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Dusting Concrete Surfaces

What is Dusting?

Chalking or powdering at the surface of a concrete slab is called dusting. The characteristics of such surfaces are:

- They powder under any kind of traffic.
- 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. The weakness can be caused by:

- Any finishing operation performed while bleed water is on the surface. Working this bleed water back into the top 1 mm of the slab produces a very high water-cement ratio and therefore, a low strength surface layer.
- Inadequate protection of freshly placed concrete from rain, snow or drying winds.
- No curing or poor curing. This omission often results in a soft surface skin which will easily dust under foot traffic.

In cold weather the concrete sets slowly, in particular cold concrete in thin slabs or floors (less than 150mm). These thinner sections do not have the mass to build up heat; they are like radiators giving up heat as it is generated. This will allow more time for water to rise to the surface and delay the correct timing of the surface. If the humidity is relatively high, water will condense on the freshly placed concrete, which, if trowelled into the surface, will increase the possibility of dusting.

Carbonation can also cause dusting of the concrete surface, usually a longer-term problem. This is usually associated with inadequate ventilation; carbon dioxide from fires, engines or generators may cause the chemical reaction known as carbonation, which greatly reduces the strength and hardness of the concrete surface.

How To Prevent Dusting

- In general, use concrete with a moderate slump (not over 75 mm), The higher slump levels can be used in hot weather when setting time is reduced and less time is available for bleeding. In cold weather delayed setting will increase bleeding and require use of lower

slump. Concrete having a low water-cement ratio and moderate slump helps produce a strong wear resistant surface.

- Excessive bleeding of concrete can be reduced by using air-entrained concrete. This is reserved for external slabs as setting times are extended. Air entrained concrete is recommended for external slabs as frost protection is given to the concrete once sufficient strength is achieved.

- DO NOT perform any finishing operations with water present on the surface. Bleed water can be worked into the surface fines from delayed floating.

- Provide proper curing by using liquid membrane curing compound or by covering the surface with wet hessian. Protect young concrete from the environment.

- When placing concrete in cold weather consider the type of cement used in your concrete. The use of cement replacements, whilst they will reduce the cost, will slow the set rate down. For faster setting concrete order CEM1 (used to be called Ordinary Portland Cement).

How to Repair Dusting

Apply a chemical floor hardener / sealer in compliance with manufacturer's directions on thoroughly dried concrete. There are many on the market and are available at most builders' merchants. Beware some sealers make bonding future surfaces and coverings difficult, so check with the supplier. In the unlikely event dusting persists, use hardeners with cementitious properties (such as latex formulations).

Follow These Rules to Prevent Dusting

- Use moderate slump concrete
- Finish properly
- Cure properly