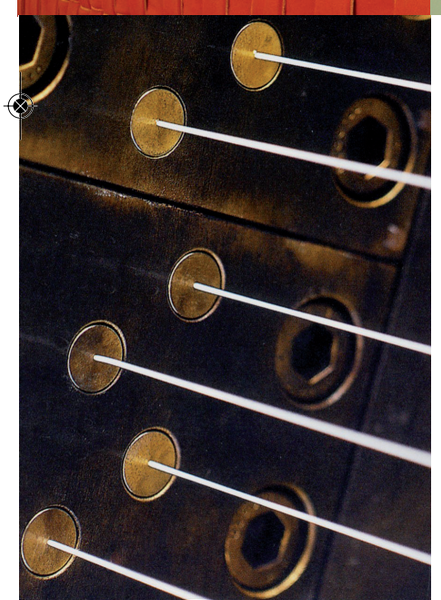
nano italtex 2009

NanoItalTex 2009

Innovazione e tecnologie emergenti per il tessile abbigliamento



10-11 novembre 2009

Grand Hotel Villa Torretta,
Via Milanese, 3 - Sesto San Giovanni (MI)

TEX CLUB TEC

Con il co-finanziamento del

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NanoItalTex 2009:

Innovazioni e tecnologie emergenti per il tessile abbigliamento

Innovation and emerging technologies for textile & clothing

10 -11 novembre 2009

Grand Hotel Villa Torretta – Sesto S.Giovanni - Milano

PROGRAMMA/*PROGRAMME*

10 novembre

9.00 -10.00 Registrazione/Registration

10.00-11.30 **Chair: Andrea Parodi, President of TexClubTec**

Competitività ed Innovazione: Strategie, Network e strumenti per le Aziende

Competitiveness and Innovation: Strategies, Network and tools for Companies

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L'Industria europea delle fibre sintetiche nel 2009/*The European man-made fibres industry in 2009: fighting recession, meeting the challenges*
Colin Purvis, CIRFS - Belgium

Biotex, nuova collaborazione della piattaforma tecnologica per il Tessile Abbigliamento: Tessili e Biotecnologie/*Biotex, a new cooperation initiative for the European Technology Platform for the future of Textile and Clothing: Textile and biotechnology*
Mauro Scalia, Euratex - Belgium

Il supporto all'innovazione attraverso la realizzazione di network tecnologici sul territorio/*Innovation support through the implementation of regional technological networks*
Eugenio Tettamanti, Unione Industriali di Como – Italy

Innovation Management: un approccio metodologico alla pianificazione e gestione dell'innovazione nelle Aziende/*Managing Innovation in Networks: a challenge for Technical textile products*
Thomas Fischer, DITV Denkendorf - Germany

Importanza delle conoscenze tecnologiche e commerciali in azienda: come salvaguardare le esistenti e acquisire le necessarie/*The importance of technological know how for companies: how to safeguard the existing knowledge and to acquire the necessary one*
Athanase Conargyris, IFTH - France

11.30-13.00 **Chair: Aldo Tempesti, TexClubTec**

Nano, smart e altre tecnologie: Prodotti innovativi da Aziende, Università e Centri Tecnologici
Nano, smart and other technologies: innovative products from companies, Universities and Technological centres

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Trattamenti avanzati Sol-Gel e plasma sui tessili/*Solplatex:advanced Sol-Gel and plasma treatments on textiles*
Lorenzo Bautista, Leitat - Spain

Dispositivi medicali auto-adattativi. La nuova generazione di tutori ortopedici/*Medical devices fit you: the next generation of smart elbow support*
Mauro Giacomelli, Grado Zero - Italy

Fibre funzionali intelligenti a base di Lyocell e loro applicazioni/*Intelligent functional fibers based on Lyocell and their application - discover the world of intelligent fibers*
Gerhard A.Neudorfer, smartfiber AG – Germany

Applicazioni dei nano tubi di carbonio nel settore tessile/*Carbon nano tubes in technical textile application, spacing from structural to functional composites*
Luca Mezzo, Nanocyl – Belgium

13.00 LUNCH/POSTER SESSION

14.15 - 15.30 **Chair: Massimo Marchi – Marchi & Fildi - Italy**

Dall'idea al prodotto: presentazione e stato di avanzamento di alcuni progetti di ricerca europei per il Tessile Tecnico

F*rom the idea to the product: Presentation and current state-of-the-art of some European Research Projects in the field of Technical Textiles*

Tessili Intelligenti nell'edilizia per il monitoraggio della stabilità di edifici, dighe e strutture civili/*Smart Textiles for civil engineering to monitor the stability of buildings, dykes and civil structures*
Thomas Messervey, D'Appolonia - Italy

Nuove prospettive per l'utilizzo di nano particelle in additivi flame retardant per materiali tessili/*Nanoparticles as promising flame retardant additives for textile fabrics*
Jenny Alongi, Politecnico di Torino, Italy

ProFiTex un'avanzata tecnologia per la sicurezza dei Vigili del Fuoco/*ProFiTex providing Fire Fighters with Technology for excellent Work Safety*
Julian Eichhoff, Aachen University - Germany

Tessili per protezione da esplosioni in eventi terroristici nel settore aeronautico/*Textiles for anti-balistic protection against terrorist attacks in the aeronautical sector*
Donato Zangani, D'Appolonia - Italy

Strutture tessili ibride con caratteristiche super elastiche e di smorzamento delle vibrazioni/Hybrid textile performs for composites with high damage tolerance and vibration damping properties
Rocco Rametta, Cetma - Italy

15.30 – 16.00 Coffee break

16.00 - 17.30 **Chair: Bruno Marcandalli, Stazione Sperimentale della Seta – Italy**

L'innovazione dalla natura: Biotrattamenti e nuove applicazioni per fibre naturali e bio-based
Innovation from Nature: biotreatments and new applications for natural and bio-based fibres

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Nuovi scenari produttivi ed applicativi per fibre bio-based ed utilizzi tecnici per fibre naturali tradizionali/*Natural and bio-based fibres: new perspectives for their production and application*

Giuliano Freddi, Stazione Sperimentale della Seta – Italy

Biotrattamenti enzimatici su scarti e prodotti di seconda scelta per il miglioramento della qualità delle fibre e loro applicazioni/*Enzymatic bioprocessing: new tool of extensive natural fibre source utilization*
Jan Marek, Innotex – Czech Republic

Nuovi prodotti a livello industriale ottenuti da fibre naturali e biobased/New industrial products obtained from natural and bio-based fibres
Daniele Beringheli, Filati Maclodio – Italy

Monofili in PLA per applicazioni medicali/*PLA Monofilaments for medical applications*
Barbara Fontana, Sider Arc – Italy

17.30 – 19.30 B2B MEETINGS AND POSTER SESSION

11 novembre
9.00 - 9.30 Registrazione/Registration – Poster Session

5th EUROPEAN TECHNICAL TEXTILES CLUB CONVENTION

9.30-10.30 **Chair: Michael Jaeneke, Messe Frankfurt – Germany**

Evoluzione e scenari di mercato per il tessile tecnico e innovativo in Europa
Evolution and market scenarios for innovative and technical textiles in Europe

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With the participation of:

Aldo Tempesti	*TexClubTec (Italy)*
Werner Zirnzak	*IVGT (Germany)*
Patrice Gallant	*Clubtex (France)*
Caroline Sonneville	*Fedustria (Belgium)*

10.30 – 11.00 Coffee break

11.00 - 13.00 **Chair: Werner Zirnzak – IGTV (Germany)**

Recenti sviluppi nel settore dei tessili per i trasporti
Recent developments in textiles for transportation

Spalmature per tessili tecnici/*Coating of technical textiles*
Edmund Lingel, Lefatex Chemie GMBH, Germany

L'offerta Alcantara® *per il settore Automotive/Alcantara® products for Automotive Interior*
Carlo Ammirati, Alcantara® - Italy

Filati Innovativi per il settore dei trasporti/*Innovative Fibres for Transportation*
Giuseppe Vicenti, RadiciGroup - Italy

Tessili a basso impatto: rivestimenti flessibili con alte performances/Low-E textiles: soft cover for high requirements
Florian Diederich, TAG Composites, Germany

13.00 LUNCH/POSTER SESSION

14.30-16.30 **Chair: Patrice Gallant, Clubtex – France**

Prodotti e tessili performanti per processi industriali
Products and high performance textiles for industrial precesses

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Tessili tecnici autopulenti/*Self-cleaning finish for Technical Textiles*
Wolfram Badura, BASF SE, Germany

Tessili tecnici per impieghi in componenti acustici/*Technical Textiles for acoustical components*
Marco Mietta, Saatitech - Italy

Tessili per filtrazione industriale/*New filter media developments to control the fine PM emissions*
Daniela De Angelis, Testori - Italy

Quando il metallo sposa il tessile/When the metal join the textile structure
Ivano Soliani, Soliani EMC, Italy

E' prevista una traduzione simultanea Inglese-Italiano e viceversa/It is foreseen a simultaneous translation Italian-English and vice-versa

ARRIVEDERCI A NANOITALTEX 2010 - 17 e 18 NOVEMBRE 2010
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SEGRETERIA ORGANIZZATIVA: promozione@texclubtec.it – Tel: 02 66118098 – FAX 02 6438689 – www.nanoitaltex.org

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nano italtex 2009

TEX CLUB TEC

Con il co-finanziamento del

Ministero dello Sviluppo Economico

Abstract
Relazioni
in ordine alfabetico

Nanoparticles as promising flame retardant additives for textile fabrics

J. Alongi[1], J. Tata[1], F. Carosio[1], A. Frache[1], G. Malucelli[1], G. Rosace[2], C. Colleoni[2], G. Brancatelli[3], D. Losio[3], G. Fusi[3], A. Andretta[4], A. Scalvedi[5], C.Pilenga[5]

[1]Dipartimento di Scienza dei Materiali e Ingegneria Chimica, Politecnico di Torino sede di Alessandria, Via T. Michel, 5-15100 Alessandria, Italy. jenny.alongi@polito.it;
[2]Dipartimento di Ingegneria Industriale, Università di Bergamo, Viale Marconi, 5-24044 Dalmine, Italy;
[3]Centro Tessile Cotoniero e Abbigliamento Spa, Piazza S. Anna, 2-21052 Busto Arsizio, Italy;
[4]Klopman International Srl, Loc. Mola dei Fanti, 03100 Frosinone, Italy;
[5] Europizzi SpA, via Provinciale, 455-24059 Urgnano, Italy.

