Discover the 2009 JEC ASIA Innovation Awards Winners

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Edito

Innovation is a winning strategy!

Ever increasingly, businesses are facing change like never before. Numerous driving forces to this change include a rapidly expanding marketplace and increasing competition, diversity amongst consumers, and availability to new forms of technology. Creativity and innovation are undoubtedly key to success!

The 2009 JEC Asia Innovations bring ground-breaking improvements in new materials and processes with the following distinctions for new materials:

- nanotech composites blended with organic nano-particles for a one-piece "jointless" ice hockey stick with the right combination of opposing features – flex, band, stiffness and whip,
- loaded surface tissues with increased anti-flame-smoke-toxicity qualities particularly for mass transit and building applications,
- polyester concrete made from selected fine sand hardened by unsaturated polyester resin for production of pipes with excellent corrosion resistance and earthquake-proof properties,
- vegetal fibers or matrix such as renewable cellulose reinforcement for a brand new environment-friendly surfboard.

Concerning thermoplastics or thermosets processes:

- a new technique of laser-assisted thermoplastic tape placement enabling the fully automatic production of light-weight components for the aerospace industry,
- a new cost-effective application for radio telescopes which clearly demonstrates the potential of composite materials for the construction of radio antennas in the size range of 10 m to 15 m,
- an application for wholly new-designed rail insulators for the airport rail lines connecting airports to downtown,
- a new winding process for non axi-symmetric profiles with integral-end dome winding for tankers,
- an application featuring special hulls made entirely out of carbon and glass fibers composites for ultra-fast interceptor boats.

Discover the 2009 composite innovations from all our winners and finalists. Together, we would like to thank them for inspiring and leading change throughout the composite industry.

Frédérique Mutel,
President and CEO
JEC

This top-level competition for Innovation is a focus of attention in the international composite market. It is supported by major companies and trade magazines in the industry that are committed to the development of composite innovation.
We would like to thank all our faithful sponsors and partners.

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AVIATION WEEK

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Why compete?

JEC Composites'role in detecting and promoting innovation has been established over 12 editions of the JEC Composites Innovation Awards programme, honouring innovative products and processes from all aspects of the global composites industry.

Created in 1998, the goals of this top-level innovation programme are to:

- identify, promote, and reward the most innovative composite solutions worldwide;
- encourage companies that are involved in composite innovation along with their partners, and also enhance their public exposure;
- contribute to the advancement of the composite industry.

There are multiple benefits for the innovations that are chosen.
JEC Composites' comprehensive communication plan includes press releases, magazine articles and website content on the programme and its entries. The number of our press partners is growing, and international trade magazines give broad coverage of the programme. JEC Composites networks with **1,500 trade magazines worldwide** – we generally spot more than a hundred articles about the innovations each year.

All in all, the companies chosen and their partners benefit from:
- greater prominence on the international scene;
- access to business opportunities and potential partners;
- international recognition and greater public exposure;
- business growth;
- customer confidence.

The JEC Composites Magazine, JEC Gazette and the two JEC e-letters actively support the programme by publishing full reports on finalists and winners.

5 Selection criterias

In the Innovation programme, a composite innovation is defined as a new composite product or process - or a new application in the composite sector – that creates value and meets the following criteria:

- Technical excellence
- Chain of partners
- Market openings
- Benefits for end-users
- Originality

A Worldwide competition

Created in 1998, JEC Innovation Programme is a worldwide competition including 5 programmes:

- Paris, during JEC Show Paris
- Singapore, during JEC Show Asia
- Shanghai in partnership with China Composites Expo
- Mumbai in partnership with the FRP Institute of India
- The JEC Environment Students Award with SAMPE

The 2009 Jury

The 2009 jury is composed of 14 international composites experts from different users sectors.

Alan CHEN (TAIWAN)
Topkey Corporation
Alan Chen is general manager of Topkey Corporation and board director of the SAMPE Taiwan Chapter. Topkey Corporation is a world-leading carbon composite manufacturer that collaborates with customers to develop high-tech composite applications worldwide, and has been consistently delivering its unique blend of cutting-edge composite technologies to the tennis, helmet, bike, medical and aviation industries. With more than 20 years of working experience in the composite sports & leisure industry, Alan Chen employs innovative design and manufacturing processes, and efficient supply chain management to support demand for carbon-fibre products, with a focus on customer satisfaction.

Ebrahim GHAVAMSHAHIDI (UNITED KINGDOM)
Umeco Composites
Ebrahim Ghavamshahidi joined Advanced Composites Group Ltd. (ACG), part of the Composites Division of Umeco plc, as senior composite design engineer in 1986. Now ACG's Group technical director, Ebby has witnessed significant growth in the Group's product portfolio, and also in its standing as custom epoxy prepreg manufacturer and leading technology provider to major companies across all market sectors. Ebby, who holds BSc and MSc degrees in Mechanical Engineering, has a passion for composites in general, particularly so when it comes to the potential that current technological advancements promise for future applications. He is particularly motivated to help those with the enthusiasm to push boundaries and develop new technologies to realize their hidden potential. Ebby's career includes a period as structural composite design engineer in aerospace and defence, sectors that the Group now actively serves as an advanced composite materials manufacturer.

