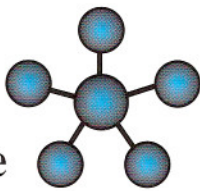


“The strength of the adhesive joint will be the strength of it's weakest member.”



Fundamentals of windshield repair adhesives.

1. **Adhesive strength** - is the interaction that develops between the resin and the glass causing the subsequent bond to the glass.

A. Adhesion - The properties of the resin that causes the bond to the glass.

A-1. Adsorption - The property of the interface between the resin and the glass.

A-2. Interface - The molecular linking of the resin to the glass.

A-3. Interaction - The atoms of the resin interacting with the atoms of the glass causing the molecules to link together.

A-4. Wetting - The filling of the surface crevices and irregularities. A must for good adsorption and adhesive strength.

2. **Cohesive strength** - The internal strength of the adhesive mass or it's resistance to creep under stress. The ability of the resin to resist splitting. To increase cohesive strength, it is necessary to increase the molecular weight and consequent chain entanglement contribution's or to provide cross

linking.

A. Viscosity - (thickness of resin) - The property of resins that cause them to resist flowing. It is caused by internal friction from the resins molecules moving against each other. One way to increase a liquids viscosity is to dissolve polymers (long-chain molecules) in it. These molecules become entangled and resist flowing. Putting solid particles in suspension in a resin also increases viscosity.

Adding strengthening fillers also increase viscosity. Temperature determines how strongly it's molecules interact. Hot resins have lower viscosity than cold. To increase an adhesives cohesive strength will also increase it's viscosity.

B. Molecular weight - The number and size of the resins molecules. As the molecular weight is increased, the cohesive strength rises as well as the viscosity. Low molecular weight (viscosity) resins have lower cohesive strength.

C. Creep - The term used to describe the slow deformation of a polymer (windshield repair resin) under constant stress.

D. Structural adhesives - Able to carry sizable loads without yielding, will support stress as well as the weight of the surfaces bonded. Structural adhesives are higher in viscosity, over 100 cps.