Abstract

FRONT is an innovative project with the main objective to produce textile fabrics resistant to fire with high performances and quality, required for the security of the human life. In order to simulate the industrial textile process, the finishing phase is mimicked. The idea is to develop a similar method based on the same physical and chemical principles at the bottom of any dyeing processes and of the current, and already consolidated, chemical finishing treatments. In order to introduce this type of approach, the nanotechnology is applied. In particular, the introduction of nanoparticles into the textile is done by the immersion of the fabrics into an aqueous nanoparticle solution, followed by the final fixation of the nanoparticles through thermal treatment. The textile material put in contact with the dispersion of nanoparticles absorbs them and, because of the formation of various types of bindings according to both the fiber typology and the nanoparticles, prevents any following release. Cotton, polyester and a blend of them are used. The action mechanism is very similar to the dyes and chemical behavior: in the case of the cotton, by formation of a chemical bond among the cellulose and the nanoparticles; in the case of the polyester by adhesion of nanoparticles on the polymer surface, after fixation using either thermal or coating treatment.
General characterization will be done starting from the determination of the chemical and physical structure of nanoparticles, their morphology and thermo-stability in air and in inert atmosphere. In addition, the study of nanoparticle/fiber interactions will be followed according to their affinity and thermal stability and of flame retardancy properties of the above textile fabric prototypes prepared. In order to measure the flame retardant properties, cone calorimeter will be used to quantify and clarify parameters as heat release rate, total heat release, residual mass that are useful information about the kinetic aspects of the combustion. Moreover, particular attention will be focused on smoke toxicity as well as smoke release and opacity which are very important parameters to take into account when developing new flame retardant materials.
The authors would like to thank European Commission for the economical funding of FRONT (Flame Retardant On Textiles) project 2008/2010 (7th Framework Program, contractual n° *222486*).

Breve Biografia/Biosketch

Experiences:

-Italian Degree of Doctor in Chemistry, July 2002, University of Genova;
-PhD in Science, Technologies and Chemical Processes, May 2006, University of Genova.

She won a research fellowship about self-healing materials in Chemistry and Industrial Chemistry of the University of Genoa. Actually, She has a fellowship with Politecnico di Torino for the textile field and the study of flame retardant properties of polymeric materials.
J. Alongi is co-author of 15 original publications on international scientific journals and of 40 contributes in national and international congresses.

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Politecnico di Torino Sede di Alessandria
Viale Teresa Michel 5
15100 Alessandria-Italy

L’offerta Alcantara® per il settore Automotive (Alcantara® products for Automotive Interior)

Carmine Carlo Ammirati
Alcantara S.p.A.

Abstract

La piena soddisfazione dei requisiti del settore dei rivestimenti interni Auto richiede una costante evoluzione del prodotto. I requisiti qualitativi e di performance diventano sempre più stringenti coerentemente alla evoluzione tecnologica e del design, alla maggiore complessità della filiera produttiva, alle evoluzioni normative. L’offerta dei car maker si arricchisce di un maggior numero di modelli e di versioni, con frequenza di aggiornamento sempre più veloce.
In questo contesto l’offerta di prodotti Alcantara® per il settore diventa necessariamente sempre più ricca e caratterizzata da un forte orientamento allo sviluppo di soluzioni personalizzate, con un occhio di riguardo ai temi della sostenibilità.

Breve Biografia/Biosketch

Laurato in Ingegneria Chimica presso l’Università di Napoli nel 1994, sin dall’inizio della sua carriera professionale si è interessato di fibre sintetiche prima presso Montefibre, nella divisione poliestere, poi presso le Filature Miroglio dove è stato responsabile dello sviluppo nuove fibre e nuovi prodotti.
Dal 2005 è Direttore del Centro Ricerche di Alcantara S.p.A.

Contatto / Contacts
Carmine Carlo Ammirati
Alcantara S.p.A.
R&D Manager
PO BOX 5
05035 Nera Montoro (Terni)

Self-cleaning finish for Technical Textiles with Mincor® TX-PES

Wolfram Badura
BASF SE

Abstract

The talk will present the current status of a new way to create a self-cleaning nano-structured surface, which exhibits improved self-cleaning properties. The correlation between structure and effect is discussed as well as limitations and opportunities for the textile industry, which can be reached with the new Mincor TX-PES.

Breve Biografia/Biosketch

12.9.1955
Born in Giengen/Brenz (Germany)

15.3.1975-7.7.1978
Study of Textile Chemistry at the FH Reutlingen

15.11.1978-31.12.1980
Employment as textile engineer for dyeing at the company Schoeller Textil AG/Eitorf Sieg

1.1.1981-30.9.1984
Employment as textile engineer for finishing at the company Ploucquet/Heidenhem

1.10.1984-30.6.1988
BK Ladenburg/Ladenburg, application engineering support to European customers in terms of pretreatment and dyeing

Since 1/7/1988
BASF SE/Ludwigshafen, application engineering support to European customers in terms of finishing

Contatto / Contacts

Wolfram Badura
BASF SE
D-67056 Ludwigshafen
Germany
EVX/TEA-H 201

SOLPLATEX: advanced SOL-gel PLAsma treatments on TEXtiles

Lorenzo Bautista, Jordi Mota, Laia Crespo, Roshan Paul, Helena Esteve, Marolda Brouta, Javier Jiménez, David Amantia, Mirko Faccini, Minerva Fernández, Esther Delgado, Meritxell DelaVarga

LEITAT TECHNOLOGICAL CENTER

Abstract

The objective of this project is to do research and development of new multifunctional textile products based on environmentally friendly emergent technologies like plasma and sol-gel and to study the optimum detergency products to maintain these functionalities.

SOLPLATEX project involves the participation of six Spanish companies. One of them manufactures detergency products. While the other five companies are textile manufacturers, dyers and finishers, which develop textile products for different subsectors such as: outdoor wear, swimwear, underwear, sportswear, personal protection equipment, medical textiles, fashion and automotive textiles. The project has two years of duration and has been partially funded by the *Generalitat de Catalunya* through ACC1Ó (financial grants IUE/810/2008, project RD08-1-0033).

Plasma technology has been applied to different textiles by surface activation, plasma pre-treatments, superficial grafting induced by plasma, plasma enhanced chemical vapour deposition (PECVD) and plasma fixation methods. Sol-gel technology has been applied to textiles by the deposition of xerogel films based on: silicon dioxide or titanium dioxide, sols doped with nanomaterials or functional molecules, functionalization of previously deposited xerogels. Combinations of sol-gel and plasma technology have also been studied. Specifically: superficial grafting of sol components induced by plasma, PECVD processes applied to previoulsly deposited sol-gel films and PECVD processes using sol-gel precursors.

Specific methodologies have been carried out for specific textiles according to their composition, physical structure and the property/properties to achieve. Some of these properties are the following: dyeability, antishrinkage, antipilling, ultrahydrophobic/oleophobic, UV absorption, visual effects, bactericide/bacteriostatic character, flame-retardant, easy-care, antiestatic character and improvements of mechanical properties, among others.

Breve Biografia/Biosketch

Mr. Lorenzo Bautista is a Bachelor of Chemical Engineering from the University of Barcelona (UB). He has a Diploma of Advanced Studies in the Polytechnical University of Catalonia (UPC). At the moment he is in the last stage of his PhD in Chemical Engineering from this University. During his research career, he has participated in various R&D projects. He has diverse scientific publications and has participated in national and international conferences. Nowadays, Mr. Lorenzo Bautista develops his professional tasks in the R&D Projects Department in LEITAT Technological Center. He participates in national and European R&D projects, being specialized in various topics as: surface treatments using plasma or ozone, bleaching and finishing of textiles, microencapsulation, coated and laminated textiles, sol-gel coatings, composites based on nanostructures, nanocoatings, surface characterisation techniques and chemical analysis in general.

Contatto / Contacts

Lorenzo Bautista
Leitat Technological Center
Passeig 22 de juliol, 218

“**Nuovi prodotti a livello industriale ottenuti da fibre naturali e biobased”**

Daniele Beringheli
Daniele Beringheli sas – Libero professionista
Consulente per la Filati Maclodio S.p.A. – Maclodio, Brescia

Abstract

La filatura Filati Maclodio S.p.A., fondata nel 1976, si contraddistingue per l’importanza dedicata alla ricerca di nuove fibre e di nuove mischie, che possano trovare impieghi sempre più diversificati ed in grado di soddisfare esigenze sempre diverse.
In particolare, in un connubio ideale di appeal e confort con elevate prestazioni tecniche, nasce la continua ricerca di Filati Maclodio per nuove applicazioni che possano migliorare la qualità all’indosso di capi tecnici. Nuove fibre o nuove mischie ed applicazioni di fibre già esistenti vengono sperimentate in collaborazione con selezionati partners, dai fornitori di fibra ai tessitori, per poter raffinare al meglio la scelta e l’applicazione con specifico beneficio dell’utilizzatore finale.
Il tessile tecnico diventa confortevole ed accattivante, nuove soluzioni tessili diventano applicazione quotidiana che migliora la qualità della vita.

Breve Biografia/Biosketch

DANIELE BERINGHELI

Nato a Genova nel 1956, vanta significative esperienze nel settore tessile, nel quale si è inserito a partire dal 1978.

Ha ricoperto ruoli di alto profilo manageriale nell'area vendite in industrie di primaria importanza, quali "Manifattura del Circeo Spa", "Manifattura di Legnano", "Legnano Tinti", "Fil Man Made Group", "Franzoni Filati", "Maclodio Filati".

