

Technical Bulletin

How To Perform ASTM E605 Dry Density Test For SFRM

ASTM E605 Dry Density Test Procedures:

Materials Needed:

1. Cutting tool to remove sample
2. Gram Scale accurate to 1/10 of a gram (ex. 1.4 g)
2. 400 ml to 1 L rigid container
3. 250 ml graduated cylinder
4. Flat pan or tray
5. 1 mm diameter glass beads
6. Funnel
7. Screed tool
8. Calculator

ASTM E605 Glass Bead Displacement Method:

1. Use cutting tool or scraper to remove spray-applied sample from substrate. The minimum sample size recommended is 8 in.³ (131 cm³). The sample shall be cut to a uniform size, removing all uneven edges. The sample must be able to fit inside the volume of the rigid container without touching the sides or clearing the top.
2. The sample must be dry and free of moisture. Once removed from substrate, condition the specimen in one of the following ways:
 - a. Leave sample at room temperature for a period of not less than 72 hours at 20° ± 5°C / 68° ± 9°F and a relative humidity not greater than 60%. Sample must be left to dry until successive weight readings, taken at 24 hour intervals, equalize and remain constant by less than a 1% differential.
 - b. Force dry sample at a temperature of 43° ± 6°C (109° ± 10°F) and a relative humidity not greater than 60% until successive readings, taken at 8 hour intervals, equalize and remain constant by less than a 1% differential.
4. Weigh the sample using a gram scale and record mass to nearest 1/10th of a gram.
5. Place the empty rigid container in the center of the flat pan and pour the 1 mm glass beads through the funnel until the excess beads fall over the rim of the container.
6. Hold a screed perpendicular to the rim of the container. Begin at the edge opposite the spout and screed off the excess beads. One pass is all that is needed.
7. Discard the overflow that collects in the pan back into the storage container.
8. Pour all the glass beads that remain in the rigid container into the graduated cylinder using the funnel.
9. Return the empty rigid container into the center of the empty pan and pour beads from the graduated cylinder into the container to completely cover the bottom of the beaker approximately 1/4 inch thick (6.3 mm). Do not shake the beaker in any way.
10. Place the sample to be tested in the center of the beaker making sure no edge touches the side of the container or protrudes over the top. Gently twist the sample to remain in place if required.

11. Pour the remainder of the beads from the graduated cylinder over the sample in the rigid container, letting the excess beads flow over the top of the beaker into the pan emptying the entire graduated cylinder.
12. Screenshot the excess beads off the top of the rigid container and remove the container from the pan.
13. To calculate the volume of the sample, use the funnel to pour the beads collected in the pan into the empty graduated cylinder and record the volume displaced by the sample in ml. Do not tap or shake the graduated cylinder when reading.
14. The glass beads can then be poured through a screen to filter out any remaining SFRM particulates and returned to the storage container.

ASTM E605 Density Calculation:

1. Calculate density of the sample using the following equation.

$$\rho = \frac{m * 62.428}{V}$$

Where:

p = Density in lbs/ft³

m = mass of specimen in g

V = Volume of specimen in ml