

## **Bentley, Emerald Automotive and Nissan all set to benefit from the Lightweighting Excellence Programme**

**4 November 2015**

It has been announced today that three UK-based automotive OEMs - Bentley Motors Limited, Emerald Automotive LLC and Nissan Motor Manufacturing (UK) Ltd – are working closely with the Lightweighting Excellence Programme (LX) in order to achieve vehicle weight reduction.

The LX consortium is seeking to enhance capability within the UK automotive supply chain to manufacture composite components in medium to high volumes, at affordable costs, by connecting the key functions of material supply, design and manufacturing.

The LX Programme is a strategic co-operation led by Sigmatech and supported by Axillium Research, in partnership with Caparo Advanced Composites, Cranfield University, Engenuity, Expert Tooling & Automation, Granta Design, Group Rhodes, LMAT, Surface Generation and Tilsatec.

Bentley Motors, Emerald Automotive and Nissan are working closely with the LX partners on the provision of three technical use cases with realistic commercial potential.

This announcement coincides with the Lightweighting Excellence Programme being officially launched at Advanced Engineering UK 2015, having received an Unconditional Offer Letter (UCOL) confirming funds of £3.8M from the Advanced Manufacturing Supply Chain Initiative (AMSCI) programme via Finance Birmingham.

AMSCI was set up by the UK Government to help existing UK supply chains grow and achieve world-class standards while encouraging major new suppliers to set up manufacturing in the UK.

A total project value of £7.15M of joint funding from AMSCI and industry will support the creation of 238 new jobs and safeguard 144 existing jobs between 2015 and 2021.

OEMs are now working on weight reduction to ensure compliance with stricter emissions standards. However, as the amount of technology demanded in today's passenger vehicles increases, so does the overall weight. Composite materials allow OEMs to counteract this effect through lightweighting and part consolidation, while maintaining structural integrity.

Many UK-based automotive OEMs have expressed interest to source a higher percentage of their composite components from within the UK. The LX Programme addresses these desires by consolidating all elements of the supply chain to produce demonstrator components to showcase UK capability.

By the conclusion of the LX Programme in 2017, the consortium will have established the design capability and processes required to produce structural, semi-structural and Class A surface finished components in significant volumes.

The three OEMs are working together with Sigmatech and ten partners on the following 'Use Cases':

### **Bentley Motors – Door Inner Structure**

Bentley has offered as a use-case the challenge of replacing a structural Door-Inner sub-assembly, currently made of numerous metallic parts, with a simplified carbon composite assembly. The Door-Inner assembly anchors the door's anti-intrusion beams and mountings for numerous components such as electric window motors, window frame guides and exterior skin connection. Using composite materials, the LX consortium aims to produce a lightweight concept that reduces the number of parts used, while retaining strength, stiffness and crash integrity. This weight reduction could ultimately enable increased functionality that is sometimes prohibitive due to the weight of the existing metallic structures.

### **Emerald Automotive – exterior body panels**

Emerald Automotive is developing a lightweight commercial vehicle that could utilise thermoplastic exterior body panels in the future. They are expected to achieve a high quality Class A surface finish that is lightweight, durable and dent resistant. The project outcome will see the LX consortium members working together in a robust supply chain to create a UK-based production facility that uses automated technology and thermoplastic composite moulding know-how to ensure an uninterrupted supply of Class A body panels to help Emerald Automotive meet demand for what will become a popular global vehicle. When the LX consortium has proven rate, process, quality and price, component production numbers are anticipated to be in low to medium volumes.

### **Nissan – structural component**

Nissan believes that significant lightening of the weight of a passenger vehicle by replacing an existing metallic body structure with lightweight carbon composite is a future requirement. One of the most difficult candidate parts for manufacturing in carbon composites could be a structural floor component which Nissan is offering the LX programme for development. The first run of prototypes will be produced in early 2016 as proof of concept, showing high volume manufacturing methodology and processes ready for future full-scale production. The key challenges for the LX partners to overcome are producing a floor that is significantly lighter than the existing metallic part, at a price that is comparable with the existing metallic component it replaces, while maintaining consistent high quality, structural performance and just-in-time delivery to the production line.

