Electro Optical Components, Inc.
5460 Skylane Boulevard, Santa Rosa, CA 95403
Toll Free: 855-EOC-6300
www.eoc-inc.com | info@eoc-inc.com

Liquid repelling coatings

Special coatings are now offered with unusual liquid repellency.

Liquid repellency is shown by surfaces with low surface energy such as per-fluoro polymers and silicones. It is associated with high contact angles between the liquid and the solid surface. It is also manifested by the beading of the liquid or non-wetting. Good repellency is also coupled with the ease of sliding of the droplets. Such surfaces are also characterized by non adhering or good release properties. The term liquid repellency is mostly associated with the term hydrophobicity, meaning, repellency of water.Repellency of other fluids is hard to achieve, because all the organic fluids and organic additives have much lower surface tension than that of water and their wetting capability is much better than water. Water repellency is commonly shown by surfaces coated with Teflon.However, Teflon coating requires high temperature of over 300ºC which is not applicable in many cases. Moreover, Teflon is characterized with a surface energy of 18 dyne/cm, but some other per-fluoro surfaces are known to reach down to 6-12 dyne/cm.Teflon is considered hydrophobic but not necessarily liquid repelling or oleophobic (oil repelling). Surfaces with lower energy are in many cases also oleophobic. Unfortunately the requirement for low surface energy is in many cases associated with the use of mechanically weak surfaces with low abrasion resistance.

MY Polymers has recently developed a series of products with unusual properties. They are characterized with water contact angles of 120-130º and they combine convenient room temperature curing with the convenience of single component. The products are available as either moisture curing coating (namely, they self cure upon application by absorbing ambient water). Alternatively, UV curing formulations with quick response are also available. The coatings exhibit excellent adhesion to most surfaces including metal, glass, oxides and many plastics. The cured coating has a very high abrasion resistance, similar to that of the better abrasion resistant polymers (polyurethanes). In addition to water repellency, these surfaces are also solvent and oil repellent.

Possible applications are for barriers against the migration of fluids. For instance, to prevent the escape of oil and grease from bearings or to stop oil from reaching sensitive components or from an adhesive to reach beyond desired areas. The picture on the left demonstrates the oil barrier property of a liquid repelling coating (right side). A drop of colored oil on a vertical surface is stopped upon reaching the coated area. The drop on the non-treated area (left side) flows freely. The non-stick properties of these coatings allow for easier to clean surfaces. They are also useful in water sensitive structures were the easier drainage of the water droplets is of advantage (in radoms for instance). The cured coating is non contaminating and can be used for mold release were cleanliness is an issue. The coatings contain no silicones.

Call or email discuss these and other applications.