

Carbonation is a chemical reaction between cement and carbon dioxide or carbon monoxide from unvented heaters. In such instances the surface will be soft and will dust as well.

### HOW to Prevent Cracking

- a. To prevent cracking, start curing the concrete as soon as possible. Keep the surface wet by either flooding with water, covering it with damp burlap and keeping it continuously moist for a minimum of 3 days, or spraying the surface with a liquid-membrane curing compound. Avoid alternate wetting and drying of concrete surfaces at an early age. Curing retains the moisture required for proper reaction of cement with water, called hydration.
- b. Use moderate slump (3 to 5 inches [75 to 125 mm]) concrete. Higher slump (up to 6 or 7 inches [150 to 175 mm]) can be used provided the mixture is designed to produce the required strength without excessive bleeding and/or segregation. This is generally accomplished by using water-reducing admixtures.
- c. **NEVER** sprinkle or trowel dry cement or a mixture of cement and fine sand on the surface of the plas-

tic concrete to absorb bleed water. **DO NOT** sprinkle water on the slab to facilitate finishing. Remove bleed water by dragging a garden hose across the surface. **DO NOT** perform any finishing operation while bleed water is present on the surface or before the bleeding process is completed. **DO NOT** overwork or over-finish the surface.

- d. When high evaporation rates are possible, lightly dampen the subgrade prior to concrete placement to prevent it from absorbing too much water from the concrete. If a vapor retarder is required on the subgrade, cover it with 3 to 4 inches of a compactible, granular fill, such as a crusher-run material to reduce bleeding.

---

### References

1. *Guide for Concrete Floor and Slab Construction*, ACI 302.1R, American Concrete Institute, Farmington Hills, MI.
  2. *Concrete Slab Surface Defects: Causes, Prevention, Repair*, IS 177T, Portland Cement Association, Skokie, IL.
  3. Ward Malisch, *Avoiding Common Outdoor Flatwork Problems*, Concrete Construction, July 1990.
  4. Ralph Spanenberg, *Use the Right Tool at the Right Time*, Concrete Construction, May 1996.
- 

### Follow These Rules to Prevent Cracking

1. Use moderate slump (3-5 inches) concrete with reduced bleeding characteristics.
2. Follow recommended practices and timing, based on concrete setting characteristics, for placing and finishing operations:
  - a. Avoid excessive manipulation of the surface, which can depress the coarse aggregate, increase the cement paste at the surface, or increase the water-cement ratio at the surface.
  - b. **DO NOT** finish concrete before the concrete has completed bleeding. **DO NOT** dust any cement onto the surface to absorb bleed water. **DO NOT** sprinkle water on the surface while finishing concrete.
  - c. When steel troweling is required, delay it until the water sheen has disappeared from the surface.
3. Cure properly as soon as finishing has been completed.