

When may I paint my Stucco?

Time is only a minor factor in determining when to paint fresh stucco. It is only important as relative to the amount of moisture available from rainfall, humidity or applied. There is no “rule of thumb” as to the amount of time that should pass prior to painting as conditions change daily and regionally. The crucial factor is the extent of curing and that can be measured in pH levels.

Stucco cement is hydrophobic, as are all portland cement-based products. Water is the catalyst for the chemical reaction that causes these materials to harden and cure. This is the reason these materials are always recommended to be moist cured for a period of days; it keeps the cement in supply of sufficient moisture to continue to hydrate or cure.

Newly placed cement products such as stucco are highly alkaline or high pH. pH is the scale by which we measure acidity (0-7 on the scale) or alkalinity (7-14 on the scale). Fresh stucco can be upwards of 13 when first placed. As it cures, the reaction binds up the lime in the mix and causes the pH to drop. For the reaction to continue it must have water. Most exterior coatings, including paint, acrylics, and synthetic finishes, have a requirement that the substrate have a pH of less than 10 prior to application. Stucco will easily attain a pH in the range of 8-9 if properly hydrated.

When coatings are applied before the stucco has a chance to reduce to a level acceptable by the coating manufacturer, a “burning” may occur. This may appear as a loss of sheen or mottling of the coating and eventually results in the breakdown of the coating. At this point, further water entry may aggravate the situation with chipping and delamination.

When applying a coating to stucco it is essential that the pH level of the wall is lower than the coating manufacturer’s recommendations. There is no magic or sacred number of days to wait for the pH level to drop to an acceptable level. As most manufacturers have varying standards, Cement manufacturers cannot make specific pH level recommendations with regards to applying coatings but we can provide some insight on the background of the subject and the necessary precautions, procedures, and problems.

To test pH the most commonly used method is a pH pencil and distilled water. These pencils may be obtained from companies that distribute paint supplies. Most pH pencils are used by scratching a small area on the test wall and wetting it with distilled water. A color chart is provided to match the color of the test area with the corresponding pH color level.



Sufficient hydration is paramount in the preparation of a stucco surface to receive coatings. The humidity of the surrounding air affects stucco hydration as does temperature, wind, and contact with direct sunlight. For instance, if the ambient humidity level is 90%, you will need less water to hydrate stucco than you would at lower humidity levels. More wind, sun, and higher temperatures will dry the wall out and make it require more water. To hydrate the wall: apply water with an

even flooding spray of a hose over the entire surface until the point of runoff. Allow the wall to absorb the water and repeat several times. It may be necessary to wet the walls several times per day for several days. The necessity for wetting is dictated by the exposure conditions, wind, humidity, temperature, and orientation. South and West facing walls may require more wetting than North or East facing walls. Continue to hydrate the wall until it reaches the desired pH of the paint manufacturer.

Priming the wall before applying a coating is always a good practice but make sure the wall is properly cured and hydrated first. Primer functions as an intermediary between the stucco and the coating. A good primer seals the cured stucco to provide a more uniform surface for applying a coating. It also prevents the stucco from sucking moisture from the coating and discoloring it. Primer helps prevent brush and roller marks in the coating. The coating is applied to the primer, not to the plaster surface. A good primer will make your coating go farther (coverage). Think of primer as a foundation for a smooth, attractive exterior coating.

In an effort to speed up the coating process, many paint manufacturers produce an alkali resistant “hot primer.” Our recommendation is to stay away from “hot primers” as they will “lock in” the alkalinity effectively halting the curing of the cement. Should a crack develop in the uncured wall (which is almost assured to happen) water will react with the stucco and release alkaline salts that will attack the coating. Improper curing by lack of hydration is a problem in itself, causing cracked and soft walls among other problems. The issue with “hot primers” is not so much with the product itself as with the time of application. Hot Primer applied after the plaster is cured works very well.

Problems:

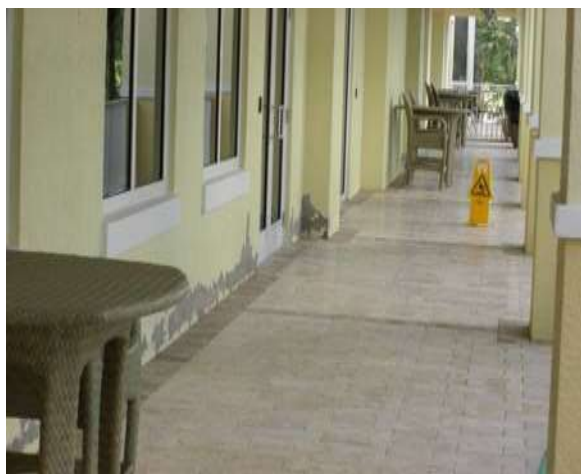
What happens when a stucco wall that is too alkaline or “hot” is painted? A condition known as alkali or “lime” burn may develop. This is somewhat due to the ingredients in the coating such as resins or pigments “bleaching out.” This results in a mottled or blotchy appearance, chalking of the coating and soft stucco.

Moisture content may also be problematic in alkali burn cases. It is a good idea to test for moisture content prior to application of coatings. It is not uncommon for walls in high sun exposure conditions to cure from the outside surface in. In other words, the surface may be cured to an acceptable degree but the stucco underneath may still be raw. In this condition or where the coated surface is cracked, the alkalinity of

the stucco immediately behind the coating may increase as alkaline salts are drawn toward the surface but are prohibited from escaping by the coating. Oddly enough, the area immediately adjacent to the cracks usually shows little evidence of this, primarily because cracks work in both directions; they let moisture in and they let moisture out. When this is the case, the coating will have a spider web appearance.

The presence of moisture inside a wall can create a condition known as efflorescence. As described above, this occurs as moisture carries mineral salts inherent in the concrete, masonry stucco or sand, are drawn out toward the surface of the wall. These salt deposits, usually white, crystallize on the exterior as the water carrying them is evaporated away. In cases where the exterior coating is of low permeability, these deposits get trapped behind the coating and may result in delamination of the coating and degradation of the stucco.

Efflorescence is relatively easy to clean but will return if steps are not taken to eliminate the source of the water within the wall.



Severe alkaline burn results in saponification. The mottled or blotchy appearance of coatings is only the first symptom of high pH. High pH combined with water may also cause saponification or, in layman's terms, the breakdown of the coating from behind resulting in blisters, softness or "mushiness," and a waxy slickness similar to soap. Long-term exposure under these conditions will result in delamination as the coating begins to dry out. It may also cause the previously hardened stucco to soften and delaminate.

I hope this helps to inform and clarify pH's importance when applying a coating such as paint or acrylic finish to stucco. Please refer to the coating manufacturer's instructions for additional recommendations.

For further information, contact In-Spex, LLC at www.in-spexllc.com or (407) 709-9001.