Peizhi GU (CHINA)
Composites Group Corp
Peizhi Gu is senior consultant for the China Composites Group Corp., where she has been working as Vice Chief Engineer. She is now mainly involved in international cooperation projects. Before joining CCGC, Mrs. Peizhi Gu worked on research projects related to advanced ceramic-matrix composite materials and industrialization at both the China Building Material Academy and the Shangdong Research & Design Institute for Industrial Ceramics. During this time, she focused on material processing and the relationship between processing, mechanical behaviour and the microstructure of materials.

Frēdērique MUTEL (FRANCE)
JEC
Frēdērique Mutel is President and CEO of JEC Group. With previous experience in international relations and managing jobs in industry and IT management, she conducted a business development based on both combination of information services and events organization on a worldwide level. She received the Legion of Honor in 1999 for her contribution to French Trade.

Drew MYERS (AUSTRALIA)
Quickstep
Drew Myers was appointed Chief Operating Officer (COO) for Quickstep Holdings in January 2007. He is responsible for the daily management of Quickstep's Australian business and the ongoing delivery of the Company's unique fluid-based composites curing technology into key target markets. Mr Myers has over 12 years' experience in international composite applications, having worked as a specialist composite consultant to Airbus UK, in connection with design, certification and manufacturing aspects of the A350 Airbus wing programme. Between 1996 and 2003, he was directly employed by Airbus as product engineering leader for the A330/A340 wing structure, team leader for the A340-500/600 composite wing leading-edge design and build, and other jobs. He also spent two years as head of Composite Production Engineering with the Red Bull Racing F1 Team (formerly Jaguar Racing Formula 1 Team) from 2003 to 2005, where he was responsible for generating and implementing manufacturing procedures and process improvements for automotive composite applications.

Kanemasa NOMAGUCHI (JAPAN)
JRPS International Exchanging Committee
Kanemasa Nomaguchi is a board member of JRPS Tokyo, Chairman of the International Exchanging Committee and the President of PLA Osaka since 2002. He has widely researched materials, processing and application technologies for composites. He has also organized FRP recycling systems and studied strategic marketing programmes in connection with businesses in advanced composites.

Hariharan PV's (INDIA)
Agro-Biogenics
Hariharan PV's has been Chief Mentor & Promoter of Agro-Biogenics since June 2008. Agro-Biogenics aim to be the facilitators for generating wealth through renewable resources conversions (for Alternate Energy and Engineering Materials). This would be made possible through the New Business of Sustainability Engineered Projects; in doing so, we shall also propagate the concept of Self Regenerative Recycling (SRR), reducing the negative impacts on the environment; we shall also strive to relocate all industry/ economic activities to be in the dilapidated villages of the less-developed countries of the world (where the world's poorest 3, 500 million people now live); and in all our businesses we shall involve the local village level people, utilizing local material resources, enhancing and modernizing local/ traditional wisdom, always answering local needs, first. Prior to this experience, Hariharan PV's was President Agro-Resources Technologies (8 years) and CEO of Polymer Products Company (12 years). Hariharan PV's is graduated from National Institute of Technology Rourkela.

Murray SCOTT (AUSTRALIA)
CRC-ACS Composites

Professor Murray Scott has 30 years experience in the field of Aerospace and Composites Engineering, and has worked in both industry and academia, mainly in Australia, but also in Germany, Netherlands, UK and USA. He has made major contributions to the development of advanced composite materials and structures, particularly over the past 20 years, and has an outstanding record of achievement in research, teaching and professional activities at various levels. His many company and academic appointments are fitting recognition of his professional standing, as was his election in 2001 as President of the International Committee on Composite Materials (ICCM). Since 1994, he has represented Australia on the International Council of the Aeronautical Sciences (ICAS) and is now the chair or member of several ICAS committees. In his current CRC-ACS position, he is responsible for the leadership of 100 researchers across 35 organisations with a budget of AUD17 m per annum.

Dr. A.SELVAM (INDIA)
FRP Institute

Dr. A. Selvam holds a Masters degree in Materials Science from National Institute of Technology, Trichy, India, and a PhD degree in Composites from Indian Institute of Technology, Madras, India. He was manager of the R&D division of TVS Sundaram Brake Linings, India, involved in the development of various disc brake pad and brake lining formulations. He has expertise in process optimization, failure analysis, process and materials development. He has been the Executive Secretary of the Indian FRP Institute since 2005 and is involved in organizing FRP technology training programmes and conferences/exhibitions on composites in India.

Henry SHAN (TAIWAN)
Cell Power Co., Ltd.

