

Limited seat
Leuven 2012 

Tuesday December 4, 2012
9:30am / 4:05pm

Novotel
Vuurkruisenlaan 4
3000 Leuven

FLAX AND HEMP FIBRES: A NATURAL SOLUTION FOR THE COMPOSITE INDUSTRY

High-performance operational green-chemistry solutions

- Flax and hemp fibres as reinforcement: a technical and ecological bonus
- Flax & hemp composites, a market reality
- Flax & hemp fibres: the industrial dynamics of an agricultural resource



With the testimony of:

- Boeing
- CELC
- Faurecia
- Ghent University
- Hochschule Bremen
- JEC Composites Magazine
- KU LEUVEN University
- NetComposites
- NPSP
- Oxylane
- PSA Peugeot Citroën

Edito



Education: one of the priority missions of JEC

Dear composites professional,

Composite materials are a fast-growing sector. This is why JEC, on the strength of its experience at both local and international level, and its in-depth knowledge of the markets and their stakeholders, aims to educate the market by means of its numerous recognized media along with programs of forums and conferences organized in Europe, Asia and the USA.

These programs allow you to:

- benefit from the strategic information required in order to remain competitive and find out about the latest developments,
- meet the professionals who matter, and who you could not approach without JEC,
- understand the challenges of tomorrow and feel more confident in defining your development strategies.

To help you prepare for the future, JEC offers you the benefits of its training expertise. For over fifty years, we have invested heavily in the USA and around the world in order to give you access to high-quality content (business intelligence, economic, technical and legal information). All year long, our in-house and external experts investigate the most significant innovations, those which drive forward the penetration of composites on the downstream markets.

This is why we are able, via our network of over 250,000 professionals, to select the companies and speakers most suited to addressing the topics that count today. Not to forget the involvement of universities, R&D centers and designers, who also provide contributions on subjects of prime importance, and whose involvement begins well upstream.

So why don't you too, by yourself or with your employees and/or colleagues who need to be informed and trained, take time out to attend our conferences in order to:

- expand your knowledge,
- develop synergies and create genuine networks on the North American composites market and all around.



Frédéric Reux
Media Director
& Editor-in-Chief

JEC composites conference in partnership with CELC



FLAX AND HEMP FIBRES: A NATURAL SOLUTION FOR THE COMPOSITE INDUSTRY

High-performance operational green-chemistry solutions

Whatever the composite application sector or the level of technical requirements, the composite industry is affected more and more by eco-design issues and the heightened focus on lowering the weight of mechanical parts. The advantages of flax and hemp reinforcements are already helping to improve the environmental footprint of composites and lower weight – in particular in the automotive and leisure sectors, where there is positive feedback on the use of these two European natural fibres. However, it is crucial to assess the scientific and technical performance of flax and hemp in order to make full use of all the innovation potential. These fibres constitute available resources, and we are gradually learning more about them and finding uses for them. The range of their capabilities is reviewed in a new reference book that was published this year: *Flax & Hemp Fibres: a natural solution for the composite industry*. The goal of this Technical Day is to shed more light on the characteristics addressed in that scientific publication, from some more pragmatic industrial angles:

- How do identified flax and hemp properties compare with other reinforcement fibres?
- Which types of flax and hemp semi-finished products to use for which type of application?
- What are the guarantees in terms of quality and quantity that proven resources will be available?
- What crucial flax and hemp innovations are needed to prepare for future regulations?

This day will provide an opportunity to meet with the experts from the CELC's European Scientific Committee - CSE, which possesses advanced expertise on the mechanical properties of flax and hemp. In parallel with their deeper assessment, feedback from various manufacturers will help to address the structural realities and perspectives facing a European agro-industrial industry that operates on the open-innovation principle.



Ignas Verpoest, Professor
Dr. Ir. Ir KU LEUVEN
& President of the European
Scientific Committee of CELC



Flax and hemp fibres: a natural solution for the composite industry.


