Cool Weather Application of EIFS, Stucco and Acrylic Surfacing Systems

Technical Bulletin

Introduction

When air temperatures begin to fall in the autumn or when they begin to rise in the spring, special considerations must be given to application of EIFS, stucco and other acrylic surfacing systems. Application of cementitious and acrylic materials is typically restricted to temperatures of 40° F and rising. This minimum is critical to the proper curing and overall performance of the products. Acrylic coatings will not develop physical strengths properly or coalesce to form a film correctly in temperatures below their design standard. (Specialty or stone finishes that are contained within an acrylic matrix tend to be even more temperature sensitive and are restricted to application at temperatures of 50° F and rising.) Application of materials in cool, cold and freezing conditions commonly cause materials to crack, flake, soften or delaminate.

Keep these facts in mind when you are applying cementitious and acrylic materials in cool conditions:

- Set times – materials with controlled set times will set up more slowly in cooler temperatures; at high relative humidity and cool temperature, they might not set up at all.
- Evaporation is generally slowed at cooler temperatures. Protect the work area for as long as it takes for completion of the curing.
- Strength – development of the initial and ultimate physical and chemical strengths of materials will be reduced.
- Crack movement – thermal fluctuations will cause movements in the substrates. Any crack in the substrate, including joints between substrate components, is subject to movement. Thermal cycling, and therefore maximum movement, is at its highest frequency during the fall months. Cracks that appear narrow in the warmth of the afternoon (when substrates are expanded) may widen significantly during the night as the temperatures fall. This type of thermal movement can cause surface cracking. In patching/repair situations, the cracking could be even more pronounced because the patching material that fills between or around seasoned material has not yet developed its full strength.

Helpful Hints

- Do not apply materials at temperatures below BASF Wall Systems' written recommendations; i.e., 40° F and rising (50° F for stone finishes).
- Monitor the extended weather forecast during the application and curing period so that you are prepared for any temperature drops. Also, pay attention to the dew point temperature. This will tell you the evaporation rate of the excess water that affects the cure and the open times of the applied material.
- Keep materials, both powder and liquids, in heated (40° F or warmer) storage until ready for use.
- Tents must be constructed to adequately enclose the entire application area and to withstand such external conditions as wind and rain. Adequate ventilation should be engineered into the tent to provide for sufficient air movement so that curing can occur.
- Avoid using kerosene or other oil-based fuel heaters.
- Warm the substrate prior to application. Both the air and surface temperature must be considered. If there was frost on the substrate, it might take an hour or more for the wall to warm to an acceptable temperature.

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- The heat source used for supplemental heat should not be the type that emits unburned hydrocarbons into the air as these will collect on the surface of the applied material, causing discoloration and adhesion problems for successive coats. When heating an enclosed area, the heat source must be in operation long enough prior to the application to properly warm the surfaces, and it must remain in operation throughout the curing process, as needed.
- Do not force hot air on the curing material. Never blow air that is 100° F or more onto a curing surface.
- If patching/repairing, keep patch areas warm after initial set of the material. This will assist in curing and reduce the thermal stresses.
- Coating materials, whether cementitious or acrylic can also be compromised in many ways when applied in cool to cold temperatures.

Related Terminology

- MFT – Minimum Film (formation) Temperature. This is the lowest temperature at which the product will properly coalesce (skim over) and form a film. Application and or curing at temperatures below this can result in a cohesively weak or softened material with an avoidably shortened life span.
- Efflorescence – a crystalline deposit of soluble salts on the surface of walls constructed of cement based components. Salt-laden moisture in the wall moves away from warmth towards coolness. Increases in thermal cycling increase the chances of this phenomenon occurring.
- Lime Bloom – soluble lime within the wall or coating carried to the surface of the fresh coating, usually resulting in turning the surface white or lightening the surface color. It is frequently caused when cementitious coatings or wall systems such as poured concrete or block are applied or constructed in cool temperatures, causing a slow cure that allows for easy movement of the soluble ingredients to the surface. Problems might not be visible until some time after application, especially if an acrylic topcoat is used.
- Pigment Float – floating of certain pigments to the surface, caused by the extended open time of the coating such as occurs during cooler weather.
- Laitance – dusty or weak cement-base materials at the surface of concrete. It is caused by extended open time or set time due to cooler temperatures and/or overworking the finish, bringing smaller ingredients to the surface. It is also caused when the wall surface is saturated with water. Weak surfaces can cause possible adhesion loss of topcoats.

For additional information about these topics or other technical issues, please contact the BASF Wall Systems Technical Support group at 1-800-589-1336.

Note
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