

PRESS RELEASE

Seoul, October 17, 2017

## 12 Innovators to receive a JEC Innovation Award in Seoul next November 2<sup>nd</sup>, 2017

*The ceremony will take place on the international composites event, JEC Asia,  
November 1-3, 2017 – COEX Center, Seoul, South Korea*

During the first JEC Asia International Composites event in Seoul, South Korea, 12 companies will be rewarded in several major application sectors: **Aeronautics, Automotive, Construction, Marine, Racing car, Railway, Transportation, Wind Energy and Sports & Leisure.**

Like the rest of the world, the Asia-Pacific region is seeing major developments in carbon-SMC materials, lighter and safer cars and transportation systems, renewable energy, processes and raw materials. This could be seen through the numerous applications received in these topics.

*“JEC Group strategy towards composites end-users appears to be truly appropriate when we notice all these industries represented in this list of winners. One can only notice that composites are now fully part of our everyday life and it is just the beginning.”* Says Ms. Frédérique MUTEL, JEC Group President & CEO.

The ceremony will take place on Thursday November 2<sup>nd</sup>, 2017 at the COEX Center of Seoul (South Korea) in the conference room of JEC Asia level 1 from 3:30 p.m. Ida DAUSSY (Seo Hye-na), a French-born South Korean broadcaster who has been awarded a presidential citation in 2005 by the South Korean Government, will host the ceremony in front of officials, industrialists, scientists and composites professionals.



Ida DAUSSY

**PRESS MEMBERS ARE CORDIALLY INVITED TO JOIN THE CEREMONY**

**[www.jec-asia.events](http://www.jec-asia.events)**

With a network of 250,000 professionals, JEC Group is the largest composite organization in the world. It represents, promotes and helps develop composite markets by providing global and local networking and information services. For the past 20 years, JEC has achieved continuous growth and acquired an international reputation. It has opened offices in North America and Asia. The Company is entirely owned by the non-profit Center for the Promotion of Composites. JEC Group's policy is to systematically invest its profits in the creation of new services to benefit the industry. After successfully winning over the composites industry, JEC Group is now enlarging its scope to the next segment of the value chain, i.e. manufacturers and end-users.

Through Knowledge and Networking, JEC's experts offer a comprehensive service package: the JEC publications - including strategic studies, technical books and the JEC Composites Magazine - the weekly international e-letter World Market News and the French e-letter JEC Info Composites. JEC also organizes the JEC World Show in Paris – the world's largest composites show, five times bigger than any other composites exhibition - JEC Asia in South Korea and The Future of Composites in Chicago; the Web Hub [www.jecomposites.com](http://www.jecomposites.com); the JEC Composites Conferences, Forums and Workshops in Paris, Singapore and Chicago and the JEC Innovation Awards program (Europe, Asia, America, India and China).

**The composite industry employs 550,000 professionals worldwide, generating 79 billion EUR worth of business in 2016.**

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## JEC ASIA INNOVATION AWARDS: THE 12 WINNERS

**RAILWAY** - Korea Railroad Research Institute (South Korea)  
*Railway sleepers using ultra-high-performance cementitious composites*

**TRANSPORTATION** - Omni Willig Carbon GmbH (Germany)  
*Carbon Mini Tank for highly-corrosive materials*

**AUTOMOTIVE** - Daimler AG (Germany)  
*Multifunctional carbon SMC spare wheel pan*

**RACING CAR** - Epotech Composite Corporation (Taiwan)  
*Lightweight body structure design*

**AERONAUTICS** - Composite Technology Centre / CTC GmbH - An Airbus Company (Germany)  
*Hybrid SMC technology for aircraft applications*

**WIND ENERGY** - Arkema (France)  
*Infusion thermoplastic resin for wind turbine blade manufacturing*

**SPORTS & LEISURE** - Chomarat (France)  
*Thin-ply carbon NCF with visual stitching applied to an innovative windsurf board*

