



PLASTIC SHRINKAGE CRACKING

Plastic shrinkage cracks appear on the surface of freshly poured concrete slabs during finishing or shortly thereafter. They are often parallel to each other and are spaced approximately one to three feet apart. At a depth of about one to two inches, they rarely degrade the strength of concrete floors and pavements, but they do mar the finished look of concrete floors and pavements, and can be minimized through the appropriate precautions.

Why Plastic Shrinkage Occurs

- Surface concrete dries out prematurely because the rate of evaporation of surface water exceeds the rate at which rising bleed water can replace it.
- The evaporation rate of surface water accelerates when the relative humidity is low, wind velocity is high and the concrete surface is warmer than the surrounding air.
- Increasing the cement content in a mixture.

What to Do About It

A common strategy is to increase the bleeding characteristics of concrete by raising the slump, by using different cement or aggregate, or through the addition of chemical retarders. However, these steps have not been found to be consistently effective, and the surest way to prevent plastic shrinkage cracks is to take precautionary measures ahead of time - especially during hot, dry weather.

- **Finish promptly.** Make sure you have proper manpower, equipment and supplies on hand so that concrete can be placed and finished quickly. If delays in finishing the concrete are unavoidable, cover the freshly poured concrete with wet burlap, polyethylene sheeting or building paper between finishing operations
- **Begin curing as soon as possible.** Spray the surface with liquid a membrane curing compound, or cover it with wet burlap. Keep the surface consistently wet for a minimum of three days.
- **Moisten sub-grade.** If the concrete is to be placed on a dry sub-grade or on previously placed concrete, these areas should be thoroughly dampened. Also dampen the formwork and any reinforcement.
- **Be careful of vapor barriers.** Cover any vapor barrier with a two-inch layer of damp sand since these greatly increase the risk of plastic shrinkage.
- **Watch the weather.** In dry, hot periods, use fog sprayers to keep the surface concrete moist; erect temporary wind breaks to reduce wind velocity over the surface; and provide sun shades if possible to control the surface temperature of the slab. Schedule placement for early morning or late afternoon if weather conditions are critical.

Products Used: Master Builders Confilm; Tamms Curing and Sealing Compounds.