Technical Bulletin: Foam Inspections

January 2024

Spray polyurethane foam (SPF) is frequently applied in the residential construction industry due to its ability to provide continuity of the water control, air control, vapor control, and thermal control layers necessary for environmental separation. However, SPF poses health hazards during the application, and raters should be aware of potential hazards and careful when collecting data on SPF. In his bulletin, we will cover safety consideration, how to measure the depth of foam insulation and calculate the approximate R-value. All safety recommendations should default to RESNET standards and guidance.

Safety Considerations

During the installation of spray polyurethane foam, only individuals with the proper PPE should enter the building; however, once properly applied and allowed time to cure, it is safe for entry after 24-hours. The Environmental Protection Agency (EPA) considers SPF inert post curing.

Figure 1: Notification Signage

At the time of application, these protective measures should occur:

- The site supervisor or insulator should post warning signs, such as the example as seen in Figure 1, around the house.
- The site supervisor should restrict unauthorized people not wearing personal protective equipment (PPE).
- Most manufacturers recommend restricting re-entry without PPE for 24 hours after application.

How to Accurately Access SPR Depth and Measure Residential Applications

To accurately measure the depth of Spray Polyurethane Foam (SPF) on residential home applications, you can use a depth gauge. The images below depict tools used to measure the thickness of a material.

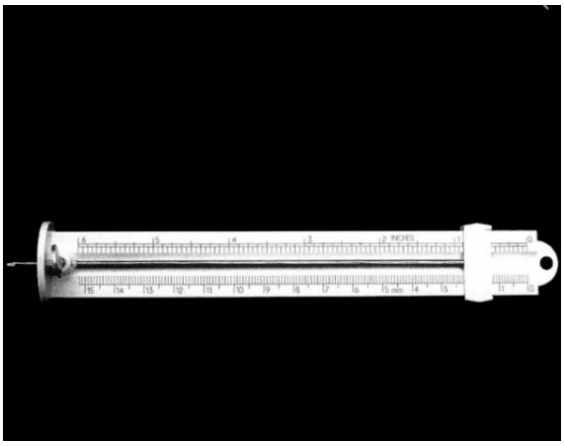

Figure 2: HC-FPDG-HD Depth Guage (~6")

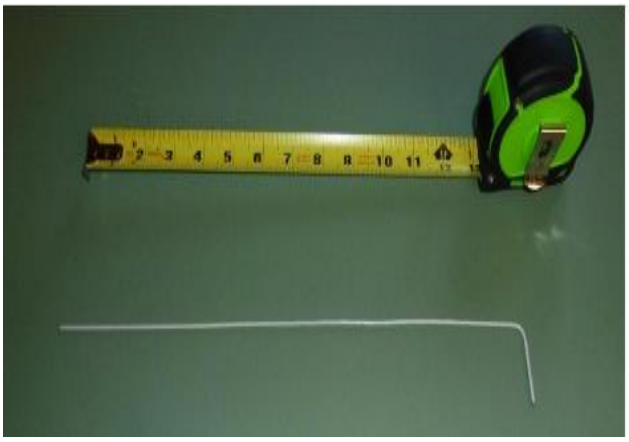

Figure 3: Measuring tape and improvised wire.

Measuring the depth of SPF can also be performed by using an improvised wire probe, seen in Figure 3. When performing thickness measurements of SPF in either manner, it is good practice to take 3 to 4 samples for each area undergoing measurement and perform the following calculations.

1. (Measure 1 + Measure 2 + Measure 3+ etc..)/ number of measurements = average measurement

   (5+7+7)/3=6.333

2. (Average measurement) * (low density polyurethane foam R-value 3.6 per inch)

   6.333 * 3.6 R-value = 22.78

Table 1 Types of Spray polyurethane Foam and R-value Ranges

Foam Insulation Type	Description	R- Value
High-density sprayed polyurethane (Close Cell)	Closed cell foam is a harder type of foam characterized by higher R-value and water tightness	6 – 7 per inch
Low-density sprayed polyurethane (Open Cell)	Open cell foam is softer and easy to probe for depth. The R-value is half of closed cell and isn't waterproof.	3 – 4 per inch

Note: Refer to the installers for an accurate R-value/inch for the insulation.

Visual Observations

Visual inspections can help identify visible defects. Common defects of SPF insulation include shrinkage, gaps in corners, damaged insulation, and inconstant depths. Therefore, it is crucial to check all corners and take multiple probes with a measuring tool to ensure that the SPF fill is continuous. The images below show an example of foam shrinkage and gaps that don't fill the cavity completely.

Figure 4: Example of foam shrinkage

Figure 5: Example of insulation not filling a cavity completely.