High-performance operational green-chemistry solutions

Key focus

- Flax and hemp fibres as reinforcement: a technical and ecological bonus
- Flax & hemp composites, a market reality
- Flax & hemp fibres: the industrial dynamics of an agricultural resource

MODERATOR

KU LEUVEN University



Ignas Verpoest
Professor
Dr. Ir. Ir KU LEUVEN
& President of the
European Scientific
Committee of CELC

🕒 9:30am - 9:50am
🍷 Welcome

🕒 9:50am - 10:10am Introduction

🕒 10:10am - 10:30am

Composite market and opportunities for the natural fibres

JEC COMPOSITES MAGAZINE



Frédéric Reux
Chief Editor

Flax & Hemp fibres as reinforcement: a technical and ecological bonus

🕒 10:30am - 10:55am


Properties of fibres and mechanical properties of flax and hemp composites

HOCHSCHULE BREMEN



Jörg Müssig
Professor of Biological Materials at the Hochschule Bremen
▶ Expert of the European Scientific Committee of CELC

KU LEUVEN UNIVERSITY



Ignas Verpoest
Professor Dr. Ir. Ir at the Department of Metallurgy and Materials Engineering –
▶ President of the European Scientific Committee of CELC

🍷 10:55am - 11:20am Break

Flax & Hemp composites: a market reality

🕒 11:20am - 11:40am

The range of marketed semi-finished products/preforms, how they are industrialised, and their multisector applications

KU LEUVEN UNIVERSITY



Joris Baets
Dr. Ir at the Department of Metallurgy and Materials Engineering
▶ Coordinator of the European Scientific Committee of CELC

CELC



Julie Pariset
Coordinator of the Technical Section

🕒 11:40am - 12:05pm

A bio based composites solution

NPSP




Willem Böttger
Director Innovation NPSP
ComposietenAmsterdam Chamber of CommerceHaarlem, The Netherlands

🕒 12:05pm - 12:30pm

The vision of the automotive industry: the process of developing semi-finished products

PSA PEUGEOT CITROËN



Frédéric Rousseau
Research and Engineering Department, Innovation project manager

FAURECIA



Valérie Marcel
Innovation Leader Acoustics & Soft Trim Division Research and Innovation Department

🍽️ 12:30pm - 2:00pm Lunch

🕒 2:00pm - 2:25pm

Biobuild project, Applications of natural fibre composites in construction

NETCOMPOSITES



Geoff Foulds
Development Engineer

🕒 2:25pm - 2:50pm

New generation of materials for the Aerospace industry

BOEING




Pedro P. Martin
Ph. D. Material Scientist at the Materials & Fuel Cells Department Boeing Research & Technology Europe, S.L.U.

Flax & Hemp fibres: the industrial dynamic of an agricultural resource

🕒 2:50pm - 3:15pm

Availability of flax and hemp for use as materials - road map of the research.

CELC



Bert Wolfcarius
Vice-President of the Technical Section

LABORATORY OF WOOD TECHNOLOGY AT GHENT UNIVERSITY




Joris Van Acker
Professor
▶ Expert of the European Scientific Committee of CELC

🍷 3:15pm - 3:35pm Break

🕒 3:35pm - 4:00pm

Managerial issues are driven by innovation transfer

OXYLANE



Guillaume Lenclen
Composite component engineer

🕒 4:00pm - 4:05pm Conclusion

CELC



Frédéric Douchy
Président

FLAX AND HEMP FIBRES: A NATURAL SOLUTION FOR THE COMPOSITE INDUSTRY

- ▶ 215 pages
- ▶ Printed version



80.57€ (TVA excl.)

Available at

<http://www.jeccomposites.com/shop/all>

The industrial sectors that use non-renewable fibres have undertaken an eco-design initiative. Having the structure to meet this new industrial need, the CELC Technical Section collaborated with its European scientific committee CSE to produce the first scientific work on natural fibre composite solutions, "Flax and Hemp fibres: a natural solution for the composite industry".

This new technical publication is the result of several years of research by the CELC's European Scientific Committee - CSE, backed up by the organised production/distribution chain and increasingly productive R&D efforts. It promotes the choice of flax and hemp fibres within the framework of an effective eco-design initiative and calls attention to the importance of an open-innovation approach to meet the needs of the industry over the medium and long term.

