

# SAE Inc. Standard No. 106

## Denisty of Cementitious Products

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### ABSTRACT

This test method is used to calculate the density of SAE's cementitious products such as ConduCrete when they are a dry powder, a slurry, and a cured solid. The volume per bag of ConduCrete can also be calculated.

### 1. EQUIPMENT REQUIRED

- 1.1 Electronic balance accurate to 0.005 kg
- 1.2 Concrete mixing equipment
- 1.3 Tape measure or ruler
- 1.4 Beaker
- 1.5 Electronic balance accurate to 1 g
- 1.6 Tamping rod
- 1.7 Vernier caliper
- 1.8 Mixing stand

### 2. PROCEDURE

- 2.1 Weigh an empty 5 US gallon pail on a scale accurate to +/- 0.005 kg and leave the pail on the scale.
- 2.2 Pour the required amount of powdered ConduCrete into the 5 US gallon pail and record the height of product in the pail and the weight of the pail. Set the pail aside.
- 2.3 Weigh a second empty 5 US gallon pail on the scale and leave the pail on the scale.
- 2.4 Pour the required amount of water to form a ConduCrete slurry into the 5 US gallon pail.
- 2.5 Place the pail of water in the mixing stand and add the powdered ConduCrete. Mix until the particles are thoroughly dispersed.
- 2.6 Record the height of product in the pail and the weight of the pail.

- 2.7 Pour / scoop the ConduCrete slurry into a 4"x8" cylinder until half full.
- 2.8 Using the tamping rod, rod the material 25 times then tap the exterior of the cylinder 15 times.
- 2.9 Pour / scoop the ConduCrete slurry into the cylinder until full.
- 2.10 Rod the material an additional 25 times, ensuring that the tamping rod reaches into the first layer of material at least once.
- 2.11 Tap the exterior of the cylinder an additional 15 times and then strike off the excess material so that the top of the sample is level.
- 2.12 Close the lid and label the sample accordingly.
- 2.13 Pour the remaining product out of the pail and dispose accordingly.
- 2.14 Fill the pail with water, keeping a record of the volume of water added in liters, until the height of the water reaches the height that the dry ConduCrete powder and ConduCrete slurry were in the pail.
- 2.15 Allow the ConduCrete sample in the cylinder to cure for 28 days then remove from the cylinder.
- 2.16 Weigh the sample and record the sample dimensions, diameter and height, using the vernier caliper.

### 3. CALCULATIONS

- 3.1 To calculate the volume of the dry ConduCrete powder and the ConduCrete slurry, convert the volume of water from liters to cubic meters:

$$V = m^3_{\text{water}} = \frac{L_{\text{water}}}{1000}$$

where,

V is the volume of the product in m<sup>3</sup>

m<sup>3</sup><sub>water</sub> is cubic meters of water

L<sub>water</sub> is liters of water

- 3.2 To calculate the volume of the cured Conducrete:

$$V = \pi r^2 h$$

where,

V is the volume of the cured ConduCrete in m<sup>3</sup>

r is the radius of the cured ConduCrete cylinder

h is the height of the cured ConduCrete cylinder

3.3 Calculate the density of the dry ConduCrete powder, ConduCrete slurry, and cured ConduCrete:

$$D = \frac{m}{V}$$

where,  
D is density in kg/m<sup>3</sup>  
m is mass in kg  
V is volume in m<sup>3</sup>

3.4 Calculate the density of the product in lbs/ft<sup>3</sup>:

$$1 \text{ kg/m}^3 = 0.0624 \text{ lbs/ft}^3$$

3.5 Report the density of the product in kg/m<sup>3</sup> and lbs/ft<sup>3</sup>

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