**CONSTRUCTION** - Logelis (France)  
*Composite sandwich panel for modular construction*

**MARINE** - Talon Technology Pty Ltd. (Australia)  
*Carbon fibre/Kevlar hinge system*

**RAW MATERIALS** - OCSiAl (Luxembourg)  
*Single-wall nanotube-based industrial predispersed concentrate*

**NDT & MONITORING** - R-TECH Services Ltd. (UK)  
*Acoustic emission system for the assessment of hydrogen tanks for fuel cell vehicles*

**PROCESS** - Textile For Life Co., Ltd. (South Korea)  
*Industry 4.0 robotic braiding factory*

**Category:** RAILWAY

**Winner:** Korea Railroad Research Institute (South Korea)



**Name of Product or Process:** **Railway sleepers using ultra-high-performance cementitious composites**

**Description:**



Ultra-high-performance cementitious composites (UHPC) are among the most advanced cement-based composites and possess superior mechanical properties, including a compressive strength greater than 150 MPa, high ductility, impact resistance and durability.

In order to achieve such impressive mechanical properties, most UHPC mixtures intentionally exclude coarse aggregates, which leads to high strength by minimizing the interfacial transition zone.

**The UHPC developed by the Korea Railroad Research Institute (KRRRI) adopted an innovative design concept that incorporates proper coarser fine aggregates without sacrifice of mechanical properties, an innovation that has never been achieved before for UHPC. This way, the KRRRI**

**UHPC can lower material cost by up to 22% compared to standard UHPC.**

The world's first railway sleepers using UHPC were recently developed and designed to fully utilize the superior mechanical benefits of composites. **The new design minimizes steel reinforcements in railway sleepers since all the reinforcing steel bars can be removed and the diameter of prestressed bars can be reduced from 11.0 mm to 9.2 mm, reducing steel usage by more than 25% compared to conventional concrete sleepers.**

Furthermore, the high durability, ductility and impact resistance of the new cement-based composites makes it possible to extend their lifespan five times compared to conventional concrete sleepers.

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**Category:** TRANSPORTATION

**Winner:** Omni Willig Carbon GmbH (Germany) 

**Partners:** Omni Tanker Pty Ltd. (Australia), Kurt Willig GmbH & CO. KG (Germany)

**Name of Product or Process:** Carbon Mini Tank for highly-corrosive materials

**Description:**



The Carbon Mini Tank was developed for the transportation of highly corrosive chemicals. This tank can be mounted on road trucks or trailers along with a specialised dangerous goods fit out, for use as road transport tankers.

Rated to a 4 bar test pressure, the Carbon Mini Tank represents a significant leap forward in composite technology for road transportation.

**It is the first carbon fibre-reinforced polymer tank qualified under United Nations ADR, and so it is considerably lighter than the steel and glass fibre-reinforced polymer technologies available on the market. The tank incorporates a fire protection system that is a major innovation allowing the thin-walled carbon structure to pass a 30-minute full engulfment fire at up to 1,000°C without insulation.**

Each tank is approximately 430 kg, and the corresponding mounting equipment is approximately 250 kg, yielding a total weight of 680 kg per 4000-litre tank.

**In comparison, the nearest market competitor weighs 930 kg per 3,200 litre tank. This equates to a weight saving of approximately 40% per litre of fluid.**

The tanks are suitable for transporting corrosive chemicals such as sodium hypochlorite, hydrochloric acid, sulphuric acid, ferric chloride, ferrous chloride, caustic soda, and many others, without degradation of the liner.



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**Category:** AUTOMOTIVE

**Winner:** Daimler AG (Germany) 

**Partners:** Mercedes-AMG GmbH (Germany), EACC GmbH (Germany)

**Name of Product or Process:** Multifunctional carbon SMC spare wheel pan

**Description:**



For the first time, the new Mercedes-AMG E-Class is built up with a new multifunctional spare wheel pan made of carbon fibre SMC material.

As a structural part in the rear structure of the vehicle, the spare wheel pan fulfils high functional requirements for stiffness, NVH (noise, vibration & harshness) performance and structural integrity in the event of a crash.

