

GIVING NEW MEANING TO COMPOSITE SOLUTIONS



Lifting Equipment

Formula 1

Roadsters

Bridges

Aerospace & Defense

 **futurefibres**
Tomorrow's innovation

The world's leading supplier of composite masts & rigging

Having pioneered the use of continuously wound, unidirectional fibre for yacht rigging almost two decades ago, Future Fibres is now the world's leading supplier of composite masts and rigging to the race, cruise and superyacht markets.

Future Fibres has revolutionised the rigging industry, allowing composite rigging to be used on every area of the boat. With more experience and sea miles than the rest of the competition put together, Future Fibres is the industry benchmark for innovation and quality. With unmatched technical experience and class leading customer support, Future Fibres has gained a reputation as the composite rigging provider of choice.

In 2007, Future Fibres became the first rigging manufacturer to be awarded

Germanischer Lloyd Type Approval for its rigging system. In the same year, the company won the coveted technology award at the Boat International Superyacht Awards, a high accolade achieved against tough competition.

Today the company continues this tradition through continuous innovation and development of its composite spars and rigging technologies, pushing the industry in new directions and exceeding the limits of performance and reliability.

State of the art 15,000m² manufacturing facility

- 140 of the best people in the industry
- 50 x 1.5 metre autoclave
- Onsite CNC machining capabilities
- GL certified production facility
- 60 metre climate controlled laminate and paint booths
- Conveniently located in Valencia, Spain

>> KNOW HOW

Composite Cables



Bringing light weight, high strength cables to a range of new applications

Lightweight, high strength composite cables offer superior performance across a wide range of applications. The company's expertise in composite rigging and cables and a proven history of delivering custom projects puts Future Fibres in a fantastic position to deliver robust performance enhancing solutions in new markets and applications.

Composite Parts



Raising the bar in the design and manufacture of complex composite parts

In 2010, Future Fibres created its mast division with the clear objective to lead the next wave of spar development. The success of this venture has been built on a world class team, an integrated design and build process, and a high technology partner – Persico Spa, leader in moulding technology. Based on its expertise to produce extremely complex carbon fibre masts, Future Fibres has built a unique capability to design a product from a prototype idea and turn it into a high performance composite part.



Technological expertise creating distinctive value

The wound composite fibres expert

Future Fibres pioneered the use of continuously wound, unidirectional fibre for yacht rigging almost two decades ago. Continuously wound fibre construction offers strength, safety and an ability to maintain a long term performance advantage.

Future Fibres is constantly refining this core technology to leverage benefits across the full range of available fibres in order to offer the optimum solution for any given combination of project and cable requirements.



GL approval for design and manufacture of composite cables and parts is a critical project milestone. Our clients benefit from Future Fibres' long relationship with GL and strong experience in fulfilling GL applications for individual projects.

The strongest, lightest cables



Continuously wound fibre provides the best fibre alignment and load sharing of any composite cable production technology. It also offers the highest cable performance in terms of strength and weight for a given stretch. Our production process has been developed and refined to control the placement of the fibre, ensuring equal load sharing and maximising cable life.

Another significant and long term advantage of this core technology is the fact that there is no need for any termination or mechanical link to transfer the load from the cable to its interface/connection. Whilst it can be supplied as a 'soft-loop', metal spools are generally used to increase longevity and ease of interface. Wound technology offers the lightest possible terminations compared to all other construction methods.

Complex high performance composite parts

Future Fibres uses the latest design and production processes to optimise the construction of complex custom composite components. Using 3D ply by ply solid-element analysis in our FEA software, Abaqus, we can accurately model detailed stress distributions, including through-thickness stresses, to refine the laminate.

We build the laminate in CATIA where we undertake fibre drapability analysis. In production, laser positioning ensures correct laminate placement.

Once complete, precision composite components often interface with custom metal parts. Future Fibres has full CNC machine shop capabilities and has experience in advanced materials such as Titanium, Nitronic steel, etc.