This new English-language reference work (200 pages), studies the mechanical and specific properties of the flax and hemp used in polymer reinforcement and assesses their major environmental advantages. The objective: help advance knowledge on fibres and preforms (UDs, fabrics, non crimp fabrics, mats, prepregs, compounds, etc.) and win over new industrial segments.

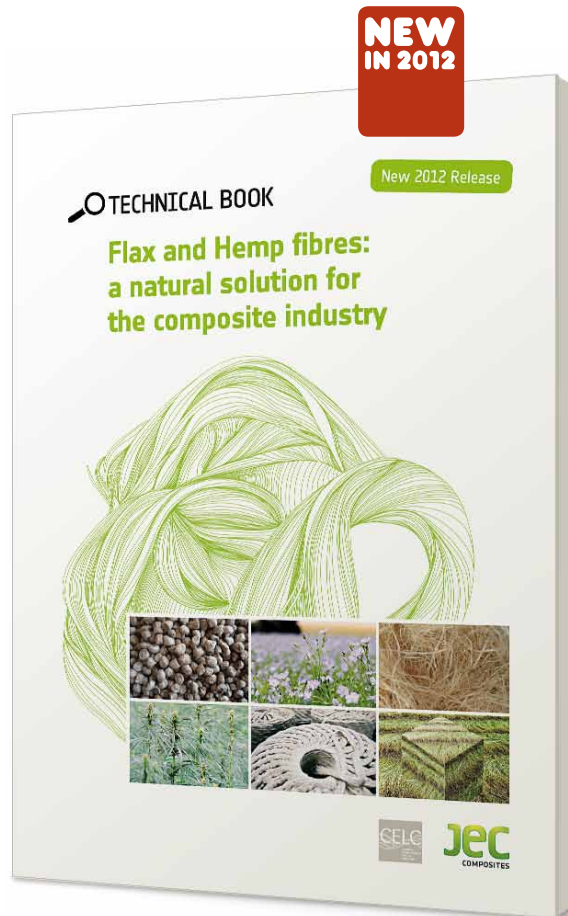
The studies are put into perspective with analyses of converting and manufacturing processes. Therefore, the publication is dedicated not only to R&D engineers who use fibres, but also to the

entire composite industrial chain. It contributes to provide a detailed review and lines of thinking on:

- the state of the art on natural flax and hemp fibres (identification of the complex structures);
- analysis of the mechanical performance of natural fibre reinforced composite materials (e.g. variation of specific properties as a function of the fibre processing method used, controlling biodegradability);
- assessment of the suitability of the different types of flax and hemp reinforcement for pro-

cessing as a function of the specific processes used (UDs, fabrics, non crimp fabrics, mats, prepregs, compounds, etc.);

- organizing a production/distribution chain to meet industry needs over the medium and long term;
- developing industrial technologies for converting plant fibres into preforms that meet the requirements of the composite industry;
- the scope of effective uses and the prospects for potential industrial applications.





THE 10 EXPERTS OF THE EUROPEAN SCIENTIFIC COMMITTEE OF CELC

BELGIUM



Professor Dr. Ir. **Ignaas Verpoest** started the polymer composites research at the Department of Metallurgy and Materials Engineering of the Katholieke Universiteit Leuven in 1982. As a full professor (since 1991) he is coordinating the Composite Materials Group, consisting of 10 postdoc and project researchers and 25 PhD-students, working in research areas like textile based and nano-engineered composites, natural fibre composites and process and product development for composites. Prof. Verpoest was President of the European Society for Composite Materials (ESCM) and of the International Committee on Composite Materials (ICCM). He serves now as President of the European Scientific Committee of CELC.



Joris Baets is Postdoctoral researcher at KU Leuven, Department of Metallurgy and Materials Engineering. He is also the coordinator of the CELC's European Scientific Committee, and is working on the use of flax and hemp fibres in composites, the optimisation of preforms made of these fibres, and the search for potential applications.