**This part also improves driving performance through a better weight balanced vehicle, enhancing ride and handling. Due to the manufacturing process, the new material offers a higher degree of freedom in component design as well as the integration of load-oriented structures with very good specific material properties.**

**Compared to conventional steel constructions, the weight reduction is approximately 44%.** Carbon SMC is an efficient and economical route providing excellent cost ratios due to rapidly decreased cycle times and related costs, together with low scrap rates and net-shape geometries. While keeping economics within acceptable ranges, carbon SMC is an option for the large-scale production of composite parts.

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**Category:** RACING CAR

**Winner:** Epotech Composite Corporation (Taiwan) 

**Partner:** KC MotorGroup Ltd. (Hong Kong)

**Name of Product or Process:** **Lightweight body structure design**

**Description:**



Epotech Composite Corporation supported the composite racing car manufacturer KCMG for the development of a lightweight body structure design for the GT86 racing cars.

The tooling used a low-temperature-cure resin system, EPO-RT 213TM (510), with good mechanical strength and  $T_g$  – making it ideal for prototyping and/or large part manufacturing

**thanks to an improved working life and wider processing window when rolling over the mould.**

For the roof, Epotech used its EPO-624 toughened epoxy resin system, allowing good processability and excellent damage resistance. Moreover, the surface finish lowers the car's wind resistance (drag), which is critical for manoeuvrability.

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**Category:** AERONAUTICS

**Winner:** Composite Technology Centre / CTC GmbH - An Airbus Company (Germany) 

**Partners:** Polynt Composites Germany GmbH (Germany) Helmut Schmidt University Hamburg - Laboratory for Manufacturing Technology (Germany), Airbus Operations GmbH (Germany)

**Name of Product or Process:** **Hybrid SMC technology for aircraft applications**

**Description:**



The Hybrid SMC technology combines tailored, preimpregnated fibre reinforcements and sheet moulding compounds (SMC) in a one-step compression moulding process to produce complex, lightweight and functional cabin aircraft components in a time-saving and cost-efficient way.

The partners developed new SMC materials using chopped and continuous glass as well as carbon fibre reinforcements (impregnated TFP, woven and UD fabrics) together with unsaturated polyester resins and flame retardants **to fulfil the strict fire-smoke-toxicity and heat release requirements for cabin applications.**

They also developed an appropriate compression moulding procedure characterized by a special preforming of the SMC fabrics in relation to the mould.

**This new technology allows cost reductions, full automation, high production rates, function integration and new designs with complex shapes.**

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**Category:** WIND ENERGY

**Winner:** Arkema (France) 

**Partner:** Pontis Engineering (Netherlands)

**Name of Product or Process:** **Infusion thermoplastic resin for wind turbine blade manufacturing**

**Description:**



Pontis Engineering (Netherlands) and Arkema (France) assessed the advantages of the new Elium thermoplastic resins in wind turbine blade manufacturing.

Current blade production mostly uses epoxy resins and the blade components are bonded with an epoxy structural bonding paste.

**The Elium resin is an alternative to thermoset resins that can be infused at room temperature and bonded, also at room temperature, with a methacrylic structural bonding paste. The use of thermoplastic resins makes it possible to weld the different components of the blades together.**

This type of processing technology results in fast cycle times together with energy, weight and raw material savings. The current trend of very long blade designs makes manufacturing and logistics more and more challenging.

**With this type of thermoplastic materials, modular blade design becomes a feasible and efficient concept. Elium thermoplastic resins also offer new potential for recycling production scraps and end-of-life parts.**

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**Category:** SPORTS & LEISURE

**Winner:** Chomarat (France) 

**Partners:** Cobra (Thailand), Neilpryde (Spain)

**Name of Product or Process:** **Thin-ply carbon CNF with visual stitching applied to an innovative windsurf board**

**Description:**



Chomarat provided its C-PLY™ Non-Crimp Fabric (NCF) technology to Neilpryde and Cobra to help them manufacture an innovative windsurf board.

The visual stitching of the fabric combines visual appeal and mechanical performance. C-PLY™ is the fruit of collaborative work between Chomarat and Stanford University's Prof. Steven Tsai, who developed the concept of bi-angle thin-ply NCF.