Henry Shan is presently the Senior Officer in charge of export sales and assistant to the CEO. He has a professional experience of over 25 years in the export of electronic products and 4 years in overseas marketing research. He was invited to join Cell Power Co., Ltd. one and a half years ago. This private company created in 1980 is not only the leading technological industrial-class UPS manufacturer, but also the leading technological wind (and/or solar) power system company in Taïwan. Cell Power is Taïwan's only manufacturer that owns the required know-how to produce small VAWT 100% in-house. Its wind power system design is both efficient and eye-pleasing. It won a JEC Innovation Award in 2008.

Ravi SHRIVASTAVA (INDIA)
Kineco Pvt. Ltd.

Ravi Shrivastava is a mechanical engineering graduate from the Madhav Institute of Technology & Science (Gwalior, India), with a post-graduate diploma in Business Administration. He is presently General Manager for Marketing & Projects at Kineco Pvt. Ltd. (Goa, India), which is a multidimensional composite producer catering to diverse markets such as railway, automotive, chemicals, industry, medical diagnostics and advanced composites for aerospace applications. He has over 15 years of professional experience in marketing, product development and project management in the field of composites. He has worked on a number of composite development projects supported by TIFAC's Department of Science & Technology and Department of Scientific & Industrial Research (Ministry of Science & Technology, Government of India), in collaboration with various academic institutes such as the Indian Institute of Technology and R&D laboratories. He has contributed to the development of many new composite products like energy-efficient axial-flow fans, train fronts, a sky bus coach and specialized filament-wound components in glass and carbon composites for the very first time in India.

Srikanth NARASIMALU (SINGAPORE)
Vestas

Dr. Srikanth Narasimalu is the Technical Director in Vestas Technology R&D Singapore. Prior to joining Vestas, he was with ASM Technology Singapore and Tata Engineering taking key role in the Research and Development department. He received his first Masters in Design Engineering from the Indian Institute of Technology, Bombay, India. His second Masters is in Materials Engineering and his doctoral degree (PhD) is from the Department of Mechanical Engineering in the National University of Singapore (NUS). Dr. Narasimalu has published articles in more than 75 international journals and conferences, and his areas of technical interests are mechanics and design, simulation, and materials engineering. He is a member of ASME, ASM, ASPE, IEEE and MRS(S).

Tong-Earn TAY (SINGAPORE)
National University of Singapore

Tong-Earn Tay is a full Professor and Deputy Head (External Relations) at the Department of Mechanical Engineering at the National University of Singapore. He has a bachelor in mechanical engineering (First Class) and PhD in solid mechanics from the University of Melbourne, Australia. He has been involved in research and education in the field of progressive damage, fracture, repair, computational analysis of composite structures and multi-scale modelling for more than twenty years. He has authored more than 200 journal and conference publications, a regular reviewer for eight academic journals, and is on the board of editors for three international journals. He also serves as a member of the international scientific advisory panel of the International Conference on Composite Materials. He is a registered Professional Engineer in Singapore and has been a consultant to various companies.

Jung Seok KIM (KOREA)
Korea Railroad Research Institute

Jung Seok Kim is presently principal researcher at the Railroad Structure Research Department of the Korea Railroad Research Institute (Uiwang City, Korea). His current research interests are lightweight railway structures using composite materials, crack propagation in composite structures, and recycling of composite structures with thermoset resins. Regarding his research activities, he has authored more than 85 journal and conference publications. Jung Seok Kim graduated in Aerospace Engineering from the Han-kook Aviation University in GoYang, Korea, and in Aerospace Engineering at Kaist, Daejeon, Korea.

Environment and Recycling

Pure cellulose high-end boards for the windsurfing, surfing, kite boarding and wakeboarding markets

Cobra International Co., Ltd.

Partner: Porcher Industries (France)

Cobra International launches **a brand new environment-friendly surfboard**, using renewable Greenlite reinforcements developed by Porcher Industries. In this application, standard glass-fibre reinforcement is replaced with Greenlite material, a new generation of high-performance renewable reinforcement. The parts concerned are surfboards, windsurf boards, kite boards and wake boards. Greenlite uses **pure cellulose fibres to replace glass fibres**. The new material constitutes a significant advance, since the other bio-based solutions considered did not offer the required quality, reproducibility and strength.

Greenlite material is biodegradable and highly compatible with bio-based resins, making it suitable for the production of 100%-bio-based composites on a large scale. Greenlite reinforcements are already available in various styles at the industrial scale for a wide range of composite applications, including summer and winter boards.
The new material **is processed using standard equipment, with no modification of the existing technology**. The new reinforcement has a unique whiteness and a positive effect on final part surface quality, thus improving aspect and minimizing subsequent rework. The final surfboards offer excellent surface finish, no weight increase, and very good performance. The first surfboards made of Greenlite fabrics kindled considerable enthusiasm and excitement among surfers.

