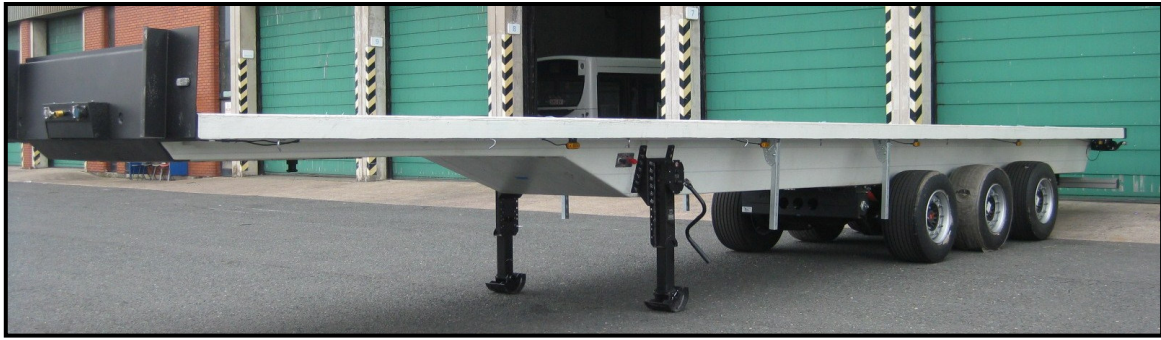
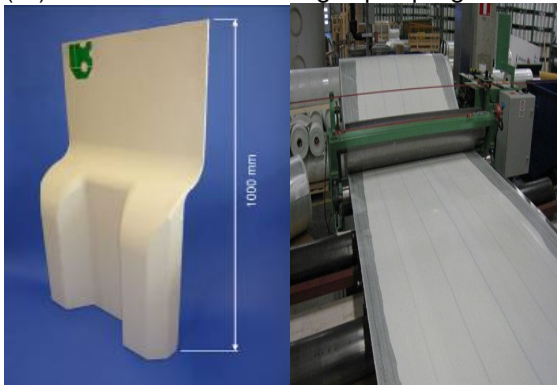


World's First Thermoplastic Composite Road Haulage Trailer



A consortium of leading technology organisations has developed the world's first thermoplastic-composite semi-trailer under the FP6 program Cleanmould (TST5-CT-2006-0315281). This ambitious project, led by EPL Composite Solutions Ltd, has seen the co-ordinated development of a range of new thermoplastic composite materials, processing methods and production techniques, culminating in the world's largest structural thermoplastic composite moulding.

Cyclics Corporation's range of polybutylene terephthalate (PBT) oligomer resins (CBT®) have been used as the matrix material within glass and carbon fibre reinforcements to create composite materials that have been successfully processed using three different traditional moulding methods: resin transfer moulding (RTM), vacuum infusion (VI) and vacuum bag pre-preg moulding.

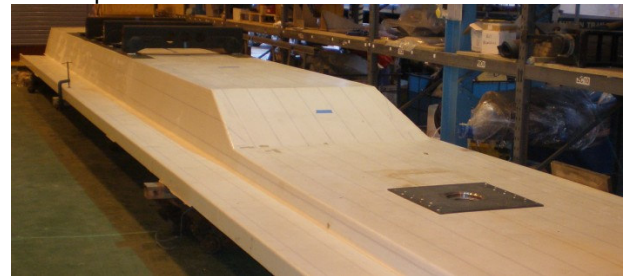


Left: RTM component, Right: Ahlstrom CBT® pre-preg

Very large components have been manufactured from pre-preg material developed by Ahlstrom Glass Fibres Oy and using a novel moulding process designed by EPL Composite Solutions Ltd. The result is a clean manufacturing process using dry, inert raw materials and no VOC emissions that is capable of moulding very large structures (50m² and 1000kg plus)

The low resin viscosity (~40cP) and moderate processing temperature (~200°C) of the CBT® range of resins facilitate the economical construction of large, high strength, high stiffness structures not previously achievable with existing

thermoplastic materials.



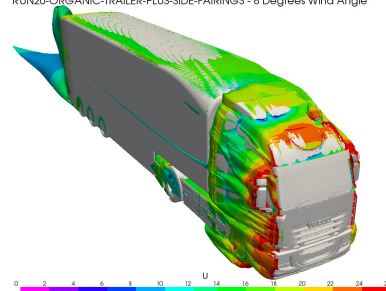
Above: One-shot 600kg trailer moulding

The mechanical properties achieved are similar to industry standard thermoset composites (i.e. 40GPa Flexural Modulus, 850 MPa Flexural Strength) yet the components have the added benefits of increased toughness, thermoformability, and full recyclability.

The use of high volume fraction reinforcements have allowed EPL Composite Solutions & BAE Systems to manufacture a tri-axle 13.6m semi-trailer that can replace existing steel units and bring big savings to road haulage fuel emissions. The huge 1000kg+ weight saving coupled with the slick aerodynamic monocoque chassis could see real world fuel savings of over 10%.

CFD of optimised bodywork

RUN20-ORGANIC-TRAILER-PLUS-SIDE-FAIRINGS - 8 Degrees Wind Angle



If you would like to know more about the exciting developments in large-scale thermoplastic composite moulding, please contact the project leader:

Dr Matthew Turner, EPL Composite Solutions Ltd. m.turner@eplcompositesolutions.co.uk

or visit the websites for more information:

www.eplcompositesolutions.co.uk

www.cleanmould.com