

CRAZING CONCRETE SURFACES

WHAT is Cracking?

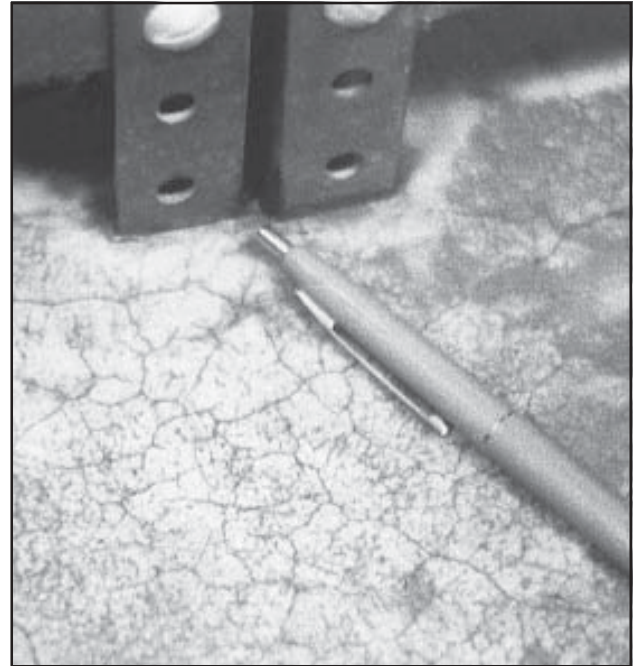
Cracking is the development of a network of fine random cracks or fissures on the surface of concrete or mortar caused by shrinkage of the surface layer. These cracks are rarely more than $\frac{1}{8}$ inch [3 mm] deep and are more noticeable on steel-troweled surfaces. The irregular hexagonal areas enclosed by the cracks are typically no more than $1\frac{1}{2}$ inch [40 mm] across and may be as small as $\frac{1}{2}$ or $\frac{3}{8}$ inch [12 or 20 mm] in unusual instances. Generally, craze cracks develop at an early age and are apparent the day after, placement or at least by the end of the first week. Often they are not readily visible until the surface has been wet and it is beginning to dry out.

Cracking cracks are sometimes referred to as shallow map or pattern cracking. They do not affect the structural integrity of concrete, and rarely do they affect durability or wear resistance. However, crazed surfaces can be unsightly. They are particularly conspicuous and unsightly when concrete contains calcium chloride, a commonly used accelerating admixture.

WHY Do Concrete Surfaces Craze?

Concrete surface cracking usually occurs because one or more of the rules of “good concrete practices” were not followed. The most frequent violations are:

- a. Poor or inadequate curing. Environmental conditions conducive to high evaporation rates, such as low humidity, high temperature, direct sunlight, and drying winds on a concrete surface. The concrete is just beginning to gain strength, causing rapid surface drying resulting in craze cracking. Avoid the delayed application of curing or even intermittent wet curing and drying after the concrete has been finished.
- b. A mixture that is too wet, excessive floating, the use of a jitterbug or any other procedures that will depress the coarse aggregate, and produce an excessive concentration of cement paste and fines at the surface.
- c. Finishing while there is bleed water on the surface or the use of a steel trowel at a time when the smooth surface of the trowel brings up too much water and cement fines. Use of a bull float or darby with water on the surface or while the concrete continues to bleed will produce a high water-cement ratio, a weak surface layer, which will be susceptible to cracking, dusting, and other surface defects.
- d. Sprinkling cement on the surface to dry up the bleed water is a frequent cause of cracking. This concentrates fines on the surface. Spraying water on the concrete surface during finishing operations will result in a weak surface susceptible to cracking or dusting.
- e. Occasionally, carbonation of the surface results in cracking, as it causes shrinkage of the surface layer.



Cracking Concrete Surface (Dampened)