© Cobrainter

www.cobrainter.com

Other finalists in the Environment and Recycling category

- Rapid sun-light UV-curable prepregs presented by **Australian Composites Pty Ltd. (Australia)** with its partners LM GlasFibre (Denmark) and Cooperative Research Centre for Advanced Composite Structures Limited (Australia).
- Continuous pyrolysis process for the recovery of carbon fibre from carbon-fibre-reinforced composites presented **by Recycled Carbon Fibre Limited (United Kingdom)** with its partner the Boeing company (USA).
- A 'green floating' house. A full concept for living on water on a foundation of recycled waste (Polystyreen/RexwallTM), presented by **Studio Noach (United Kingdom)**.

Raw Materials

FireShield, a ground-breaking material endowing composites with high fire-resistant properties

Regina Glass Fibre Pty Ltd.

Partners: CRC-ACS (Australia) and Ampelite (Australia).

FireShield® is a chemically loaded surface tissue that can be added to any composite laminate during manufacture to provide fire-resistance. Using this product as a normal surface tissue, the manufacturer produces a fire-resistant laminate. When FireShield® is used as the exterior ply in a composite laminate, the halogen-free fire-retardant chemical is placed just beneath the surface, where it is most needed. This approach to providing fire resistance does not require any special fire-retardant resins, and thus allows standard laminating resins to be used to manufacture composites that meet international fire standards. When exposed to flame, FireShield® produces a well-bonded charred layer on the surface of the product.
Manufacturers do not need to modify processes or train staff in order to produce composite structures that meet international standards for flame, smoke and toxic gas emission. They can use their normal manufacturing processes and resins. This **opens the door to companies of all sizes to participate in the fire-protection field without further capital investment**. In most cases, laminate cost is lower than for alternative ways of achieving the same degree of fire protection.

With increased emphasis on flame, smoke and toxicity performance of composite structural materials, particularly for mass transit and building applications, the market potential is seen to be substantial.

© Reginaglass

www.reginaglass.com.au/Fireshield.php

Other finalists in the Raw Materials category

- A novel structural core composite materials for components of the auxetic type, presented by **Chismatech (Italy)** with its partner University of Catania (Italy).
- Reinforced composite rebar presented by **EG Intellectural Asset Creative Development Co Ltd. (Taïwan)** with its partner Rockey Ho (Taïwan).
- Lamilux's heatable GRP presented by **Lamilux Heinrich Strunz GmbH (Germany)** with its partners Frenzelit (Germany) and Stadur (Germany).

Process

Design and process development of non axi-symmetric four-axis integral filament winding of double-'D'-shaped, all-composite road tankers

Modern Engineering Plastics Pvt, Ltd. MEPPL

Partners: NGN Composites (India), CNC Technicthes Pvt. Ltd. (India), Crescent Consultants (UK) and TIFAC Govt. of India

Road tankers are used all over the world for transportation of water, edible oil, milk, chemicals and petroleum products. Traditionally, road tankers have a steel or aluminium body, with or without rubber lining inside. Metallic tankers are heavier with 12 to 15% of the liquid they carry and the rubber lining requires frequent repair and relining every four years. **Unlike pressure vessels, road tankers for transportation of liquids under gravity are made of double-'D'-shaped cross-sectional profiles in order to keep the overall centre of gravity low for better stability and vehicle road holding**. No winding process for such non axi-symmetric profiles with integral-end dome winding has been developed so far. **This innovation is intended for the filament winding of such tankers**.

These composite tankers are more resistant to water and many chemicals. Their high strength-to-weight ratio and stiffness-to-weight ratio make them lighter and long lasting. **They offer 45% weight saving over a steel tanker**. The jointless winding of shell in an automated machine makes production faster and the product stronger. **Two tankers can be made in a day vs. several days for steel. A factor of safety of six or above is guaranteed without any resin leakage**.

www.modernengineeringplastics.com

© Modernengineeringplastics

Other finalists in the Process category

- A radius composite materials with innovative heat-directed properties presented by **Hassan Associates Co., Ltd. (Japan)** with its partners Japan Aerospace Exploration Agency (JAXA) (Japan) and Kyoto Institute of Technology (KIT) (Japan).
- A new kind of continuous-filament-winding machine for pipe production presented **by Qingdao Longtech Machinery Co, Ltd. (China)** with its partner Qingdao Deyili Pipe Co, Ltd. (China).
- Use of a new textile technology to produce fabrics with curved or annular structure in accordance with the shape requirements of composite products presented by **Tianjin Polytechnical University Textile Institute (China)**.

Automation

The laser-assisted thermoplastic tape placement process

Fraunhofer IPT

Partners: Suprem SA (Switzerland) and Diehl Aircabin GmbH (Germany)

The new technique of laser-assisted thermoplastic tape placement which has been developed by the research consortium enables **the fully automatic production of light-weight components from filament-reinforced plastics**. Such components are required, for example, by the aerospace industry for horizontal stabilizers and fuselages and by other industries as well.

