

WET PROCESSING FOR SILK

Chemical processing of silk is carried out in stages of **Degumming, Bleaching, Dyeing and Finishing**. Under chemical examinations, silk fibre consists of two elements i.e. inner layer called silk fibroin which forms the core of the fibre. It is insoluble even when boiled in hot water.

Chemical processing of silk

Silk is one of the strongest natural fibers but loses up to 20% of its strength when wet. It has a good moisture regain of 11%. Its elasticity is moderate to poor, if elongated even a small amount it remains stretched. It can be weakened if exposed to too much sunlight. It may also be attacked by insects, especially; if left dirty. Silk is a poor conductor of electricity and thus susceptible to static cling. Unwashed silk may shrink up to 8% due to a relaxation of the fiber macrostructure. So silk should either be pre-washed prior to garment construction, or dry cleaned. Dry cleaning may still shrink the material up to 4%. Occasionally, this shrinkage can be reversed by a gentle steaming with a press cloth. There is almost no gradual shrinkage or shrinkage due to molecular-level deformation. Chemical processing of silk is carried out in stages of *Degumming, Bleaching, Dyeing and Finishing*.

WET-PROCESSING

Fist process of stages>Spinning>Weaving and Knitting>Wet-Processing>Manufacturing>Trading

Wet-Processing is the processing stage at which textile substrate is treated with colourants and/or chemicals, collectively referred to as inputs in GOTS terminology. This includes sizing, desizing, pre-treatment, dyeing, printing (including digital

printing), finishing, laundry, etc. Non-woven manufacturing, using hydro entanglement, is also a wet-processing step.

Sizing includes applying natural or chemical inputs on yarns to strengthen them, so that they can withstand the strain during the warping and weaving process. Post weaving, desizing is the process of removing sizing chemicals from the woven fabrics. This is followed by pre-treatment operations like bleaching, boiling, kiering, washing, mercerisation, optical brightening, etc. The objective is to increase absorbance and whiteness, while making the substrate (usually a fabric or yarn) ready for dyeing/printing. Dyeing and printing operations are the process of imparting colour to the substrate using dyes, inks, pigments, etc. Some auxiliaries are also used to enhance exhaustion or uniform uptake of colour, etc.

Finishing is usually the final step in wet-processing operations. It is used to improve the look, performance, or softness of the finished textile. Sometimes, stitched garments undergo washing in laundries post manufacturing. This is also covered under the finishing section in GOTS.

Elements of Inspection

As other processes explained above, separation and identification of organic yarns, fabrics, garments, etc. is still important. Once more, training and awareness of workers is crucial.

Buying GOTS certified raw materials, maintaining records of quantities, consideration of wastage, volume reconciliation, appropriate transportation documentation, etc. are important yet again.

Due to use of water and chemicals, this section has the highest level of associated risks and, therefore, very stringent criteria are applicable here. Chemical inputs used for wet-processing of GOTS Goods must be approved prior to their use. To know more about how to get chemical inputs approved, [click here](#).

For sizing, at least 75% of sizing agents should be of natural origin. For pre-treatment, ammonia treatment, as well as chlorination of wool are prohibited. Only oxygen-based bleaches like peroxide, ozone, etc. are allowed.

For dyeing and printing, there are additional curbs on allergenic dyes, carcinogenic and suspected carcinogenic colourants, as well as dyes containing heavy metal. To avoid exploitation of natural resources, the use of natural dyes and auxiliaries that are derived from a threatened species listed on the Red List of the [IUCN](#) is also prohibited.

For printing, there are limits for inputs containing permanent Adsorbable Organic Halides (AOX). Additionally, printing methods using aromatic solvents, phthalates or chlorinated plastics (e.g. PVC) are prohibited.

For finishing, the use of synthetic inputs is forbidden for certain treatments. These

include anti-microbial, coating, filling, stiffening, lustring, matting and weighting. At the same time, finishing methods like sand blasting, which are considered harmful to workers, are prohibited.

Wastewater Treatment by Wet Processing Units

Wastewater from all wet-processing units is treated in an internal or external functional Effluent Treatment Plant (ETP). Since laws vary around the world, the most stringent legal requirement – whether local laws or GOTS criteria – is applicable. The criteria include pH, temperature, total organic content, biological oxygen demand, chemical oxygen demand, colour removal, etc. The extent of treatment required for the wastewater and sludge depends upon types of inputs being used and is evaluated by the Approved Certifiers.

Some parameters are equally applicable to all processing stages under GOTS certification, like:

- Social Criteria
- Ethical Business Behaviour
- Environmental Management

Flow process of Diagram



