**FAQ – Dishwasher Gel**

**What is a rinse aid?**

A rinse aid is a surfactant that prevents water from beading up on dishes, helping it to sheet off instead. This promotes faster drying without leaving behind water spots. The term is a bit of a misnomer though, as rinse aids have more to do with drying than with rinsing.

**What are surfactants?**

Surfactants are compounds that lower surface tension between liquids and solids. This is what happens to food residues on dishware, as surfactants lower the surface tension of the food debris and the water in the dishwasher allows the detergent to penetrate and loosen dried-on food for cleaner dishes.

Surfactants consist of hydrophilic and hydrophobic components. The hydrophilic component is attracted to water, while the hydrophobic component is repelled by water. In your dishwasher, the hydrophobic component of a surfactant attaches itself to the dirt, oils and debris while the hydrophilic component attaches to water molecules. These polarizing forces are what lifts the residue off dish surfaces during a washing cycle. Surfactants also emulsify oils and keep them dispersed and suspended during the wash cycle to prevent them from settling back onto your dishes.

**What is hard water?**

When water filters through deposits of calcium and magnesium-containing minerals such as limestone, chalk and dolomite, it takes on a high mineral content and forms what is known as hard water.

Did you know that hard water actually reduces the cleaning power of your detergents? The minerals in hard water act like dirt and use up the surfactants, so there are fewer available to work on the dishes you want to clean.

**What is a chelator?** Chelators (key-laters) serve several different functions including reducing water hardness, removing particular types of stains, and keeping soil in suspension so it doesn’t redeposit onto surfaces. Chelators bind to calcium and magnesium (the main culprits behind hard water), effectively trapping them so they can’t do any more damage. Due to their affinity for calcium, chelators are very effective in removing stains with large concentrations of calcium such as cheese, milk or other dairy products. By binding to calcium and magnesium, chelators allow the surfactants to work more effectively. In the absence of chelators in hard water loads, surfactants are drawn to the calcium and magnesium in the hard water before they’re able to reach stains. Simply put, more cleaning product would be required to eliminate the same stains.

**What are phosphates?** Phosphates are compounds containing phosphorous. This ingredient helps soften hard water and remove oil, grease and soil. While phosphates offer exceptional cleaning power on everything from clothes to dishes, they have a severely negative impact on the environment. When large amounts of phosphates are washed away into waterways such as lakes, rivers and streams, they cause excessive algae growth called algae blooms. These algae blooms cover the surface of the water and deplete oxygen levels, killing fish and plant life. Cleaning products containing phosphates that are washed down the drain will eventually end up polluting waterways, as secondary water treatment only removes a small percentage of gray-water phosphates.

**What is NPE?** Nonylphenol ethoxylate (NPE) is a surfactant used to remove stains and debris. Water treatment facilities are typically able to remove about 85% of this chemical, but what does wash down the drain eventually ends up in lakes, rivers and streams and is considered by the EPA to be moderately bio-accumulative; in other words, it is absorbed by the body at a rate faster than the body is able to break down and excrete it.. NPE is an endocrine disruptor that can alter estrogen levels in fish, causing hormonal issues that adversely affect aquatic life.

**What is SLS?** A common ingredient in sudsing products marketed for personal care and home cleaning, sodium lauryl sulfate (SLS) is a surfactant and known irritant to the skin. In fact, SLS is commonly used in lab testing to intentionally irritate skin so scientists can test the effects of products intended to heal skin.

**What is SLES?** Sodium laureth sulfate (SLES) is similar to SLS but has undergone additional chemical process. As part of this process SLES can become contaminated with low level amounts of 1,4 dioxane which is a probable human carcinogen.

**What is DEA?** Cocamide diethanolamine (cocamide DEA, DEA) is chemically modified form of coconut oil used as a surfactant to thicken or increase foaming in a cleaning formula. It is a possible human carcinogen and can cause severe skin irritation.

**What is 1,4 dioxane?** A probable human carcinogen that can contaminate some household products, 1,4 dioxane may be toxic to the brain and central nervous system, kidneys and liver. It is commonly found in polyethylene glycol (PEG) and sodium laureth sulfate (SLES).