



### Crucial converting services for technical textiles and composites

Having invested more than US\$10 million in equipment and additional converting services for flexible materials at sites in North America during 2018, Web Industries is now looking to expand its operations in Europe. Adrian Wilson interviewed key personnel to learn more.

**F**ounded in 1969, Web Industries has become one of the largest and most diverse providers of converting services for flexible materials. The company runs a wide array of slitting, spooling, winding and ply-formatting equipment for converting technical textiles, nonwovens, composites, speciality films, papers, foils, laminates and foams. In addition, it operates advanced technologies for delivering converted materials onto custom-designed spools and rolls, or as pads and ply kits, in order to make downstream manufacturing more efficient and cost-effective for its customers in the aerospace, medical, personal and homecare, multi-layer insulation, and wire and cable industries.

Wholly owned by its employees, Web Industries has its headquarters in Marlborough, Massachusetts, USA, and has US manufacturing sites in:

- Suwanee (Atlanta), Georgia;
- Boston, Massachusetts;
- Dallas, Texas;
- Fort Wayne, Indiana;
- Hartford, Connecticut;
- Montpelier, Vermont.

It also has a manufacturing facility in Stade, Germany.

#### Fort Wayne expansion

In May 2018, Web Industries announced the completion of a project to expand and install new equipment at the site in Fort Wayne. At a cost of more than US\$8 million, the company has constructed a new 0.46-ha (50 000 square feet) climate-controlled building for manufacturing and warehousing. The facility houses two new eight-colour flexographic printers, each able to work with water- and solvent-based inks, and a new proprietary wide-web spooler, which is capable of traverse-winding slit materials with widths up to 30.5 cm (12 inches) onto spools up to 127.0 cm (50 inches) wide with outside diameters (ODs) of 152.4 cm (60 inches).



*The new large-format web spooling line is part of an over US\$8-million investment at the company's Fort Wayne plant.*

The aim of the investment is to bolster the company's services for processing flexible materials for nonwoven-based baby diapers, and adult incontinence and feminine care products. However, the new equipment is also intended for processing industrial and medical textiles, and flexible packaging.

Specifically, Web Industries has identified a large demand for multi-coloured materials, which provide opportunities for customers to differentiate their products, and a growing desire for spooled flexible fabrics. According to Vice President of Corporate Development Kevin Young (see also, page 19): "A research project we commissioned revealed emerging branding needs for multi-colour graphics on certain personal and homecare products, as well as a growing recognition of the advantages of spooling in manufacturing processes." The investment gives Web Industries an advantage over its competitors, he believes: "To our knowledge, no other converter has these capabilities [together] in the same facility.

"Our new eight-colour printing capability will be of particular interest to diaper producers who are co-



marketing with entertainment brands and wish to produce logos and graphics, as well as to feminine hygiene and adult incontinence product manufacturers wanting to convey an extra dimension of quality to end-users.”

### Open sourcing

He adds that the company’s strategy of openly sourcing materials is another advantage, allowing its customers who produce hygienic disposables to work with a converter that is adaptable. “We can work with multiple streams of materials, whereas vertically integrated businesses only provide their own nonwoven materials. We believe our customers benefit from our strategy, a benefit no other nonwoven materials’ formatter can offer.”

Typically, nonwoven suppliers often slit and rewind their material into rolls of smaller widths and lengths (called pads), but they do not commonly slit and traverse-wind the material onto spools. In contrast, Web Industries believes spooling adds value by making rolls that are typically 10-to-25-times the

length of traditional pad-wound rolls. This greatly reduces the number of rolls customers need to splice into their manufacturing processes, as well as reducing the converter’s downtime. Fewer roll changes mean less labour is needed for handling materials, less time is lost preparing splices and less product is wasted from discarding material around the splice.

For woven-fabric manufacturers, meanwhile, precision slitting and corresponding two-end wind-up onto spools reduces the need for creel space.

### Aerospace markets

Composites have become an increasingly significant part of Web Industries’ business, particularly with respect to its services to the aerospace industry.

“We frequently work with aerospace clients on component design very early in the product development process,” says Young. “We then support them through material selection and formatting, and ensure that optimal processes are used to shorten cycle-times and cut costs wherever possible.” He adds that aerospace customers require exacting standards in terms of quality and technical precision.

To supply aerospace manufacturers with ply-formatted and kitted composites, Web Industries has invested a further US\$2 million, this time at its site in Atlanta where it has installed five new cutting tables equipped with laser-guidance devices and quality-control systems for ensuring every ply in a kit is in the correct order. New video systems positioned above the cutting tables keep records for all the products.

### Thermoplastic composites

This investment in Atlanta has also allowed Web Industries to establish a new Thermoplastic Composite Development and Qualification Center there to develop processes to convert thermoplastic carbon fibre prepregs – including those based on polyetheretherketone (PEEK), polyether ketone ketone (PEKK) and polyphenylene sulphide (PPS) – for use in various fabrication technologies.

