Speedo is acknowledged globally as one of the leading brands in performance swimwear and as a pioneer in cutting-edge technology, but few will be aware of the debt this success owes to a company in Sri Lanka.

The flow of technology downstream

The world's elite athletes, including the legendary Michael Phelps, work closely with Speedo to develop and further improve the technical properties of its products in order to enhance swimmers' performance and shave milliseconds off their times. Speedo launched the latest version of its Fastskin 'shark' suit—the Fastskin FS-Pro—in February and it has already yielded impressive results.

Michael Phelps made history in the suit as the first man not only to win seven gold medals in a world championships but also to claim a staggering five new world records at the 12th FINA World Championships held in Melbourne, Australia, in April.

Said to be the fastest and most powerful light-weight swimsuit in the world, it is a true 'masterpiece' in terms of apparel engineering. Developed at Speedo's global research and development facility Aqualab, based in the UK, it is produced in the patent pending ultra lightweight and water repellent LZR Pulse fabric to provide further reduced surface friction drag and suit passive drag, whilst Speedo's 3D engineering also creates optimum fit. With 15% more power and compression, it also claims to offer greater core stability, increased power transfer and reduced muscle oscillation. The Fastskin suits also feature seams that are engineered to follow the direction of the water flow to help to reduce drag and super stretch thread which allows greater comfort and freedom of movement.

A scientific approach

Developing such highly-engineered swimwear is a precise science and Aqualab works with experts from many diverse industries such as aerospace, engineering and medical professionals as well as leaders in sports science, fabric technology and garment construction to produce the best suits possible for Speedo's elite athletes. The Olympic suits are all made to measure but Speedo has to appeal to a wider market in order to be a viable business entity

Michael Phelps wins Gold wearing Speedo Fastskin FS-PRO.

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Modular manufacturing at Linea Aqua, Speedo's manufacturing base in Sri Lanka.

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and it has done this very successfully through the production of a commercial version of its technical suits, manufactured far from its UK-based Aqualab (where the elite suits are made) in Sri Lanka.

Whilst sportswear production in South East Asia is nothing new—as the majority of companies have moved facilities offshore—many envisage manufacturing in lower cost countries as some kind of behemoth spewing out low cost, low quality goods. But the facilities and swimwear produced at MAS Linea Aqua PVT Ltd—Speedo's sole joint venture manufacturing base—in Sri Lanka, meet all of the high specifications demanded by the world's top swimwear brands and is a shining example of how elite technology can be diffused downstream.

A joint venture between Sri Lankan MAS Holdings, Speedo and US-based investment firm Brandot International, Linea Aqua was established in 2002 and is Sri Lanka's first exclusive swimwear manufacturer, and one of the few factories in the world that is dedicated solely to swimwear production. But although it may be the first such facility in the country, there has been no 'start small' mentality involved. The company produces 2.2 million Speedo swimsuits each year, of which 70% are manufactured on dedicated Speedo production modules to meet the brand's special construction requirements.

A demanding environment

Although the suits produced at Linea Aqua are aimed at the commercial market they are still highly technical. Most of them tend to be flat seamed rather than overlocked with some machines requiring specially developed feet, feeds and stitch densities. Highly chlorine resistant polyester derivative yarns are used in place of Lycra to extend the life of the products and special chlorine resistant and tougher longer lasting thread also has to be used. The zips also need to be stretchable, hard wearing and highly chlorine resistant. Digital printing has largely replaced wet screen printing to provide a better lasting wash and wear quality.

In order to meet these exacting standards and ensure the highest level of efficiency Linea Aqua uses cutting edge manufacturing technology and has even developed bespoke machinery in collaboration with specialist manufacturers.

The company uses Gerber spreaders as it considers these to introduce the least tension of any automated laying up machine. Vacuum and multi-layer conveyor tables are also used to store and transport the unidirectional lays to three Lectra Vector 5000 V2 computerised cutting machines. With their variable vacuum the Lectra cutting beds hold whatever height of cut—ranging from one ply to fifty—very firmly during the cutting process, which is imperative for warp knit nylon swimwear fabrics. All of the production information is then integrated into the SAP ERP system, from the time the fabric comes in to the factory to the time it leaves as a finished garment. The SAP production information is even fed to electronic data boards at each team of operators so that they can see how efficient they are.

The company also works closely with specialist sewing machine manufacturers to develop specific systems to meet its demands. One example of this is Linea Aqua's collaboration with Yamato to create an electronically-controlled rubber device which can be programmed to sew the correct amount of elastic around the waist and legs of the

Linea Aqua uses three Lectra Vector 5000 V2 computerised cutters as shown above.

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swimwear for every size and style of suit. The tensioning can be varied around the shape of the opening and the electronic controls can even cater for different thicknesses and weights of elastic. 100 programs can be held in the machine's memory at any one time so that each suit is produced precisely. And Linea Aqua does not stop there in its quest for perfection. In order to further guarantee the quality of its swimwear, whilst four to fourteen operators can work on the Speedo-dedicated lines at the factory, when it comes to the high performance Fastskin FS11 suits, these are taken through the entire manufacturing process by one person alone, so that this individual is responsible for the final product.

Pooling production know-how

This is all good news for Speedo as it is assured that the swimwear bearing its brand meets the required quality expected of such a well-known name, and Linea Aqua has also branched out further and now produces suits for many top brands. As mentioned earlier, the company produces some 2.2 million Speedo suits a year, but this only accounts for 40% of the total production volume. Its products range from top end Olympic swimwear to high-end fashion bikinis and 75% of the suits produced is now fashion swimwear for brands such as Victoria's Secret, Calvin Klein, and Lands' End, and more recently for retail giants Tesco and Wal-Mart. Although most of its customers carry out their own designs and provide technical and manufacturing specifications, the company offers a full range of design and development services from product, trim and accessory design, CAD product development including Optitex fit technology, sampling, material and trim sourcing and boasts a 100-strong product development team. It can also produce runs ranging from ten suits per design through an average order size of approximately 1,300, to the likes of Tesco's mass produced ranges which may exceed 20,000—all of which are produced to the company's same high standards.

Whilst the swimsuits seen in the local municipal pool may not visually resemble Michael Phelps' high tech suits and may be produced thousands of miles apart, thanks to Speedo's research and foresight in diffusing its technical know-how and one very well-run and successful company in Sri Lanka, in reality they are more similar than most would ever imagine.

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