

PORESHIELD™ STUDENT LAB EXPERIMENT INSTRUCTIONAL GUIDE



OBJECTIVES

- To observe how water and salt, like those used as deicing agents, infiltrate the pore network of concrete
- To observe the benefits of concrete protection with PoreShield™ concrete durability enhancer

MATERIALS

- 2 – Concrete samples
- Clear heat shrink wrap
- White heat shrink wrap
- Printed labels
- PoreShield Concrete Durability Enhancer (1.7g provided to treat 6 sq inches)
- 2 – CaCl₂ bottles
- 2 – 4 oz. plastic squirt bottles
- Epoxy applicator

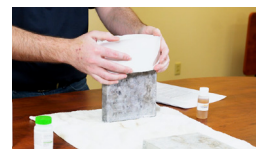
STEP 1: Create viewing window around sample with clear heat shrink wrap.

- Slide the sample into the clear heat shrink wrap sleeve.
- Align the sleeve so that it is flush with the edges of the top surface of the sample.
- Apply heat with a heat shrink gun or hair dryer.
 - If neither is available, samples can be placed in a lab oven at 200°F. If needed, gradually increase oven temperature until shrink wrap forms to sample.
- Repeat for the second sample.



STEP 2: Bond white heat shrink wrap to create a dam.

- Overlap the white shrink wrap sleeve so that it overlaps the concrete sample down to 1" below what will be the top surface.
- Apply heat with a heat shrink gun, hair dryer or lab oven to shrink the white heat shrink wrap so that it is firmly attached to the top of the concrete sample.
- Repeat for the second sample.
- To prevent runoff between the concrete and vinyl window, apply a bead of epoxy where the dam and the concrete meet. Keep it as close to the edge as possible to avoid blocking absorption at the surface. Allow to dry before moving to Step 3.



The samples should now be able to stand up with a clear view of the cross section and a barrier for fluid containment at the top.

- Label the samples with the printed tape: "Untreated" for one sample and "PoreShield" for the other sample.

STEP 3: Apply PoreShield in the dam.

- Apply all of the PoreShield Concrete Durability Enhancer in the top dam of the PoreShield labeled sample to cover the top of the concrete.
- Wait 24 hours for PoreShield to be fully absorbed into the concrete from the surface.
 - At 24 hours, any remaining PoreShield can be removed.



STEP 4: Prepare high concentration Calcium Chloride solution to simulate deicing salt.

- Add one of the two CaCl₂ bottles into a 4 oz. plastic squirt bottle.
- Fill remainder of 4 oz. bottle with water and shake vigorously.
- Repeat for second bottle.

STEP 5: Apply CaCl₂ solution to the concrete surface inside the dam.

- Add CaCl₂ solution to each dam.
 - Add as much CaCl₂ solution as you can without creating a concern of spilling from the dam, filling about half of the depth of the dam.



STEP 6: Add additional CaCl₂ periodically as fluid evaporates.

Over the coming weeks this salt solution will be absorbed by the concrete. Meanwhile, some of the water from this solution will be lost to evaporation into the air.

- Over time, periodically add CaCl₂ solution onto the samples as needed as fluid evaporates until one full bottle has been applied to the surface of each sample.

STEP 7: Add additional water periodically as evaporation occurs.

- After one full bottle of CaCl₂ solution has been applied to each sample, periodically apply additional water as needed.
 - This will dissolve any remaining salt from the surface and continue the exposure process.

STEP 8: Observe differences between treated and untreated samples.

- Observe the differences in fluid and salt ingress penetration between the PoreShield treated and untreated samples.
 - Notice the deep penetration of the salt solution into the untreated sample, while the sample treated with PoreShield continues to maintain most of the salt on the surface. This is the same protection used to preserve the life of pavements, bridge decks and many other concrete structures that are exposed to water and salt.



To watch the demonstration video, print lab instruction guides or request student lab kits, visit: poreshield.com/lab-kit

