

The term “Curing” can be used to describe the process by which hydraulic-cement concrete matures and develops hardened properties, over time, as a result of the continued hydration of the cement in the presence of sufficient water and heat. The term “Curing” is also used to describe action taken to maintain moisture and temperature conditions in a freshly placed concrete so that the potential properties of the concrete may develop (ACI).

ASTM C-309 is the main performance specification for curing compounds

- Liquid Membrane – Forming Compounds for Curing Concrete. The curing compound shall not allow the concrete specimen to lose more than .55kg /m² of water in 72 hours.
- The white pigmented compound shall exhibit a reflectance of at least 60% of that of a standard magnesium oxide reference plate.

Types of curing compounds

- Type 1 – Clear or translucent without dye.
- Type 1D – Clear or translucent with fugitive dye.
- Type 2 – White pigmented.

Curing compound shall also be one of the following classes

- Class A – no restrictions on the vehicle solids material in the curing compound – typically, wax based materials.
- Class B – the vehicle solids material in the curing compound must be all resin.

NOTE: According to the ASTM Committee on Curing, sodium silicate do not meet ASTM C-309 specifications.

Application of curing compounds

Always apply the curing compound uniformly at the specified application rate (typically 200 ft²/gallon, 4.9 m²/L).

A major problem on most jobsites is the spraying of the curing compounds at extremely high application rates, i.e., the material is applied at 300-400 ft²/gallon, rather than 200 ft²/gallon. As a result, the quality of the concrete goes down dramatically!

A good rule of thumb on flatwork is to apply the curing compound heavy enough to create a slight flood of material on the concrete surface or, as another option, apply the curing compound in two applications, one at right angles to the other.

Resin based curing compounds Dayton Superior Clear Resin Cure J11W will normally oxidize and *begin* to wear off in 30 to 60 days,

Clear Cure VOC J7WB will normally oxidize and *begin* to wear off in 7-10 days). However, this process depends on the amount of sunlight and traffic the curing compound receives. Additional cleaning of the surface by high pressure water blasting (2000 psi, 13.8 MPa), light sand blasting, or chemical removal may be necessary.

A good test to see if the curing compound has been removed is to place a few drops of water on the surface and see if the water is readily absorbed into the concrete. If it is readily absorbed, then additional cleaning may not be necessary.

Wet burlap, water spray and plastic sheets are effective methods of curing only if the concrete is kept constantly damp for 7 days.

Otherwise, membrane-applied curing compounds are preferred.

Guide to Curing Continued

Water based products should be agitated or stirred before use to bring the solids back into suspension. However, do not over agitate them or use high speed mixing equipment.

It is very important to cure the concrete immediately after finishing. Don't wait!

If concrete is not cured, its strength can be reduced by up to 40% and can result in surface cracking, curling, crazing, and dusting.

Curing compounds will have to be removed before application of a liquid hardener, a sealer like an epoxy or urethane, or a water repellent like a silane or siloxane.

Cold Weather "Alert"

Colder weather does not lessen the importance of proper curing techniques and materials. Cold weather requires the same, if not more, urgency for curing than in the summertime. "Even when the relative humidity of the outdoor air is high, at low temperatures this translates to very low quantities of water vapor. Cold air is therefore generally dry, even at high humidity. Remember, it is in the cold weather that you use the lip balm to prevent chapped lips....cold weather & low humidity dries lips. Concrete, in the cold weather and low humidity, also undergoes a loss of moisture & thus the need for proper curing techniques to prevent the loss of water that could cause distress, deterioration and esthetic problems.

Dayton Superior Curing Membranes

Resin:

Clear Resin Cure J11W

- ASTM Type I, Classes A & B

Resin Cure with Dye J11WD

- ASTM Type ID, Classes A & B

White Resin Cure J10W

- ASTM Type II, Classes A & B

Wax:

City White Cure J8

White Wax Cure J9A

- ASTM Type 2, Class A

White Wax Cure CRD300

- ASTM 2, Class A, CRD C-300