

# DRIVING GROWTH BY REDESIGNING DISH-WASH CLEANERS FORMULATIONS

## ABOUT THE AUTHOR

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1) Dr Herbert ECK (Germany) who has more than 100 scientific patents under his name

2) Dr Laszlo Vegh (Switzerland, Formerly associated with Harvard University and Dow Chemicals)

3) Mr Peter Bakker (The Netherlands, Formerly with Akzo Noble with 20 years of experience in development of Acrylic Resins, Urethane Resins etc)

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DISHWASHING application deals with food soil removal from various dish-ware hard surfaces by both hands as well as by machines.

Dishwashing cleaner manufacturer, with their traditional formulations wonders - Why their sales are not picking up? However they never try to understand the consumers' expectations and shortcomings in the performance of their product.

The removal of oily soils should not be the sole criterion for evaluating dish washing cleaners. Even after properly rinsing the dishes with water stream, many such products available in the market leaves behind some deposits and ugly unpleasing white spots and streaks on the dishes. These products simply lack in a one basic component i.e. Polymeric Dispersant. or to be more specific Acrylic Polymer. Before we explain how these polymers give magically sparkling spotless cleaning

to dishes, we first would like to go to the basics of what normally goes in dish-washing formulations.

Dishwashing differs from fabric washing. Here surfaces are hard and soils are oily. Food stuff soils mainly consist of Oils, Fats, Proteins, Carbohydrates, etc. For cleaning such surfaces you need to have high levels of Surfactant (mainly Alkyl Benzene Sulfonates) and Alkaline agents. In presence of strong Alkalis, fats get solubilised by a process of saponification. Presence of Surfactant and Soap so formed emulsifies the remaining soils. Dishwashing Cleaners should also contain silicate, preferably meta silicate, phosphates and minerals and water softeners. Metasilicates and phosphates also transform the dirt and remove it from the surface. Surfactants also help in giving wetting properties as they reduce surface tension which help in speeding up the washing action. Minerals help in removing the soils by



abrasive action. These minerals are nothing but are externally added particulate soils. If formulation of dishwashing product is not properly designed, difficulties occur in keeping these soils in suspension & preventing it from getting re-deposited on cleaned surfaces. Such shortcomings in the formulations results in deposits and white spots on cleaned dishes.

To overcome these problems and to have sparkling cleaned dishes with no white spotting one has to modify the formulation by incorporating very little amount of Acrylic Polymer Dispersant Such As ACR 4500 which does both the functions of keep-



ing the dirt in suspension and prevent it from getting redeposited by electrostatic repulsions. Further it balances the negative effects of Calcium, Magnesium Salts, present in hard washing

water. Presence of Polymers inhibits the growth of Calcium and Magnesium Carbonates thereby they also remain in suspension form. Surprisingly, these polymers are effective at concentration as low as 1% and can be used for best results at concentration upto 3% and STPP can be eliminated. They perform multiple tasks of inhibiting growth of Calcium, Magnesium Carbonate Crystals, does Sequestration, help Soil Removal, Prevent Re-deposition of Dirt, Dispersing the insoluble Clays and Minerals, and prevent Scale Formation in the machines. The Acrylic

Polymers will make the dishwash formulation stronger overall with eye pleasing results on washed Crockery, Glass Wares, Silver Wares etc. and will boost the sales manifold.

For the benefit of the readers and formulators, we have provided some very simple but extremely effective typical Dish-wash formulations (PHOSPHATE FREE) based on ACR 4500.

Liquid dish wash - 100 kg Batch		Dish wash Scouring Bars - 100 kg Batch	
1) Deionised Water	76 Kg (Below 30 tds)	1) Dolomite	44 Kg
2) Caustic Lye (50%)	3.5 Kg	2) Calcite	4 Kg
3) Acid Slurry (89%)	12 Kg (After this the pH needs to be adjusted to 10 - 11)	3) China Clay	32 Kg
4) Salt	0.75 Kg + 1 Kg DI	4) Acid Slurry	10 Kg
5) SLES	Water 2.5 Kg	5) AOS	1 Kg
6) ACR 4500	3 Kg	6) SLES	3 kg
7) Alkaline Thickener	0.250 Kg + 0.250 Kg	7) ACR 4500	1.5 Kg
8) Perfume (water soluble)	water	8) Caustic Lye (50%)	0.6 Kg
9) Color(water soluble)	As Desired	9) Sodium Silicate	2 Kg
10) Preservative	Final pH to be adjusted to around 8.5 using CITRIC ACID.	10) Soda Ash	1.5 Kg
		11) Perfume and Colour as Desired	

## BIBLIOGRAPHY:

V.Lohiya. Discover the Magic of Polymers in Soaps and Detergents. SDTR, Nov. 2014.  
Lange, K. R. (1994). Detergents and Cleaners. Hanser

Publishers.

Zini, P. (1995). Polymeric Additives for High Performing Detergents. Tehchnomic Publications.