From microsurgery to aircraft wings with the BTMA

At the forthcoming ITMA Asia + CITME exhibition in Singapore, specialists from a 20-strong delegation of British Textile Machinery Association (BTMA) companies will be on hand to discuss some of the highly advanced industries they are now actively supporting.

The manufacture of medical sutures, for example, is a very specialised process and because these items are implanted directly into the human body, every stage of production is tightly controlled to ensure safety, sterility and reliable performance.

Absorbable sutures are usually made from polymers that degrade safely within the body, such as polyglycolic acid, polylactic acid or polydioxanone, while non-absorbable sutures use durable materials like nylon, polypropylene, polyester, silk or even stainless steel. All of these must be of medical grade and fully biocompatible.

The UK's Fibre Extrusion Technology (FET) is a world leader in both the fibre selection and production technologies behind this industry and in Singapore will highlight a groundbreaking new parallel technology for the medical sector based on supercritical CO2. Further developments in the field of automation and control in advanced fibre production will be highlighted by BTMA members including Autofoam, James Heal, Roaches, Strayfield, Verivide and Wira Instrumentation.

AFP and ATL

From the micro to the macro, sophisticated aerospace technologies such as automated fibre placement (AFP) and automated tape laying (ATL) meanwhile involve the precise placement of carbon fibre tapes or tows on a mould surface, which are then cured to form lightweight yet strong components.

AFP allows for complex geometries by steering individual tows, making it ideal for fuselage sections, wing skins and other curved structures. ATL, on the other hand, is more efficient for larger, flatter surfaces such as wing covers or stabilisers, where wider tapes can be laid down at high speed with minimal gaps or overlaps. Together, these technologies significantly reduce material waste, improve repeatability and deliver structural performance beyond what traditional hand lay-up methods can achieve.

The UK's Cygnet Texkimp has developed a new technology to greatly assist this industry which will be unveiled in Singapore.

Collaboration

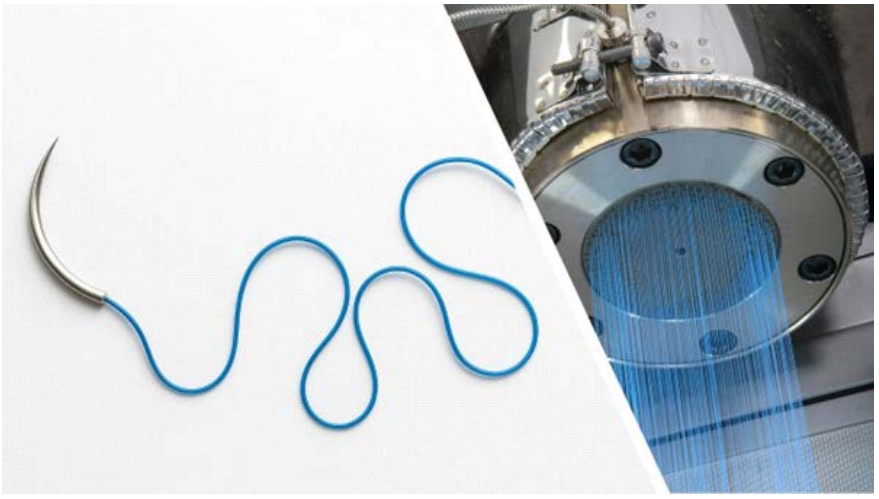
“High value industries such as aerospace, defence, renewable energy, automotive and the medical sector are areas of high growth and opportunity and an important factor underpinning the success of our companies here is the strong collaboration between industry and the many universities and institutes in the UK,” says BTMA CEO Jason Kent. “Machine builders can also be important in driving material developments as well as technologies.”

UHMWPE

A good example of this is the flexible new process for manufacturing ultra high molecular weight polyethylene (UHMWPE) that will be introduced in Singapore by FET.

UHMWPE is prized in many industries due to its extraordinary properties, being for example, ten times stronger than steel by weight. It is increasingly used in medical implants, but the current systems for manufacturing it are on a huge scale, with very complex processing routes.

This restricts the opportunity for new product development – a disadvantage that is fully addressed with FET's series lab and small scale gel spinning system, which is already industrialised.



FET is a world leader in both the fibre selection and production technologies behind medical sutures

"We have supplied many extrusion systems to the biomedical market and in exploring what else we could do for the same customers it became clear that there was a need for smaller quantities of UHMWPE fibres in bespoke sizes." explains FET Managing Director Richard Slack. "We believe our introduction of a patented batch system for solvent extraction exploiting supercritical CO2 is a game changer."

Early stage development

Cygnet Texkimp has meanwhile just introduced a next-generation, production-scale prepreg tape slitting machine at its UK Innovation Centre in Northwich.

This enables organisations to trial the slitting of continuous thermoset, thermoplastic and ceramic prepreg tapes for AFP and AFL processes in real-world conditions using their own materials or those produced on Cygnet Texkimp's in-house R&D prepreg machines on the machine. The technology can slit tapes at speeds of up to 60 metres per minute, subject to the input material.

"We're pleased to be able to offer partners the opportunity to engage with us at an early stage in process development, to test out their concepts, explore machine parameters, assess output quality and validate performance with support from our expert team," says Graeme Jones, wide web product director at Cygnet Texkimp.



Cygnet Texkimp new prepreg tape slitting machine supports AFP and ATL operations

Splicing portfolio

Also providing back up services to the aerospace industry is Airbond, with splicing technologies which ensure resource efficiency in the processing of extremely expensive carbon and aramid fibres. Pneumatic yarn splicing is a process established in the textile industry for joining yarns and works by intermingling individual filaments closely together, to make joint which are stronger and flatter than knots.

"We are continuing to find new partners in the wind turbine, hydrogen and aerospace industries and are doing a lot of developmental work with research institutes and universities," says technical director Carwyn Webb. "This is leading to us expanding our portfolio and we are currently working on systems for carbon tape splicing, for example, as well as an automated system for full weaving beams."

Further developments for the technical textiles and composites sectors will be showcased by BTMA members including Garnett Controls, Roaches International, Slack & Parr and Tatham.

Spirit of openness

"Many BTMA members are currently developing new technologies, either in-house or increasingly through joint projects, and we have much to reveal in Singapore," says Jason Kent in conclusion. "There's a new spirit of openness and adventurous interaction in the UK right now – especially in the fields of advanced fibres and technical textiles – which is very encouraging for the future."

BTMA companies taking part in ITMA Asia + CITME 2025 are Airbond (stand A202, Hall 2), Autofoam (B309, Hall 7), AVA CAD/Cam (C210, Hall 6), Cygnet Texkimp (B493, Hall 8), Fibre Extrusion Technology (B306, Hall 4), James Heal (B306, Hall 3), MCL (A203, Hall 5), Roaches (A112 Hall 2), Saurer Fibrevision (C301c, Hall 3), SDC Enterprises (B107, Hall 8), Sellers (B207, Hall 7), Shelton Vision (B308, Hall 7), Slack & Parr (D305, Hall 4), Society of Dyers and Colourists (B203, Hall 3), Strayfield (B509, Hall 7), Tatham (D205, Hall 2), The Textile Institute (B105, Hall 8), Verivide (B201, Hall 3), Vickers Oils (B102, Hall 5) and Wira Instrumentation (A108, Hall 3),

Founded in 1940, the British Textile Machinery Association actively promotes British textile machinery manufacturers and their products to the world. The non-profit organisation acts as a bridge between its members and the increasingly diverse industries within the textile manufacturing sector.