E' stato membro delle principali associazioni del settore.

E' stato personalmente promotore della creazione di nuove *business divisions* orientate alla produzione e vendita di filati per i settori fashion e tecnico.

Attualmente svolge attività di consulenza per industrie del settore tessile, nell'ambito organizzativo e di sviluppo e vendita di nuovi prodotti.

Contatto / Contacts

Daniele Beringheli

Daniele Beringheli sas
Viale Piave, 219
Lancenigo di Villorba
Treviso - Italia

The importance of technological know how for companies: how to safeguard existing knowledge and acquire the necessary one.

Athanase CONTARGYRIS
IFTH (Institut Français du Textile Habillement)

Abstract

Introduction first demonstrates how technical know-how is one of the key comparative advantages on which EU industries can build strategies for facing globalisation challenges. Know-how can be valorised not only to maintain market positions but also to introduce innovation, attract new talents and new clients and improve credibility for funding. Why this competitive advantage is currently under risk is then analysed: loss of key personnel detaining this know-how (linked to relocations, lay outs and demographic evolutions - retirement), technical evolutions requiring updates of currently detained know-how or even active search for the acquisition/production of new know-how…
Main presentation is devoted to PASSAGE project, which is offering to industrial SMEs in Textile and Clothing in Italy, France, Greece, Bulgaria and Romania solutions to better understand, handle and manage their know-how needs in a systematic way. Then are presented the tools and methods offered:
1) To assess SME job profiles needs according to their activity, associated market and technology evolutions, alternative strategies and actions they are engaged in for facing these challenges
2) To identify in strategic job profiles which strategic know-how may provide key competitive advantages
3) To evaluate the level of risks for each of their strategic know-how (probability and possible impact of losing a know-how) for identifying which is their most critical know how requiring actions (safeguard, transfer, reinforcement or acquisition)
4) To safeguard all their existing knowledge to fully document their critical know-how and prepare its later transfer or reinforcement
5) To acquire necessary know-how which they need, do not have but may exist around them (in R&D or technical support centers, consultancies or even competitors).

Breve Biografia/Biosketch

Born in 1956. French and Greek. M.Sc. in Management (HEC-FR) and studies in Law.
Since 2003 in-house consultant of IFTH (Institut Francais du Textile Habillement, currently technical Coordinator of PASSAGE project (R&D for SME Associations) and contributor in EcoTex Design (NMP). Has participated in the definition of strategic R&D roadmaps through several EU R&D projects on Textile and Clothing, such as TexMap (1st R&D Roadmap of EU research for textile and apparel industries), Webtexpert, Clevertex, Leapfrog-CA and Leapfrog IP.
Since 1988, as General manager and founder of two small consultancies in innovation management (CEDECS – FR- and DIALOGOS –GR), has been involved in EU projects on ICT based education and training, the set up of European Networks of Teleservices for SMEs, the networking and cooperation with Eastern Countries SMEs, as well as in European Parliament (STOA) studies on eDemocracy and on Multi-cultural issues related to Information Society.
Academic Evaluator of eLearning, Minerva and LLL Programmes and e-inclusion (2001-2007).
Formerly auditor of Pechiney Group, Controller of one Company employing 2000 people and later Investment and Management supervisor of Aluminium and Copper Branches at the Headquarters of Pechiney Group. Worked there with Mr Kron (current President of Alsthom), Mr Woerth (current Ministry of Budget), Mr Gandois (later Prt of MEDEF), Mr Vinciguerra (later Financial Manager of FT).

Contatto / Contacts
Athanase CONTARGYRIS
IFTH (Institut Français du Textile Habillement)
address: 16 rue des Reculettes – 75013 PARIS – FRANCE

New filter media developments to control the fine PM emissions

Daniela De Angelis,
Testori S.p.A.

Abstract

Dust removal is a very important subject in the cement industry and coal fire boilers as it covers the production process and environmental issues .Nowadays, the legislation in different countries is becoming more strict and fixing lower emission limits especially for the fine dust, the PM10,responsible for very serious atmosphere pollution problems.
As a consequence, the market needs are for more performing filter media either in process and environment uses.
Testori started an important R/D program in this area to evaluate with laboratory tests but also “in situ” the performances of different filter media with focus on different finishing treatments and materials.
A comparison of these results shows the in deniable advantage of Testori polyurethane coating Novates with regards of fine dust emissions and pressure drop for the cement industry and microfibers on the dust side for the applications in coal fired boilers.

Breve Biografia/Biosketch

Technical Engineer in Testori S.p.A. da maggio 2007: assistenza tecnica ai clienti, responsabile laboratorio e ufficio tecnico;
Precedente esperienza nei materiali per impieghi tecnici (compositi e balistica): dal 1998 ricercatore presso la Tecnotessile di Prato e poi responsabile R&D tessile per la Seal S.p.A. di Legnano.

Contatto / Contacts

Michela Magro
Testori S.p.A.
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Low-e textiles - soft cover for high requirements.

Dipl.-Ing. Florian Diederich
TAG Composites & Carpets GmbH, Krefeld,Germany

Abstract

The term low-e describes materials with reduced or low emission features.

The lecture will explain the development of a textile material with low-e features for building textiles and further the possibility to use this material and the low-e features for vehicle interiors.

The uses for sun protection fabrics in vehicle interiors are especially highlighted and the possibilities and effects for the vehicle interior are discussed.

Breve Biografia/Biosketch

1960		born in Düsseldorf
1980	- 1985	studies and final degree as Dipl.-Ing. at the University of applied science, Mönchengladbach
1986	- 1988	Sales manager for H.W. Meyer, Werther
1988	- 1990	Sales manager Bogie GmbH, Neuss
1990	- 2005	Partner and General manager of Wellington Mode GmbH, Bielefeld
2006	- 2007	Coordinator European Product Support, W.L.Gore, Putzbrunn
2008	- today	Marketing Manager TAG Composites & Carpets GmbH, Krefeld

Contatto / Contacts

Dipl.-Ing. Florian Diederich

TAG Composites & Carpets GmbH
Gladbacher Straße 465
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ProFiTex – Providing Fire Fighters with Technology for Excellent Work Safety

Julian Eichhoff, Thomas Gries
Institut für Textiltechnik, RWTH Aachen University, Germany

Abstract

The aim of project ProFiTex is to support fire fighters in their perilous work with a system that supplies mission-relevant information without overwhelming the fire fighter. The design approach will be user-centered with tests starting at an early point in the project to gain maximum user acceptance. Professional fire fighters will be involved from the beginning of the project to ensure, that the system will be tailored to their needs. Project ProFiTex will continue part of the work from the successful EU-funded project wearIT@work.

The ProFiTex system comprises electronic devices like an, localisation sensors, communication devices and a human-computer interface device integrated into the fire fighters jacket. Since wireless communication is difficult over long distances and through several walls of a building, an innovative method to transmit information will be applied. A security rope carried by fire fighters during a mission shall be equipped with data transmission capabilities. This allows information to be sent outside to the command post and back to the fire fighter.

By monitoring several parameters of the fire fighters condition like his movement pattern and stance, problems can be detected immediately. The fire fighter himself is supplied with the possibility to navigate even in smoky environments thanks to the infrared camera and the positioning system implemented into his equipment. Localized information (e.g. “door”, “victim”) can be fed into the system using the garment-integrated human-computer interface device.

Information will be displayed to the fire fighters, their group leaders and the commander outside the building. The amount and type of information supplid will be carefully chosen, considering the physical danger and psychic stress fire fighters are opposed to.

Work safety of fire fighters shall be increased, thus lowering the number of work-related accidents and casualties. Fire fighting missions will be more efficient using the system.

Project ProFiTex started on 01st of October 2009 and has a duration of 36 months. The consortium comprises twelve partners from five different European countries with universities, research laboratories and SMEs participating

Breve Biografia/Biosketch

Dipl.-Ing. Julian Eichhoff studied mechanical engineering and specialised in textile technology.
Since June 2008 he is working as a scientific researcher at the Institut für Textiltechnik of RWTH Aachen University, acting as the head of the Smart Textiles / Joining Technology department. Mr. Eichhoff coordinates the EU-funded project ProFiTex.

Contatto / Contacts

Dipl.-Ing. Julian Eichhoff
Institut für Textiltechnik of RWTH Aachen University
Otto-Blumenthal-Str. 1 / 52074 Aachen / Germany

Managing Innovation in Networks – A Challenge for Technical Textile Products

Prof. Dr. Thomas Fischer
DITF-MR Denkendorf

Abstract

The development of innovative products and processes is a key factor for keeping competitiveness in today's rapidly changing industrial environment. Especially for technical textiles, where innovations are driven mainly by new material developments or by applications in new markets, knowledge from various sources is required, as the required knowledge can only scarcely be covered by a single company. Thus, knowledge contributions of various partners are essential in order to effectively and efficiently transfer an initial idea to market success. Knowledge required for innovation is likely to be obtained and distributed more easily within a collaborative setting, e.g. in enterprise networks. Emerging technologies enable new dimensions of collaboration, regarding not only the agreement on common goals and the regular exchange of information, but also the conjoint performance of actions to realize innovation. A systematic support for specific tasks of the innovation process can be offered by methods for collaborative innovation management. The application of these methods draws on available knowledge and can benefit from various viewpoints of actors on a specific problem.

This will be illustrated with examples from the European integrated project AVALON.

Breve Biografia/Biosketch

Professor Dr. Thomas Fischer is head of the Centre for Management Research (DITF-MR) of the German Institutes for Textile and Fibre Research Denkendorf (DITF Denkendorf). He is a University Professor of two faculties, the Faculty of Engineering Design, Production Engineering and Automotive Engineering at the University of Stuttgart and the WHU – Otto Beisheim School of Management at Koblenz. His teaching and research focuses on the fields of system-oriented management and applied computer science in business and management.