The Center houses slitting equipment capable of cutting materials into tapes as narrow as 1.6 mm (0.0625 inches) on a traverse-wound spooling line. A second



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advanced composites



*Web Industries' Vice President of Corporate Development Kevin Young (see also, page 17) says the fact that the company is wholly owned by its employees has several benefits.*

Thermoplastic composites can be stronger and have higher thermal- and chemical-resistance, while also helping engineers make parts lighter in weight than is possible with thermoset composites. He adds: "These and other material advantages can reduce the overall cost of an application; for example, instead of having to fasten aerospace components with adhesives or metallic fasteners, thermoplastics can be assembled by thermal welding or co-consolidation."

This growing business for the company also prompted it to open a new sales office in Hamburg, Germany, in March 2018, and to draw-up plans to add another factory in Europe, which will house a variety of processes for the precision processing of advanced composites, including ply-cutting and kitting services, slitting thermoset and thermoplastic composites, and chopping thermoplastic composites.

According to Young: "This will support the demand for aerospace materials from global original equipment manufacturers (OEMs) and Tier-1 market leaders, as well as allowing us to meet faster response times on new orders and enquiries within Europe."

### Cleanroom conditions

Dealing with high-performance composites, including prepregs and multiple-ply materials, also requires cleanroom environments, suitable ones being available at two of the company's facilities: processing of both

slitter/winder cuts wide rolls into strips –2.54 to 15.24 cm or more (1–6 inches or more) in width – for planetary wound formats, and there is machinery to chop materials into fibre flakes measuring 1.27 × 1.27 cm (0.5 by 0.5 inches) or 0.16 × 1.27 cm (0.0625 by 0.5 inches) for use in compression-moulding processes.

Seaming technology will be made available at the Center during 2018. All of the equipment is capable of operating with high precision, offering tolerances of the order of tens of microns (a few thousandths of an inch), depending on the quality of the unprocessed material.

Web Industries' Director of Research and Technology Grand Hou says: "The aerospace industry has long dreamed of having automated processing for thermoplastic composites manufacturing and this is now feasible thanks to advancements in fabrication techniques. As a result, an increasing number of aircraft parts are being designed to use thermoplastics. The industry is expected to use thermoplastic composites for a large number of primary structures in upcoming commercial programmes."

*A slitting line for high-performance thermoset composites.*





*Thermoplastic chopped fibres prepared for use in compression moulding at the company's Suwanee site.*

prepreg and multi-ply materials is carried out in Atlanta; in Stade, the company converts prepreg.

Young says Web Industries controls the environmental conditions of its cleanrooms to ensure that they meet each customer's requirements, adding every customer has different demands: "Beyond this, we have developed a foreign object debris (FOD) control programme, which is required for all of our aerospace locations—Atlanta, Dallas, Montpelier and Stade."

The FOD programme specifies three levels of performance, each of which has its own set of rules and guidelines about how to protect a particular space, such as what occupants must wear in the room, and employees and visitors alike are required to follow these regulations.

The three levels are:

- FOD Critical Zone—an area that presents the highest risk for potential FOD incidents, such as one containing processing equipment. These are the only areas in the company where unprotected material might be exposed;
- FOD Control Zone—the area in which items that will ultimately come in direct contact with unprotected materials are processed and in which there exists a high potential for entrapment and migration of FOD to unprotected materials;
- FOD Awareness Zone—areas that have a low potential for entrapment and migration of FOD to processing materials. Any area that is not designated as a Critical or Control Zone will be considered an Awareness Zone.

### Recycling and sustainability from top to bottom

Web Industries says it is committed to recycling of materials and sustainable manufacturing, proactively looking for ways to reduce waste, prevent pollution and adopt suitable processes.

Young says the company has adopted an approach it calls "green pyramid". Starting at the top, the preferred solution is to eliminate waste. "We always strive to eliminate waste and excess materials where we can, but if we can't we re-use and recycle."

The last option, at the bottom of the pyramid mentality, is to send waste to landfill.

Web Industries also collaborates closely with its suppliers and this has led to the introduction of programmes to eliminate components of cardboard and plastic packaging, and to re-use shipping pallets, plastic plugs, cores, wood boards and frames.

### Reaping the benefits of employee ownership

An extra dimension to the motivation of everyone is that since 2000 the company has been wholly owned by its employees. Young says this model contributes to the recruitment of talented workers and above-average staff retention rates.

"As our founder Bob Fulton approached retirement, he wanted to share with his employees the experience and benefits of company ownership he had enjoyed." He agreed to a ten-year buy-out plan, structured to enable Web Industries' employees to purchase the company without becoming highly burdened by debt.

The success, growth and investments described here suggest Fulton was on to something.

#### Further Information

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