

## **Why phosphates are indispensable for professional automatic dish washing (industrial and institutional - IIP)**

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### **Preface**

In context with the Baltic Sea Action Plan (HELCOM) or the Danube River Basin Management Plan, the European member states and the commission are thinking about amending the Detergent Regulation EEC 648/2004 in order to further restrict or even ban any phosphate in detergents within Europe. By this legal act one of the sources of unwanted phosphate pollution in surface waters shall be switched out. Under unfavorable conditions the essential plant nutrition factor phosphate can stimulate an excessive growth of algae, a so-called algae bloom, which subsequently can imbalance the water ecosystem in direction of an eutrophication.

Phosphate substitutes shall take charge of the phosphate tasks in detergents instead. During the last decade mineralic zeolites have been successfully used for this purpose in detergents for household washing machines. Therefore a ban of phosphate for those household laundry detergents seems reasonable and up to date. However, a phosphate ban for detergents to be used in special machines designed for professional purposes is neither feasible at the moment nor leading to the essential environmental goal.

### **1. Why zeolites cannot be used in automatic dish washing**

There are big technical differences between washing machines and dish washers including multitank-transportdishwashers. The successfully zeolites known from phosphate-free domestic laundry cleaning products (DLCP) cannot be used in professional dishwashers. One of the main reasons is the dosing technique being completely different. The solid zeolites are not soluble in water and would obstruct pumps and tubes and also gradually silting up the washing liquors in the tank inside. Anyway, zeolites can only be formulated in solid powders but not in liquids as mostly preferred in professional machines with automatic dosing systems.

### **2. Why no other today's phosphate substitutes can replace on its own phosphate in professional dishwasher detergents**

Phosphate in detergents has two completely different tasks simultaneously: Cleaning and water softening. None of the today's potential substitutes could challenge this double job, especially not under time pressure common for professional working areas or in combination with co-formulated bleaches also being essential for this area. Furthermore, the performance requirements in the profes-

sional area are significant higher than those for private homes as can be seen in official standards like DIN 10510-10512.

### **3. Why a phosphate ban in professional detergents would not lead to the intended political goal of reducing pollution or eutrophication resp. in European waters**

Phosphates being a natural component in all living beings as well as an essential nutrition factor get into European waters from most different sources: Nearly 50-60 % originates from animal or human faeces, approximately 16 % get into nature via surplus fertilizer washed away from agricultural land, approximately 9 % from natural (mineral) sources. The percentage of phosphates from detergents is about 10 % at the highest, which means all detergents together – from private homes and from professional applications. The contingent of professional automatic dishwashing detergents is estimated to be below 1 %. Compared to all other sources of phosphate the contribution of professional detergents is therefore neglectable.

### **4. Phosphate is a safe chemical under toxicological and ecotoxicological aspects**

As already mentioned above, phosphate and the element phosphorous (P) resp. is an important component of all living organisms. Among other things it is playing an essential part in the energy metabolism and it is a building block of the genetic material (nucleic acids, DNA) as well as for the bones. Apart from its eutrophication potential under unfavorable conditions-too much of the nutrition factor phosphate gets into open waters like lakes- phosphate is neither harmful for human health nor for the environment. Not any of the designated phosphate surrogates is known for being equally safe or scientifically proved for its real long-term effects yet.

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