



## Troubleshooting Heat Activated Adhesives

Heat activated adhesives dry to a tack-free solid. Most frequently they are coated using wide-width coating equipment on foils, fabrics or films. It is necessary to reheat these adhesives to a liquid state under pressure for a given time to obtain a good bond. Time, temperature and pressure are critical and must be controlled. Even when a proper selection study is undertaken, problems with adhesion may still occur during the transition to full-scale production. (See our Tech Tip *Adhesive Selection* for more information). An examination of how the adhesive failed can provide guidance to attaining a good bond.

Clean surfaces, control of conditions for activation and experimental optimization will enhance quality, reduce waste and the cost of production.

### **The most common problems relating to heat activated adhesives are discussed below:**

**1. PROBLEM**—Low peel adhesion, zippy bond or adhesive remains when the material being bonded is bent or flexed.

#### **SOLUTIONS:**

- The adhesive may not have been heated adequately. *Increase the platen temperature and time under pressure.*
- The material being bonded may be contaminated with materials that create a weak boundary layer, such as oil or low molecular weight mold release. Clean the adherend with appropriate solvents and dry.
- Extruders and injection molders that depend upon the residual heat of the extruded material to activate the adhesive may not get hot enough to activate the adhesive. *Preheat the mold to about 200°F to allow activation, choose an adhesive with a lower activation temperature, or heat material in an oven or by using IR lights immediately before inserting it into the mold.*

**2. PROBLEM**—Blistering or a porous adhesive coating after heat activation indicates residual solvent or water remains in the adhesive

**SOLUTION**—This indicates residual solvent or water remains in the adhesive. *Increase drying time or temperature.*

**3. PROBLEM**—Low peel values, non-zippy bond, some adhesive transfer

**SOLUTION**—These features usually indicate the molten adhesive was squeezed out of the bonding area. *Reduce pressure to assure that the material being bonded is not distorted. It may also be necessary reduce the processing time and temperature.\**

**4. PROBLEM**—adhesive bonds incompletely to the material.

**SOLUTION**—The topography of the material being bonded may require adjustment of the dry adhesive thickness. *A coating of 0.25 to 0.3 mils of adhesive normally provides a good bond to relatively smooth material. Rougher material requires more adhesive and a greater time to melt the thicker adhesive.*

\***Note:** If multiple products are being produced using different platens on the injection molder, it may be necessary to adjust the processing time, temperature and pressure.