Technical Bulletin

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HOT WEATHER APPLICATION

Water-based (latex) paints are formulated to perform within defined environmental conditions. Hot weather can create application challenges that affect appearance, film formation, and long-term durability. Successful application requires managing air, surface, and material temperatures and planning work to prevent overly rapid drying.

Temperature Considerations

Most water-based architectural coatings are intended for application when air and surface temperatures are below approximately 90–100°F, unless otherwise specified. Air temperature alone is not sufficient to judge conditions. In hot weather, surface temperatures can exceed ambient air by 20°F or more, particularly on dark substrates, metal, stucco, masonry, and sun-exposed areas. Because sun-heated surfaces can quickly exceed acceptable limits, it is good practice to verify substrate temperature with an infrared thermometer or surface probe before and during application.

Figure 1

Effects of Rapid Drying

High temperatures accelerate water evaporation, which can prevent proper flow and leveling. This often results in brush and roller marks, lap marks, poor leveling, dry spray, stipple that does not settle, and uneven sheen or flashing.

Wind and low humidity further shorten open time, making it difficult to maintain a wet edge and increasing the likelihood of visible transitions on large surfaces.

Adhesion and Film Integrity

Excessively hot substrates can prevent proper wetting, reducing penetration and adhesion. In extreme cases, the coating may skin over while moisture remains trapped beneath, leading to blistering, pinholing, or reduced durability.

Rapid surface drying may also leave the film soft below the surface, increasing sensitivity to early moisture exposure, dirt pickup, and surfactant leaching.

Material Handling

Material temperature plays a critical role in hot weather performance. Paint stored in metal containers or direct sunlight can become overly thin, leading to reduced film build, sagging, and faster drying. Whenever possible, store coatings in shaded or temperature-controlled areas and keep containers closed when not in use.

Best Application Practices

Direct sun exposure is a major contributor to hot-weather problems. A key best practice is to follow the shade (Figure 2) by scheduling work on shaded sections as the sun moves to maintain manageable surface temperatures and longer open time.

Additional recommendations include:

- Starting work early in the day
- Avoiding peak afternoon heat
- Monitoring temperature and humidity
- Working in manageable sections
- Maintaining consistent spread rates
- Using proper roller nap and spray settings

Figure 2

Key Takeaways

Applying coatings outside recommended temperature ranges can lead to defects such as flashing, lap marks, poor leveling, and sheen variation, as well as reduced adhesion and premature wear. These issues are typically environmental rather than product-related.

By monitoring conditions, controlling material temperature, and planning work around sun exposure, contractors can achieve uniform appearance and long-term performance in hot weather.