Filament winding is the process of winding resin-impregnated fiber or tape on a mandrel surface in a precise geometric pattern. This is accomplished by rotating the mandrel while a delivery head positions fibers on the mandrel surface. By winding continuous strands of carbon fiber, fiberglass or other material in very precise patterns, structures can be built with properties stronger than steel at much lighter weights.

Entec Composite Machines

Entec Composite Machines is the world's oldest continually operating manufacturer of filament winding machinery, with over 40 years experience in the field, having built more multi-spindle filament winding machines than any other manufacturer. Entec changed the face of filament winding by producing the world's first computer-controlled filament winding machine, and has continued to lead the industry ever since. Entec engineers also created the world's most-used application software for winding pattern generation, FiberGrafiXTM. These contributions and countless others made over the years, along with our continued pursuit of technological innovations, has given Entec a reputation for producing the most durable and reliable winding machines available.

Our staff includes the industry's most experienced mechanical engineers, electrical engineers and software programmers. Using their skills, Entec built the world's largest five-axis filament winding machine. This machine is used to produce large wind turbine blades with a part length capacity of 180 ft. (54.54 m), a diameter of 27 ft. (8.23 m) and a weight capacity in excess of 300,000 lbs. (136,363 kg). In contrast, Entec has also created some of the world's smallest machines for use in universities, research facilities and commercial companies to develop and test parts before full-scale production.
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Improved Performance

Filament winding composite applications has become the high-performance alternative to traditional manufacturing methods. From recreation equipment to rocket motors to wind turbine blades, composites provide a quality solution.

Composites Outperform Metals

Composites have more strength and less weight than metals. Carbon fiber is roughly half the weight of aluminum and twice the stiffness of steel, making it ideal for applications such as high-performance sporting goods and aerospace equipment.

Composites can also be highly flexible, enabling the creation of virtually any shape through filament winding, molding and bonding.

Composite Mechanical Properties

Composites can offer a low coefficient of thermal expansion, high thermal conductivity, negligible creep and improved fatigue resistance.

FW Series

Our basic product line, the FW Series machines are robust and reliable. Models are designated by the size of the part supported in millimeters, and include the FW600, FW1000, FW2000, FW5000.

PW Series

The PW series offers a sturdy and reliable overhead beam design. This machine is one of our most popular and can be supplied with 2 spindles.
Filament Winding Machinery

Entec offers a complete line of filament winding machines, giving us the flexibility to ensure that we can build a solution to fit your needs. Product lines include the FW, PW, PS and 5K series, our gantry systems and various specialty and custom machines. Our basic models can be adapted to customer specifications, regardless of part length, diameter, weight, number of machine motion axes or number of spindles.

Fiber Management & Resin Systems

To compliment our filament winding machines, we offer expertise in designing delivery systems that meet your needs. Whether you are planning on using prepreg fibers or implementing a wet-wind process, we can provide creels, tensioners, resin baths and stands that complete the job in an efficient and economical manner.

Entec has worked closely with our parent company, Zoltek, to develop large-tow fiber management systems that will work efficiently with our equipment. Large-tow fiber materials drive down filament winding costs and enable manufacturers to develop new applications. Zoltek is the leader in developing large-tow carbon fiber material. An efficient large-tow delivery system allows our customers to use the new Zoltek Panex-35 fiber material in manufacturing, resulting in lower production costs.

3-20 Spindles

Our PS Series offers multiple spindles that provide high volumes of production at low costs.

5K Series

For high quality production within precise tolerances, we suggest making the investment in one of our 5K Series machines. Durable, reinforced components provide greater rigidity and strength, making machine motions the most accurate in the industry.
Entec's heavy-duty gantry machines are built around an overhead frame that allows precise multi axial movement and orientation. The work cell has the ability to fabricate complex composite structures such as inlet ducts, fuselage structures and complex geometric shapes. Entec offers small or large versions of the gantry design.

Auxiliary Equipment

Entec offers a wide range of auxiliary equipment, including:

- Curing ovens
- UV gel stations
- Cut-off saws
- Resin baths
- Tensioners
- Fiber delivery systems
- Resin dispensing systems
- Mandrels
- Extractors
- Dies & tooling
- Presses
- Thermoplastic heads

Turnkey Systems & Retrofitting

Entec's filament winding turnkey systems offer the ultimate resource to fulfill your factory needs. We can provide you with a complete equipment and technology package to manufacture high pressure pipes, large diameter pipes or SCBA / CNG pressure vessels.

Entec also offers economical retrofit options for your preexisting machinery, including retrofit of machinery that was built by other manufacturers.

Gantry Systems

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Custom Machinery

In addition to our standard product lines, Entec offers a wide variety of specialty winders. We have experience producing polar winders, tumble winders, turret winders, pipe systems and tape wrappers. For the complete filament winding solution we can provide multi-station turnkey systems to accommodate the entire production process.
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