



**Fibre Reinforced Composites for Alternate and Renewable Energy**

# Wind, Wave and Tidal Generation, and Fuel Cells

Advanced Composites Group Ltd (ACG) specialises in the manufacture of high performance pre-impregnated (prepreg) advanced fibre reinforced composites.

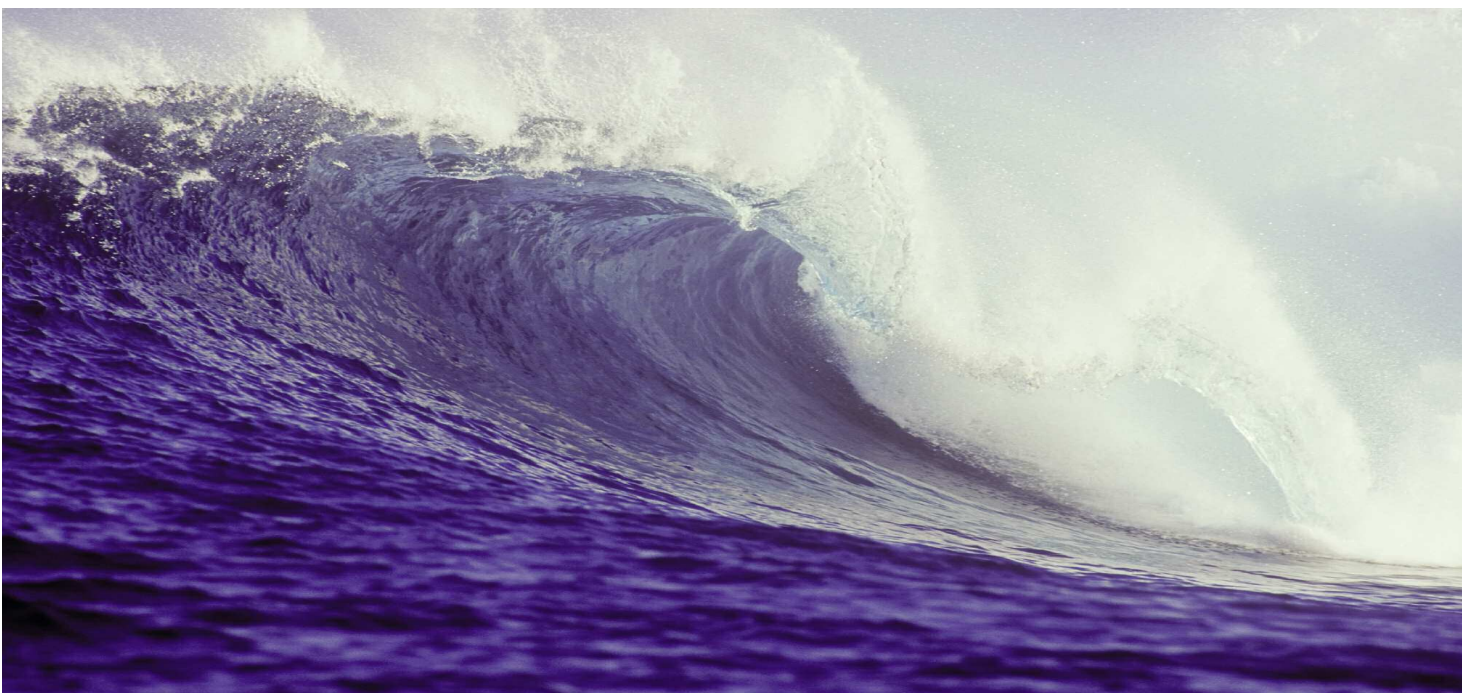
Our carbon fibre and glass fibre reinforcements, which are pre-impregnated using specially formulated epoxy, cyanate ester or bismaleimide resin matrixes, are used in woven and stitched fabrics or as unidirectional tape formats across a diverse range of industries. In wind and wave energy, ACG has played a significant role in recent years, having developed materials and techniques specifically to improve handling and processing in this demanding arena.