The newly designed process delivers substantially **higher processing speeds** (i.e. shorter production cycles) and requires a substantially smaller energy input during the manufacturing process than the conventional duroplastic tape placement technique which is currently used to produce these components. It allows the manufacturer, for example, to **dispense with the hot-setting process**, required to harden the currently used thermosets, which incurs high investment and process costs, because of its high energy consumption over several hours.

The breakthrough was made possible by some key contributions from the tape manufacturers Suprem SA who optimized their tape production processes to match the requirements posed by the laser-assisted tape placement technology, enabling the company to supply continuously improved tapes. The Fraunhofer IPT played the key role in the development project, having designed, developed and constructed the facility as well as the methods for the process analysis and process development and having assumed the responsibility of managing and coordinating the project. A vital contribution to the increases in component quality was provided by Diehl Aircabin who had provided real component specifications and verified these by subjecting component samples to technical inspections.

www.ipt.fraunhofer.de

Other finalists in the Automation category

- A precision injection pressure control for mould filling presented **by Magnum Venus Plastech (USA)**.
- New Olmar generation autoclaves presented by **Olmar (Spain)** with its partner TC Industrial (Spain).

Aerospace

Composite Applications for Radio Telescopes (CART) project

National Research Council of Canada – Herzberg Institute of Astrophysics' (HIA) Dominion Radio Astrophysical Observatory (DRAO) – (Canada)

Partner: Profile Composites Inc. (Canada)

The Composite Applications for Radio Telescopes (CART) project is an ongoing effort to investigate the application of composite materials to radio telescope structures to provide a cost-effective collecting area for the Square Kilometer Array (SKA). **The result of this effort, the CART Mk 2 reflector, clearly demonstrates the potential of composite materials for the construction of radio antennas in the size range of 10 m to 15 m**.
The CART project research focuses very specifically on the technology development for the SKA, which will require several thousand 12-m class reflectors to be fabricated over a period of several years. Space communication ground arrays are another potential application where a number of reflector antennas are required.
The key benefit of CART technology reflectors is to make a high-performance yet cost-effective collecting area for the SKA possible, thanks to quantity production manufacturing techniques, high stiffness/lightweight structure, thermal stability, repeatable surface accuracy.

www.nrc-cnrc.gc.ca

© National Research Council of Canada

Other finalist in the Aerospace category

■ Local metal hybridization: the tendons of high-performance composite parts presented by **German Aerospace Center, Institute of Composite Structures and Adaptive Systems (Germany)** with its partners INEGI - Instituto de Engenharia Mecânica e Gestão Industrial (Spain) and EADS CASA Espacio (Spain).

Building & Construction

FRPM pipes for sewage system

Kurimoto,Ltd.

Partner: National Institute for Rural Engineering (Japan)

The FRPM pipes consist of a layer of high-strength glass fibres wound in the circumferential and axial directions by the filament winding process and hardened by thermo-setting unsaturated polyester resin. The included resin mortar is a polyester concrete **made from selected fine sand hardened by unsaturated polyester resin, having a compressive strength several times as high as an ordinary cement concrete**.
These FRPM pipes have **such excellent corrosion resistance properties that they can serve as sewage pipes for a long time**, whereas concrete sewage pipes are corroded by the highly acid environment in sewage systems. FRPM pipes have **such excellent earthquake-proof properties that they do not crack** even in case of strong earthquake. These flexible pipes can adjust to ground displacement, due to the flexibility and elasticity of joints.
The strength of FRPM pipes is great enough to protect them from internal and external pressure. Therefore, they don't require any special foundation, regardless of ground depth, deep or shallow. Superior dimensional precision at joints and an original rubber ring design guarantee outstanding water tightness, with no risk of leakage or external injuries.
FRPM pipes are substituted for steel pipes and concrete pipes to reduce costs and to prolong the system's service life. The applications of FRPM pipes are the following: sewage, jacking pipes, water for irrigation, tube well casing & screen, protection for power & communication cables.

www.kurimoto.co.jp

©Kurimoto

Other finalist in the Building & Construction category

■ Bamboo composite pole presented by **Mahindra Composites (India)** with internal teams to develop the winding machine, end castings, connectors and applications.

Two winners come first equal

An all carbon hull for Damen Shipyards DI 1102 Interceptor boats.

DK Composites

Partner: Damen Shipyards Gorinchem (The Netherlands)

The Damen Interceptors 1102 are a new generation of ultra-fast boats featuring special hulls made entirely out of carbon and glass fibre composites. These boats can reach operating speeds of 60 knots, are highly manoeuvrable, and best suited for maritime law enforcement operations. The need to protect the world against smugglers and other undesirable elements at sea has generated a growing demand for interception boats. The fast-moving Damen Interceptor 1102 is Damen's response to this demand.

The structural design uses advanced carbon and glass composites. The Interceptor **has passed a stringent set of tests with flying colours**. The results were excellent and show just how solid the Damen Interceptor 1102 is. The Damen Interceptor 1102 **is a small, lightweight craft, which makes it inexpensive not only in terms of the purchase price, but also in terms of fuel consumption. It combines reliable technology with good seagoing behaviour and high speeds. It's ideal for intercepting fast-moving targets**.

