

## **BREAKING UP WITH EPOXY SILANES - CONSEQUENCES & SOLUTIONS IN FLEXIBLE FOOD PACKAGING**

Consumers expect the food industry to provide safe products which comply with the latest legislations. FEICA already recommends avoiding the use of epoxy silanes in food contact applications, and the European Union is expected to set new limits during the course of this year. These limits will require complex testing methods that lead to challenges for converters and packaging manufacturers. Thanks to Henkel's longstanding experience in food safe packaging, the company has been able to develop a new range of laminating adhesives free of epoxy silanes and a new test method that requires a combination of several sophisticated analytical techniques to detect epoxy silanes and its degradation products.

Epoxy silanes, like GLYMO and GLYEO, are adhesion promoters used in food packaging, for example for laminated pouches that must be resistant to sterilization and hot filling. In some cases, it is also used for microwaveable packaging. These adhesion promoters have very favorable attributes, which is why they can be found in a variety of applications. They increase the adhesion between aluminum and polyolefin films and maintain the bond strength even at elevated temperatures.

Due to the fact that GLYMO is used in a wide variety of food contact applications, the European Food Safety Authority (EFSA) had a closer look at existing toxicological data. In 2017, EFSA concluded that GLYMO must be considered to have a genotoxic potential. Therefore, the European Union is now working on a legislative framework for 2020 to regulate the use of epoxy silanes according to their genotoxic potential. The deadline is envisaged for September 2020. This will raise demand for suitable alternatives. FEICA, the Association of the European Adhesive & Sealant Industry, already recommends replacing the adhesion promoter as soon as possible.

### **Changes required for the whole industry**

In the near future, the use of GLYMO as an adhesion promoter will still be permitted as long as it can be demonstrated that it does not endanger human health. Products containing epoxy silane are not permitted to be used for fatty filling goods, and epoxy silanes must not be detectable in aqueous filling goods. The critical part, however, will be that converters and packaging manufacturers need to provide proof for the absence of GLYMO and structurally similar chemicals such as GLYEO. This implies two factors: having the right adhesive and the right testing method to prove it. Henkel Corporate Analytics developed a unique approach for determination of GLYMO & GLYEO derivatives, which is leading within the market. The testing, however, will create additional workload and administrative paperwork for the converter's quality control departments.

### **Providing suitable alternatives**

As a leading adhesive manufacturer, Henkel anticipated this development early on and started to work on epoxy silane-free adhesives. These systems, which are specifically designed for high-temperature food contact and medical retort applications, are modular in their design: The adhesive base LOCTITE LIOFOL LA 2798 can be combined with a variety of hardeners, making it versatile and reducing complexity for converters. Currently, five hardeners are offered, each with different features to cover a broad range of applications.

The adhesion properties and performance of these GLYMO- and GLYEO-free adhesive systems have already been confirmed during industrial use by several customers. The products are commercially available and offer a very effective opportunity to be on the safe side of the epoxy silane discussion early on.