Professor Fischer is acting for the European Union as reviewer, coordinator of research projects and Project Technical Advisor. He also advises EURATEX, the Representation of the European textile industry in the EU in research topics

Since 1986 Prof. Fischer has been a member of the board of directors of the German Society of Economic and Social Cybernetics, since 1999 he has been its president.

In 1998 he has been awarded with the “Max-Kehren-Medaille” of the VDTF (Association of German Textile Finishing Professionals Association) for his contributions to applied textile research.

Contatto / Contacts

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Monofili in PLA per applicazioni medicali (PLA monofilaments for medical applications)

Barbara, Ing. Fontana
Sider Arc S.p.A.

Abstract

L'intervento inizia con una breve presentazione dell'azienda Sider Arc, dei suoi prodotti e dei settori di applicazione degli stessi. In particolare la *lecture* è incentrata sui monofili Sider Arc in PLA (tradename Biolene), progettati e sviluppati per applicazioni in campo medicale.
Vengono descritte dapprima le caratteristiche base del polimero PLA, le fonti di approvvigionamento e le differenze rispetto ai polimeri normalmente impiegati per la realizzazione di monofili destinati al settore medicale.
Segue un approfondimento sulle caratteristiche prestazionali richieste per i monofili in PLA e sui vantaggi nell'utilizzo degli stessi rispetto all'uso di filati prodotti con altri materiali; inoltre viene descritta l'attività di Ricerca e Sviluppo svolta da Sider Arc, che ha portato all'individuazione dei processi di produzione dei monofili in oggetto.

Breve Biografia

Relatore dell'intervento è l'Ing. Barbara Fontana, Responsabile Tecnico Monofilo in Sider Arc.
Laureata in ingegneria chimica presso il Politecnico di Milano, ha conoscenze legate in primo luogo ai materiali polimerici e alla loro trasformazione / modifica, oltre che alle loro applicazioni.
Lavora dal 2000 nel settore della trasformazione di materie plastiche, nell'area tecnica, e in particolare in ricerca e sviluppo / assistenza clienti / marketing tecnico / qualità di prodotto.
Ora, all'interno di Sider Arc, è responsabile tecnico / R&D, e si occupa di materie prime e prodotti finiti, oltre che di processi di sviluppo di nuovi prodotti con e presso clienti.

Contatto

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Natural and bio-based fibres: new perspectives for their production and application

Giuliano Freddi
Stazione Sperimentale per la Seta, Milano – Italy

Abstract

Natural fibres are subdivided based on their origins, coming from plants, animals or minerals. All plant fibres are composed of cellulose while animal fibres consist of proteins (hair, silk, and wool). For some countries natural fibres are of major economic importance because incomes depend on proceeds from their sale and export. The increasing importance of environmental compatibility as a sales argument and the desire for eco-friendly and organic textiles is fostering the use of natural fibres leading to a renaissance in fibres such as hemp and to the adoption of non traditional fibres, such as bamboo, for use in apparel. Natural fibres have a wide range of uses, from high priced apparel to industrial applications. They are important materials in clothing and home textiles, but are increasingly finding their way into a range of new uses. For example, cellulosic fibre reinforced polymeric composites are finding applications in many fields ranging from construction to automotive industry. Over the last few years, a number of researchers have been involved in investigating the exploitation of these fibres as load bearing constituents in composite materials. Their use has increased due to their relative cheapness, their ability to recycle and for the fact that they can compete well in terms of strength per weight of material. The concept of using natural fibres in technical applications is to open up new market perspectives, to draw attention to the benefits offered, to promote efficiency and sustainability, and to contribute to a cleaner global environment. Advantages and drawbacks of using natural fibres for technical applications will be presented and discussed.
For the development of new materials, including new fibres, novel concepts for conserving precious and limited resources like energy and mineral oil are becoming more and more important. This means looking at nature not only as a model for producing new substances in a more sustainable way, for example by using water as a solvent, but also exploiting the wide range of renewable natural resources as a source of precursors and polymers for producing bio-based fibres. A fibre made from renewable raw materials, using an environmentally friendly and commercially viable process, and having triggered biodegradability (i.e., be biodegradable in composting situations after disposal) or recycling capability can be considered eco-friendly. Agro-polymers (e.g. polysaccharides, starch) can be obtained from biomass by fractionation. Polyesters are obtained by fermentation from biomass or from genetically modified plants (e.g. PHA, polyhydroxyalkanoate) and by synthesis from monomers obtained from biomass (e.g. PLA, polylactic acid). The latter are already commercially available as textile fibres, while others are still under investigation. In this context, protein fibres regenerated from waste or by-product sources can also be considered. Feather keratin and wheat gluten may both be suitable. They are annually renewable, commercially abundant, of consistent quality, and have guaranteed supply. The exploitation of existing biomasses will divert potential waste streams into useful products for the production of environmentally friendly fibres as replacements for part of the 38 million tonnes of synthetic fibre produced annually. Developing bio-based alternatives for even a portion of this would offer the potential of significant environmental benefits.

Breve Biografia/Biosketch

Study qualification: University degree in Biological Sciences (Biochemistry). Present position: senior researcher, head of biomaterials and biotechnology department of Stazione Sperimentale per la Seta. Activity: Research on protein fibre structure, properties, and industrial processing, with emphasis on bioprocessing and biomedical applications of silk proteins. Project leader in national and international research projects. Consultations and investigations commissioned by textile companies. Training (university and PhD students, post-doc). Standardization and development of standard methods for textile testing. Publications: about 115 papers published in peer reviewed international scientific journals.

Contatto / Contacts

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The French Technical Textiles Markets, its competitiveness clusters and the actions of CLUBTEX to promote Technical Textiles.

Mr Patrice Gallant,
CEO of Nigal, Honorary President of CLUBTEX.

Abstract

The presentation will give an overview of the current French market for Technical Textiles. It will also explain why and how it has organized into competitiveness clusters to enhance the collaboration between R&D centres and SMEs to develop new partnerships and new businesses. Then it will introduce CLUBTEX's actions to encourage SMEs into collaborative projects.

Breve Biografia/Biosketch

Mr Patrice GALLANT has spent two years at NC State College, School of Textiles. He has been President of company Rubans Gallant, manufacturer of narrow fabrics with technical applications from 1973 until 2004. Mr Gallant is now President of NIGAL which is the European leader in sewing-free mending and has 50 years experience in coating and fabric cutting.
Mr Gallant is also vice-President of FUTEX, the European Technical Textiles Convention which takes place every two years in Marcq-en-Baroeul.
Mr Gallant is also Vice-President of CLUBTEX. CLUBTEX is the French association dedicated to the promotion of Technical Textiles. CLUBTEX gathers 74 members, among which 63 companies, 8 R&D and educational centres, 3 institutional members.

Contatto / Contacts

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Dispositivi medicali auto-adattativi - La nuova generazione di tutori ortopedici

Marco Giacomelli
Grado Zero Espace

Abstract

La Grado Zero Espace è un'azienda italiana di ricerca, consulenza e prototipazione che, dopo anni di collaborazione con l'Agenzia Spaziale Europea ed industrie leader in vari settori, ha sviluppato una importante esperienza nel trasferimento tecnologico di materiali e conoscenze dalla sfera della ricerca a quella industriale, in particolare per la realizzazione di prodotti tessili altamente tecnologici e/o performanti, destinati ad essere impiegati tanto nell'abbigliamento o nell'arredamento, quanto in settori più estremi quali l'aeronautica o la nautica.
Negli ultimi anni, la Grado Zero Espace ha partecipato attivamente al Progetto "AVALON", sviluppato in seno al Sesto Programma Quadro e finalizzato, da un lato, alla realizzazione (per applicazioni multi-settoriali) di nuove strutture tessili ibride contenenti Leghe a Memoria di Forma e, dall'altro, alla ottimizzazione delle relative tecniche di lavorazione, dalla progettazione alla simulazione di comportamento, fino alla sistematica di processo.
All'interno del Progetto AVALON, la Grado Zero Espace è giunta a due importanti risultati, a livello di filamento e di prodotto.
A livello di design e lavorazione della fibra, ha sviluppato l'industrializzazione del processo per la realizzazione di filamenti in Ni-Ti a serpentina, con comportamento shape memory o superelastico e con vari diametri. L'industrializzazione di questo processo permette di ottenere per la prima volta in assoluto filamenti continui e di lunghezza virtualmente infinita, caratterizzati da una forma a serpentina con geometria regolare e predeterminabile, oltre che dotati di particolari ed interessanti proprietà meccaniche.
Contemporaneamente, all'interno dello stesso contesto di ricerca, e grazie alle risorse ed alle strutture messe a disposizione dal Progetto AVALON e dai Partner del Consorzio, la Grado Zero Espace ha sviluppato e realizzato un tutore ortopedico ibrido, caratterizzato da proprietà funzionali tali da collocarlo in una fascia di prodotto intermedia fra un tutore rigido ed una semplice fascia (o fascia elastica). In particolare, l'obiettivo perseguito è stato quello di realizzare, con macchinari già propri dell'industria tessile, un supporto medicale o riabilitativo per il gomito, con caratteristiche funzionali che potessero variare dalla compressione ad una parziale riduzione della mobilità articolare. Le tre diverse tipologie di prodotto sviluppate per la riduzione delle problematiche di traumatologia articolare sono caratterizzate da diverse proprietà funzionali, che ne differenziano le opportunità applicative.

Breve Biografia/Biosketch

Marco Giacomelli si è laureato in chimica industriale presso il Dipartimento di Chimica e Chimica Industriale dell'Università di Pisa, con una Tesi relativa all'ottimizzazione del processo produttivo di un biopolimero (acido polilattico - PLA). In Grado Zero Espace dal 2006, è stato il Responsabile interno per quanto concerne tutte le attività svolte per il Progetto Europeo denominato "AVALON", sia dal punto di vista delle attività di ricerca tecnica che manageriale. Allo stesso tempo, collabora allo svolgimento delle attività di ricerca all'interno di altri Progetti finanziati dalla Comunità Europea ed è responsabile interno per lo sviluppo di varie attività di consulenza aziendale.

