

What's in Your Concrete?

Problems and Practice #8

Many ready-mixed concrete producers offer specialty concretes for decorative concrete, such as “stamp-mix summer” or “stamp mix winter.” Such designations give the decorative concrete contractor an indication that the concrete can be stamped in either summer or winter. The difference between summer and winter mixtures may be related to the amount of supplemental cementitious material (SCM) and the type of admixture used in the concrete. Both the owner and concrete producer need to be aware of the effects of SCMs and different admixtures on the appearance and performance of decorative concrete in areas other than stampability and setting time.

Environmental concerns and cement shortages have caused increased emphasis on reducing the portland cement content of all concretes. Thus decorative contractors often order concrete that may contain fly ash, slag cement, and water-reducing admixtures. The use of SCMs and admixtures can offer substantial performance improvements, but they may also result in some unwanted effects:

- Delamination when high air-content, slow-setting concretes are colored with shake-on hardeners
- Color variations for slabs with integral or shake-on colors
- Unexpected chemical stain colors
- Longer required curing periods
- Longer required drying periods before a sealer can be applied.

When shake-on hardeners are used, the concrete should be non-air-entrained in warm climates, and to decrease the chance of delamination should not exceed the upper limit on air content required for frost resistance in cold climates.

In-place color may not match the color manufacturers' samples because slag cements and fly ash can both cause color variations when compared with concretes containing straight

portland cements. Normally slag cements produce a lighter colored concrete and fly ash produces darker colors. Calcium chloride accelerators also darken and model concrete color creating an unpredictable finished product.

Some stains produce color by reacting with alkaline cement hydration byproducts such as calcium hydroxide. When fly ash or other pozzolans are used in the concrete they reduce the amount of such alkalis and the permeability of the surface. This affects the ability of the reactive stains to produce the expected coloration of the concrete emphasizing the need for mock-ups or samples on the same slab.

Extended curing times needed to attain a specified strength or long drying times needed to reach desired moisture content can result in discoloration if the slab is unprotected before a sealer is applied.

Decorative concrete contractors need to know what's in the concrete. They should be present during the pre-construction meeting to answer any questions about effects of concrete composition on the appearance of the finished product. It is also important to ensure that the concrete of the same composition is used for mock up panels and the construction itself. Decorative concrete contractors will work with owners and architects in developing concrete specifications and ensuring that mockup panels are required when appropriate. If you have any questions, contact your ASCC/DCC concrete contractor or the ASCC Decorative Concrete Hotline at (888) 483-5288.



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