Having heard of the company's reputation for fabricating high-quality composites hulls, Damen commissioned DK to build the first Damen Interceptor 1102 in 2007. The job was completed in the specified time and passed all sea tests conducted in Port Dickson, as well as harsh testing in the rough North Sea in Europe. In 2008, Damen awarded a contract to DK Composites Sdn Bhd for the building of four Damen Interceptors 1102 boats. This order concerns the first "production series". One of these can be used as demonstrator for other potential customers in other parts of the world. It is also hoped that the Malaysian Maritime Enforcement Agency will also test this boat for their interceptor operations in Malaysia.

www.dkcomposites.com

© DkComposites

A railway composite insulator

En-Liang Enterprise Co,.Ltd

Partner: Brecknell Willis & Co. Ltd. (Taiwan)

En-Liang has been working on railway insulators with Brecknell Willis & Co. Ltd. Taiwan (short name BW Taiwan) since 2000. **In 2008, En-Liang worked with BW Taiwan to develop a new insulator for Taiwan's Tao-Yuen Airport metro line which connects the airport to the Taipei area**. This time, En-Liang designed the insulator shape directly and developed a suitable material according to the customer's requirements.
Metro systems will be more and more popular in the future. **This special material and design process are perfect for meeting different environmental conditions and different transportation systems**.
The advantages of this insulator material (BMC/SMC) are high insulation strength and a substitute for ceramic insulators as well as high strength and a partial substitute for the metal support used for supporting the insulator. The insulator material is also perfect for outdoor insulation applications.
Ansys software was used to analyse whether the shape would be capable of withstanding these forces in order to prevent future failures when the mould is completed. The designed shape not only met the customer's requirements but also was compatible with the moulding conditions used. As a professional moulder, En-Liang knew how to mould a strong insulator when changing the design. As a result, the actual insulator mould and the moulding stage were a great success. **The BMC/SMC material was created specially for the railway insulator application. It is UL-V0 approved and qualified by the customer for outdoor applications**.

www.enliang.com.tw

© Enliang

Other finalists in the Transportation category

- "BUCCHUS" brand G-FRP/C-FRP car aero parts hand lay-up and/or L-RTM processed presented by **FRP Services & Company (Japan)** with its partner Fusso Trading Co.,Ltd. (Japan).
- Composite recreational mobile home and shelter systems presented by **Penguin Composites Pty Ltd (Australia)** with its partners Innovan Campers and Caravans (Austalia) and Attard Agency Pty Ltd (Australia).

Sport & Leisure

One-piece "jointless" composite ice hockey

Composites Busch SA (Switzerland)

Partners: Huntsman (China) and EPFL (Switzerland)

Ice-hockey players are always looking for the right combination of opposing features – flex, band, stiffness and whip. **The challenge is designing an ice-hockey stick that has good stick and blade slashing properties, as well as bending and torsion features**. The player is not only hitting the puck directly, he is sometimes hitting the ice. The energy stored during this shock needs to be released efficiently onto the puck, and this is where the one-piece "jointless" design brings full benefits. The energy is smoothly and accurately transferred through the stick to the blade and then to the puck with total control from the player, who always keeps close and direct contact with the puck. **Huntsman Advanced Materials provided the easy-to-process Araldite® NanoTech composite RTM system, blended with organic nano-particles that exhibit outstanding toughening effects**. EPFL independently quantified and validated the properties (toughness and resistance to impact and vibration).

Today, Busch is producing 5,500 hockey sticks a year (mainly custom sticks). The goal is to increase production by 25% to reach 7,000 sticks.

www.compositesbusch.ch

© Compositesbusch

Other finalists in the Sports and Leisure category

- Alpico ice-axe in three foldaway sections presented by Polynt SpA (Italy) with its partners Soluzioninventive Srl (Italy) and Aludesign SpA (Italy).
- CFS CarbonFibre stone to replace wood, aluminium, steel and concrete for almost any kind of application in mechanical engineering and the building sector with superior properties presented by TechnocarbonTechnologies (Germany) with its partner GCERM Foundation (Germany).

