



# Standard Specification for Foaming Agents Used in Making Preformed Foam for Cellular Concrete<sup>1</sup>

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## 1. Scope

1.1 This specification covers foaming agents specifically formulated for making preformed foam for use in the production of cellular concrete.

1.2 The function of this specification is to provide the means for evaluating the performance of a specific foaming agent. This is accomplished by using the foaming agent in making a standard cellular concrete test batch (see Test Method C 796) from which test specimens are cast. Then, significant properties of the concrete are determined by tests and compared with the requirements of Section 3.

1.3 The values stated in inch-pound units are to be regarded as the standard.

## 2. Referenced Documents

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

C 796 Test Method for Foaming Agents for Use in Producing Cellular Concrete Using Preformed Foam

## 3. Performance Requirements

3.1 The test batch shall conform to the requirements prescribed in Table 1.

## 4. Test Methods

4.1 The foaming agent being tested shall be used in making the test specimens required.

<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 C09.23 on Chemical Admixtures.

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<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.

TABLE 1 Physical Requirements

| Property  | Requirement  |
|---|--|
| <i>Density</i> —The density shall satisfy either of the following:          |  |
| Density after pumping (see Test Method C 796)                               | 40 ± 3 lb/ft <sup>3</sup><br>(641 ± 48 kg/m <sup>3</sup> )     |
| Oven dry density <sup>A</sup> (see Test Method C 796)                       |  |
| For Type I cement   | 30.4 ± 2.5 lb/ft <sup>3</sup><br>(487 ± 40 kg/m <sup>3</sup> ) |
| For Type III cement   | 29.3 ± 2.5 lb/ft <sup>3</sup><br>(469 ± 40 kg/m <sup>3</sup> ) |
| <i>Compressive Strength</i> (see Test Method C 796), min                    | 200 psi<br>(1.4 MPa)   |
| <i>Tensile Splitting Strength</i> (see Test Method C 796), min              | 25 psi<br>(0.17 MPa)   |
| <i>Water Absorption</i> (see Test Method C 796), max                        | 25 % by volume   |
| <i>Loss of Air During Pumping</i> (see Test Method C 796), max <sup>B</sup> | 4.5 % by volume  |

<sup>A</sup> For this comparison, the calculated oven-dry density of the test batch may be determined by assuming that the water of hydration is 20 % of the weight of the cement. Then the oven-dry density =  $\frac{W_c + (0.2 W_c)}{V_{batch}}$ , where  $W_c$  = weight of cement; and  $V_{batch}$  = volume of batch.

For example: using the test batch specified in Test Method C 796, for Type I cement ( $W_c = 100$  lb;  $W_{TW}/W_c = 0.58$ , where  $W_{TW}$  = total weight of water), the total weight of materials is  $100 + 0.58 \times 100 = 158$  lb (71.67 kg). For a wet density, after pumping, of 40 lb/ft<sup>3</sup>(641 kg/m<sup>3</sup>), the batch volume is  $158/40 = 3.95$  ft<sup>3</sup>(0.11185 m<sup>3</sup>). The calculated oven dry density is then  $(100 + 0.2 \times 100)/3.95 = 30.4$  lb/ft<sup>3</sup> or  $(45.36 + 0.2 \times 45.36)/0.11185 = 487$  kg/m<sup>3</sup>. Finally, the oven-dry density as determined by Test Method C 796 shall be  $30.4 \pm 2.5$  lb/ft<sup>3</sup> ( $487 \pm 40$  kg/m<sup>3</sup>).

<sup>B</sup> The loss of air during pumping includes air that is accidentally entrapped during mixing of the concrete.

4.2 For each of the properties listed in Table 1, the test procedure, the number and type of test specimens, and the method of molding, curing, and testing shall be as described in Test Method C 796.

## 5. Keywords

5.1 cellular concrete; foaming agents

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