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## Why is White Cement Used in Swimming Pool Plastering?

*based on:*

### **NPC Technical Bulletin #5 – White Cement & Swimming Pool Plastering**

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White cement used in concrete, plaster, and masonry is often specified for its color consistency, appearance, and the ability to create durable rock-like materials. White cement also creates a consistent brightness and tone – the canvas upon which to base your pool’s most beautiful color and bright appearance. Cement color is an important quality aspect in the white cement industry. While most cement has a gray color, primarily due to the iron and manganese oxide compounds found in the raw materials used to manufacture cement, white cement is made from raw materials with very low levels of these compounds. In addition, the firing (calcining) process is controlled in such a way as to improve the white cement’s whiteness, consistency, and color tone. White cement typically has greater strength than gray cement, and together with the added aesthetic benefits of the white color, are the principal considerations for its selection for swimming pool plaster.



### **The Artist’s Canvas**

The color and brightness of plaster, concrete, mortar, or any cement-based material will primarily depend on the cement, any supplementary cementitious material (SCM) used, and the color of the aggregate used in the mixture. If you seek a dynamic color or decorative finish as your pool’s interior finish, you will benefit from products that exclusively use white cement.

Pool plasterers typically use white cement for swimming pool interiors to ensure a clean, bright, consistent color, especially when formulating light pastel-colored plaster. Similar to the idea of using a base tint when mixing a paint color for your walls, white cement provides the neutral base color from which to create a brighter, more intense color for your pool’s interior finish. The palette of decorative colors and finishes available to customers is greatly expanded by combining white cement, pigments, and various colored aggregates, to create a variety of surface finishes and textures. Plastering

contractors and designers rely on careful materials selection and attention to mixing and placement details to achieve the most eye-catching plaster colors and finishes. It is truly both an art and a science!



### **Cement Hydration and Color**

Cement chemically reacts with water and hardens into a strong binder through a process called hydration. Chemical additives called 'accelerators' are often used to speed up hydration in plaster mixes. The most common accelerator is calcium chloride ( $\text{CaCl}_2$ ). When added to gray cement used in concrete,  $\text{CaCl}_2$  retards the hydration of the compound  $\text{C}_4\text{AF}$  (ferrite phase) which can cause a darkened discoloration of the finished material. Since white cement for pool plastering contains very low ferrite phase, adding calcium chloride to a swimming pool interior finish has a very low risk of discoloration.

### **A Final Note on Pool Finishes and Chemistry**

Using calcium chloride as a set accelerator in amounts not exceeding 2% (by weight) of the cementitious binder does NOT cause the finish coating to be weak or inferior, nor does it promote deterioration or surface etching of the swimming pool finish. It simply allows the finishers the ability to better control the set of the material, and in turn, create the best finish possible.

The leading cause of deterioration of the finish coating in swimming pools is from unbalanced water chemistry. Good water chemistry and proper pH balance, as per PHTA and NPC recommendations, is the key to prolonging the life of the finish coating and preserves the aesthetic beauty of your pool's surface from experiencing etching deterioration, discoloration, or mineral scale.



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