



## ***OUR SCIENCE – Water & Soil Repellent (Hydrophobic) vs. Water & Soil Adhesive (Hydrophilic) Surfaces***

No matter how much we clean, sanitize or disinfect surfaces, it is inescapable that dirt, grime and surface-contact germs keep coming back; sometimes in seconds.

Even hard surfaces are like sponges; they have microscopic pores that trap water, organic and inorganic soils that adhere, build up and form films in layers that become increasingly difficult to remove without scrapping and scrubbing the surface. Many surfaces, like glass, porcelain and ceramics, are naturally hydrophilic, even though water will not pass through them. Others, like plastics and laminates, are naturally hydrophobic, but become hydrophilic as they age, soil and weather.

The development of cationic, anionic and nonionic surface active agents (surfactants) spawned a whole range of “detergent” cleaners. Surfactants are mostly organic compounds that are “amphiphilic”; meaning that they contain both hydrophobic (water insoluble) and hydrophilic (water soluble) groups. Surfactant molecules will migrate to the water surface, where their insoluble groups will mix with the oil phase of soil and the soluble groups remain in the water phase. This alignment and aggregation of surfactant molecules alters the surface properties of water at the water/air or the water/oil interface.

Until the advent of surfactants, cleaning was limited to the use of soaps or solvents. Today, however, detergents have far surpassed the use of traditional soaps and solvents in cleaning. They easily represent 75% of the cleaning products used for hard surfaces, dishes & cooking utensils, and for laundry in both residential and commercial applications because they readily reduce the surface tension of water to help penetrate water-soluble soil and/or emulsify oil-soluble soil for improved removal.

While surfactant-based detergents definitely improve the ease and quality of ordinary cleaning, they remain chemically unchanged in the washing process and invariably leave surfaces in a “wettable” (water filming) condition. Such wettable surfaces readily increase the adhesion and buildup of re-soiling from everyday spills & splatters, dirt, grime and dust. Wettable surfaces also enhance the growth of organisms contained in everyday soil. Also, as water evaporates on wettable surfaces, the inorganic minerals that are contained in water and are left on the surface, readily bond to the surface and become increasingly insoluble.

Detergent manufacturers have no problem with this negative attribute, because it leads to more cleaning...and the greater use of detergents. Another problem with many surfactants – even in the small quantities contained in detergents – is that they end up in waste water systems and play havoc with water reclamation.

**The viable alternative for improved surface hygiene and easier cleaning – without the profuse use of detergents – is a new surface cleaning & shielding technology that cleans everyday soil with newly-patented surfactant-free cleaning compositions. These products clean...and simultaneously shield surfaces with an invisible water, soil & stain repellent barrier coatings that effectively reduce the adhesion & buildup of re-soiling and the attachment of mineral deposits for easier next-time cleaning...and prevent the growth of odor-causing bacteria, mold & mildew in-between cleaning.**