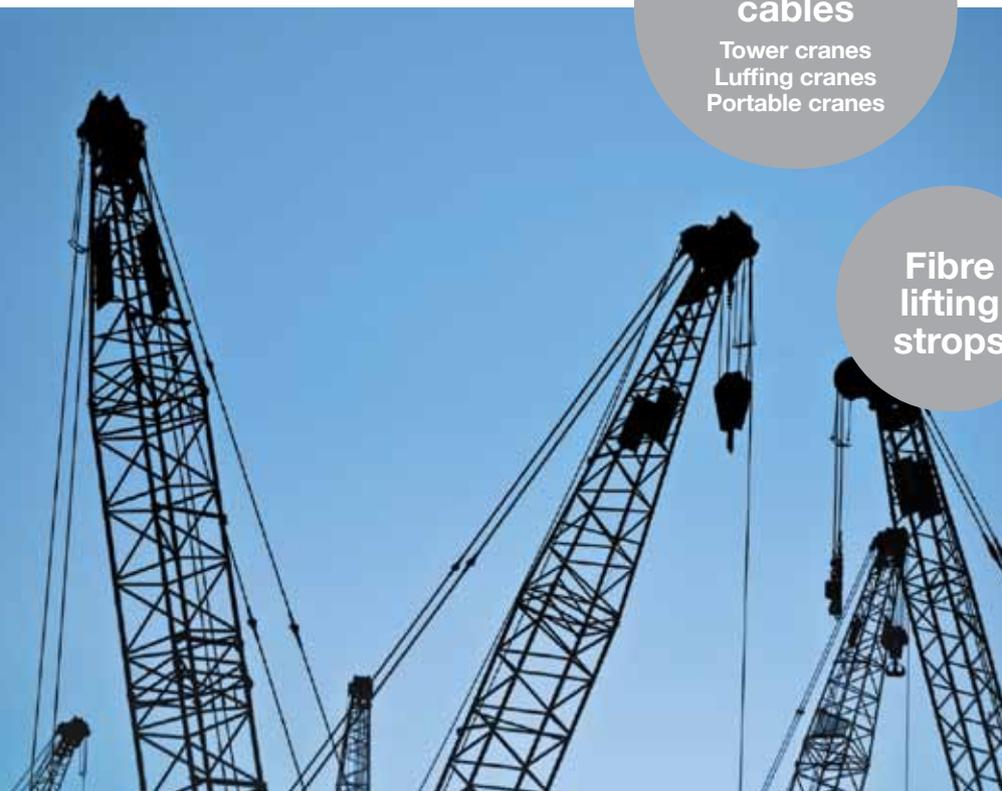
The right fibre for the right application

Future Fibres believes in finding the right fibre or resin system for the right application. We balance various competing project needs – weight, usability, durability, strength, stretch, diameter, performance and price – finding the right combination to meet client's objectives. Unlike the majority of suppliers, we are not restricted to one material. We can offer an unbiased recommendation of all and any fibre type and production technology.

Bringing our composite expertise to the world



LIFTING EQUIPMENT



Solid carbon structural cables

Tower cranes
Luffing cranes
Portable cranes

Fibre lifting strops

While crane designs have experienced radical change in the last decades, wire cable for lifting has remained essentially the same for around 100 years. However, innovative Future Fibres composites high performance cables offer an interesting alternative to traditional steel cables.

They have distinctive benefits such as weight reduction, improved fatigue resistance, extended cable life, reduced maintenance cost and a variety of Non Destructive Testing (NDT) methods allow rational judgements to be made on cable health throughout its life.

The reduction in weight generates an improved load chart allowing for increased outreach and load capacity up to 50%.

These combined benefits provide a lifetime cost reduction making Future Fibres high performance composite cables ideal to replace both short wire cables and steel structural cables with composite cables in a variety of lifting applications such as tower, luffing and portable cranes.

Game changing lifting equipment

- ✓ Weight reduction by 70-90%
- ✓ Improved fatigue resistance
- ✓ Improved load chart
- ✓ Ease of handling and reduced installation costs
- ✓ Reduced maintenance cost
- ✓ Non Destructive Testing
- ✓ Corrosive resistance



FORMULA 1



Since 1998, Formula 1 cars have been equipped with safety tethers connecting the wheels to the chassis thereby preventing the wheels potentially injuring spectators in the event of an accident.

Based on the wound unidirectional fibre principles pioneered for yacht cables, Future Fibres is equipping F1 and other open wheel race car circuits with carbon safety tethers, contributing to improved car racing safety.

“Future Fibres provides a level of expertise and professionalism both in technical knowledge and customer service, it has been a pleasure working with them over the last 10 years.”

FORCE INDIA >> Formula 1

For a safer Formula 1

- ✓ Weight savings
- ✓ Energy absorption
- ✓ Improved safety
- ✓ Reliability
- ✓ Corrosion resistance
- ✓ Stability at high temperatures

Future Fibres is now leveraging its wealth of experience and knowledge in composite materials to the benefit of new markets and applications.

>> ROADSTERS



Future Fibres is leveraging the highest precision moulding technology the company uses to manufacture masts for the production of a roadster tube and main chassis. Designed by RPX engineers, this extremely light weight carbon fibre chassis offers excellent aerodynamics while remaining affordable.

