

ATB-101 Weather Conditions for Applying Waterborne Coatings

Introduction

Waterborne coatings offer benefits such as ease of application, water clean-up, and VOC compliance. They are also safer to use than solvent based coatings for the applicator, the occupants of the buildings where the coatings are being applied and the environment as well. One limitation to the use of waterborne coatings is that they are more sensitive to weather conditions during and immediately after application.

Appropriate Weather Conditions

For the best performance, paints and coatings should only be applied in appropriate weather conditions. The best time to apply paints or coatings is when the weather is warm and dry and there is no wind. Unfortunately these "perfect" conditions don't occur all the time. This can be especially true in the fall and spring when atmospheric conditions can be less than ideal.

No matter the season, careful consideration of the weather must always be given when using waterborne coatings. Applying coatings in cold or extremely hot conditions can negatively impact their performance. Additionally, if a waterborne coating is subjected to disruption by heavy dew, rain, or fog before it has sufficiently cured, then the coating will be damaged and it can even wash off.

Cold Weather

If it is necessary to apply coatings in colder weather, application should be done on sunny days, and the surface to be coated should be allowed to warm up as much as possible. Waterborne coatings should never be applied unless surface and ambient temperatures have attained the temperatures specified for the specific coating. (Generally no less than 45° F). As a surface is exposed to the sun, it will absorb infrared heat energy and become warmer than the air temperature. This will help improve the cure rate of the coating. Application of coatings should be stopped earlier in the afternoon than normal before temperatures begin to drop.

Cold temperatures experienced during application or before the coating can thoroughly dry can interfere with the film formation process and cause coalescence problems. Poor coalescence of the coating film will result in very early coating failure. Accordingly, a close eye should be kept on weather forecasts with special attention given to the predicted temperatures for the 24-48 period after application.

Using darker colored base and/or intermediate coats can help the drying process since darker colors will absorb more infrared energy from the sun. Acrymax SUN-1 is a photo-reactive pigment that can be added to Acrymax white elastomeric roof coatings to "dye" the coating blue. This will increase the coatings infrared absorbance during the drying phase, but will "bleach" out after several days of exposure to sunlight, leaving a bright white reflective coating.

Waterborne coatings should not be applied when temperatures are below 45°F. Temperatures for 24 hours after application should also remain above freezing. At very low temperatures any water left remaining in the coating film can freeze and damage the paint film.

Hot Weather

If it is necessary to apply coatings in hot weather, application should be done early in the morning when cooler temperatures exist. Dark colored building materials such as asphalt or EPDM have very low reflectivity and warm very quickly once the day breaks. This will greatly speed the drying process and if a coating applied to a "hot" surface dries too quickly then adhesion properties and proper film formation can be adversely affected.

Waterborne coatings dry from the top down, forming a skin of dry coating over the applied wet coating. This can cause two problems in hot weather. First, if the skin is disturbed by brushing or rolling over the partially dried coating then a deformation in the coating is created that is not only aesthetically undesirable, but can cause a weak point in the coating system. The second and more common problem is that blistering may occur. If the top of the coating dries too quickly, then the remaining water in the underlying wet coating cannot easily escape. The intense heat of direct sunlight then can cause the water and other volatile compounds in the paint to vaporize, building pressure under the paint layer until the paint bubbles away from the substrate. Applying a second coat of paint before the first coat has thoroughly dried can compound the problem.

When installing fabric reinforcement into a basecoat the open time can be improved by using a light colored base coat. A light colored basecoat can also help lower the surface temperatures and improve conditions for subsequent coatings in a multi-coat system.

Humidity & Rain

Humidity and dew points play a significant role during the curing process of waterborne coatings. High relative humidity will slow and can even stop the drying process of a waterborne coating. The dew point is the temperature at which dew begins to form. Relative humidity is the amount of moisture in the air compared to what the air can "hold" at that temperature. These two measures of humidity are interconnected in that when the air can't "hold" all the moisture, then it condenses as dew. A drop in temperature will result in an increase in the relative humidity and dew points can be rapidly reached when sun goes down, especially in the spring and fall. Once the dew point is reached a waterborne coating will not dry and can even be dissolved if it has not developed a sufficient resistance to moisture. Exposure of the applied coating to high humidity or moisture before the coating has dried completely can damage the paint film.

Clearly, waterborne coatings should never be applied when it is raining and should not be applied when precipitation is imminent. Since a freshly applied coating can be damaged by rain you would be well advised to err on the side of caution when rain is in the forecast.

Dos & Don'ts

Things that you shouldn't do:

- Do not apply Acrymax coatings when freezing temperatures or rain are forecast within 24 hours of application.
- Don't take chances with rain.
- Never apply coatings to surfaces covered with frost or ice.
- Do not store coatings outside if temperatures will fall below the freezing point.
- Do not work late in day when dew is expected.
- Do not apply coatings when relative humidity is above 80%.

- Do not apply coatings unless the dew point temperature is at least 5° F less than the ambient or surface temperature.
- Do not apply subsequent coats before the previous coats are thoroughly dry.

Things that you should do:

- Make sure that both the ambient temperature (the temperature of the air) and the substrate temperature (the surface to be coated) are as specified for the coating being applied. (Generally no less than 45° F)
- In cold weather, check the surface temperature of the area to be coated with an infrared thermometer to make sure that the temperature specified for the coating that is being applied has been attained.
- Keep informed of weather conditions present and forecast. Check websites such as wunderground.com or accuweather.com for current and forecasted conditions.
- Be observant of the weather conditions throughout the application process and halt application of coatings if weather conditions are deteriorating.
- In very warm or cold temperatures, apply coatings in multiple thinner applications rather than 1 or 2 heavy applications.
- Store products inside and as close to room temperature as possible until ready for use.
- Follow the sun around the structure when painting to avoid subsequent heating or cooling of the surface before the finish has dried

Remember: It is your responsibility to determine if present and forecasted weather conditions are suitable for application of the coatings. Make an informed decision.

For additional information contact the Acrymax Technical Department.

Acrymax Technologies Inc.
221 Brooke Street
Media, PA 19063
610-566-7470
800-553-0523 Toll-free
610-891-0834 Fax
e-mail: info@acrymax.com