

# LAUNDRY

Fabric washing is the process by which dirt is removed from a fabric, thanks to washing in water with the aid of a washing machine.

In a washing machine, 4 factors always interact:

- **MECHANICAL ACTION**  
to beating of the washing thanks to the alternating movement of the drum.
- **THERMAL ACTION**  
the temperature of the water.
- **TEMPORAL ACTION**  
the duration of the washing process.
- **CHEMICAL ACTION**  
the action of detergents, bleaches, additives, etc., so as to allow water to remove the dirt from the fabric.

## WASHING PROCESS

A washing process consists of 7 different phases (some optional) depending on the type of dirt and fabric:

### 1. SOAKING

The soaking phase is an optional phase, recommended when it is necessary to eliminate large quantities of dirt that are easily removable with water (light dirt, such as particulate, smog and biological dirt, i.e. blood, faeces, urine, vomit, etc.).

### 2. PRE-WASH

The pre-wash phase is optional: it is used when the fabric is particularly dirty and has the purpose of preparing it for the washing phase. It can also be used to perform low temperature bleaching with chlorine on resistant white or chlorine-resistant fabrics.

### 3. WASHING

The washing phase is always present and has the purpose of completely eliminating the dirt. It is normally also used for bleaching with products that develop oxygen at medium/high temperature on all types of fabric and all colours.

### 4. BLEACHING

The bleaching phase is optional: it has a finishing action on coloured marks when the fabric is very stained (tomato, fruit, etc.). It is mainly used when it is necessary to wash catering linen. Chlorine is used at medium temperature on white or chlorine-resistant fabrics.

### 5. RINSING

The rinsing phase is always present: the purpose is to eliminate traces of detergent, additives, etc. 3 rinses are normally carried out, in particular cases 2 or 4.

### 6. NEUTRALISATION AND/OR FINISHING

The neutralisation and/or finishing phase is always present. Performed in the last rinse, it has the purpose of neutralising traces of alkalis, additives, etc., so as to bring the pH of the fabric to its original value. Finishing is obtained with a fabric softener that spreads out the fibres so as to make them soft to the touch and at the same time give them a note of fragrance.

### 7. SPINNING

The spinning phase is always present: it has the purpose of extracting the water from the fabric. At the end, the fabric will have a correct amount of residual moisture to be dried/ironed using less time/resources.



### 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 symptom of contamination to prevent the fabrics from being contaminated in turn.
- **Soft or softened:** the hardness indicates the quantity of calcium and magnesium salts present in the water.

Problems caused by greater water hardness are visible on fabrics and washing machines.

On fabrics we can have: greying, sensation of roughness to the touch, poor washing quality, difficulty in eliminating stains, decrease in hygiene (bacteria are more likely to proliferate) and greater rapidity in the degradation of the fabric.

On 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 holes in the drum.

- **Iron max 0.1 ppm:** iron in the water can cause a decrease in the degree of whiteness. Under specific conditions, a chemical reaction could be generated with consequent irreversible damage to the fibre (formation of holes).
- **pH approx. 7.**
- **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 ON FABRIC

There are many types of dirt. To simplify, we can divide them into 6 macro areas:

**1. SOLID:** polvere, sabbia, ruggine, terriccio, fuliggine, calcare sono degli sporchi ottenuti da particelle solide, spesso minerali che sono normalmente non solubili in acqua. Vengono rimossi normalmente negli ammolli o nel prelavaggio. A volte richiedono la disincrostazione della biancheria.

**2. COLOURANTS:** fruit, coffee, tea, wine, sauces, lipstick and blood contain coloured substances that are not soluble in water. They must be bleached with chlorine, bleaches that develop oxygen.

**3. OILY FAT:** vegetable, animal or mineral fats constitute oily dirt which is not soluble in water and particularly related to certain fabrics such as polyester. They must be treated with detergents based on surfactants able to make them soluble in water. They are removed during the pre-wash and washing phases, preferably at medium/high temperatures.

**4. WATER-SOLUBLE:** saline or sugary substances constitute dirt which is soluble in water. They must be treated with the sole action of the water. They 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 fabrics, especially if you leave them dirty in a humid environment for a long time. They must be treated with disinfectants and/or bleaches to reduce their presence.

**6. DIRT NOT WASHABLE IN WATER:** paints, synthetic oil and enamel paint constitute dirt that cannot be washed in water. For this type of dirt, "dry cleaning" machines are used.



## TYPES OF FABRIC

There are various types of fabric; to simplify they can be grouped into 3 macro families:

- **Natural fibre fabrics**

These exist in nature and can be of animal (wool and silk) or vegetable (cotton, linen, hemp) origin. Each must be washed differently to preserve its integrity. Wool and silk are altered at medium temperatures, with significant mechanical action and alkaline products. Cotton, linen and hemp are very common due to their chemical and physical resistance.

- **Synthetic fibre fabrics**

These do not exist in nature and come from the chemical industry. They are basically yarns of polymeric substances (polyester, nylon, etc.) The most common is polyester, used in many fabrics (tablecloths, furniture, clothing, etc.), very resistant to mechanical, chemical and thermal action, but must be cooled gradually to avoid damage.

- **Mixed fibre fabrics**

These are made with a mix of natural and synthetic fibres (polyester-cotton in different percentages). They are very common in catering because they have a high mechanical resistance and are relatively easy to wash.

All washed fabrics degrade over time. If this happens prematurely, it is due to a series of causes: too high temperature, too energetic mechanical action, mechanical problems with the washing machine etc.

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

1. **CORRECT USE OF THE WASHING MACHINE**

2. **CORRECT USE OF DETERGENTS**

3. **CORRECT USE OF BLEACHES**



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