Over the past 12 years, the JEC Innovation Programme has involved 1,100 companies worldwide. 144 companies and 364 partners have been rewarded for the excellence of their composite innovations, including 72 Asian companies:

Among them are the following companies:

◆ AEROSPACE RESEARCH INSTITUTE OF MATERIALS AND PROCESSING TECHNOLOGY ◆ ADVANCED COMPOSITE PROGRAM (TIFAC) ◆ AEROSPACE RESEARCH INSTITUTE OF MATERIALS AND PROCESSING TECHNOLOGY◆ AGRO-RESOURCES TECHNOLOGIES ◆ AMPELITE AUSTALIA Pty Ltd ◆ AYRES COMPOSITE PANELS ◆ BEIJING BEI AN HE FRP PRODUCTS FACTORY ◆ BEIJING COMPOSITE MATERIAL Co. Ltd ◆ BEIJING FRP AUTO PART Corp. Ltd. ◆ BEIJING TBHY COMPOSITES INSTITUTE ◆ BOTER SPORTS EQUIPMENT COMPANY Ltd. USA (Co-exhibitor with SHENZHEN HUADA FRP PRODUCTS CO Ltd) ◆ BRECKNELL WILLIS & Co. Ltd ◆ CELL POWER Co. Ltd ◆ CHANGSHOU DONGNAN PLASTIC COMPANY Ltd. ◆ CHANGZHOU BAILONG 3-D COMPOSITE COMPANY Ltd. ◆ CHONGQING INTERNATIONAL COMPOSITES Co., Ltd. ◆ CHONGQING POLYCOMP INTERNATIONAL CORP ◆ CNC TECHNICS Pvt. Ltd ◆ COBRA INTERNATIONAL Co. Ltd ◆ CRC-ACS Ltd ◆ DALIAN MARITIME AFFAIRS UNIVERSITY ◆ DANYANG ZHONGYA GLASS FIBER COMPANY Ltd. ◆ DESUNNANO Co. Ltd ◆ DK COMPOSITES ◆ DONGRUAN PHILIPS MEDICAL EQUIPMENT SYSTEM CORP Ltd. ◆ DSM COMPOSITE RESINS AG ◆ EAST CHINA UNIVERSITY OF SCIENCE AND TECHNOLOGY ◆ EN-LIANG ENTERPRISE Co. Ltd ◆ EXLINK COMPOTECH (DONGGUAN) Co. Ltd ◆ FENG-CHIA UNIVERSITY ◆ FRP SERVICES & Co. Ltd ◆ FUJI CLEAN Co. Ltd ◆ GUANGZHOU SUNNY FRP CO LTD ◆ HANKUK-FIBER GLASS Co. Ltd ◆ HARBIN FRP INSTITUTE ◆ HARBIN INDUSTRY UNIVERSITY ◆ HAWKER ◆ DE HAVILLAND AEROSPACE PTY Co. Ltd ◆ HUNTSMANN ADVANCED MATERIALS ◆ INDIAN INSTITUTE OF TECHNOLOGY ◆ JIANGSU JIUDING NEW MATERIALS COMPANY Ltd ◆ JIANGSU SHUANGLIANG COMPOSITES MATERIAL Co. Ltd ◆ KINECO ◆ KOREA RAILROAD RESEARCH INSTITUTE ◆ KURIMOTO Ltd ◆ LIANYUNGANG ZHONGFU LIANZHONG COMPOSITES GROUP Co., Ltd. ◆ LIANYUNGANG ZHONGFU LIANZHONG COMPOSITES GROUP CORPORATION ◆ MARSHAL INDUSTRIAL CORP. ◆ MODERN ENGINEERING PLASTICS Pvt. Ltd (MEPPL) ◆ NATIONAL INSTITUTE FOR RURAL ENGINEERING ◆ NATIONAL NET WUHAN HIGH VOLTAGE INSTITUTE ◆ NATIONAL TSING HUA UNIVERSITY ◆ NGN COMPOSITES ◆ NORTHWESTERN POLYTECHNICAL UNIVERSITY – SHENZHEN RESEARCH INSTITUTE ◆ QINGDAO LONGTECH MACHINERY Co., Ltd ◆ REGINA GLASS FIBRE Pty Ltd ◆ RESEARCH, DESIGNS & STANDARDS ORGANIZATION (RDSO) ◆ SHANGHAI FRP RESEARCH INSTITUTE ◆ SHANGHAI RUSSIA AND GOLD BASALT FIBER Co. Ltd Of HENGDIAN GROUP ◆ SHENZHEN HAISIBI BOAT DEVELOPMENT COMPANY Ltd ◆ SHENZHEN HUADA FRP PRODUCTS Co. Ltd ◆ SHENZHEN TIGER COMPOSITE TECH COMPANY Ltd. ◆ SINOMATECH ◆ TAISHAN FIBER GLASS INC ◆ TECHNOLOGY INFORMATION FORECASTING AND ASSESSMENT COUNCIL (TIFAC) ◆ TEXLINK COMPOTECH(DONGGUAN) Co. Ltd ◆ TEXTILE COLLEGE OF DONGHUA UNIVERSITY OF SHANGHAI ◆ TUNG HSING TECHNOLOGY CORPORATION ◆ WUHAN UNIVERSITY OF TECHNOLOGY, SCHOOL OF MATERIALS SCIENCE AND ENGINEERING ◆ WUXI ANFEI ADVANCED FIBER MATERIALS TECHNOLOGIES, Ltd. ◆ XI'AN AEROSPACE COMPOSITE MATERIALS RESEARCH INSTITUTE ◆ XI'AN AEROSPACE COMPOSITES RESEARCH INSTITUTE ◆ XIAN SUPER-CYBER SCIENCE & TECH CORP Ltd

This top-level competition for Innovation is a focus of attention in the international composite market. It is supported by major companies and trade magazines in the industry that are committed to the development of composite innovation. We would like to thank all our sponsors and faithful partners.

