

## Case Study

### Developing and Producing Lindex Knitwear using Huntsman AVITERA Dyes at Multifabs Ltd. Bangladesh

*This case study has been developed to compliment the Decision Support Guidance (DSG) through documentation of successes in the adoption of the processes recommended in the guidance manual. This case outlines the collaboration between Huntsman Textile Effects, Lindex and PaCT partner factory Multifabs Ltd to develop and produce products for the Lindex 2017 Spring/Summer collection using Huntsman AVITERA® reactive dyes. The case demonstrates the resulting resource savings and underlines the importance of partnerships in enabling sustainable change in the textile industry.*



The Bangladesh PaCT: Partnership for Cleaner Textile is a holistic program that supports textile wet processing factories in adopting Cleaner Production (CP) practices, and engages with brands, government, communities, financial institutions, and other stakeholders to bring about systemic, positive environmental change for the Bangladesh textile wet processing sector, its workers, and surrounding communities, and to contribute to the sector's long-term competitiveness and environmental sustainability. For more information, visit [www.textilepact.net](http://www.textilepact.net)



## INTRODUCTION

Textile wet processing comprises various activities in pre-treatment, dyeing, printing and finishing of fabrics and garments. Dyeing is the process by which dyes are applied to a fibre, textile or garment to impart colour through a reaction between fibre and dyestuff. Generally, the types of dyes and methods of application used depend on multiple variables, particularly the type of fibre, desired effect/shade/hue, stage of manufacturing, and performance requirements.

Currently most cellulosic fabrics, such as cotton, are dyed using reactive dyes in an exhaust dyeing process, whereby the fabric is immersed in a liquor of dyestuffs in water. Large amounts of salts (concentrations up to 100g/litre) are also added for these dyes to adhere/fix to the fibres, especially for darker shades, with alkali

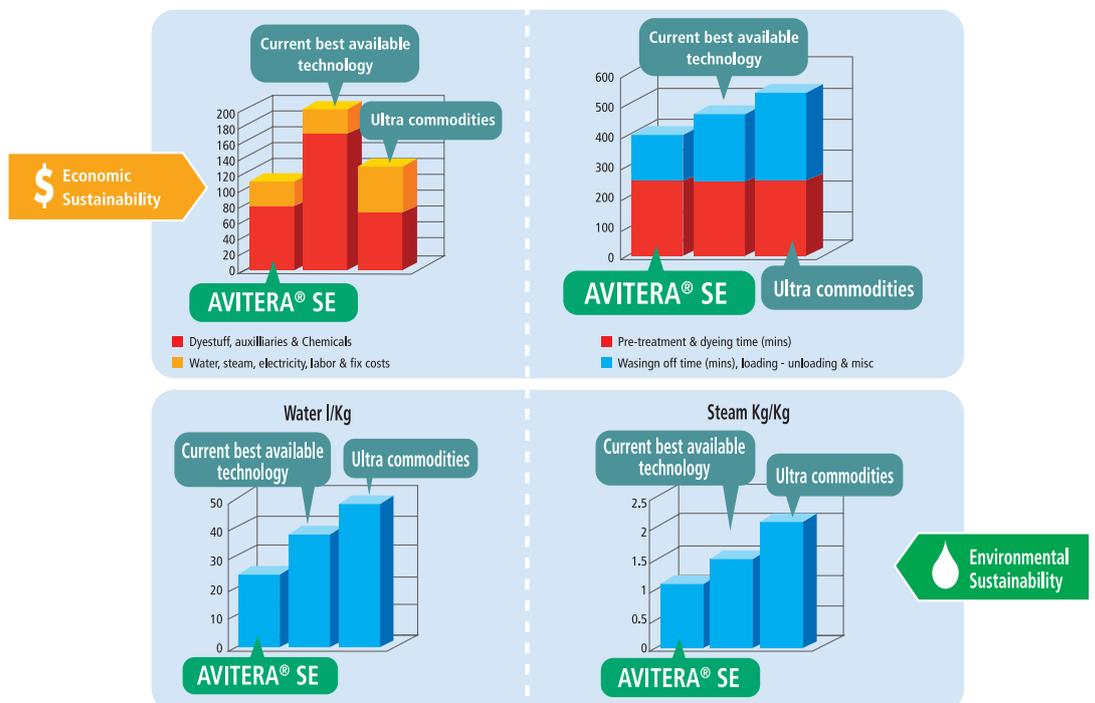
auxiliaries also regularly used. Conventional reactive dyes typically yield fixation rates (percentage of dye molecules linked to fibres) of around 70%. This results not only in wastage of dyestuffs, but also the need to remove the residual dye through rinsing with large amounts of water to dilute the salt concentration to acceptable levels. Considering the limitations of these dyes - low fixation rates and generation of large volumes of highly salinated wastewater - the textile sector is increasingly inclined towards the use of more efficient and environmentally friendly dyes like High Fixation Reactive Dyes (HFRD), which can achieve fixation rates of over 90%. This means that less dye is wasted and less salt is consumed, resulting in reduced number of rinses and reduced effluent treatment.



