

DECORATIVE CONCRETE

What Are Acid Stains and How Do They Work?

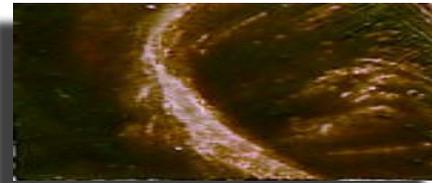
Chemical Stains can be applied to old, new, plain or colored concrete surfaces. Although they are often called acid stains, acid isn't the ingredient that colors the concrete. Metallic salts in an acidic, water-based solution react with hydrated lime (calcium hydroxide) in hardened concrete to yield insoluble, colored compounds that become a permanent part of the concrete.



The acid in chemical stains opens the top surface of the concrete, allowing metallic salts to reach the free lime deposits. Water from the stain solution then fuels the reaction, usually for about a month after the stain has been applied.



Other factors that affect the outcome include: Cement properties and amount of cement in the mix, admixtures used, type of aggregate used, concrete finishing methods, concrete age and moisture content when stain is applied, weather conditions when stain is applied and efflorescence.



In general, cements that produce larger amounts of calcium hydroxide during hydration will show more stain color, and higher cement contents produce more intense colors. Air-entrained or water-reducing admixtures do not pose a problem. However, calcium-chloride accelerators can cause very mottled, darkened areas, and is not recommended. Non-chloride accelerators don't cause this problem. If they are near the surface, calcium based

aggregates, such as limestone, take stain readily and deepen the color of the concrete above them. Siliceous aggregates, such as gravel do not react with stain. Concrete with minimal troweling will take more stain and produce denser colors. However these finishes lose color faster because of concrete wear. Hard troweled finishes hold color longer and look richer. Hard troweled surfaces sometimes require sanding the surface or using a higher acid concentration for adequate stain penetration.

Slabs placed in wet weather result in a richer stain if stained soon. However, wet slabs are more likely to effloresce, lightening the color and the stain many times will not take in affected areas because efflorescing salts hinder penetration. The continued presence of water will cause the reaction to continue for a longer time and some blues and greens can even turn brown or black.