Great advantages for the selected innovations: Past winners testify


© Profile Composites Inc

A&P Technology, winner of the 2009 JEC Paris Transportation Award

"As a supplier of state-of-the-art braided materials, A&P Technology is fortunate to forge partnerships with innovative, forward-thinking companies such as Profile Composites, the National Center for Manufacturing Sciences, Mag Cincinnati Automation, Bayer Material Sciences, and Toyota Engineering and Manufacturing. To be recognized by JEC with an Innovation Award for the development and rapid manufacture of high-pressure hydrogen storage tanks is truly an honour. The Innovation Award validates each company's leading role within the composite industry, and the internationally-recognized JEC Show provides us the opportunity to promote this role on the world stage. Thank you, JEC, for this opportunity and for continuing to support the success of the composite industry." **Pam Schneider, EVP.**

Cell Power Co., Ltd., winner of the 2008 JEC Asia Construction and Energy Award

"We think it is a great honour and inspiration to win the JEC Innovation Award. We added this fact to our presentation content to promote the image of our company and products – small vertical-axis wind turbines. Winning the JEC Innovation Award is a good record for our products. We do believe it will help better sell our product.
Henry Shan, Senior Officer, Export Sales Chief and the assistant to the CEO


© CELL POWER


© FUJI CLEAN CO, Ltd.

Fuji Clean, winner of the 2008 JEC Asia Environment and Recycling Award.

"The award we received for the Jokaso domestic wastewater treatment system was a great motivation for our staff, especially the R&D and overseas divisions. Efficient use of our water resources is a vital issue facing the world today. Our innovative technology, with its small-scale applications, environmentally-friendly utilization of bacteria, and potential for recycling of grey water, particularly drew the attention of developing countries thanks to this award. We are grateful for the international exposure and would like to use this publicity to make our technology available globally where it is most needed". **Toshiro Otowa, General Manager, Overseas Business Division**

Hankuk Fiber Co., LTD, (partner of Korea Railroad Research Institute), winner of the 2008 JEC Asia Transportation Award

"Winning the 2008 JEC Asia Innovation Award for one of our composite technologies was a great honour for Hankuk Fiber Co., Ltd. We develop composite vehicle bodies for the transportation sector, such as trains, buses, APMs, WIGs and tram bodies. Our 37 years of experience in composite materials and engineering contributed tremendously to the results in terms of structural lightweight and high performance. We are studying and investing not only in composite structure improvements but also in operation systems. We want to be recognized as a manufacturer of whole vehicles using as many cutting-edge composite structure bodies and parts as possible, while meeting our customer requirements as regards price, quality, performance, lightweight, environmental friendliness and A/S. "No future but for originality." **Se-hyen Cho, Managing Director**


© Korea Railroad Research Institute


© Institut für Verbundwerkstoffe

Institut fuer Verbundwerkstoffe GmbH, winner of the 2009 JEC Paris Process Award

"Not only aerospace, but also the automotive and construction sectors are looking for highly-efficient and fully-automated processes. This demand is satisfied through the development of an in situ consolidation process resulting in laminate properties at the level of autoclave-consolidated laminates by the Institut fuer Verbundwerkstoffe (IVW) in Kaiserslautern, Germany. To receive a JEC Innovation Award for this development is a great honour for the institute. It has had a very positive impact on IVW and furthered the worldwide recognition of our R&D work. Many of the contacts we made at our booth during the JEC show were thanks to the JEC award. IVW is proud to be the 2009 winner in the Process category together with our partner Airbus Deutschland GmbH".
Ralf Schledjewski, Group Leader Manufacturing Science, Institut fuer Verbundwerkstoffe GmbH.

Kineco, winner of the 2008 JEC Asia Special Mention Award

"Receiving the JEC Innovation Award for our filament-wound composite undercarriage water tank for passenger trains was a great recognition and honour for Kineco. This reaffirms the value of our innovative engineering development not only for our partners and customers, but also for the entire composite industry. The JEC award gives us the publicity and visibility we needed to develop our product globally, as we have indeed received requests from all over the world for similar lightweight undercarriage components".
Ravi Shrivastava, General Manager, Marketing & Projects


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OCV Reinforcements, winner of the 2009 JEC Paris Building and Construction Award

"We're thrilled with the JEC Award, especially as it is rewarding the joint development with our customer. This kind of custom-tailored solution is the key to our focus on delivering differentiated value to our customers. When our collaborative work can deliver a product that is not only more energy-efficient, but also greatly improves manufacturing and design flexibility while being recyclable, well, that's a powerful combination and a win-win situation for everyone."
Nicolas Bedouin – Sales and Marketing Leader Specialties.

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