DISH WASHING

Automatic dish washing is the process by which dirt is removed from dishes, thanks to washing in water with the aid of adequate products and a dish washing machine.
In a dish washing machine, 4 factors interact:

- **MECHANICAL ACTION**
  the dishes are sprayed with a jet of pressurised water which is generated by the washing pump.
- **THERMAL ACTION**
  the temperature of the water.
- **TEMPORAL ACTION**
  the duration of the washing process.
- **CHEMICAL ACTION**
  the action of the detergent and rinse aid allowing the water to remove the dirt from the dishes.

WASHING PROCESS

A washing process consists of several phases depending on the type of dirt and the type of dishes.
The phases can be divided into:

1. SOAKING

The soaking phase is an optional phase, recommended when the dishes are not washed immediately.

2. PRE-WASH

The pre-wash phase is optional, used when the dishes are very dirty and are washed immediately.

3. WASHING

The washing phase is always present and has the purpose of completely eliminating the dirt.

4. RINSING

The rinse phase is always present and has the purpose of eliminating traces of detergent and distributing the rinse aid solution to speed up dish drying.

WATER CHARACTERISTICS

For best results, the water should have the following characteristics:

- **Clear** and **colourless**.
- **Odourless:** it must be odourless because a foul smell can be a sign of contamination.
- **Soft** or **softened:** the hardness indicates the quantity of calcium and magnesium salts present in the water.

Greater hardness of the water can cause problems on the dishes: formation of whitish streaks, a sensation of roughness to the touch, poor washing quality.
On dish washing machines we can have: loss of efficiency of the heating elements, proliferation of bacteria in the machine, encrusted pipes and partial or total obstruction of the filters.

- **Iron max 0.1 ppm:** iron in the water can cause a decrease in the degree of whiteness and washing effectiveness with the formation of brown streaks on the dishes.
- **Total salinity approx. 500 ppm:** in general, we can say that all the substances dissolved in the water interact with the washing process. Water with a content of salts dissolved in it exceeding 500ppm (approx. 0.5g of substances per litre of water) is to be considered unacceptable.

TYPES OF DIRT

There are various types of dirt; to simplify they can be grouped into 6 macro categories:

1. SOLID: particulate, sand, rust, soil, soot and limestone are dirt obtained from solid particles, often minerals that are normally not soluble in water. They are normally removed in the soaking or pre-wash phases. Sometimes they require the descaling of the dishes.

2. COLOURANTS: fruit, coffee, tea, wine, sauces, lipstick and blood contain coloured substances that are not soluble in water. They are removed more easily with chlorine-based detergents that destroy the coloured pigments they are rich in.

3. FOODSTUFFS OF VARIOUS KINDS (FAT, PROTEIN, STARCH ETC.): dirt which is removed by alkaline detergent in combination with the thermal action.

4. WATER-SOLUBLE: saline or sugary substances constitute dirt which is soluble in water. They can be treated with the sole action of the water and are removed during the soaking or pre-wash phases.

5. MICRO ORGANISMS: bacteria, spores, fungi and moulds constitute dirt due to micro organisms that proliferate on the dishes, especially if you leave them dirty for a long time. They must be treated with appropriate products to reduce their presence. They are removed during the soaking or pre-wash phases, provided that the product instructions are followed. Sometimes more than one treatment is necessary for their complete removal.

6. DIRT NOT WASHABLE IN WATER: paints and substances not soluble in water that must be removed manually with specific products.

TYPES OF DISHES

Dish types can be grouped into 6 families:

1. Ceramics
2. Glass
3. Crystal
4. Stainless steel
5. Aluminium
6. Copper

• Ceramics

Ceramics are used to produce various objects, such as dishes, decorative objects, etc. They have a high resistance to heat. They are glazed and sometimes decorated. As long as the glazing is not damaged, due to rubbing between plates, they are absolutely free from porosity and easy to clean.

• Glass

Glass is transparent, hard, almost inert from the chemical and biological point of view and has a very smooth surface. These characteristics make it a material used in many sectors; at the same time, glass is fragile and tends to break into sharp fragments. Glasses, and more generally non-flat dishes, are particularly difficult to rinse. For this reason it is preferable to wash them in a dedicated dishwasher or not with the same water as the dishes.

• Crystal

Crystal is glass with the addition of up to 35% of lead. It is used for artistic objects (for example, particularly fine glasses). It has contraindications for washing in the dishwasher; at a temperature of 50/60°C with high alkalinity of the washing water, crystal objects are permanently damaged. It is advisable to wash them with a dedicated dishwasher and at a low temperature with specific detergent.

• Stainless steel
Stainless steels are iron alloys characterised by a remarkable resistance to corrosion. This ability to resist corrosion is due to the presence of alloy elements, mainly chromium, able to generate a thin and adherent layer of oxides, practically invisible, which protects the underlying metal from the action of chemical agents. Soaking/pre-washing is recommended in the presence of resistant dirt.

• Aluminium
Aluminium is a ductile silver-coloured metal.
It is an excellent conductor of heat and for this reason it lends itself well where uniform cooking is required. It is ruined, becoming whitish, in the presence of high alkalinity.

• Copper
Copper is a pinkish or reddish metal, with very high electrical and thermal conductivity, surpassed only by silver; It is very resistant to corrosion.
It is easy to work, extremely ductile and malleable.
It is used in the most prestigious kitchens because of its cost. Like aluminium, it does not withstand high alkalinity.

If the washing result is not satisfactory, this is often due to a series of causes: too low temperature, technical problems with the dishwasher etc.

It is rarely the fault of the detergents, if we comply with certain fundamental principles:

1. CORRECT USE OF THE DISHWASHER

2. CORRECT USE OF DETERGENTS

3. CORRECT USE OF RINSE AIDS

Sutter Professional offers a complete automatic dish washing system consisting of products and equipment.
Expert consultants are available to customers for the creation of customised washing systems.