

JISTES 2010 KYOTO

Japan International SAMPE Technical Seminar 2010 Kyoto

Final PROGRAM



July 15 Thursday & 16 Friday, 2010

DOSHISHA UNIVERSITY, Kyoto, Japan

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Main Theme

Dynamic Challenge for the Renovation of Processing of Advanced Composites.

1. **Date** : July 15th, Thursday and 16th, Friday 2010
2. **Venue** : Kanbaikan Hall , at the Doshisha University in Kyoto
3. **Lecturers to be invited** : From Japan 2, U.S.A. 2, Europe 6, Total 10.
4. **Table Top Exhibits.**

Tables are provided for showing brochures and samples enabling the attendees to understand the lectures, and for the exhibits of any composites relevant products.

5. Lectures and Titles.

From Japan

- **Energy saving strategy in transportation by using CFRP**
Prof. Jun Takahashi
The University of Tokyo
- **The Development of the new Lexus LFA's CFRP monocoque**
Mr. Nobuya Kawamura
Toyota Motor Corporation

From U. S. A.

- **Electromagnetic Design Considerations for Advanced Composites and Examples Thereof**
Mr. George Hansen
President, Conductive Composites Company
Composite materials, though mechanically robust, lack the electromagnetic properties of the metals that they displace. Historically, the reintroduction of electromagnetic properties to the composite is a secondary operation. This paper will describe materials and methods which can be used to engineer conductivity directly into or onto the composite itself. These methods provide savings in weight, time and labor, while providing integrated and durable lightweight solutions to the problem of electromagnetic management of composites.
Several real world example demonstrating these multi-functional technologies at work will be presented.
- **Advanced Composites Tooling - Its History and Future**

Mr. Willam J. Welychko
Director Advanced Composites,
Touch Stone Research Laboratory Ltd.

From Europe

• **Keynote Address : ‘Aircraft Structures in the Future’**

Prof. Adriaan Beukers

TU Delft, The Netherlands

In the 20th century mobility became an important part of life. Aircraft and cars have evolved for over 70 years, and the conventional solutions for further improvements are reaching the point of saturation. Since the fifties, aircraft efficiency improvements were mainly based on refinements in aerodynamics (15%) and propulsion (40%). Structures on the other hand (concepts, materials and manufacturing techniques), did not change all that much and relative weight reductions were annulled by comfort, safety and more systems. Even the latest developments in tools for analysis and design did not result in structure weight reduction, which might be an indication that a leap to novel materials and manufacturing techniques, a leap to new technologies, is the only way to achieve the necessary improvements. In this paper composite materials are presented as a solution to not only reduce structural weight, to a maximum of 12 percent operational empty weight, but also to reduce exploitation costs and emissions for a 30-year life span.

Even though, by today's pricing, fibre reinforced polymers are more expensive per kilogram than most metals, on a life time basis, operational cost can be reduced by a decrease in fuel consumption, maintenance and inspection costs and, last but not least, manufacturing cost, which leads to long term cost savings. Therefore an integral approach for structure development is discussed, from concepts and materials to downstream manufacturing techniques. The emphasis is on structure and material simplicity and, on the reduction of the number of production steps from suppliers to final construction.

• **Cost efficient assembly by welding of thermoplastic composites.**

Prof. Harald Bersee

TU Delft, The Netherlands

In the paper the potential of thermoplastic composite for cost efficient manufacturing of aircraft structures will be discussed. One of the advantages of thermoplastic composites is their ability to be welded.

Welding is a robust and fast assembly process offering cycle time and labour cost reduction. Two of the welding techniques are being investigated at the TU-Delft, namely resistance welding and ultra-sonic welding. Results on the static and dynamic tests of welded lap shear specimens will be presented.

- **Application of latest developments in fast processing techniques to production of highly contoured or hollow parts with TPFL[®] aligned discontinuous fibers thermoplastic materials.**

Mr. Oliver Thouron

Schappe Techniques, France

Due to short processing cycles, Thermoplastics materials are obviously considered when high production rates are needed. However, when using continuous fibers reinforcements, parts can not really be very complex, and wrinkles are appearing. Use of discontinuous fibers, allow to avoid these hurdles while keeping fibers aligned in accordance to designer wishes.

Schappe Techniques produces stretch broken fibers for textile application since end of the 19th Century. This technology has also been developed for reinforcement fibers such as Carbon, Glass or Aramide. TPFL[®] yarns are obtained by blending such discontinuous fibers with discontinuous thermoplastic polymer filaments.

Since fibers are discontinued, these materials are offering superior formability, while keeping porosity level extremely low and fibers aligned. And while discontinuous, mechanical properties are similar to the continuous materials ones.