Professor **Joris Van acker** is head of the Laboratory of Wood Technology at Ghent University. His team is active in the anatomical and chemical study of natural fibres and their chemical (pre)treatment. Further research includes moisture dynamics and biological durability of natural fibre composites.

DENMARK



Hans Lilholt is Chief Scientist at the Materials Research Division, Risø DTU, Denmark. His research areas include composite materials based on metals and polymers with inorganic, organic and natural fibres; mechanical properties and microstructures of metals and composites; process technology and fabrication of composite materials and components; and composite materials based on renewable resources, cellulose fibres and biopolymers.

FINLAND



Mark Hugues is Professor of Wood Technology and head of the Wood Material Technology group at the Department of Forest Products Technology, Aalto School of Chemical Technology. His current work focuses on lignocellulosic fibre reinforced composites, with emphasis on fibre-matrix interactions, material behaviour and fibre modification.

FRANCE



Christophe Baley is Professor at the University of Bretagne Sud, LIMATB (materials engineering laboratory of Bretagne), at Lorient, France. Since 1991, he has been working on natural fibre reinforced polymers, specifically those with an organic matrix. He studies the mechanisms of plant fibre reinforcement of polymers.



Peter Davies is Research Engineer at the French Ocean Research Institute IFREMER in the Materials and Structures group, located in Brest, France. His activities are centred on the mechanical behaviour and durability of fibres, composites and adhesives in a marine environment.



Moussa Gomina is Research Scientist for the CNRS Crismat Laboratory at the national school of engineering Ensicaen in France. He works on the development of composite materials based on ceramics and biopolymers with synthetic or ligno-cellulosic fibres; functional materials (superconducting and thermoelectric ceramic oxides); and microstructural analysis and correlation with thermomechanical properties.

GERMANY



Since 2007 **Jörg Müssig** is Professor of Biological Materials at the Hochschule Bremen - University of Applied Sciences, Bremen, Germany. He obtained his degree in Mechanical Engineering at the University in Duisburg, Germany in 1995 and his doctorate from Bremen University in 2001. After graduating in 1995 he joined the Faserinstitut Bremen e.V. – FIBRE – where, between 2001 and 2007, he was the leader of the department 'Bio-based Materials/Sustainability' till 2007. From 2004 till 2009 he was an appointed member of The Young Academy, Berlin, Germany. His main current research topics are the development of concepts for sustainable materials, bio-inspired materials, natural fibres & natural fibre composites as well as adhesion & interphases.



Gerhard Ziegmann is Professor Dr. Ir at the Institute for Polymer Materials and Plastics Processing, Clausthal University of Technology, in Germany. He works on natural and man-made fibre composites and the surface modification and processing of composites.

www.mastersoflinen.com

Organizations informations

CELC



The European Confederation of Flax and Hemp (CELC) is the only European agro-industrial organization federating all the stages of production and transformation for flax & hemp. It is the privileged spokesperson for 10 000 European companies and oversees the fibre's development from plant to finished product. Created in 1951, the CELC incites reflection, market analyses, industry concertation and strategic orientations. With the creation of its Technical Pole and European Scientific Committee, the CELC helps its members move towards the future to discover new technical opportunities such as eco-construction and high-performing composite products.

Faurecia



Engineers and automotive component manufacturers, Faurecia has almost all the world's car manufacturers as customers, including those in the emerging economies of India, China and Korea. The Group supports its customers in an active approach of co-development, from the concept to the pre-production of each product. This synergy is based on a continuous programme of innovations that are, each year, better able to meet the demands of a growing respect for the environment.