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Coating of technical textiles

Edmund Lingel
Lefatex Chemie GmbH

Abstract

Coating of technical textiles

The technical textiles have a growth of nearly 10% in the last years also in Europe. By the example of the work protection garment, we want to introduce here a coating and an impregnation with nano particle which gives the textile a technical utility "function". In our presentation, we speak about the application typs and the Chemicals which we us here. We explain the technical characteristics and the market were it is possible to use the nano particle
impregnation.

Breve Biografia/Biosketch

Edmund Lingel studied , textile technician and technical economy management expert

Contatto / Contacts

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Enzymatic bioprocessing – new tool of extensive natural fibre source utilization

Marek Jan[1], Antonov Viktor[1], Bjelkova Marie[2], Smirous Prokop[2], Fischer Holger[3],
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[3] FIBRE, Faserinstitut Bremen e.V., Am Biologischen Garten 2, 283 59 Bremen,Germany

Abstract
New enzymes are currently going to have great potencial in bast fibres processing and modifications for different end uses (fashion garmewnt, PPE, technical textiles, composites etc.). There are several new technologies using enzymes, which are able to modify fiber parametres, achieve requested properties, improve procesing results and ecology in the area of bast fibres processing and fabrics finishing. Enzymatic retting of flax, enzymatic cottonization of bast fibres, enzymatic hemp separation, enzymatic processing of flax rovings before wet spinning etc. create the group of new technologies supported by effective mechanical treatments. New effective utilization of low quality fibres (under-retted)fibrous wastes, improvement of liseed flax production attainable by use of extracted fibres use help to gai the new position of renewablefibrous materials. It seems that only complex solution of relations between agricultural and processing sphere and utilization of new technologies of biochemical and mechanical processing enable to create suitable conditions for utilization of traditional and perspective renewable fibre sources and to open them ways to new qualities and to other industrial areas of use.

Breve Biografia/Biosketch
Jan Marek, 23.September 1950, Czech, married, two children
Languages: German, Russian, English
Eduacation: 1970-1975 Institute of Chem.Technol., Prague Faculty of Food and Biochemical Technol. academic degree Ing-MSc
1983-1988 Institute of Chem.Technol.,Prague Postgrad.work academic degree CSc -PhD
1987 Tampere University of Technology 3 Weeks - textile chemistry and technology, biotechnology, environmental protection
1992 February, March OWZ München, FRG (East-West Managementtraining Ltd), course of export Management
1994 Juni, July - JICAP III Joint industrial and commercial award programme The British Council London, Centre for Industrial and Commercial Training, Middlesbrough, England.

Work experience:
Joined Textile Finishing Research institute in 1975 and spend professional carrier with textile wet processing (textile chemistry, finishing technology & textile material functionalisations, biotechnology) research and innovations. As leader of textile auxiliary agent department later on as technical and sales director coordinator in charge of R&D projects in mentioned areas (national, international). Close cooperation with textile and chemical enterprises. Responsible for starting of low volume production of special textile auxiliary agents in VÚTZ-INOTEX (1987). Devoted to research work and project activity coordination on new bioprocessing cleaner production finishing systems and new natural renewable fibre sources processing. Since 1993 engaged in international R&D activity cooperations (EURATEX, TEXTRANET). Experienced in R&D innovation project consortia management within on the national and European level. Since 2005 member of TEG´s of European Technology Platform for Textile and Clothing EURATEX (co-chair of TEG3 – Bio based materials, biotechn.and envi friendly text. proces.).
Publications and other activities:
Frequent research and technical publications and papers at the international conferences, workshops and journals, incl. 1 book, 14 CZ patents and patent applications. Sci and research cooperation with Textile Faculty of Technical University Liberec (member of state examination board since 2003). Technical programme guarantor of Czech Textile Chemist and Colourists Society international seminars and conferences.

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Intelligent textiles for the monitoring and management of buildings, earthworks, and civil infrastructure.

Thomas Messervey
Innovation and Research Division
D'Appolonia, S.p.A.

Abstract

Smart sensor-embedded materials will be the construction elements of tomorrow. They will help us validate design assumptions, control construction, make maintenance and management decisions, and provide warning in the event of danger. Textiles are an ideal candidate to lead this transition because they are well suited for the integration of sensor technologies, can be mass produced, and are already widely utilized in construction. In geotechnical applications, these materials provide reinforcement for slopes, retaining structures, roadways, embankments, as well as various drainage structures. In masonry applications, textiles can be utilized to repair cracks, damage, and to provide additional ductility and strength. For both geotechnical and masonry applications, textile materials can improve structural performance under service conditions and provide protection in the event of earthquake, landslide, accident, or other unforeseen loading condition.

Polyfunctional Technical Textiles against Natural Hazards (POLYTECT) is an Integrated Project for small to medium enterprises (SMEs) under the 6th Framework Program. The project involves 27 partners from 12 countries and is coordinated by D'Appolonia S.p.A., Italy. The aim of Polytect is to provide reinforcing strength and monitoring capability for geotechnical and masonry applications through the industrial production of multifunctional technical textiles as seen in the following project objectives:

- to increase ductility and structural strength;
- to monitor deformations, temperature, acceleration, and chemicals;
- to measure structural health
- to increase safety

The client for this work are all parties responsible for the design and safe performance of roads, retaining walls, embankments, railways, landfills, drainage structures, dykes, masonry structures (buildings and bridges), as well as historical monuments (cultural preservation).

Breve Biografia/Biosketch

Dr. Thomas Messervey is a civil engineer who is expert on smart materials and their integration in to the built environment for structural health monitoring, condition-based maintenance, energy efficiency, and increased security.

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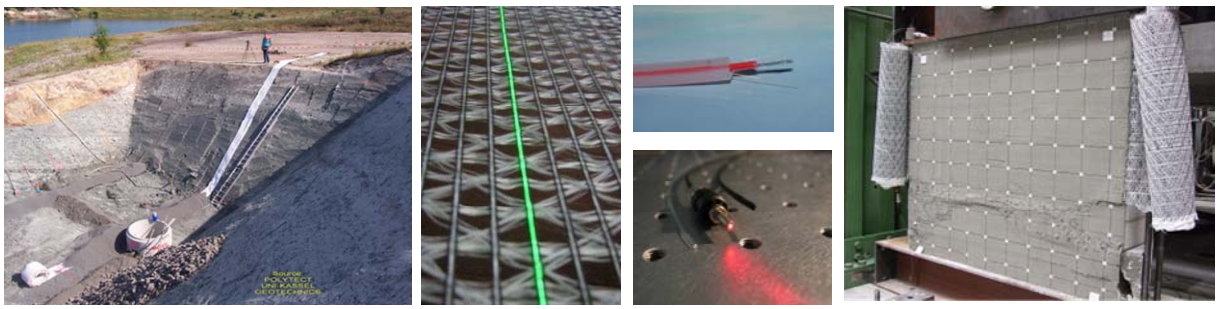

Sensor-embedded textiles and their use for geotechnical and masonry applications in the POLYTECT project

Applicazioni dei nano tubi di carbonio nel settore tessile

Luca MEZZO
Nanocyl

Abstract

La necessità di avere fibre e tessuti multifunzionali, ovvero che combinano elevate proprietà meccaniche con altre proprietà quali ad esempio, conducibilità elettrica, resistenza alla temperatura e sensibilità…è notevolmente aumentata in questi ultimi anni. Non solo, queste proprieta' multifunzionali debbono essere espletate, preferibilmente, dalle fibre e dal tessuto nel suo complesso e non da altri materiali o apparecchiature che vengono 'depositati' sulla superficie del tessuto, utilizzando quindi il tessuto o la fibra come semplice supporto. E' quasto il caso del progetto finanziato dalla Comunità Europea denominato INTELTEX che ha come scopo la produzione di fibre polimeriche specifiche, contenenti al loro interno nano tubi di carbonio (CNT), quale filler in grado di formare un network elettricamente conduttivo. Queste fibre polimeriche modificate, qualora esposte a variazioni di temperatura, oppure a vapori tossici, o a solventi, oppure ancora a stress meccanici, sono in grado di rilevarne la presenza sia in termini qualitativi che quantitativi, per semplice lettura della variazione di conducibilità elettrica della fibra polimerica additivata di CNT. Questa variazione di conducibilità elettrica è dovuta alla variazione di morfologia del polimero, che comporta una conseguente variazione della struttura del network dei CNT.
La seconda parte dell'intervento si concentra sui compositi strutturali fibro-rinforzati, in cui vi e' la crescente necessità di migliorarne le proprietà meccaniche e di resistenza all'impatto, aumentando nel contempo altre caratteristiche funzionali quali la conducibilità elettrica, la resistenza alla fiamma ed alla dilatazione termica.

Breve Biografia/Biosketch

Luca Mezzo si è laureato in Chimica Macromolecolare presso l'Università di Torino nel 1998. Ha maturato alcune iniziali esperinze nel settore biomolecolare in Italia e negli Stati Uniti, per poi approdare nel settore dei materiali compositi strutturali, come Responsabile di Divisione e di Ricerca & Sviluppo per la FTS di San Maurizio (TO). Dal 2006 è Responsabile Business Development e Ricerca & Sviluppo, per quanto riguarda l'applicazione dei nano tubi di carbonio all'interno di fibre e compositi strutturali presso la società Nanocyl (Belgio). Dal 2006 è anche coordinatore del progetto europeo INTELTEX, che raggruppa 25 partner di 9 differenti nazioni europee.

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Tessili tecnici per impieghi in componenti acustici
Technical Textiles for acoustical components

Marco Mietta
SAATI S.p.A.

