The Effects of Weather on Polyurethane Sports Surface Installations

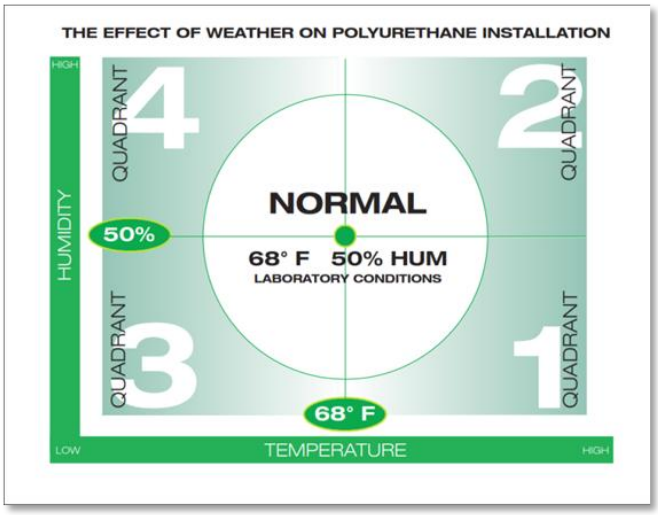
The effects of differing weathering conditions on the installation of Polyurethane Sports Surface Systems is often not understood or is misunderstood. This can lead to conflicts between the surfacing system installer, the designer, the General Contractor and the owner. These weather effects on surface installation timelines and overall quality of the surface system should be of primary concern and focus to ensure a quality installation and reasonable schedule.

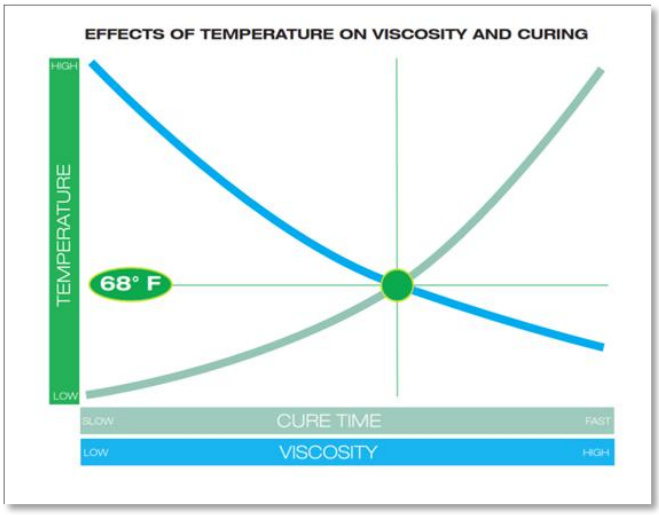
The majority of polyurethane surfacing products are designed and tested at a consistent 68 degree Fahrenheit temperature with 50% humidity, which are ideal conditions for the installation of high quality, high performance sports surfaces.

The following chart shows the effects of weather conditions on the installation of polyurethane surfaces.

The effects grid:

- Quadrant 1 - High Temp/Low Humidity
    - Viscosity is lower than data sheet. Polyurethane will be thinner during application than design.
    - Cure time is likely to be substantially longer
        - Two component products are affected similarly, but not as severely
    - In base mat installations, the binder can in extreme situations migrate toward the bottom third, creating changes in texture and structure.
    - The effect on the surface could show as follows:
        - Base-mat can show stress cracking
        - Structural spray can wear out prematurely
- Quadrant 2 -High Temperature / High Humidity
    - Viscosity is lower than data sheet. Polyurethane will be thinner during application than design
    - Cure time is likely to be substantially shorter.
    - In base-mat installations, the binder can in extreme situations migrate toward the bottom third, creating changes in texture and structure.





    - The effect on the surface could show as follows:
        - Base mat applications can experience "cold seams", not having the passes bonded well at the seams.
        - Structural spray can wear out prematurely
        - Can show "micro-bubbling" and “bubbling" in top portion of the application causing premature wear.
- Quadrant 3 - Low Temperature / Low Humidity
    - Viscosity is higher than data sheet. Polyurethane will be thicker during application than design.
    - Cure time is likely to be substantially longer.
    - In base-mat installations, the binder can be inhibited from forming a proper bond between the rubber granules.
    - The effect on the surface could show as follows:
        - Base mat applications can experience "spider cracking", not having a proper bond between the rubber particles.
        - Structural spray can wear out prematurely
- Quadrant 4 - Low Temperature / High Humidity
    - Viscosity is higher than data sheet. Polyurethane will be thicker during the application than design.
    - Cure time is likely to substantially longer.
    - In base-mat installations, the binder can experience "micro foaming” changing the porosity (closed matrix) of the mat, causing premature wear.
    - Two Component applications can experience incomplete cure in application.
    - The effects on the surface could show as:
        - Structural Spray texture and appearance can be uneven and inconsistent.
        - Two component applications can remain "gummy" and never completely cure.
- This chart shows the effects of temperature to viscosity and cure speed of polyurethanes:

Ideally, polyurethane sports surfaces should be installed within 50 to 90 degrees F. and between 30% to 70% humidity to ensure quality and integrity in the finished surface. Outside of these conditions, special care and attention must be taken to determine the potential challenges and pitfalls of the surface installation. The polyurethane manufacturer can be a valuable source of information for these non-ideal installations. Additional time and considerations will often be necessary.

Differences in site, weather and soil conditions require variations in construction and repair methods and materials. Readers are advised to consult an ASBA Certified Track Builder, a design professional with experience in designing sports facilities or a qualified contractor before undertaking construction or repair of a running track facility.

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