# FUNDAMENTALS OF ADHESION

Selecting the proper type of adhesive requires consideration of environmental, surface, appearance and other performance requirements.

Adhesion is the molecular force of attraction between unlike materials. Surface contact is fundamental to adhesive performance. The strength of attraction is, besides clean, dry and fee of grease, 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, the adhesive can 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. In comparison, water beads up into small spheres on freshly waxed car. It is an example of low surface energy — the liquid (or adhesive) does not flow out.

TWEHA adhesives, based on Silane modified polymers, are polar and therefore have a relatively high surface energy. Therefore achieve these adhesives an optimal adhesion to polar substrates (e.g., glass or metal) with a relatively high surface energy.

MSP- and SMP-Adhesives will not readily adhere to substrates with a low surface tension (apolar substrates) such as polyethylene (PE), polypropylene (PP), polystyrene (PS), polytetrafluoroetthylene (PTFE) and polyoxymethylene (POM), silicones and powder coatings.

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