Abstract

Numerosi prodotti acustici di largo consumo utilizzano al loro interno componenti in tessile tecnico. Particolare rilevanza rivestono la telefonia cellulare (filtri acustici su microfoni ed altoparlanti), l'HiFi professionale (microfoni, cuffie e speakers) e quello di largo consumo (MP3, bluetooth, auricolari).
In tutti questi casi, in prossimità degli altoparlanti o dei microfoni vengono montati piccoli schermi in tessuto tecnico aventi molteplici funzioni: stabilizzazione del segnale sonoro, protezione dall'intrusione di polvere e corpi estranei, barriera idrorepellente per applicazioni outdoor.
Il tessuto a maglia aperta in monofilo sintetico (PET), consente di soddisfare i tre principali requisiti di queste applicazioni: garantire un flusso d'aria (e sonoro) calibrato e ripetibile, proteggere dalla polvere grazie ad una ridottissima apertura maglia, evitare l'intrusione della pioggia nell'utilizzo all'esterno.

In merito alla prestazione acustica, Saati ha sviluppato un nuovo metodo per misure in regime di flusso d'aria stazionario, adattando la comune procedura di permeabilità all'aria alle esigenze dell'acustica, in cui le pressioni e le velocità in gioco sono sensibilmente minori.
In particolare, sono state definite le condizioni per ottenere un flusso d'aria laminare attraverso il campione, in modo da calcolare la resistenza specifica al passaggio d'aria come rapporto fra perdita di carico e velocità di attraversamento del media poroso.
L'analisi è stata completata da misure acustiche di pressione sonora (dB) in funzione della frequenza.
Sulla base di ciò, Saati ha sviluppato una gamma di innovativi tessuti dotati di impedenza acustica perfettamente definita. Scelti opportunamente, essi possono per esempio livellare "picchi" sonori non graditi, oppure limitare disturbi quali il rumore del vento durante l'uso dei telefoni cellulari all'aperto.

In merito alla protezione da polvere e particelle estranee, le reti in monofilo sintetico risultano più performanti rispetto ad altri media (non-tessuti), grazie alla maggiore consistenza e alla possibilità di ottenere minime aperture senza sacrificare il passaggio dell'aria e l'impedenza acustica.
In particolare, sono stati sviluppati nuovi tessuti estremamente battuti, in grado di evitare l'intrusione di particelle ferromagnetiche negli speakers, problema particolarmente sentito per i telefoni cellulari.
Infine, le caratteristiche idrofobiche di questi materiali sono allineate con le esigenze dell'applicazione, come dimostrato da misure di angolo di contatto (metodo Wilmelmy), water intrusion pressure e valutazione dell'indice di protezione (IP - secondo lo standard usato per i componenti elettici).

Breve Biografia/Biosketch

Marco Mietta, ingegnere meccanico, opera da 15 anni nell'ambito del Gruppo Saati.
Inizialmente coinvolto nello sviluppo di prodotti tessili per serigrafia, si è poi dedicato all'Ingegneria di Processo per l'innovazione del processo produttivo degli elementi filtranti confezionati.
Attualmente fa parte della funzione R&D, in qualità di coordinatore dello sviluppo prodotto per la divisione Filtrazione (SaatiTech). Project leader per numerosi sviluppi in ambito automotive, medicale, appliance ed acustica, coordina le attività interne di sviluppo prodotto e di interfaccia con i clienti.
Ha presentato lavori su specifiche applicazioni del tessile tecnico per filtrazione: tessuti idrofobici ed idrofilici, filtrazione carburante, misure di efficienza filtrante, teoria acustica.

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Titolo (Title) **Intelligent functional fibers based on Lyocell and their application - Discover the world of intelligent fibers**

Nome, cognome autore(i) / Author(s) first name, family name **Gerhard A. Neudorfer**
Sales Director Fibers

Organizzazione (i) / Organisation(s) **smartfiber AG**

Abstract

The smartcel™ and SeaCell® functional fibers are made from cellulose using a modified ALCERU® production process. By adding the various functional polymers, a full range of smartfiber product segments are obtained

smartcel™ clima fiber is a PCM (Phase Change Material)-micro composite with thermo regulating features.

smartcel™ bioactive benefits from the advantages of the bactericide silver and kills bacteria and viruses in a natural way.

SeaCell® pure is a wellness fiber containing seaweed. Contents of the seaweed: minerals, vitamins, proteins, carbohydrates and fats.

SeaCell® active and SeaCell®active plus are our freshness fibers with seaweed and silver. The fibers acts antibacterial and fungicidal.

The separate functionalities of the fibers can be recovered in the smartcel™ and SeaCell® segments which make innovative and market suitable products in different industrial sectors possible.

Breve Biografia/Biosketch

The smartfiber AG develops produces and distributes smartcel™ and SeaCell® Lyocell fibers with different functionalities and for different segments of industry.

smartfiber AG was founded in the year 2005. The company combines the scientific know-how of the Thuringian Institute for Textile and Plastics Research (TITK) in Rudolstadt with the corporate knowledge of Michael Kohne, who is a professional in sales and marketing affairs. The TITK gained its expert knowledge in over ten years of research and development activities. In July 2007 the smartfiber AG took over the factory the patents and the employees of SeaCell® in Rudolstadt. The result of this takeover was an increasing of the production capacity to 800 tons per year.

Contatto / Contacts

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The European man-made fibres industry in 2009: fighting recession, meeting the challenges

Colin Purvis
CIRFS (European Man-made Fibres Association) and EATP (European Association for Textile Polyolefins)

Abstract

This presentation opens by emphasising the fundamental strengths of the European man-made fibres industry – the world's second largest. It then looks at the challenges facing the industry and the role of innovation in helping to meet them. It analyses the impact of recession, and the gradual recovery now taking place. The problem of trade distortions is covered, as is the need for the whole textiles chain to meet society's expectations on sustainability. The presentation closes by stressing the continued commitment of the European fibre producers to innovation, including through work on nanotechnology applications.

Breve Biografia/Biosketch

Colin Purvis is Director General of CIRFS, the European Man-made Fibres Association (since 1994) and of EATP, the European Association for Textile Polyolefins (since 1999).

CIRFS is the Brussels-based representative body for the European man-made fibres industry, a sector with annual production of over 3.7 million tonnes, valued at over € 11 billion. Its members account for over 85% of European production of the fibres within the scope of CIRFS.

EATP is the representative body for European producers of polyolefin (polypropylene and polyethylene) fibres and textiles, a sector with annual output of 2.5 million tonnes, valued at over € 4 billion.

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Hybrid textile performs for composites with high damage tolerance and vibration damping properties

Silvio Pappadà, Rocco Rametta
CETMA – Centro di Progettazione, Design & Tecnologie dei Materiali

Abstract

The increasing demand for new materials to use in engineering applications with the need of high performances and low weights, implies today the development of new materials called “smart”, “multifunctional”, “adaptive”. The mechanical properties of these materials are usually higher than those of the traditional materials which intend to substitute, and these properties can change as a function of the external conditions or depending on specific external or internal stimuli.
In general, the realization of these systems is obtained by integrating materials with actuating or sensing properties, or having high specific properties. In particular, the present work is focussed on the study and relevant experimental activities carried out for the development of polymeric matrix composites with higher damage tolerance and vibration damping properties, by means of textile hybrid preforms integrating shape memory alloys (SMAs) wires.
Composite materials are commonly used in applications where high specific properties are requested, especially in fields like aeronautic, aerospace and transport industry. These materials are often characterized by a long time service life, thus being subjected to several small repeated impact as well as vibration loads. In order to enhance their service behaviour and performance, better impact and vibration damping response are required, without increasing weights or decreasing the other mechanical properties. The integration of SMAs wire within composite laminates has been proved to be a suitable response to the fore-mentioned issues.
CETMA’s researchers carried out specific research activities in order to evaluate the resistance to repeated low-velocity impacts in the case of composite laminates hybridized with SMA superelastic wires and to measure the improvement in terms of vibration damping.
Thanks to these studies and to the cooperation with experts in the textile field, a deep knowledge on the development of new hybrid preforms for composites in different applications has been achieved, together with the possibility to predict the behaviour of the final product.
This work has been carried out within the framework of the only just closed European Project AVALON (6FP Integrated Project), whose main objective was the development of multifunctional technical textiles by means of the integration of shape memory alloy wires.

Breve Biografia/Biosketch

Rocco Rametta graduated in Materials engineering in 2000 and since then he has been engaged as researcher by CETMA, an Italian private research centre involved in research related activities. Within the Department of Materials and Structures Engineering he is the Manager of the Technologies and Processes Area, which counts 9 engineers, 1 chemist and 1 technician: the main activities are related to industrial research as well as consultancy in the field of materials and processes, from design to prototypes production and validation: polymeric and composite materials, textiles and structural components, testing and processing technologies. He is also the Head of the Laboratory of Materials Technologies in which technological as well as characterization equipment are available. Co-author of several technical-scientific papers on composite materials, technologies and design methodologies.
He is responsible for CETMA for a number of national as well as European projects. He is the chairman of Italian Club of SAMPE (Society for Advancement of Materials and Process Engineer) since 2006.

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Biotex, a new cooperation initiative for the European Technology Platform for the future of Textile and Clothing: Textile and biotechnology

Mauro Scalia
EURATEX

Abstract

Il settore del tessile abbigliamento europeo si sta strutturando per poter collaborare con altri settori industriali e per poter usufruire di strumenti economici di supporto che l'Unione Europea mette a disposizione con il VII Programma Quadro per la Ricerca. Dopo l'avvio della Piattaforma Tecnologica per il futuro del Tessile Abbigliamento, sarà presentata BioTex, la nuova iniziativa creata per favorire l'interazione fra tessile e biotecnologie.
La presentazione si apre con una rapida descrizione di Piattaforma Tecnologica Europea (European Technology Platform - ETP) al fine di spiegarne sia il tipo di struttura che le attivita svolte; cio permette di identificare il ruolo giocato da una ETP nella definizione di programmi Europei di ricerca ed in ultima analisi per le Aziende che partecipano in tali programmi. La parte centrale dell'intervento presenta obiettivi e contenuti della collaborazione BioTex creata per iniziativa di due ETP, quelle dell'industria Europea del settore Tessile & Abbigliamento e dell'industria Europea della Chimica.
Sin dalle prime fasi di attivita, la collaborazione all'interno di BioTex ha permesso di identificare alcune area di ricerca di comune interesse ai due settori industriali, queste aree verrano sinteticamente descritte in prospettiva delle possibili applicazioni per l'industria Tessile Europea.

