Additionally, compliance with the physical properties in existing unit specifications does not mean that non-traditional units are in compliance with those specifications as traditional unit standards are only applicable to units produced with those materials and processes defined within that specification (refer to Appendix X1).

6. Procedure

6.1 *Preparation:*

6.1.1 Review the referenced Specifications, Test Methods, Terminology standards and *Form and Style for ASTM Standards* for general background information and required sections and components. Include all mandatory sections described by the *Form and Style for ASTM Standards* documents during the development of the unit specification.

NOTE 1—During this review, it may be determined that the product does not satisfy the definition of a manufactured masonry unit and is outside of the scope of Committee C15. In that case, developing a unit specification under another ASTM committee can be considered.

6.1.2 The unit specification must be written in a manner to avoid contractual language.

6.1.3 Consider and develop mandatory and non-mandatory sections including but not limited to Scope, Referenced Documents, Terminology and Ordering Information Sections (see Section 7). Modify accordingly as the specification is developed.

6.1.4 Select appropriate standard test methods to determine the required physical properties. All modifications to the standard test methods should be identified.

7. Typical Sections

7.1 The following list of sections are typically provided in a unit specification. Depending on the scope of the non-traditional unit specification some sections may not apply.

7.2 *Materials and Manufacturing:*

7.2.1 *Constituent Material(s)*—Define the range of constituent material(s) that may be used in the manufacture of the masonry unit. Include constituent materials and any additives. There may be a wide range of materials allowed by the specification if specific performance criteria for the unit and assemblage are defined.

7.2.2 *Manufacturing Process*—Define the manufacturing process and the mechanism(s) that bonds the materials in the unit.

7.2.3 *Coating or Surface Treatments*—Consideration should be given to whether coatings or surface treatments at point of manufacture should or can be applied to the unit. The type and durability of those coatings should be established. There should be a requirement that the effects of any coatings on the properties and performance of the unit and the assembly be identified and where possible, quantified.

7.3 *Defects and Deficiencies*—Provide limitations for defects and deficiencies that may interfere with the proper laying of the unit or significantly impair the strength or performance of the construction.

7.4 *Physical Properties*—Physical properties are an important predictor of the unit performance as well as the performance of unit assemblies. The physical property requirements of the specification should ensure that the masonry unit and unit assemblies perform as required in use, both in the short-term and long-term, including consideration of the various environments to which the unit and assembly likely will be exposed to in service. Consideration should be given whether different unit classifications will be needed for different applications. These unit classifications will likely have different physical properties and specifications.

7.4.1 *Strength*—Minimum unit strength requirements may be required to ensure that when units are placed in an assembly, it will possess sufficient strength to retain integrity for its intended application and use. Consideration needs to be given to whether the units are intended to be used in non-structural facing or structural applications, or both. Typical strength requirements include minimum compressive, flexural, and shear strengths. Effects of unit strengths on the structural performance of the assembly must be considered including required, or limits on, mortar types or mortar properties should be stated so that the anticipated performance is achieved. Strength may change with unit orientation and this should addressed in the standard.

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