## **What composites can offer you . . .**

- Excellent Corrosion Resistance
- Low Weight (75% less than steel)
- High Stiffness and Strength
- Excellent Fatigue Life
- Rapid Manufacture of Complex Shapes
- High Environmental Tolerance

ACG caters for all applications, with prepreg materials that cure at temperatures as low as 28°C (77°F) for low cost structures and high performance prepreps capable of withstanding service at temperatures as high as 800°C (1312°F).

Process technologies include standard autoclave, vacuum bag, out-of-autoclave and press moulding.



# From concept to reality with ACG

Consultancy, conceptual design, 3-D modelling  
Prototypes, manufacturing, technology transfer

## What Advanced Composites Group can offer you . . .

High performance pre-impregnated (prepreg), technologically advanced, application specific composite materials customised to suit your needs and the demands of the operating environment.

Prepreg solutions that embrace the essential elements of design/specification, prototype/production manufacturing, taking your concepts right through from inception to realisation of the finished product.

Prototype and manufacturing facilities, and full technology transfer where needed.

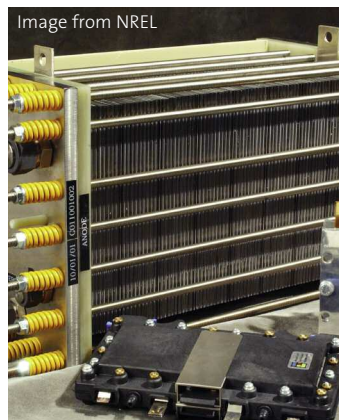
To learn more about fibre reinforced composites, download the publication '**An Introduction to Advanced Composites and Prepreg Technology**' from our web site ([www.acg.co.uk](http://www.acg.co.uk)), and talk to us . . . you'll discover that we speak your language!



SeaGen 1.2MW tidal turbine produced by Marine Current Turbines Ltd. - rotors in 'raised for maintenance' position.



Courtesy Dr I J Stevenson



## THE COMPOSITE ADVANTAGE

Advanced composite materials offer engineers a new freedom to design functional, aesthetically pleasing structures of optimum performance not previously possible with more traditional products. The performance of these unique and exciting materials is now being realised in many everyday applications.

## THE PREPREG ADVANTAGE

A prepreg consists of a reinforcement material (carbon, glass, etc.) in unidirectional or fabric form pre-impregnated at a pre-determined and controlled level with a resin matrix. Prepreg is a fully compounded, reactive system (no handling or mixing of potentially dangerous chemicals). Simply take it from the roll and laminate.

All prepregs have a clearly defined working life (or out life) at room temperature. Material is stored frozen to maximise its life. The reactivity of a particular prepreg system is predetermined and this, in turn, dictates the minimum temperature at which a particular resin system will cure.

The out life and the minimum cure temperature are key considerations when optimising material selection, balancing lay-up time (large structures) and selection of the mould material (low temperature curing - low cost tooling).

Prepregs are supplied with a controlled level of tack. Plies can be easily and accurately positioned on the mould to give a high level of fibre orientation control without the risk of movement, fibre wash out or the development of resin rich areas during subsequent processing, all of which will lead to loss of performance.

Cored structures (foam, honeycomb, etc.) are also easily produced using complementary, formulated film adhesive systems which offer high strength bonding and controlled and consistent bond line thickness, rather than just depending on the parent resin matrix.

## PRODUCT RANGE

Advanced Composites Group provides a complete range of products to serve the advanced composites industry.

### - Prepregs (for components and tooling)

- LTM® (Low Temperature Moulding) Series: typical cure temperatures: 20 to 80°C
- MTM® (Medium Temperature Moulding) Series: typical cure temperatures: 80 to 135°C
- HTM® (High Temperature Moulding) Series: typical cure temperatures: >135°C
- VTM® (Variable Temperature Moulding) Series: typical cure temperatures: 65 to 180°C

### - Film adhesives/resin films

### - Syntactic films

### - Tooling block

### - Syntactic epoxy and urethane

### - Tooling ancillaries

### - Backing structures, sealers, adhesives

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