

## Determining Optimum Adhesive Thickness



Example of a sample prepared to measure peel force.

To determine the optimum dry film thickness for your application, you must consider the surface properties of the material being coated and the destructive forces that will be applied to the adhesive bond.

### **Surface Properties**

It should be obvious that a rough surface will require more adhesive than a smooth one. Use just enough adhesive to avoid entrained air in the bond line. Another factor in determining the thickness of your coating is the surface free energy of the material you wish to coat. Surface free energy, usually measured in "dynes", derives from the bonding potential of molecules at the surface of a material. Materials with low surface free energy can be difficult to coat, provide weaker adhesive bonds, and may require a thicker coating of adhesive. Untreated polypropylene, for example, with a surface free energy of 33 dynes will yield lower peels than PET, which has a surface free energy of 44 dynes.

### **Destructive Forces**

It is important to consider the kind of force that will be applied to your adhesive bond. Destructive force can be applied either parallel (shear) or at an angle (peel) to the bond line. For example, if peel adhesion is the dominant force, then an elastomeric adhesive will have a larger "footprint area" than a rigid adhesive and yield higher peels/resistance. The key to success is finding the right adhesive for each process. Your adhesive supplier can evaluate your present adherents and provide data to verify the bonds to test and the feasibility of various adhesives.



Example of a sample prepared to measure shear force.