Breve Biografia/Biosketch

Mr. Mauro Scalia
Mauro Scalia is Project Manager with Euratex, the European Apparel and Textile Confederation based in Brussels. He holds a degree in Political Science with specialization in Politics and Economics. Over the past decade he has been working in the field of international cooperation for research and innovation, particularly within private R&D organisations, SME consulting and a European Union institution. He has therefore acquired substantial experience in project management for international cooperation among companies, European R&D and Innovation policies set up and implementation.
In early 2005 he joined EURATEX where is responsible for management of cooperation projects which are of strategic importance for the European Textile and Apparel sector, particularly in the field of industry R&D and innovation.

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Quando il metallo sposa il tessile - When the metal join the textile structure

Ivano Soliani dott ing
SOLIANI EMC SRL

Abstract
La SOLIANI EMC srl ha avviato una produzione di trattamento elettrochimico di metallizzazione a base nickel ed altre leghe su strutture tessili di vario genere bi dimensionali e tridimensionali e non tessuti .Il trattamento oltre che conferire un riporto costante e preciso su ogni singolo filamento crea una adesione forte alla struttura e garantisce una tenuta abbinata alla ottimizzazione della flessibilità richiesta dal tessuto o dal tessile in generale . Attualmente sono possibili metallizzazioni su filati di poliestere, poliammide,carbonio,kevlar e Nomex e vari tipi di non tessuto con grammatura anche da 5 grammi consentono un riporto di 10 grammi di metallo con valori di resistività sui 100 milliohms o più bassi . Le considerazioni applicative sono lontane dai processi conosciuti vedi sputtering sotto vuoto per la quantità di metallo realmente impiegato e per il valore di resistività tangibile sulla struttura tessile . Le strutture tessili in particolari i triassiali hanno dato nuovo impulso alle applicazioni che mettono in risalto una concatenazione tra le richieste meccaniche ed elettriche conduttive . I valori schermanti elettromagnetici sono stati realizzati testando i vari prodotti in campi di frequenza dal magnetico all'elettrico sino all'onda piana sino a 18 GHz .
L'attuale sviluppo prevedere utilizzo di metalli diversi in relazione all'applicazione .
The SOLIANI EMC have a production for electroless nickel treatment and other metals available over textile structure as bi axial and tri axial with a range of non woven in several fibers filament. The treatment offer a diffusion over the textile fiber surface of the metal covering each single filament with a strong adhesion to guarantee a good flexibility for the fabric involved and for the final application. Today are available metallization process over filaments as structure with polyester, polyammide,carbon,Nomex and Kevlar and different non wovens raw materials from 5 grams per sq meter with a metal deposition of 10 grams of pure metal with resistivity measurements of 100 milliohms square or less . The applications results are far from the sputtering under vacuum for the quality of the metal involved and for the resistivity over the textile surface . The new triaxial textile have offered a new development that can arrive to offer applications for the mechanical and electrical requirements . The different value from the magnetic field to the electrical field until 18 GHz of the plaine weave have offered a results for shielding results . The actual development take care of the several metals related to the final application .

B*reve Biografia/Biosketch*
La SOLIANI EMC Srl ha una vasta esperienza nel campo della schermatura elettromagnetica e produce vari materiali all'interno quali siliconi e varie tipologie di guarnizioni schermanti . Inoltre realizza prodotti finiti qualificati in ambito militare medicale telecomunicazioni ed altre realtà operative .dal due siti www.solianiemc.com e dal secondo introdotto www.solianiemcnews.com possiamo dare una indicazione delle ns applicazioni :la SOLIANI EMC ha varie qualifiche oltre all ISO 9002 . L'ing Soliani Ivano è l'amministratore unico della SOLIANI EMC ed è localizzata la produzione in due sedi operative in via Varesina n 122 a Como ed in via 1° Maggio a Cavallasca . L'ing Soliani laureato in ingegneria elettrotecnica ha fatto una specializzazione anche in tecnologie tessile dopo la laurea presso il Politecnico Di Milano ed opera con il POLITECNICO di Milano e con la FONDAZIONE del Politecnico per vari progetti regionali finalizzati .
The SOLIANI EMC have a large experience in the electromagnetic shielding field solutions and manufacture different raw materials in teh inside of the company as silicons and severals gaskets for shielding .We can offer also products qualified in military mediacal telecomunications and others reality that you can see on our two web sites www.solianiemc.com and www.solianiemcnews.com . The SOLIANI EMC have also qualifications on the military references and has ISO 9002 approval. The Soliani Ivano is the CEO of the SOLIANI EMC and the production is located on two sites one in Como via Varesina n 122 and the second in Cavallasca via 1° Maggio . The Soliani Ivano is Ph. Eng in electrotecnic in Polytechnic of Milano

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Belgium, more than just beer and chocolates !

Caroline Sonneville (Fedustria)

Fedustria : At the service of the industry

Fedustria represents the **textile**, **woodworking and furniture industry's** companies. In Belgium, these sectors account for more than 60,000 jobs in 2,700 companies and generate a turnover of 12 billion euros. In other words, one of the most important sectors of the Belgian industry.

Fedustria acts as a representative of the textile, wood and furniture industries, provides an **even more active protection of the common interests of the members** and **a larger range of specialised services**, is a common training and meeting platform for its members and also supplies **accurate and up-to-date information**.

The "Technical textiles" product group includes the following textile products: geotextiles and textiles for building, agriculture, gardening and fishing, defence, protection and security, automotive industry, medical applications, transport and packaging, industrial applications (filtration means, etc.).

Key figures for 2008	
Number of companies	130
Number of employees	8,500
Turnover (in million EUR)	2,300
Exported turnover share	70%
Activity evolution in 2008 (in volume)	+4%
Share in the total added value of the Belgian textile sector	33%

Biosketch

Caroline Sonneville is in charge of the development of the international business for technical textiles at Fedustria, the Belgian Federation of the textile, wood and furniture industries. She has a masters degree in Public Relations and has been working for the federation for nine years : the first three years as Press & Communication Manager, the last six years as Export Promotor for Technical Textiles.

Her key activity at the federation is the provision of economical services to the member companies of Fedustria such as : support in customs regulation and rules of origin; follow up of the technical textiles business worldwide; organization of individual or corporate prospecting trips; organization of a Belgian Paviljon at international tradefairs for technical textiles, organization of networkevents and B2B conventions such as Matchtex (www.matchtex.eu) etc.

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Scenario and evolution of the Italian Technical Textiles sector

Aldo Tempesti
TexClubTec

Abstract

Clothing and fashion is one of the world's biggest consumer goods category with a global market estimated to be worth well over 1 trillion Euros . Into the near future, demand for clothing, is expected to grow significantly only in the strongly populated fast growing economies as Asia and Latin America or Eastern Europe, while in the highly developed countries it is expected to be slower.
In the next future only some significant innovations like functional and smart garments may however provide an additional growth stimulus in more mature markets . The evolution of this scenario is very important for the Italian Textiles and Clothing industry as Italy has a longstanding tradition of leadership in terms of innovation, fashion and creativity.
Textile and Clothing represents one of Italy's major industrial sectors with, in 2008, an annual turnover of more than € 54 billion Euro , a total workforce of 508,000 and 55,000 companies. It is the second player in world trade, the first in wool yarn and fabric export, the second in silk fabrics and clothing, and the third in knitting products. In this context too, Italian textile machinery manufacturers themselves lead the world, moving in technology and innovation
During 2008, and still today, in all advanced countries, the textile industry underwent a strong contraction, caused, on one hand, by the competition coming from the low labor cost countries, and, on the other hand, by the worldwide financial crisis. This economic situation has produced a lack of consumer confidence and consumers have stopped spending, creating problems in every sector
In Italy, the sector of textile and clothing was drastically reduced, in the year 2008, with a loss of the number of the companies around 3000, and 5000 jobs. In Italy , the industry is down, as everywhere, and most industrial segment down about 20-40%
The technical Textile sector
As other products the Italian technical textiles sector is tied to the economy and if some segments, very important for traditional applications of technical textiles, as automotive or construction areas, are down, also the technical textiles industry will be down as well. However , in spite of the fact that the textile industry underwent a strong contraction and that normally the textile industry is considered a traditional sector, today many companies are developing new business strategies. The new market standards, achievable with process innovations, which on one hand reduce costs, whereas on the other hand allows to distinguish oneself from the other competitors, have become a very important competitive factor. With a share of 14.4% of the total European consumption of technical textiles, Italy, along with Germany, France and UK is one of the main European markets. In this sector are involved more than 800 companies with a turnover of 3,2 Bill. €

Breve Biografia/Biosketch

Aldo Tempesti got his Diploma Degree in Chemistry at the University of Milan. He worked for the development of modacrylic fibre as well as of the promotion of acrylic fibre for Snia Fibre and Montefibre Spa. He's involved in different working groups operating at European level (i.e. CEN, ISO), as well as national level (i.e. Confindustria, UNI). From 1990-2002 he was the Secretary General of AITA (the Italian flame retardant textiles association) and President of the CEN/TC248/SC1. Since 1998 he's the Director of TEXCLUBTEC (the technical and innovative textile association). He also participates in the "Barriers to trade", "R&D" Working Group and he is President of "Technical Textiles" Working Group of Euratex (European Textile and clothing Association). He taught textile industrial technologies at University of Bergamo (Italy) from 2003 to 2006. He has published different works regarding technical textiles and presented speeches on the same subject during international conferences.