**Originally dedicated to the design of aeronautical parts, the concept is now successfully applied to the sports and leisure sector. C-Ply™ is a NCF multiaxial carbon reinforcement comprised of stitched plies that allow precise tailoring of the fibre angles in the load directions.**

In this construction (C-PLY SP), tows are spread to create thin plies which are then stitched with precise angles of  $\pm 45^\circ$ . The C-PLY™ NCF structure respects the fibre alignment and is optimized in terms of fibre angles and ply weights thanks to unique spreading technology.

The result is a leading-edge carbon NCF reinforcement allowing structural design benefits, premium surface quality and overall part cost savings. **C-PLY™ SP BX 150 X1 is an innovative carbon NCF with a unique stitching yarn that is designed to be processed easily on production lines, to remain visible after resin impregnation, to capture resin colour pigments and to contribute to additional reinforcement in the Z axis.**



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**Category:** CONSTRUCTION

**Winner:** Logelis (France) 

**Name of Product or Process:** Composite sandwich panel for modular construction

**Description:**



Logelis uses its Logimur® technology to build individual and collective buildings offering a very high energy value at low cost.

**Logimur® constructions have a thermal resistance greater than 7 while keeping the price down to €950/m<sup>2</sup> only in France.**

The construction system is highly innovative and allows fast, high-quality construction due to the use of sandwich panels (2.80x1.25x0.16m) that combine composite skins with a polyurethane foam core. These constructions can be weather-proofed within 3 to 10 days of construction.

This patented technology meets all building needs worldwide: hospitals, houses, commercial buildings, schools, etc.

The Logelis system can be used with wood, steel or concrete structures depending on the requirements and local regulations. Doors, windows and electrical conduits are integrated at the factory. No special skills are required on site as the panels are preassembled in the factory.



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**Category:** MARINE

**Winner:** Talon Technology Pty Ltd. (Australia) 

**Name of Product or Process:** Carbon fibre/Kevlar hinge system

**Description:**



At present, almost all hinges in the world are metal with a small number of low-stress plastic designs, and this has been the case for at least the last 100 years.

**This carbon/Kevlar hinge uses advanced composite materials in a very unusual way, that creates a high-strength, lightweight and extremely durable hinge that is also corrosion resistant and maintenance free.**

**The 1.6mm-thick (closed) hinge is probably the world's thinnest hinge, yet able to hold a 150kg load (50mm wide).** Having no metal parts and made entirely from an epoxy/carbon/glass/Kevlar composite, the hinge can be used in some very extreme environments.

It is easily bondable to composites structures (fibreglass boats), significantly reducing fitting time and the cost of expensive fasteners. Moreover, Talon recently tested the hinge to over 1 million flex cycles with almost no change in the hinge's stability.

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**Category:** RAW MATERIALS

**Winner:** OCSiAl (Luxembourg)

**Name of Product or Process:** **Single-wall nanotube-based industrial predispersed concentrate**

**Description:**



OCSiAl's Tuball nanotubes are the first single-wall carbon nanotubes available for commercial applications in a wide range of industries.

The breakthrough, yet low-cost, mass-production technology invented by OCSiAl for Tuball nanotubes has unlimited scaling potential and makes the widespread use of single-wall carbon nanotubes (CNT) economically viable.

**The mass-production process is able to preserve the CNTs' high quality (the iron content is less than 1%). The exceptional physical properties, nanometre dimensions and chemical universality of Tuball nanotubes result in a great leap forward in improving the key properties of composite materials, such as mechanical strength and electrical conductivity.**

**Unlike conventional additives such as multi-wall carbon nanotubes, carbon fibres and most types of carbon black, Tuball provides significant improvements in material properties upon the addition of just 0.01-0.1% by weight.**

To facilitate the effective incorporation of its CNT into materials, OCSiAl developed Tuball Matrix, a line of easy-to-use predispersed concentrates that are compatible with various industry-standard formulations.

