

Concrete in Practice

What, why & how?



CIP 100 - CONCRETE IN PRACTICE

- CIP 1 Dusting Concrete Surfaces
- CIP 2 Scaling Concrete Surfaces
- CIP 3 Cracking Concrete Surfaces
- CIP 4 Cracking Concrete Surfaces
- CIP 5 Plastic Shrinkage Cracking
- CIP 6 Joints in Concrete Slabs on Grade
- CIP 7 Cracks in Concrete Basement Walls
- CIP 8 Discrepancies in Yield
- CIP 9 Low Concrete Cylinder Strength
- CIP 10 Strength of In-Place Concrete
- CIP 11 Curing In-Place Concrete
- CIP 12 Hot Weather Concreting
- CIP 13 Concrete Blisters
- CIP 14 Finishing Concrete Flatwork
- CIP 15 Chemical Admixtures for Concrete
- CIP 16 Flexural Strength of Concrete
- CIP 17 Flowable Fill Materials
- CIP 18 Radon Resistant Buildings
- CIP 19 Curling of Concrete Slabs
- CIP 20 Delamination of Troweled Concrete Surfaces
- CIP 21 Loss of Air Content in Pumped Concrete
- CIP 22 Grout
- CIP 23 Discoloration
- CIP 24 Synthetic Fibers for Concrete
- CIP 25 Corrosion of Steel in Concrete
- CIP 26 Jobsite Addition of Water
- CIP 27 Cold Weather Concreting
- CIP 28 Concrete Slab Moisture
- CIP 29 Vapor Retarders Under Slabs on Grade
- CIP 30 Supplementary Cementitious Materials
- CIP 31 Ordering Ready Mixed Concrete
- CIP 32 Concrete Pre-Construction Conference
- CIP 33 High Strength Concrete
- CIP 34 Making Concrete Cylinders in the Field
- CIP 35 Testing Compressive Strength of Concrete
- CIP 36 Structural Lightweight Concrete
- CIP 37 Self Consolidating Concrete (SCC)
- CIP 38 Pervious Concrete
- CIP 39 Maturity Methods to Estimate Concrete Strength



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CIP 1 - Dusting Concrete Surfaces

WHAT is Dusting

Formation of loose powder resulting from disintegration of surface of hardened concrete is called dusting or chalking. The characteristics of such surfaces are:

- a. They powder under any kind of traffic
- b. They can be easily scratched with a nail or even by sweeping.

WHY Do Concrete Floors Dust

A concrete floor dusts under traffic because the wearing surface is weak. This weakness can be caused by:

- a. Any finishing operation performed while bleed water is on the surface or before the concrete has finished bleeding. Working this bleed water back into the top $\frac{1}{4}$ inch [6 mm] of the slab produces a very high water-cement ratio and, therefore, a low strength surface layer.
- b. Placement over a non-absorptive subgrade or polyethylene vapor retarder. This reduces normal absorption by the subgrade, increases bleeding and, as a result, the risk of surface dusting.
- c. Floating and/or troweling operations following the condensation of moisture from warm humid air on cold concrete. In cold weather concrete sets slowly, in particular, cold concrete in basement floors. If the humidity is relatively high, water will condense on the freshly placed concrete, which, if troweled into the surface, will cause dusting.
- d. Inadequate ventilation in enclosed spaces. Carbon dioxide from open salamanders, gasoline engines or generators, power buggies or mixer engines may cause a chemical reaction known as carbonation, which greatly reduces the strength and hardness of the concrete surface.
- e. Insufficient curing. This omission often results in a soft surface skin, which will easily dust under foot traffic.



Dusting concrete surface

- f. Inadequate protection of freshly placed concrete from rain, snow or drying winds. Allowing the concrete surface to freeze will weaken the surface and result in dusting.

HOW to Prevent Dusting

- a. Concrete with the lowest water content with an adequate slump for placing and finishing will result in a strong, durable, and wear-resistant surface. In general, use concrete with a moderate slump not exceeding 5 inches [125 mm]. Concrete with a higher slump may be used provided the mixture is designed to produce the required strength without excessive bleeding and/or segregation. Water-reducing admixtures are typically used to increase slump while maintaining a low water content in the mixture. This is particularly important in cold weather when delayed set results in prolonged bleeding.
- b. *NEVER* sprinkle or trowel dry cement into the surface of plastic concrete to absorb bleed water. Remove bleed water by dragging a garden hose across the surface. Excessive bleeding of concrete can be reduced by using air-entrained concrete, by modifying mix proportions, or by accelerating the

