

## Adhesion Fundamentals

### How Surface Prep, Temperature, Pressure, Adhesives and Time Impact Bond Strength

Adhesion is influenced by several key factors—especially during the first 24–48 hours, which is the critical curing period. A true measure of bond strength shouldn't be expected until at least 48 hours after application.

The most important factors include:

- Surface cleanliness
- Temperature
- Application pressure
- Adhesive quality
- Curing time

Clean surfaces are essential. Contaminants like dust or oil can prevent proper contact and significantly reduce adhesion. Warmer temperatures improve performance by increasing adhesive flow and speeding up curing, while cold conditions can reduce flexibility and bond strength.

Low Surface Energy (LSE) adhesives provide the best overall performance across a wide range of materials. While no adhesive is ideal for every surface, LSE adhesives bond especially well to difficult or textured substrates, while still performing strongly on smooth, high surface energy (HSE) surfaces.

DomeLabels require additional consideration. The polyurethane dome naturally wants to return to its original flat shape, which can create edge tension when applied to curved surfaces. This effect is stronger in cold temperatures, where both the label's polyurethane dome and adhesive are more rigid.

For best results, apply labels to clean surfaces using firm, even pressure—especially at the edges—and allow them to cure undisturbed at room temperature. Most adhesion develops within 48 hours, but full cure can take up to two weeks. Simply put: proper preparation and time lead to stronger, longer-lasting adhesion.

## Successful Label Adhesion Factors

