

FIGURE 1. Adhesion modified Sol-Gel Process.

## HydroPhil™ TECHNOLOGY PROFILE

HydroPhil™ solutions now offered by Lotus Leaf Coatings fill a critical need in hydrophilic functional coatings. HydroPhil™ products can be applied to a variety of substrates and can be tailored to meet your specific needs, including maximum durability, optical clarity and hydrophilicity. Our mission is to enable our customer to provide a better user experience by using our hydrophilic nano-coatings.

Our coatings are based on the sol-gel process, as shown in Figure 1. In its most basic form, this process uses the hydrolysis and condensation of silicate esters into a network of silicate bonds, as shown in Figure 2.

By varying the chemical processing conditions we can obtain a set of well-defined unique surface chemistries and morphologies that combine to make the resulting coatings unique. HydroPhil™-S maximizes the hydrophilic nature of the surface, while HydroPhil™-EZ sacrifices some hydrophilicity to ensure an abrasion resistant coating. In addition to hydrophilic, Lotus Leaf Coatings has hydrophobic coatings, HydroFoe™, which are chemically modified to reverse the polarity of the surface chemistry into a non-polar water-rejecting layer.

Aside from the varying chemistries, Lotus Leaf Coatings' are unique due to the controlled growth of nano-size particles for the coatings. This allows well controlled deposition into optically clear coatings as the particle size is well below the wavelength of visible light.

The application form can be varied as well, a variety of solvents for spin or dip coating and spray applications can be provided to the user, including non-flammable alcohol-water mixtures.

The coatings resulting from the HydroPhil™ application are typically less than 100 nm in thickness and show excellent coverage without pores and without increasing the surface roughness of the substrate, as seen in Figure 3.

Depending on the substrate, most coatings are long-term stable under application conditions. Shelf life in solution is typically 6 - 12 months.

## CURRENT PRODUCTS

**HydroPhil™-S: Superhydrophilic Coating:** HydroPhil™-S provides a nanoscale coating that provides water contact angles of less than 10°. The coating is optically clear and modestly durable. The current market includes HVAC and Microfluidics.

**HydroPhil™-EZ:** HydroPhil™-EZ is an easy to clean nanoscale hydrophilic coating that provides water contact angles between 25° and 30°. The coating is durable and optically clear. The current market is ophthalmic.

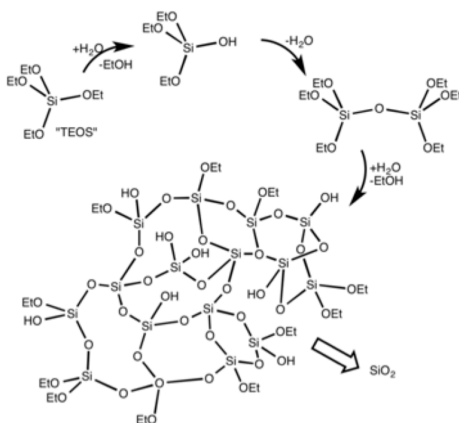


FIGURE 2. Growing silicate gel network.

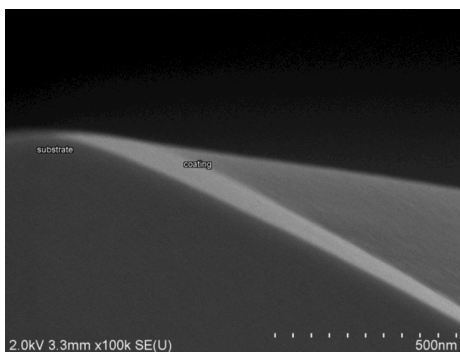


FIGURE 3. Scanning Electron Microscopy of spin-coated HydroPhil™-S coating on silicone wafer.