ALTEX

Automated Laser Welding

The textile product manufacturing sector in Europe is facing decline as a result of the labour intensive methods used and competition from the Far East. The following main aspects are being explored to improve the competitiveness of European manufacturing:

- **INNOVATION: design of new products with high functionality and added value**
- **PRODUCTIVITY: reduced labour input and increased automation in manufacturing**
- **REDUCED TIME TO MARKET: rapid turnaround from design to product**

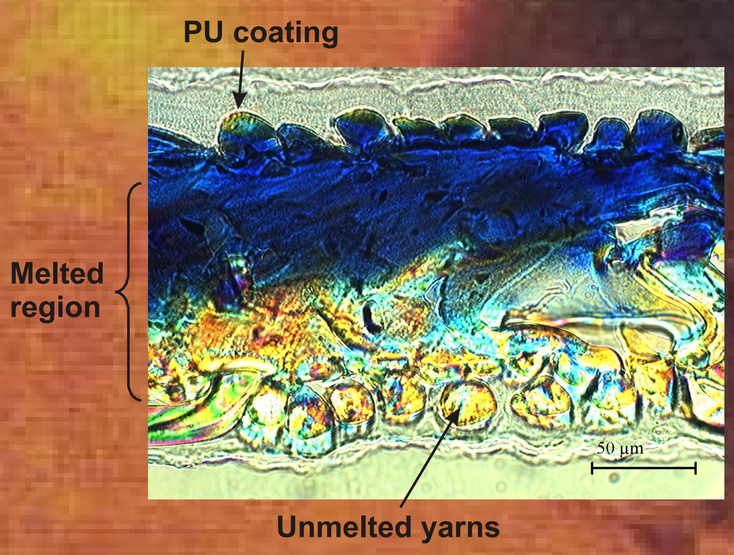
The EC funded ALTEX project is primarily designed to provide a development platform for an alternative joining method suited to automation in manufacturing. However, as described below, there are many other impacts of this innovative joining method, including a new way of providing sealed seams for many applications.

The ALTEX project aims to develop the fabric materials, equipment and procedures required to allow use of laser welding of seams in textiles

TECHNICAL OBJECTIVES

- **Preparation of textile barrier structures most suited to use with LASER SEAMING EQUIPMENT**
- **Development of a RECONFIGURABLE SUPPORT MOULD able to precisely reproduce 3D forms**
- **Development of a LASER WELDING HEAD and PRESSURE APPLICATION SYSTEM**

This project will work closely with the on-going Leapfrog Initiative coordinated by Euratex, the European Textile and Clothing Federation, which is focused on the full automation of the clothing manufacture chain starting with automated sewing machines



Example of a weld between blue and yellow nylon fabrics showing region of fused material in the centre and unmelted yarns on the outer surfaces.

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INDUSTRY IMPACTS

The textile and clothing industries were at the forefront of the Industrial Revolution. Since then the sewing machine, albeit more sophisticated and rapid than its nineteenth century forebear is still the tool to form complex 3D shapes by sewing together 2D component parts. Although sewing is today the most effective joining technology as far as mechanical properties and suitability for a full range of materials are concerned, it is not as suitable for protective clothing because of the stitching holes which locally break barrier properties. Taping is therefore required, being a time consuming operation requiring highly skilled operators. The tape is also prone to delamination compromising the barrier properties.
By replacing stitching and seam taping with welding, the seam barrier properties, reliability and endurance will be improved. This will not only reduce the total time required for making sealed seams, but will also improve the safety of those using protective clothing. The land filling rate will be reduced as a result of the increased life time of the textile products.
Applications benefiting from the improved performance and automation provided by these welding developments include manufacture of clothing for weather, nuclear biological or chemical protection, fire fighting, wet suits, upholstery for bed manufacture and more general areas such as tents, parachutes and inflatable structures. As a result a new market will be created in supply of automated equipment and fabrics for textile welding.

PARTNER	COUNTRY	ROLE IN THE SUPPLY CHAIN
TWI Ltd	UK	RTD - Project Coordinator
Akatex	Poland	End-User
Arlen Spólka Akcyjna	Poland	End-User
D'Appolonia SpA	Italy	RTD
Dorimi Srl	Italy	End-User
Frizza SpA	Italy	End-User
Grado Zero Espace Srl	Italy	RTD
Monarch Textiles Ltd	UK	End-User
Silentnight Beds Ltd	UK	End-User
Prolas Produktionslaser GmbH	Germany	SME
PIL Membranes Ltd	UK	End-User
HighfTech Engineering Srl	Italy	SME

SIXTH FRAMEWORK PROGRAMME
PROJECT CO-FUNDED BY THE EUROPEAN COMMISSION