Coffee Break Training

VisionMark
An ISO 9001:2008 Registered Company

Fundamentals of Adhesion

There are differences in adhesives. Selecting the proper adhesives for a nameplate, label, or membrane switch application requires consideration of environmental, surface, appearance, and other performance requirements.

Surface contact is fundamental to adhesive performance. To maximize adhesive performance on a surface:

· The surface must be dry and free of contaminants. (VisionMark carries high performance adhesives that may provide adhesion on oil contaminated surfaces.)

· Apply firm pressure to increase the flow and contact of the adhesive with the substrate.

· The surface contact and adhesion values will increase with time and temperature.

Adhesion is the molecular force of attraction between unlike materials. The strength of attraction is determined by the surface energy of the material. The higher the surface energy, the greater the molecular attraction. The lower the surface energy, the weaker the attractive forces.

Greater molecular attraction results in increased contact between an adhesive and substrate. In other words, a high surface energy material allows the adhesive to flow (or "wet out") to assure a stronger bond.

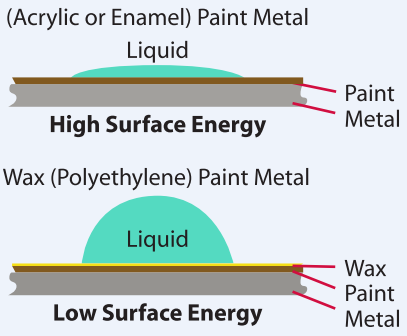
Consider an automobile that has not been waxed for a long time. When water contacts the surface it spreads in large puddles. The unwaxed car surface exhibits high surface energy – the molecular attraction allows the water to flow.

On the other hand, water beads into small spheres on a freshly waxed car. This is an example of low surface energy – the liquid (or adhesive) does not readily flow across the car's surface.

Surface energy is measured by dynes per centimeter. The dyne level is the actual reading of the critical surface tension.

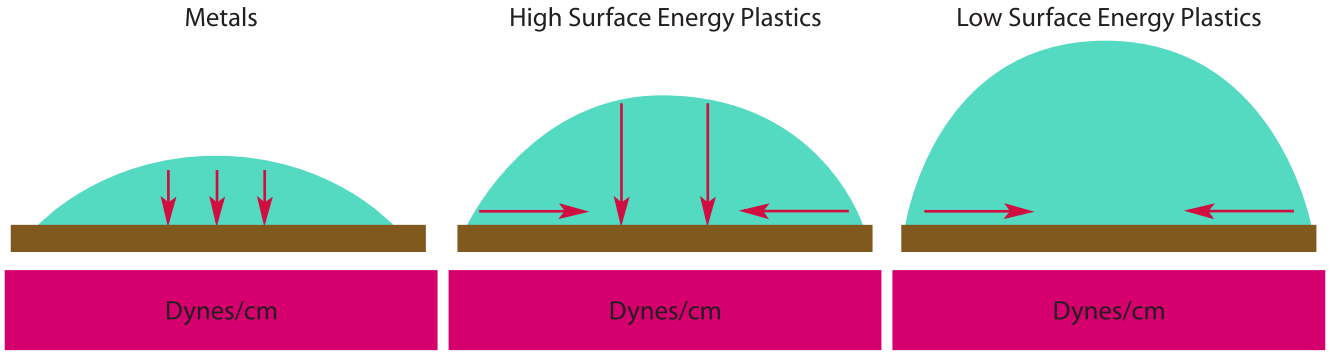
Manufacturers have developed modified acrylic and synthetic adhesives with better flow (or "wet out") characteristics to adhere to low surface energy substrates. The Surface Energy Chart on this page compares the relative energy of commonly used substrates.

Wettablility Principle



This illustration demonstrates the effect of surface energy on adhesive interfacial contact. High surface energy materials draw the adhesive closer for high bond strength.

Surface Energy Charts



2309 Industrial Drive P.O. Box 4219 Sidney, OH 45365-4219
937-492-3100 Fax: 937-492-3108 www.visionmark.com