

Multiplexed Laser Surface Enhancement (MLSE)

 Textile Centre of Excellence
Red Doles Lane
Huddersfield HD2 1YF
United Kingdom

 www.textilehouse.co.uk

 Mr. Bill Macbeth

 bill.macbeth@textile-training.com

 +44 1484 346500



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INFORMATION ON THE ECO-INNOVATIVE SOLUTION PROVIDER

This eco-innovative solution is the output from the project titled “Multiplexed Laser Surface Enhancement” co-funded by the European Commission within the framework of the Competitive and Innovation Program. This solution has been developed by a team coordinated by the Textile Centre of Excellence (UK), in partnership with MTIX Ltd and W.T Johnson & Sons (UK).

SHORT DESCRIPTION OF THE ECO-INNOVATIVE SOLUTION

The Multiplexed Laser Surface Enhancement (MLSE) system is a process that enables fibres and fabrics to be converted for enhanced hydrophilicity (for improved dyeing functions), hydrophobicity, fire retardancy, digital print preparation and antimicrobial functionalities, without the use of harmful chemicals or water and with massive energy savings energy. This technology works with all natural and man-made fibres and can be integrated into existing production lines. Removal of all chemicals, particularly fluorocarbons, from the processing operation offers massive environmental improvements and the introduction of dry processing will reduce energy usage by up to 99%, across processes from wool scouring to textile finishing.

INDUSTRIAL SECTOR – MARKET SEGMENT AND ACTUAL APPLICATION IN INDUSTRY

22 Textile Mill Products

INDUSTRIAL CLASSIFICATION - NACE CODE;

13 Manufacture of textiles

1. DESCRIPTION OF ECO-INNOVATIVE SOLUTION

Technical aspects of the eco-innovative solution

MLSE is a dry process, carried out at atmospheric pressures using safe, inert gases; nitrogen, oxygen, argon & carbon dioxide. The combination of gas plasma and photonic energy creates permanent material synthesis in the surface of a substrate without changing its feel or handle. MLSE technology works through the creation of high-frequency (RF) plasma in an envelope between rotating and driven rollers that extend across the width of the processing chamber. The process has been developed for material cleaning and performance enhancements, including low temperature dyeing, water-proofing, fire retardancy and anti-microbial treatments. The technology has successfully demonstrated both anti-pilling and anti-bacterial treatments. The MLSE system can work with a wide variety of natural and man-made fibers and fabrics, operating at 55 meters a minute. The technology can bring benefits in fabric preparation, improve dyeing efficiencies or printing as well as creating enhanced performance characteristics on finished fabrics. The technology can be integrated into an existing process line as a 'modular' unit, operating at the speed of the existing process using the same materials handling system, or as an additional, stand-alone system.

The process has been shown to work across a broad spectrum of fabrics. However, the technology owner has recognised regional particularities which can influence the effectiveness of the process; weaving oils, scouring standards etc.. Therefore, for particular applications to meet local standards, there is a need for customizing of the process following a chemical and physical analysis of the substrate, to ensure maximum effectiveness.

The MLSE system is based on a sophisticated and complex core technology, whose elements are the system components (atmospheric plasma unit, UV excimer laser, material handling system, gas supply including nitrogen generator, series chillers etc.) and the extensive process know-how of the MTIX team

Economic and environmental benefits of the eco-innovative solution

The sale of equipment is augmented by an associated license which gives the equipment purchaser rights to use the technology. The total cost of a fully installed solution, including training, shipping etc., that is capable of the full 55m/min and is 2m wide will be in the region of 2.5 million€. For the high value added processes (fire retardancy etc.) a payback period of under 18 months would be typical, depending on the volume of processing. Savings in excess of 80-90% of current consumption of water and energy have been independently verified by environmental experts. Water consumption is reduced by 75%. The use of hazardous resources (irritant/corrosive & bio-accumulative) is eliminated completely.

2. AVAILABILITY OF THE ECO-INNOVATIVE SOLUTION AND BUSINESS PARTNERSHIP

Market readiness, Trade mark, existing market coverage, commercialization strategy

Two production systems have been installed in the UK. MLSE is a registered trademark.

Requirements to adapt the solution to the local market and potential applications/market size

Although the system does not require a clean room environment, it is advised that the system be run in an area with minimal dust and without excessive moisture. This is to protect the constituent elements of the system, especially the interfaces with the outside world (lens covers, mirrors etc.)

On-site after-sales services support and the technical assistance requirements

In the first instance the technology owner has agreements in place with all of the constituent machine component suppliers, who can draw on their international network of service engineers to provide immediate and local service support. The control software of the MLSE system incorporates handshake hardware and software that allow the system to be interrogated over the Internet. Thus in the event of any problems, MTIX can quickly identify the fault and then initiate the necessary service response from suitable local technicians.

In the first phase, the primary support will come from the UK.

Targeted local business partners

Large fabric producers or finishers in the textile industry

Type of local business partnership sought

In the event that a local market shows potential, but has several small potential MLSE users without a clearly identifiable leader, then MTIX will consider entering into some form of a joint venture to support that local market. MTIX has already started a dialogue on two such potential ventures. In both cases the structure, governance and management are fundamentally different to best suit local conditions.

MTIX has the experience and market understanding that allows it to have a dynamic business plan, allowing for its strategies and implementation programs to be modified to best exploit local conditions.