



## Standard Specification for Lightweight Aggregates for Concrete Masonry Units<sup>1</sup>

This standard is issued under the fixed designation C 331; 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.

*This standard has been approved for use by agencies of the Department of Defense.*

### 1. Scope

1.1 This specification covers lightweight aggregates intended for use in concrete masonry units when a prime consideration is to reduce the density of the units.

1.2 The values stated in SI units are to be regarded as the standard. The values shown in parentheses are for information purposes only.

1.3 The text of this specification references notes and footnotes which provide explanatory materials. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

C 29/C 29M Test Method for Unit Weight and Voids in Aggregate<sup>2</sup>

C 40 Test Method for Organic Impurities in Fine Aggregates for Concrete<sup>2</sup>

C 114 Test Methods for Chemical Analysis of Hydraulic Cement<sup>3</sup>

C 136 Test Method for Sieve Analysis of Fine and Coarse Aggregates<sup>2</sup>

C 142 Test Method for Clay Lumps and Friable Particles in Aggregates<sup>2</sup>

C 151 Test Method for Autoclave Expansion of Portland Cement<sup>3</sup>

C 157 Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete<sup>2</sup>

C 641 Test Method for Staining Materials in Lightweight Concrete Aggregates<sup>2</sup>

C 702 Practice for Reducing Samples of Aggregate to Testing Size<sup>2</sup>

C 1262 Test Method for Evaluating the Freeze-Thaw Durability of Manufactured Concrete Masonry Units and Re-

lated Concrete Units<sup>4</sup>

D 75 Practice for Sampling Aggregates<sup>5</sup>

### 3. Classification

3.1 Three general types of lightweight aggregates are covered by this specification, as follows:

3.1.1 Aggregates prepared by expanding, pelletizing, or sintering products such as blast-furnace slag, clay, diatomite, fly ash, shale, or slate, and

3.1.2 Aggregates prepared by processing natural materials, such as pumice, scoria, or tuff, and

3.1.3 Aggregates consisting of end products of coal or coke combustion.

3.2 The aggregates shall be composed predominately of lightweight-cellular and granular inorganic material.

### 4. Chemical Composition

4.1 Lightweight aggregates shall not contain excessive amounts of deleterious substances, as determined by the following limits:

4.1.1 *Organic Impurities* (Test Method C 40)—Lightweight aggregates subjected to the test for organic impurities that produce a color darker than the standard shall be rejected, unless it is demonstrated that the discoloration is due to small quantities of materials not harmful to the concrete.

4.1.2 *Staining* (Test Method C 641)—An aggregate producing a stain index of 60 or higher shall be rejected when the deposited stain is found upon chemical analysis to contain an iron content, expressed as  $\text{Fe}_2\text{O}_3$  equal to or greater than 1.5 mg/200 g of sample.

4.1.3 *Loss on Ignition* (Test Methods C 114)—Loss on ignition of aggregates, consisting of end products of coal or coke combustion, shall not exceed 12 %. Loss on ignition of other aggregates shall not exceed 5 %.

NOTE 1—Certain processed aggregates may be hydraulic in character and may be partially hydrated during production; if so, the quality of the product is not reduced thereby. Other aggregates may, in their natural states, contain innocuous carbonates or water of crystallization, which will

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.21 on Lightweight Aggregates.

Current edition approved Jan. 10, 2000. Published April 2000. Originally published as C 331 – 53 T. Last previous edition C 331 – 98b<sup>ε1</sup>.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 04.02.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 04.01.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 04.05.

<sup>5</sup> *Annual Book of ASTM Standards*, Vol 04.03.