Future Fibres is partnering with Persico Spa, the world leading experts in moulding technologies. Persico's moulding expertise allows us to manufacture light weight carbon chassis with:

- Perfect fit and finish, straight out of the mould
- Less filler and glue
- Perfect bonding of external fittings
- Overall build accuracy and consistency
- Significantly reduced production time

Building the future of racing roadsters

- ✓ Unbeatable combination of strength and lightness
- ✓ Increased stiffness
- ✓ Improved safety
- ✓ Life time cost reduction
- ✓ Easy moulding into any kind of shapes

>> BRIDGES



The world's longest stress ribbon bridge was awarded the JEC Innovation Award 2012 in the construction category. Future Fibres provided wound, unidirectional solid carbon fibre cables as the primary load-bearing supports of this footbridge built in Cuenca, Spain.

The final design involved 16 lines of cables, side by side, made up of five individual cables joined with link plates, to achieve the required 216m long, 3m wide footbridge. Each of the eighty, 43.4m long, solid carbon cables had a working load of approximately 95 tonnes, a diameter of 42mm and weighed in at just less than 100kg.

Future Fibres' innovative composite solution enabled Acciona Infrastructures design team to conceive a distinctive, contemporary design for this bridge; one which would not have been possible with standard building materials. Unsupported spans were significantly increased, supporting structure was reduced and installation time and cost were reduced by over 80%.

Enabling innovative bridge design

- ✓ Distinctive, contemporary design
- ✓ Increased unsupported spans
- ✓ Reduced supporting structure
- ✓ Reduced installation time and cost by over 80%

>> AEROSPACE & DEFENSE



The ability to design and engineer custom cable and component solutions opens up a myriad of opportunities for driving performance improvement in both aerospace and defense.

For example:

- Carbon rods to aid in the deployment of telecommunication satellites
- Composite safety tethers
- Composite booster rockets
- Locking straps to hold helicopter blades to the motor

"Future Fibres knowledge and experience of working with high tech fibres and their positive approach were key to achieving a successful design and its subsequent manufacture."

MBDA UK Ltd

Taking aerospace & defense to the next level

- ✓ Light weight
- ✓ Increased strength
- ✓ Reliability
- ✓ Corrosion resistance
- ✓ Ease of handling
- ✓ Non Destructive Testing

>> SERVICES

We are custom composite solution providers with experience in engineering high performance parts for extremely challenging environments. We rely on the latest technologies to facilitate rapid design development and prototyping through to small batch manufacture and full scale production. Our efficient process results in an overall savings of time and cost, and most importantly in the delivery of unparalleled performance solutions.

1. Design

Future Fibres in house design team has a long proven track record in expert mechanical engineering design, prototyping and product development services. Our designers are not limited by pre-existing solutions. We offer a 'ground up' flexible design package, which will maximise client input during the development phase. Our designers will suggest modifications to help reduce cost, improve ease of development, and will keep your development cycle moving forward. A good level of communication ensures your queries and needs are worked on and options for solutions are offered in a short time.



2. Prototyping

Based on its expertise to produce extremely complex carbon fibre masts, Future Fibres has built a unique capability to take an idea and turn it into a high performance composite part. Prototyping will streamline the product through the manufacturing process utilizing soft tools and production equipment. This prototype phase allows our engineers to check for improvement opportunities and will catch any complications that may arise when developing hard tools and transferring the product into full-scale production.

3. Testing

Testing is at the heart of Future Fibres success. Having pioneered new, mission critical technology we had to constantly prove its capabilities. We have therefore developed a range of testing capabilities from destructive test beds to Non Destructive Testing (NDT) methods – e.g. ultra-sound and acoustic emissions – which allow for examination without impairing the part's future usefulness.

4. Quality Control

Future Fibres supports a lean manufacturing environment allowing for an unrivalled quality record and the highest levels of accuracy and consistency. Our industry leading quality control system encompasses the entire process and starts at the design stage with stringent production checks

throughout the build process. Future Fibres quality system ensures complete control and traceability on material specification and production processes.

5. Monitoring

Regular monitoring and NDT inspections provide the opportunity to see inside a cable or composite part and allows for rational judgment on the health of each part while our full traceability processes allow for identification of each and every component with full as-built data records. We maintain proactive contact with our clients, liaising on active maintenance and recommended service and replacement schedules.

6. Technical Support

Future Fibres is committed to providing fast, courteous and professional technical support to its customers. Based on our technical knowledge, specific background and overall product experience, our team of technical support professionals provide high quality and efficient answers to your technical inquiries. Support is also available 24 hours a day, 7 days a week for emergency situations.



Future Fibres is passionate about performance and innovation. Future Fibres challenges design, materials and technology to deliver unrivalled composite solutions. The breadth of our technical expertise enables us to leverage technologies developed in the marine sector to solve client challenges in others.



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