

New Market Opportunity for UV-Curable Adhesives

Wet-Wipe Closure Systems

By Nicole O'Brien

Wet wipes and moist towelettes got their start with baby wipes many years ago. As the world started to look for ways to become more convenient and disposable, the wet wipe revolution began. Now consumers can find most of their favorite cleaning, polishing, dusting and sterilizing products in the form of wet-wipe disposable packages. This revolution brought a new opportunity to the adhesive world.

Wet-Wipe Application

These wet-wipe packages have a re-sealable label that is used as the closure system. The adhesive on this label must be resistant to the chemicals inside the package, and this can only be achieved with a solvent acrylic or a UV-curable acrylic adhesive. The reason water-based adhesives cannot be used for this application is because the chemicals in the package will cause the water-based adhesive to re-emulsify

and lose sealing properties. Standard hot melt adhesives cannot be used because the raw materials in these adhesives are also sensitive to the chemicals in the package, and they will lose cohesion properties over time.

Solvent acrylics were traditionally used for this application, but this limits the manufacturers of these labels to solvent coaters. And as always, there are the existing safety and health issues with solvent-coating processes. Recent advances in UV-curable adhesive technology now offer an environmentally friendly solution for this application, and these advances have also opened this market to all manufacturers with hot melt coating equipment and UV lamps. The market for these products is large and also technically demanding.

Factors in Choosing Adhesive

There are many factors that need to be considered when choosing an adhesive for a wet-wipe closure system. Some of these challenging factors are:

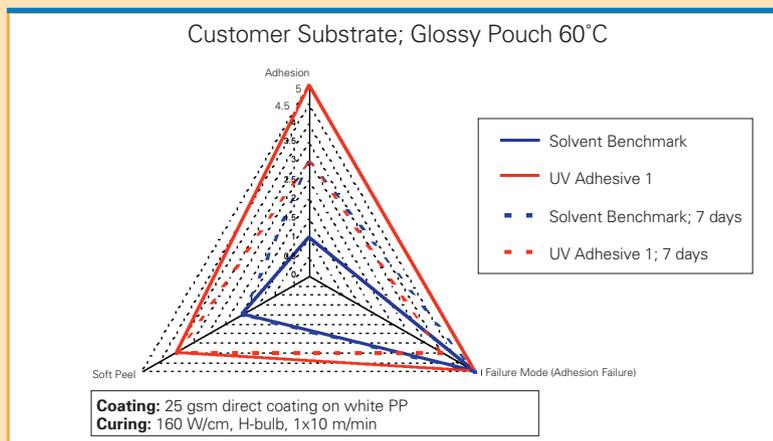
- Chemicals inside the pouches.
- Number of times the package needs to be opened and re-sealed.
- Construction of the wet-wipe closure system.
- Type of film used for the label.
- Type of film used for the pouch.
- Desired peeling performance (smooth, strong, easy, etc.).
- Coating method—direct or transfer coated.
- Label printing and converting process.



Baby wipes have a re-sealable label that is used as the closure system.

FIGURE 1

Test results compare new UV acrylic adhesives to traditional solvent-based adhesives



Therefore, adhesive formulation allows the right product selection for each wet-wipe product, package, manufacturing parameters, and end-use requirements. Comparative testing methods have also been developed to compare the new UV acrylic adhesives to the traditional solvent-based adhesives. The closure systems are assessed in its final packaging by comparing adhesion, failure mode, and the zippiness of the closure system. The results are reported in a graph similar to Figure 1.

The evaluation is always in comparison to at least two products. The values stated in Figure 1 are subjective and are shown after immediate application to the package and after seven days on the package. The seven-day time frame gives an opportunity for the adhesive to be exposed to the wet-wipe package contents, and it also gives a better indication of the adhesion to the package over time.

“Adhesion” is evaluated by the strength it takes to remove the label from the package. The stronger the peel strength required, the higher the number will be. The “Failure Mode”

refers to a range between cohesion failure and adhesion failure. For this application, we want adhesion failure from the package because we do not want any adhesive residue on the package. Therefore, cohesion failure is not desired. The highest number on the chart represents complete adhesion failure as the failure mode. The “Soft Peel” evaluation indicates whether the peeling of the label from the package is smooth and soft or hard and zippery. Different customers prefer different adhesive and sealing properties for each application, so the desired properties have to be discussed. Figure 1 gives customers a good way of comparing different adhesive/package performances.

Summary

There is a new application for UV-curable pressure sensitive adhesives on the market. The market continues to grow and so do the opportunities for hot melt coaters. The advantages of UV-curable pressure sensitive adhesives for wet-wipe applications are:

- Environmentally friendly alternative to solvent-based systems.

- Possibility for in-line adhesive application and label production.
- Consistent residue free removal.
- High-initial tack on a wide range of pouch materials.
- Soft, noiseless opening and good resealing properties.
- Excellent resistance to wet-wipe substances allows residue free opening.
- Adhesives can be formulated according to specific end-use applications.
- Production with UV-curable adhesives is safer than using solvent-based products.
- Companies with hot melt equipment and UV lamps can produce these labels and/or label stock. ▶

—Nicole O'Brien is an account manager with Collano, Greenville, SC (Collano AG, Switzerland).