

Energy and time saving in pretreatment



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From the clothes on our backs to the curtains in our homes, thousands of everyday items we rely on are produced by the world's textile industry. With the industry now centered in countries with still-developing environmental regulatory systems, such as China, Bangladesh, India, and Vietnam, textile manufacturing has a huge environmental footprint.

Cotton and its blended fabrics contain some inherent impurities such as oil, fat, wax and pectin within the fibre structure. The composition of these impurities depends on the fibre blend, maturity of the cotton fibre, weathering and agricultural conditions, to name but a few.

The yellowness of cotton fibre, for example, is due to the presence of protoplasm, protein residue and flavones pigments. Pretreatment processes are designed to remove specific types of impurities from a fibre. The specific methods to deal with the removal of sizes, natural impurities and colouring components are known as desizing, scouring and bleaching respectively. All these processes employ specific chemicals and process conditions such as temperature, pH, and time to remove the specific impurity. Each individual pretreatment process separately consumes water, steam, electricity and chemicals causing Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD) loads in the washing effluent. In addition, separate time spans are required for each process lowering the machines productivity.

Today, the industry has become increasingly aware of the optimal use of resources like water and energy, as well as the pollutants caused by industrial textile processes. All the pretreatment methods mentioned here consume large amounts of water and energy.

However, combining any of the two or all processes can result in huge savings in terms of water, energy and reduced effluent load.

A one-step combined pretreatment process cannot only reduce the load of COD and BOD but will also make it suitable for cleaner textile processing by reducing the consumption of water and effluent discharge and savings in energy. Combining pretreatment processes has remained an important research area for cleaner, sustainable and economical textile processing. To overcome these drawbacks, Sarex has introduced a series of all-in-one products explained below:

Unique features of Univ-AIO:

- All-in-one product for combined scouring and bleaching of cotton and its blends.
- Bleaching requires only Univ-AIO and Hydrogen peroxide. No caustic soda required.
- Milder bleaching as compared to conventional bleaching. Ease of dyeing process.
- Reduces weight loss by 2-3% of cotton. More than a kilogram of material after bleaching.
- No alkali added during Univ-AIO bleaching hence softer hand feel achieved.
- Low Total Dissolved Solids (TDS) and Low Chemical Oxygen Demand (COD) thereby reducing effluent load.

Univ-AIO contains multiple ingredients which gives the desired pH for scouring at the start and then reduces pH which is suitable for the controlled decomposition of Hydrogen peroxide. This imparts a gentle bleaching action which retains cotton strength and feel unlike conventional bleaching. Conventional bleaching keeps the pH level very high throughout the bleaching process making cotton harsh with reduced strength.

Unique features of Ketoprep-LA (Conc):

- Novel bleaching aid for cotton requiring less caustic soda for bleaching.

- Most suitable for delicate cotton fabric as it retains the fabric strength.
- An all in one product, thus no need to add other auxiliary during bleaching.
- Lower chemical consumption and less inventory requirement.
- Low caustic required, hence less Total Dissolved Solids (TDS) and less Chemical Oxygen Demand (COD) in the effluent.

In a combined scouring and bleaching process, hydrogen peroxide decomposition is faster due to high caustic concentration, which reduces the fabric strength considerably. Ketoprep-LA (Conc) acts as a catalyst in the bleaching process and activates peroxide at low concentration of caustic soda. Hydrogen peroxide decomposition at low caustic concentration is well controlled and consequently causes less damage to the cotton fabric.

Unique features of Alkanol-NP(MOD):

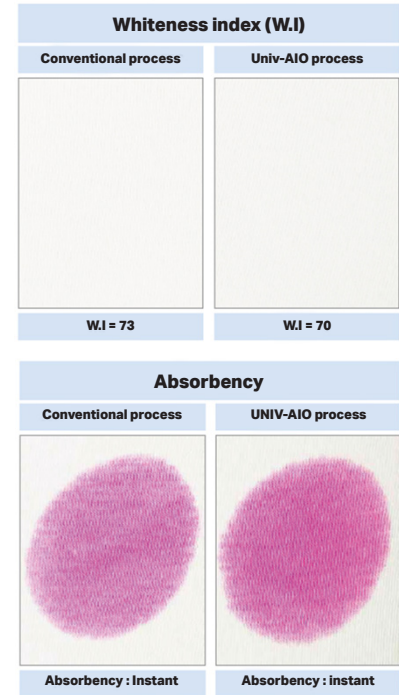
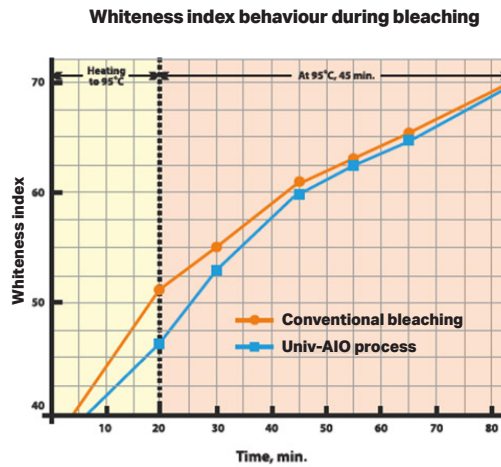
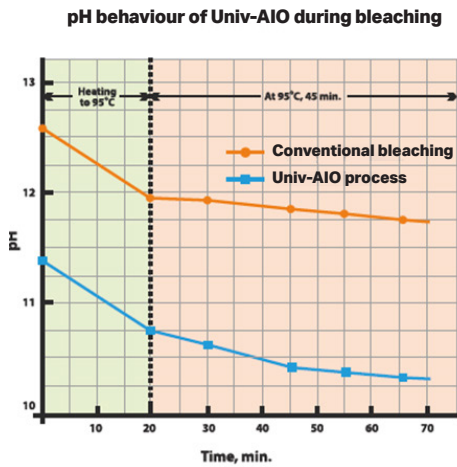
- No alkali added during Univ-AIO bleaching hence softer hand feel achieved.
- Single pretreatment auxiliary as no caustic and peroxide is required during bleaching.
- As no caustic is used in the process, there is lower degradation and weight loss of treated fabric.
- Does not contain APEO (alkylphenol ethoxylates).
- Low Total Dissolved Solids (TDS) and Low Chemical Oxygen Demand (COD) thereby reducing effluent load.

