

ALDOT-434-09

ABSORPTION OF WATER FOR POLYURETHANE PRODUCTS USED IN UNDERSEALING PAVEMENT

1. Scope

- 1.1. This procedure describes the method used to measure the instant absorption of water for polyurethane products used in the stabilization, undersealing, or raising of concrete pavements.

2. Equipment

- 2.1. A calibrated portable digital scale, with a minimum capacity of 50 lbs and 0.01 lbs accuracy.
- 2.2. A bucket with at least five gallon capacity.
- 2.3. Potable water.
- 2.4. A dry cotton cloth.

3. Procedure

- 3.1. Fill about $\frac{1}{2}$ to $\frac{3}{4}$ of the bucket with water, weigh the bucket plus the water, and record your reading to the nearest 0.01 lbs; this is your initial reading W_1 (fig. 1).
- 3.2. Pump about one half pound of the polyurethane under the water slowly; at this stage the polyurethane will sink in the water, and do not spill any water outside the bucket. The actual weight of the polyurethane pumped inside the bucket can be verified by monitoring the reading on the scale (fig. 2).
- 3.3. Record the reading on the scale for the bucket plus the water plus the polyurethane to the nearest 0.01 lbs; this is your final reading W_2 .
- 3.4. Subtract the initial reading from the final reading; this is the dry weight of the polyurethane sample ($W_2 - W_1$).
- 3.5. Once the top surface of the polyurethane sample has set, keep the sample immersed in the water for 15 minutes by forcing it down with a heavy object.
- 3.6. Remove the bucket from the scale.
- 3.7. Remove the polyurethane sample from the water and quickly dry the outside surface with a cloth.
- 3.8. Place the polyurethane sample on the scale, measure and record the wet sample weight to the nearest 0.01 lbs; this is your wet sample weight W_3 (fig. 3).
- 3.9. Subtract the dry weight (step 4) from the wet sample weight; this is the weight of water absorbed by the sample.
- 3.10. Divide the absorbed water weight by the dry sample weight; this is the absorption. Multiply the absorption by 100 and report to the nearest tenth in percent.

$$\% \text{ Absorption} = \frac{W_3 - (W_2 - W_1)}{(W_2 - W_1)} \times 100\%$$

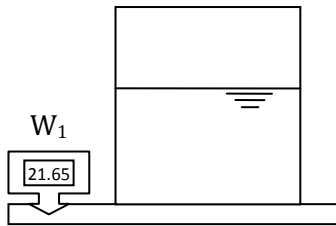


Fig. 1 - Initial Reading (Bucket + Water)

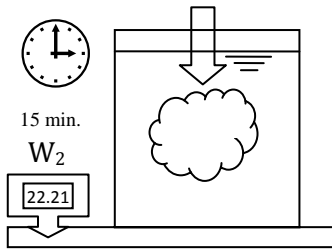


Fig. 2 - Final Reading (Bucket + Water + Sample)

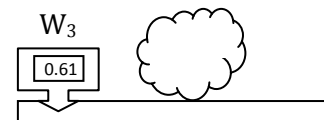


Fig. 3 - Wet Sample Weight (Dry Surface)

Using the numbers in the figures for example purposes only to calculate the absorption;

$$\% \text{ Absorption} = \frac{W_3 - (W_2 - W_1)}{(W_2 - W_1)} \times 100\% = \frac{0.61 - (22.21 - 21.65)}{(22.21 - 21.65)} \times 100\% = \frac{0.61 - 0.56}{0.56} \times 100\% = 8.9\%$$