### **About Sigmatex**

Sigmatex develops and manufactures carbon fibre textiles for composite material applications. From global locations, Sigmatex supplies woven carbon fibre textiles including 3D, spread tow, innegra, recycled, unidirectional, multiaxial, and 2D woven solutions across a broad spread of industries, ranging from the world's top supercar manufacturers to high performance leisure brands and most of the world's major aerospace companies. In all cases, Sigmatex helps its customers to achieve improved product performance through lightweight strength. Sigmatex was established in 1986 and has specialised in helping customers create cutting-edge carbon fibre textiles since then.

### **Partners**

#### ***Axillium Research***

Specialises in enabling enterprises deliver technology innovation that is open, collaborative and effective within complex, multi-partner projects with industry, academia and government agencies to deliver Digital Design, Manufacturing Systems and Composites Manufacturing outcomes that make a difference.

### ***Caparo Advanced Composites***

Combines engineering knowledge and expertise in design and precision manufacture of advanced composite components for the automotive sector, including whole vehicle design, crash structure, body structure, systems, design and production solutions for a wide range of components.

### ***Cranfield University***

Offers world-class and niche research, education, training and consultancy, bringing together design, technology and management expertise to develop novel technologies that improve the science base of manufacturing research.

### ***Engenuity***

Provides the automotive industry with a predictive analysis capability in the field of composite materials, characterising the performance of composite material and adhesive for impact, crash, fatigue and structural integrity. Collaborations can be from discrete projects to full BIW development and often include technology transfer to enable rapid deployment within a client's infrastructure.

### ***Expert Tooling & Automation***

The UK's leading manufacturer of industrial automation systems, assembly tooling, automated assembly, special purpose machinery, single and multi-robotic cells, including robotic assembly.

### ***Granta Design***

Helps engineering enterprises manage information on the materials (metals, plastics, composites, and more) that are essential to their businesses, while developing and applying material intelligence, to enable better materials decisions, saving time and money, and reducing risk as products are optimised.

### ***Group Rhodes***

Manufactures and markets over fifty basic ranges of machines, making it one of Europe's largest Original Equipment Manufacturers in its field, supplying an extensive range of machinery for Metal Forming, Material Handling, Waste Management, Clay Preparation, Concrete Working and Special Purpose applications.

### ***LMAT***

Established with the objective of improving composite product performance by eradicating manufacturing defects as well as lowering the risks associated with complex processing. LMAT closely collaborates with the aerospace and wind energy industries, constantly improving composite production methods as well as overall product quality.

### ***Surface Generation***

Develops and commercialises its unique Production to Functional Specification (PtFS) technology which optimises the use of advanced composite materials to enable the manufacture of products such as aircraft wings, consumer devices or automotive components far more efficiently than applying traditional manufacturing techniques. PtFS enables a paradigm shift in cost, quality and delivery that provides significantly fast and energy efficient solutions to manufacturing OEMs and material suppliers.

### ***Tilsatec***

A division of Sirdar Spinning Limited, Tilsatec is a leading supplier of advanced textile

products and specialises in the manufacture of high performance materials for hand and arm protection, supplying the UK, Europe and Australasia.

## **OEMs**

### ***Bentley Motors Limited***

Bentley Motors is one of the most sought after luxury car brands in the world. The company's headquarters in Crewe is home to all of its operations including design, R&D, engineering and production of the company's four model lines, the all-new Bentayga, Continental, Flying Spur and Mulsanne. The combination of fine craftsmanship, using skills that have been handed down through generations, alongside engineering expertise and cutting-edge technology, is unique to UK luxury car brands such as Bentley. It is also an example of high-value British manufacturing at its best. Bentley employs around 3,800 people at Crewe.

### ***Emerald Automotive LLC***

Emerald Automotive LLC is a wholly-owned subsidiary of Zhejiang Geely Holding Group (Geely), specialising in the design, development and production of lightweight, low-emission and long-range commercial vehicles. Emerald is currently undertaking several whole vehicle design and development projects for Geely.

### ***Nissan Technical Centre Europe***

Nissan has one of the most comprehensive European presences of any overseas manufacturer, employing more than 17,600 staff across locally-based design, research & development, manufacturing, logistics and sales & marketing operations. Last financial year Nissan plants in the UK, Spain and Russia produced more than 675,000 vehicles including award-winning crossovers, small cars, SUVs, commercial vehicles and electric vehicles, including the Nissan LEAF, the world's most popular electric vehicle with 96% of customers willing to recommend the car to friends. Nissan now offers a strong line-up of 23 diverse and innovative models in Europe under the Nissan and Datsun brands.