SAE Inc. Standard No. 111
Density of Cured Latex-Based Products

ABSTRACT

This test method is used to calculate the density of SAE's cured latex-based products such as the ConduDisc, ConduFlow, and ConduForm.

1. EQUIPMENT REQUIRED

1.1   Electronic balance accurate to 1 g
1.2   Band saw
1.3   Vernier caliper
1.4   Tape measure or ruler

2. SAMPLE PREPARATION

2.1   Prepare the latex-based product for testing (i.e. ConduFlow, ConduDisc, etc.). For ConduFlow and ConduForm ensure that the curing agent has been added.
2.2   Pour the material into a grey (4"x8") test cylinder coated with a thin layer of petroleum jelly, as a mold release agent.
2.3   Remove the sample from the grey test cylinder after one week, use mineral spirits to remove any residual petroleum jelly, which will inhibit the cure.
2.4   Allow the material to cure for an additional three weeks, four weeks total.
2.5   Using the band saw trim both ends of the sample so that the surface is smooth and flat.

3. PROCEDURE

3.1   Weigh the sample on a scale accurate to +/- 1 g and record the weight of the sample.
3.2   Using a Vernier caliper measure the diameter of the sample, recording a minimum of three measurements from each end.
3.3   Using a tape measure determine the height of the sample, minimum of three measurements.

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4. CALCULATIONS

4.1   Calculate the average diameter of the sample:

$$Average\ Diameter = \frac{Sum\ of\ Diameter\ Measurements}{Number\ of\ Measurements}$$

4.2   Calculate the average radius of the sample:

$$Average\ Radius,\ r = \frac{Average\_Diameter}{2}$$

4.3   Calculate the average height of the sample:

$$Average\ Height,\ h = \frac{Sum\ of\ Height\ Measurements}{Number\ of\ Measurements}$$

4.4   Calculate the volume of the sample:
$$Volume = \pi r^2 h$$

where,
V = Volume in m^3
r = radius in m
h = height in m

4.5   Calculate the density of the cured product:

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

where,
D = Density in kg/m^3
m = Mass in kg
V = Volume in m^3

4.6   Calculate the density of the cured product in lbs/ft^3:
$$1\ kg/m^3 = 0.0624\ lbs/ft^3$$

4.7   Report the density of the cured product in kg/m^3 and lbs/ft^3.

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