3M

Concrete Protector & Restorer

Concrete Sample—Curing, Proper vs. Poor

The Problem

Proper curing is maintaining satisfactory moisture content and temperature in freshly placed and finished concrete.

Poor curing is the lack of satisfactory moisture content or temperatures that are too cold which has a negative effect on cured concrete strength and hardness.

Curing is the process of the portland cement in the concrete mix chemically reacting with the water in the mix. This process is called hydration. Without an adequate supply of moisture, the portland cement cannot react to form quality concrete.

If concrete is allowed to dry out during curing, proper hydration will not occur. If concrete temperature is too low during curing, the rate of hydration will be too slow. Humidity and wind conditions can contribute to poor or improper curing. Concrete that is placed in high temperatures may also be adversely affected.

Concrete that is poorly cured (ie. allowed to dry out while curing) can lose as much as 50 percent of its potential strength compared to similar concrete that is moist cured. The poorly cured concrete will have a soft surface with poor resistance to wear and abrasion.

Proper curing improves durability, freeze/thaw resistance and surface hardness which increases watertightness and reduces crazing, dusting and scaling. See separate sheets for more information on crazing, dusting and scaling.

3M Concrete Protector & Restorer (CP&R) Solution

CP&R can help improve the durability and surface strength of poorly cured concrete because of the high strength that CP&R develops once cured. CP&R high mod develops compressive and tensile strength exceeding that of normal concrete. CP&R low mod is an elastic product that can accommodate some movement and also helps improve surface durability. Both products have excellent penetration ability.

Because CP&R is very low viscosity it can penetrate into the very tiny pores and capillaries of poorly cured concrete. Once CP&R gets into poorly cured concrete it actually becomes an integral part of the surface concrete. Once cured, the CP&R hardness and toughness contributes to the concrete surface hardness, strength and water repellency.

Many of the benefits of treating porous concrete with CP&R are the same as treating poorly cured concrete. Concrete may have more than one cause for the problems. For example, concrete may be very porous resulting from high w/c ratio and have low surface strength because of poor curing. See other Concrete Sample sheets for other effects of poor curing.

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