

Concrete Q&A

Curing Concrete with Saturated Burlap or Curing Compound

Q. Many of our projects are in Saudi Arabia. Our standard specification calls for 7 days of wet curing using saturated burlap, but contractors have asked us to allow the use of curing compounds for flatwork. What are the tradeoffs?

A. Per ACI 308R-01, Section 1.2,¹ “The objectives of curing are to prevent the loss of moisture from concrete and, when needed, supply additional moisture and maintain a favorable concrete temperature for a sufficient period of time.” Furthermore, Section 1.4.2.2.5 says: “Curing compounds and so-called ‘breathable sealers’ meeting the requirements of ASTM C309 and C1315, permit moisture transmission and have a variable capacity to retard moisture loss, depending on the quality of the product used, field application, and field conditions. Wet curing by ponding, sprinkling, or the application of saturated burlap not only prevents water loss but also supplies additional curing water to sustain cement hydration...”

A study conducted in the Riyadh area indicated that curing by twice-a-day sprinkling for 7 days is adequate if a burlap cover is used, but it’s inadequate if no cover is used.² To make the determination, the researchers compared the strengths of field-cured test cubes with the strengths of lab-cured test cubes from the same mixtures. Adequacy was determined using the criterion from ACI 318-89, Section 5.6.3.4³: “Procedures for protecting and curing concrete shall be improved when strength of field-cured cylinders at test age designated for determination of f'_c is less than 85 percent of that of companion laboratory-cured cylinders.”

Questions in this column were asked by users of ACI documents and have been answered by ACI staff or by a member or members of ACI technical committees. The answers do not represent the official position of an ACI committee. Only a published committee document represents the formal consensus of the committee and the Institute.

We invite comment on any of the questions and answers published in this column. Write to the Editor, *Concrete International*, 38800 Country Club Drive, Farmington Hills, MI 48331; contact us by fax at (248) 848-3701; or e-mail Rex.Donahey@concrete.org.

The researchers did not evaluate curing compounds. Also, strength is not the only concern—cracking may be even more important. Recent studies of bridge decks show that cracking can be minimized if:

- Fogging and wind protection are used during placement;
- The first of two layers of pre-soaked burlap is placed on the newly finished concrete within 10 minutes of strikeoff and finishing;
- The second layer of burlap is placed within another 5 minutes;
- Soaker hoses and white polyethylene sheeting are placed on the concrete as soon as it will support foot traffic; and
- The concrete is protected following a 14-day wet-curing period through the application of a curing compound to slow the rate of drying.^{4,5}

The 14-day wet cure is considered to be the “curing” period for these decks, and the curing compound is used only to slow the rate of evaporation and give the young concrete a chance to creep as it shrinks.

To make the final determination of what is required for your applications, you’ll have to consider the costs and the long-term benefits of the curing methods.

References

1. ACI Committee 308, “Guide to Curing Concrete (ACI 308R-01),” American Concrete Institute, Farmington Hills, MI, 2008, 31 pp.
2. Arafah, A.M.; Al-Haddad, M.S.; Al-Zaid, R.Z.; and Siddiqi, G.H., “Efficiency of Concrete Curing in Riyadh Area,” *Proceedings of the International Conference on Concrete under Severe Conditions: Environmental and Loading*, V. 2, 1995, pp. 890-897.
3. ACI Committee 318, “Building Code Requirements for Reinforced Concrete (ACI 318-89) and Commentary,” American Concrete Institute, Farmington Hills, MI, 1989, 353 pp.
4. Browning, J.; Darwin, D.; and Hurst, K.F., “Specifications to Reduce Bridge Deck Cracking,” *HP Bridge Views*, Federal Highway Administration and the National Concrete Bridge Council, Issue No. 46, Sept.-Oct. 2007, pp. 1-2.
5. Browning, J.; Darwin, D.; and Hurst, K.F., “Specifications to Reduce Bridge Deck Cracking,” *HP Bridge Views*, Federal Highway Administration and the National Concrete Bridge Council, Issue 55, May-June 2009, pp. 1-3.

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