Alkanol-NP (MOD) contains active ingredients which have the capability to emulsify the oils, fats and decolourise the colouring matters present on cotton.

Technical briefing: Pretreatment

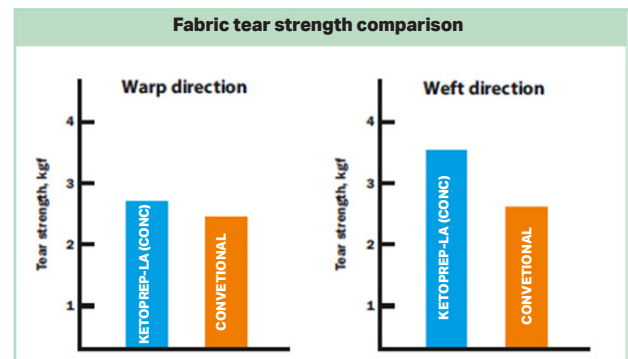
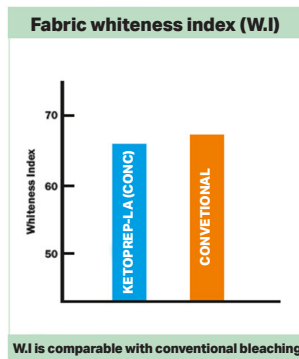
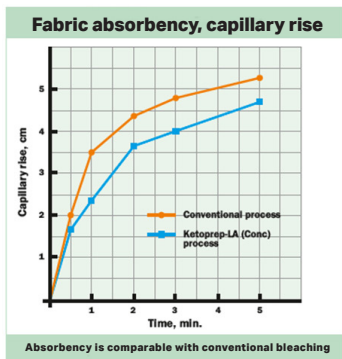
Results:

Product performance data for Univ-AIO:



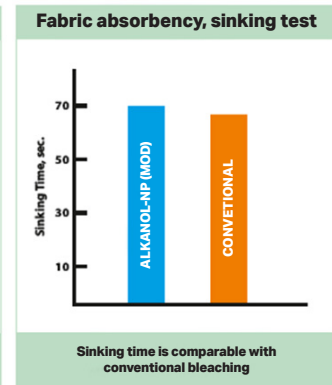
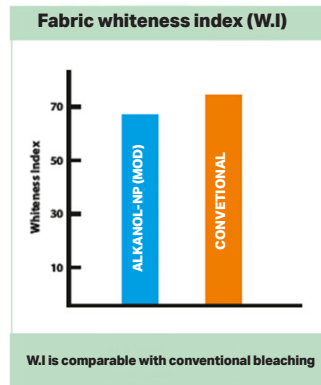
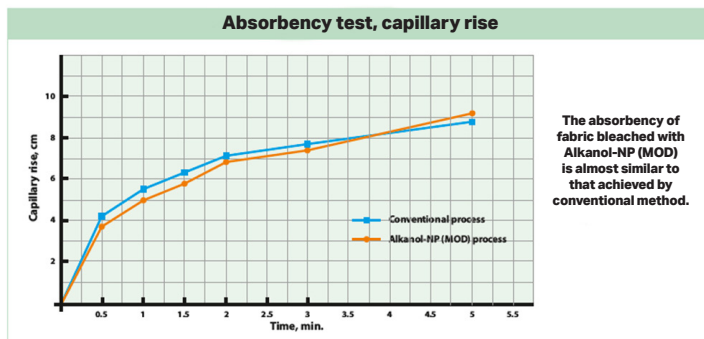
- In conventional bleaching, pH is very high at the start and does not drop much during bleaching.
- In Univ-AIO process, the pH lowers down and drops with time and maintains a comparatively optimum pH.
- The graph shows gradual increase in whiteness of the fabric.

Product performance data for Ketoprep-LA (Conc):



- Absorbency is comparable with conventional bleaching.
- W.I is comparable with conventional bleaching.
- Ketoprep-LA (Conc) bleached fabric sinks equally as fast as conventional bleached fabric.
- Ketoprep-LA (Conc) process achieves better tear strength than conventional bleaching process.

Product performance data for Alkanol-NP(MOD)



- The absorbency of fabric bleached with Alkanol-NP (MOD) is almost similar to that achieved by the conventional method.
- W.I is comparable with conventional bleaching.
- Sinking time is comparable with conventional bleaching.