Ghent University



Founded in 1817 as a Latin-speaking State University by William I, King of the Netherlands, Ghent University is a relatively young university. After its independence in 1830, the Belgian State was in charge of the administration of Ghent University; French was the new official academic language. In 1930 Ghent University became the first Dutch-speaking university in Belgium. The Decree of 1991 assigned great autonomy to the university. With a view to cooperation in research and scientific service, numerous research groups, centres and institutes have been founded over the years. Several of them are renowned worldwide, in various scientific disciplines such as biotechnology, aquaculture, microelectronics, history,... Today, after decades of uninterrupted growth, Ghent University is one of the leading institutions of higher education and research in the Low Countries. Ghent University is an open, committed and pluralistic university with a broad international perspective. Located in Flanders, the Dutch-speaking part of Belgium

and the cultural and economical heart of Europe, Ghent University is an active partner in national and international educational, scientific and industrial cooperation. Because it plays a leading role in the academic and scientific world, Ghent University attaches great interest to a transparent organization structure, a dynamic human resources policy, an active environmental policy, its support to spin-offs and other new initiatives.

JEC Composites Magazine



JEC Composites Magazine (8 numéros par an) s'adresse aux professionnels de l'industrie Odes composites, fournisseurs et transformateurs, et des secteurs utilisateurs (Aéronautique, Automobile, Naval, Transports Terrestres, Construction et BTP, Énergie, Sports et Loisirs...). JEC Composites magazine compte 32,000 abonnés (certifié BPA).

JEC Group



JEC is the largest composites industry organization in Europe and in the world with a network of 250,000 professionals. JEC represents, promotes and expands composites markets by providing global or local networking and information services. Through knowledge and networking, the JEC experts offer a comprehensive service package: the JEC publications – including strategic studies, technical books and the JEC Composites Magazine – the weekly international eLetter "World Market News" and the French eLetter JEC Info Composites. JEC also organizes JEC Europe Show in Paris – world and European leader, strongly supported by the industry and five times bigger than any other composites exhibition – JEC Asia in Singapore and JEC Americas in Boston, the Web Hub www.jeccomposites.com, the JEC Composites Conferences, Forums and Workshops (including I.C.S., the Innovative Composites Summit) in Paris, Singapore and Boston, and the JEC Innovation Awards program (Europe, Asia, America, India and China). The composites industry employs 550,000 professionals worldwide and generates 77 billion euros worth of business in 2011.

KU LEUVEN



The KU Leuven, founded in 1425, is the largest university of Belgium. Recognized for his research on European level, this university offers a broad range of programs in dutch and english. The university is driven by interdisciplinary research from high international level, in the university itself or its university hospitals. More than 6000 people from 120 countries are dedicated to research inspired by scientific curiosity. They are doing strategic research pushing the limits of science or application oriented research. The university has a broad network with external partners.

NetComposites



NetComposites was founded in 2001 with the specific objective of developing and exploiting new composite materials technologies. The company is active in materials development and web-based information, and is also well-known for its insight into emerging technologies in composites, having undertaken studies into the future of the industry for the UK Government, European Commission and private companies. The company is experienced in collaborative research projects, at European and national level, with successful, commercially exploitable outcomes, for example Recycle UK DTI project (€700K), Futureplas UK Technology Programme project (€900K), Combine UK Technology Programme (€1.25M) and Natex European FP7 project (€4.18M). They have been developing and moulding naturally-derived biocomposites for over 5 years and have developed materials for hand lay-up, vacuum infusion and compression moulding. They coordinated the development of enhanced performance flax-based composites, which has resulted in the commercialisation of a new biocomposite material, Biotex. They have also been active in the development of furan-based biocomposites for use in structural, fire-critical applications in sectors such as construction.

NPSP



our strength is composites

NPSP Compositen creates sustainable, fiber-reinforced plastics for construction,

design, mobility and industry. Together with its clients NPSP realize surprisingly beautiful solutions to technical problems. Aesthetic, technical and durable. NPSP is leading the way towards making composites more and more sustainable. NPSP are working in all areas to reduce the environmental impact as much as possible. They use natural raw materials and innovative production techniques that go beyond current legal requirements. NPSP make products that have a longer life cycle and that generate less waste at competitive prices. You can recognise NPSP's environmentally friendly composites by the Nabasco® label.

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PSA Peugeot Citroën



With two world renowned brands,

Peugeot and Citroën, the PSA Group is a leading player in the automotive world. As Europe's number two car manufacturer, the Group is dedicated to R&D in its research centers throughout the world, notably in the field of new power sources.

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