## Towards Sustainable Dyeing at Multifabs Ltd.

Multifabs Ltd is an integrated export-oriented manufacturer of knitwear products, situated near Dhaka, Bangladesh. Previously, the factory was using monofunctional reactive dyes that yielded fixation rates as low as 50-60% and consumed substantial amounts of resources. Realizing the inherent benefits of multifunctional dyestuffs, Multifabs switched to bifunctional and polyfunctional dye products. The switch resulted in improved fixation rates greater savings in resources, and improved effluent quality (reduced COD load to effluent treatment plant). Following this, Multifabs continued looking for further opportunities to improve efficiency in the dyehouse, and to this endeavour has adopted products from the AVITERA® range of high fixation reactive dyes produced by Huntsman Textile Effects (Huntsman) where possible.

AVITERA® is a range of poly-reactive dyes that ensure rapid and high exhaustion for cotton dyeing and other cellulosic fibres/blends. AVITERA® can achieve high fixation rates, with potentially less than 10% dye remaining unfixed. Since less salt is required to support fixation, removal of residual dye is easier to achieve at lower temperatures than removal of unreacted dyes in a high-salt solution. Their low sensitivity to variations in liquor ratio, rapid exhaustion and fixation, and low temperature also keeps reprocessing to a minimum. As a result, dyeing and washing cycles are shorter, with reduced resource consumption and improved productivity.



## Collaboration for Sustainable Apparel: Huntsman, Lindex and Multifabs

Lindex is a brand that places great importance on sustainability, and is working to produce 80% of products using more sustainable processes by 2020. To help achieve this, they are working in partnership with their suppliers to adopt sustainable and environment-friendly processes. To support this, they have developed a database of processes used by their suppliers, allowing them to determine which suppliers are best placed to use particular processes.



For their 2017 Spring/Summer children's wear collection, Lindex decided to use the most environmentally friendly dyeing processes feasible. After much deliberation, they opted to build the collection around the AVITERA® range of dyes from Huntsman and their database allowed them to identify Multifabs as a partner owing to their experience using the product. The decision of Multifabs to proactively adopt process innovations therefore not only yielded direct savings, but also helped generate further business.

Lindex's design and development teams worked closely with Multifabs and Huntsman to develop the collection around AVITERA. One challenge faced while working on the collection was developing solutions to produce certain shades for which AVITERA® is not well suited. For these, blends were developed using Huntsman NOVACRON® bifunctional reactive dyes as well as AVITERA®, which helped achieve difficult shades, whilst also providing resource savings. Following a successful trial in October 2016, Multifabs has produced around 380,000 pieces for Lindex using the products and in 2017 Lindex aims to work with two further suppliers to produce garments using AVITERA®.

By using AVITERA® dyes when feasible, Multifabs has managed to eliminate a minimum of three rinsing stages in the dyeing process. This has enabled the factory to make substantial resource and efficiency savings:

## Results

- **Reduced water use by 24 litres/Kg** fabric as a result of reduced rinsing requirements;
- **Reduced processing time** from 10.05 hours/tonne to 9.15 hours/tonne as a result of both the faster fixation rate of the dye as well as reducing the time required to rinse salts. ;
- **Reduced energy use by 1.7 kWh/Kg** fabric in the dyeing process, primarily through reductions in groundwater extraction;
- **Reduced wastewater treatment requirements** through a 15-20% drop in COD and BOD as well as reduction in volume of inlet effluent.

## Huntsman Textile Effects

Huntsman Textile Effects is a leading global provider of high quality dyes and chemicals to the textile and related industries. Huntsman's integrated business process allows environmental, health and safety impacts to be identified, managed and minimized at every stage of a product's life cycle. For more information, please visit [www.huntsman.com](http://www.huntsman.com)

## Lindex

Lindex is a leading European fashion brand, based in Sweden, providing fashionable, affordable and sustainable apparel for women and children, with a commitment to produce quality products to the highest social and environmental standards. Lindex believes that achieving their sustainability goals is most effectively undertaken through collaboration with partners in the supply chain, from suppliers to technology providers, as reflected in their placing of more than 80% of their production in Bangladesh with suppliers under the PaCT program. For more information, please visit [www.lindex.com](http://www.lindex.com)

## Decision Support Guidance

The Decision Support Guidance (DSG) was developed under the PaCT program as a tool for embedding sustainability into product design, development and sourcing within brands. It acts to promote supply-chain collaboration between brands, suppliers and technology producers to support the adoption of more sustainable wet processing techniques. It was developed by Solidaridad in conjunction with MADE-BY and GoBlu International, and has been peer reviewed by subject matter experts from the sector.

The DSG covers denim and lightweight knits, providing detailed information on a range of relevant conventional and sustainable wet processing techniques. For each process it provides information on water and energy intensiveness, chemical use (including RSL/MRSL risks), and effluent and safety considerations. Crucially, the DSG also contains specific guidance for brands to allow decision making at key stages that can influence the uptake or use of a particular technique.



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