To validate its R&D results, the company relies on the expertise of more than 20 independent global scientific centres, including Fraunhofer, Leibniz, DIK and TUHH in Germany, SAIT in Korea, Moscow State University in Russia, Bar-Ilan University in Israel and Rice University in the USA. OCSiAl partners with high-tech manufacturers and chemical companies throughout the world, including Lanxess in Europe, Grace Continental in Korea, Union Chemical and Haiyi in China and Kusumoto chemicals in Japan.

To improve the performance of composite materials, OCSiAl also partners with Büfa Composite Systems, who is developing unique high-performance resin formulations with Tuball nanotubes.

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**Category:** NDT & MONITORING

**Winner:** R-TECH Services Ltd. (UK) 

**Partners:** Pancom Ltd. (UK), TWI Technology Centre Wales (UK), Arcola Energy (UK) and Si-Plan Electronics Research Ltd. (UK)

**Name of Product or Process:** **Acoustic emission system for the assessment of hydrogen tanks for fuel cell vehicles**

**Description:**



R-TECH Services Ltd. and its partners developed a continuous monitoring system for detecting damage in Type III hydrogen storage vessels for hydrogen fuel cell vehicles.

**These vessels are manufactured from a filament-wound epoxy-matrix CFRP material with an aluminium liner and are designed for an operating pressure of 350 bar.**

The monitoring system is based on an acoustic emission (AE) technique, and is designed to be applied permanently to the vessel. It is interrogated during the vessel's fill cycle, when any progressive damage can be detected by the AE transducers. **This system can improve the safety of hydrogen fuel cell vehicles as well as consumer confidence in the technology.**

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**Category:** PROCESS

**Winner:** Textile For Life Co., Ltd. (South Korea)



**Name of Product or Process:** Industry 4.0 robotic braiding factory

**Description:**



T4L developed the world's first propeller shaft produced by CFRP braiding in 2015. Propeller shafts are automotive driving parts that require very high quality and productivity.

Through this project, Textile For Life Co., Ltd. applied IoT (Internet of Things), CAE, (Cyber Physical System) and Big-Data technology.

**The Industry 4.0 factory has been built, and the process and process control can be conducted in virtual space. This process is all possible in one factory, cooperating with others.**

**It allows quick production and quick product changes. Applications are numerous, including automotive parts, sports equipment, household goods, etc.** This project was supported by the Ministry of Trade, Industry & Energy (Korean Government), DYETEC, Gyeongsangbuk-do (Provincial Office) and Gyeongsan-City.

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**Railway sleepers using ultra-high-performance cementitious composites**  
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**Hybrid SMC technology for aircraft applications**

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**WIND ENERGY** – Arkema (France)

**Infusion thermoplastic resin for wind turbine blade manufacturing**

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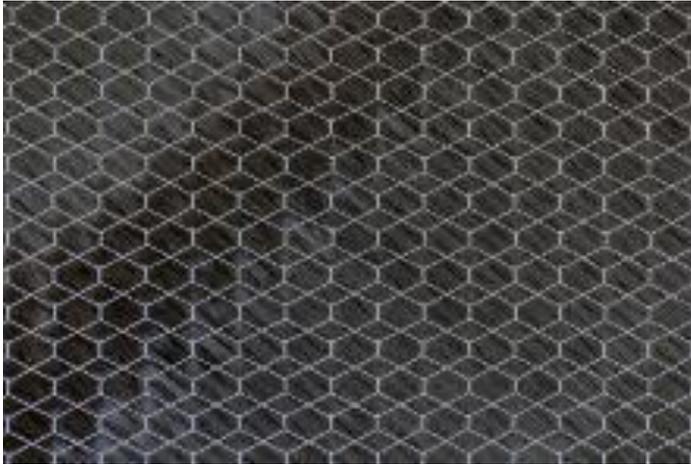
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**Thin-ply carbon NCF with visual stitching applied to an innovative windsurf board**

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**CONSTRUCTION** – Logelis (France)

**Composite sandwich panel for modular construction**

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**Carbon fibre/Kevlar hinge system**

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