However, in some cases limitations exist due to usual processing techniques. For example, bladders able to withstand temperatures above 300°C are extremely rare and very expensive. Recent developement in processing techniques, such as induction heating technique, allows solving this issue, fast processing limiting the thermal exposure of materials and so allows use of standard bladder for processing material such as PPS. Such fast heating technique also allows reduction of thermal exposure of fragile materials such as natural fiber, and so composites combining natural fiber and PA can be now easily processed, without performance drop.

- **Global concept for production RTM parts**

Mr. Henri-Pierre Hiblot

President, ISOJET, France

Mr. Loïc Lajarge

Calculation and Development Engineer,

Techni-Module Engineering (TME), France

Evolution of composites in the aerospace market fields is going very fast; technologies are in constant evolution. The resin injection way is more and more developed in all aircraft manufacturers and subcontractors. A lot of parts are now designed to be injected in RTM or infusion process. The approach needs to integrate a complete set of technical competences in a very short time. As a consequence, the know-how in this business field is a key point.

The technology needs now a global approach. The way of moulding can't be dissociated of the way of injecting the parts. More and more projects are now in production phase and suppose possible high productivity, software integration and high level of design and technology.

TECHNI-MODUL ENGINEERING is specialised in all moulding processes from development phase to the realisation of turn-key units for production.

ISOJET EQUIPEMENTS has a high level of experience in injection units for RTM and / or INFUSION processes.

TECHNI-MODUL ENGINEERING and ISOJET have acquired, step by step, a very high and unique level of competences and references with key companies in Europe (AIRBUS, EADS, SAFRAN, DAHER).

In this presentation, realised equipments made for key customers will be presented.”

• **Continuous Compression Moulding (CCM) of Thermoplastic Composites - Latest developments**

Mr. Ulrich Speltz

Xperion AEROSPACE GmbH, Germany

In the last 5 years, continuous compression moulding technique finally has established for manufacture of flat panels (organic sheets) and shaped parts for industrial and automotive applications as well as for aircraft applications.

For aircraft components, high temperature thermoplastic composites, as C-PPS, PEEK, PEKK or PEI are already under serial production and CCM showed its capability to reduce fabrication costs for mass production of long, straight components receiving high performance properties at the same time.

To answer the demand of more complex shapes as C- and H-beams for aircraft industry, xperion developed a new generation of manufacturing equipment. Two machines, one for flat panels, one for complex shapes were installed in Avon Ohio.

The machines are equipped with the latest state of the art features. Both machines are able to produce in an isobar or isochor mode. This enables the machines to consolidate solid components as well as sandwich or foam based parts.

The presentation gives an overview about CCM technique, the achievements to date and the materials used for fabrication of high performance parts.

6. Program Schedule

7/15 (Thu)		7/16 (Fri)
10:30 – 10:40	Opening Address	Session Chair : Mr. Iizuka

		9:30 – 10:30	Mr. Oliver Thouron France
Session Chair : Mr. Tanaka		Session Chair : Mr. Yamane	
10:40 – 11:40	Prof. Jun Takanashi Japan	10:30 – 11:30	Mr. Nobuya Kawamura Japan
11:40 – 13:00	Lunch	11:30 – 13:00	Lunch
Session Chair : Mr. Sakatani		Session Chair : Mr. Matsuo	
13:00 – 14:00	Mr. George Hansen U. S. A.	13:00 – 14:00	Prof. Harald Bersee The Netherlands
14:00 – 15:00	Mr. Willam J. Welychko U. S. A.	14:00 – 15:00	Mr. Ulrich Speltz Germany
15:00 – 15:30	Coffee Break	15:00 – 15:30	Coffee Break
Session Chair : Mr. Matsui		Session Chair : Mr. Iizuka	
15:30 – 17:00	Mr. Henri-Pierre Hiblot and Mr. Loïc Lajarge France	15:30 – 16:30	Keynote Address Prof. Adriaan Beukers The Netherlands
17:30 – 19:30	Banquet at at SECOND HOUSE will (Kanbaikan 7F)	16:30 – 16:40	Closing Address
		18:00 – 20:30	Farewell Dinner party for lecturers

7/16 (Fri) Pre-Festival Evening, Gion Festival
7/17 (Sat) Gion Festival Parade



Evening Fest



Grand Parade

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SAMPE Japan Chapter

JISTES 2010 KYOTO Organizing Committee

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**Access to Kanbaikan Hall,
 DOSHISHA UNIVERSITY, Kyoto, Japan**



Kanbaikan Hall (22 in the map)