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Il supporto all'innovazione attraverso la realizzazione di network tecnologici sul territorio

Eugenio Tettamanti,
Confindustria Como

Abstract

Le sfide per il cambiamento che il settore tessile italiano è chiamato ad affrontare richiedono un impegno concreto e costante di tutti gli operatori coinvolti nella filiera. Il lavoro del gruppo di ricerca e innovazione di Confindustria Como ha visto uniti in questi anni, imprenditori, ricercatori pubblici e privati nella realizzazione di progetti tesi a migliorare la capacità competitiva delle nostre imprese sui mercati europei ed internazionali.
Un particolare impegno è stato profuso nell'ascoltare le esigenze di innovazione di prodotto/processo delle imprese incrociandole con le competenze necessarie e con le opportunità di finanziamento pubblico offerte dai bandi Provinciali, Regionali e/o Nazionali.
La necessità di una migliore efficacia ed efficienza nello scambio di informazioni è stato possibile con la valorizzazione e condivisione tra le imprese di adeguati strumenti IT/ICT

Breve Biografia/Biosketch

Eugenio Tettamanti, nato a Faloppio il 13 maggio 1952, ha studiato presso il Collegio Gallio di Como e l'Università Cattolica di Milano
Ha ricoperto nel tempo incarichi di responsabilità partecipando a consigli di amministrazioni di società tessili sia industriali che commerciali.
Ha avuto l'incarico di Giudice Onorario presso il comune di Faloppio per una decina di anni.
A livello associativo ha ricoperto il ruolo di Presidente della Piccola Industria presso l'Unione Industriali di Como e contemporaneamente Vice-presidente, Membro di Giunta, e Consigliere del Direttivo dell'Unione Industriali di Como, ha partecipato nel tempo al lavoro di diverse Commissioni quali quella informatica, sindacale e assicurativa ed ai lavori come Consigliere del gruppo Tinto Stampatori e consigliere della Associazione Serica Italiana.
Ha ricoperto la carica, su nomina della Regione Lombardia di membro del Consiglio Direttivo del Tessile di Como dove nei primi anni dell'Associazione era stato co-responsabile di due progetti (Banca dati e Telematico)
Quale rappresentate della Camera di Commercio di Como ha partecipato al Comitato di Controllo del progetto I-Cast della Regione Lombardia.
Prima Sindaco, oggi Consigliere dell'Acquedotto Industriale
Consigliere del Gruppo Filiera Tessile
Presiede la commissione Ricerca ed Innovazione di emanazione del Gruppo filiera Tessile presso Confindustria Como
Prima Consigliere poi Vicepresidente poi Presidente presso la Stazione Sperimentale per la Seta di Milano.

Contatto

Maurizio Moscatelli

Filati Innovativi per il Settore dei Trasporti

Dott. Giuseppe Vicenti
Radici Group

Abstract

La continua richiesta da parte del mercato di prodotti con performance superiori agli standard ha portato RadiciGroup a sviluppare filati di poliestere che utilizzano le nanotecnologie per soddisfare tali esigenze.

Dopo un'introduzione sulle attività del Gruppo, con particolare riferimento ai filati di poliestere, fibra predominante per la realizzazione di tessuti destinati al settore trasporti, si approfondirà lo stato dell'arte, la metodologia di produzione ed i vantaggi derivanti dall'uso di poliesteri additivati con effetti batteriostatici ed antifiamma.

Particolare rilevanza verrà data al filo Nanofeel® , il primo poliestere continuo, già disponibile su scala industriale, che unisce la nanotecnologia per l'effetto batteriostatico ai vantaggi della tintura in massa per ottenere le performance di solidità, riproducibilità del colore, resistenza all'abrasione e durata nel tempo, prerogative essenziali in tessuti destinati al settore trasporti.

Si accennerà infine a sviluppi in corso in merito all'uso delle nanotecnologie per la produzione di tessuti antimacchia e/o antistatici.

Breve Biografia/Biosketch

Giuseppe Vicenti, laureato in Chimica Industriale, dopo alcune esperienze in ambito commerciale, nel 1999 entra a far parte di RadiciGroup, multinazionale italiana attiva nei settori della chimica, della plastica e nella filiera delle fibre sintetiche.

Dal 2005 è Sales Industry Manager Automotive di Noyfil Spa e Noyfil Sa, aziende di RadiciGroup specializzate nella produzione di filati di poliestere ad alte prestazioni. La gestione della rete commerciale, lo sviluppo di prodotti innovativi a stretto contatto con i clienti ed in collaborazione con il team Ricerca&Sviluppo costituiscono le sue attività principali, insieme alla gestione diretta di alcuni key customer produttori di tessuti in poliestere destinati ad usi tecnici.

Tra i suoi obbiettivi un rafforzamento ed un ampliamento della presenza nel mercato automotive in particolare per quanto riguarda le applicazioni ad elevato valore tecnologico.

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Textiles for blast protection against terrorist threat in aircraft structures

Donato Zangani
Innovation and Research Division
D'Appolonia, S.p.A.

Abstract

The rise in worldwide terrorism has required measures be taken to harden aircraft against catastrophic in-flight failure due to concealed explosives. Commercial aviation can be protected from the threat of explosives by either preventing explosives from reaching the aircraft or by mitigating the effects of an onboard explosion.
The risk that a small quantity of an explosive, below the threshold of the detection instruments, could get undetected should be considered, and the introduction of countermeasures to reduce the effects of on-board explosions should be considered. Hardened containers (HULD) have been developed for the latter scope, but have some disadvantages which prevent their wider utilisation: they are heavier and more costly than standard luggage containers and only applicable to wide-body aircrafts. The issue of containing explosions aboard narrow-body aircrafts has yet to be resolved.

A novel approach, investigated in the European Collaborative Project FLY-BAG, is based on the use of a combination of novel textile materials and composite materials to achieve a higher flexibility for the luggage contained, together with a low weight and a high resistance to blasting events; moreover, this concept applies to both wide- and narrow-body aircrafts and can be further customised for practically any application and configuration. Textile structures are flexible, light and can be designed to resist explosions by controlled expansion and mitigation of the shock waves, while at the same time retaining hard luggage fragment projectiles and preventing them from hitting the aircraft fuselage at high speed. A multi-layer structure is developed to absorb the large dynamic loads of the explosion and the large deformation related to the gas expansion. The idea is to use a textile structure made of ballistic yarns as an internal high strength layer to stop the ejected debris, coupled with an external layer which could deform in a controlled way during the explosion, in a way similar to car airbags, mitigating the blast pressure. The combination of different innovative textile materials shall allow achieving a great blast resistance while retaining an acceptably low weight.

Breve Biografia/Biosketch

Dr. Donato Zangani is a civil engineer who is expert on textiles, composites, and their integration into the built environment, aeronautical sector, transport, and shipping for efficiency, increased performance, and increased security.

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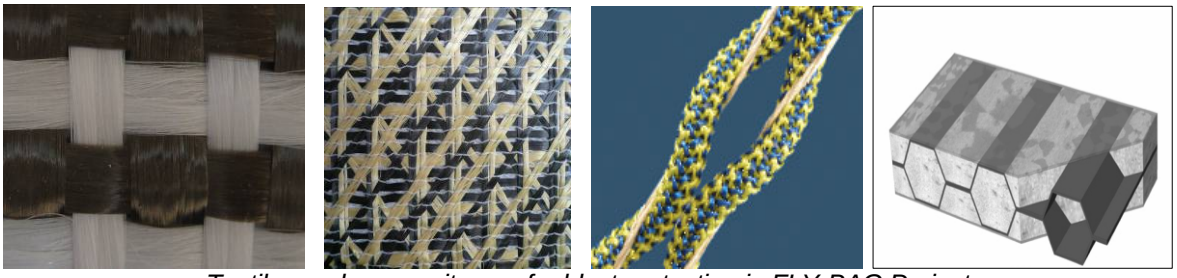

Textiles and composite use for blast protection in FLY-BAG Project

Technical Textiles Market in Germany – Actual Situation

Werner Zirnzak
Industrieverband Garne – Gewebe – Technische Textilien e. V. (IVGT)

Abstract

1. Actual Economic Situation in Germany
2. Market Development Technical Textiles in Germany
3. World Market Technical Textiles
4. Prospects Technical Textiles
5. R & D Technical Textiles
6. Barriers Technical Textiles

Breve Biografia/Biosketch

Deputy Managing Director of IVGT and Secretary of ETT CLUB since 2001/2002. Before more than 27 years manager in the chemical industry and specialist in thermoplastics, thermosets, chemical and natural fibres, functional polymers, fine chemicals, composites and technical textiles.

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Abstract
Poster Session
in ordine alfabetico

Nanofilled HDPE Fibers.
Effect of pyrogenic nanosilica on spinnability and drawing.

Matteo D'Amato, Andrea Dorigato, Alessandro Pegoretti, Luca Fambri
University of Trento

Abstract

Scarce literature data are available on polyolefin nanocomposite for fiber production. In the case of polyethylene some results on nanoclay dispersion in polyethylene showed the beneficial effect of filler on both mechanical properties and thermal stabilization.

Object of this research is the preparation of nanofilled HDPE (MFI 0.9 g/10min) by using pyrogenic silica (Aerosil, Degussa), as previously studied in the case of LLDPE. Formulation with 2% of AR974 by vol. was selected for processing. Preliminar solid mixing of the powders, was followed by twin-screw melt mixing and spinning. As spun fiber of 0.5 mm in diameter were drawn at 125°C with increasing draw ratio up to 40.

Both crystallinity and mechanical properties were found to increase due to macromolecule alignment. The effect of fillers showed not only a similar spinnability, but also an increase of drawability of nanofilled HDPE with respect to virgin HDPE. Drawn fibers with final diameter of 80-100 micron (corresponding to 50-70 dtex) showed tensile modulus between 15-50 GPa, strength in the range 0.8-1.5 GPa with higher values in the case of nanofilled HDPE, and deformation at break of 25-10%. Tensile modulus of 44 and 63 GPa, and strength of 1.8 and 2.0 GPa were extrapolated from experimental data for HDPE and nanofilled HDPE fiber respectively.

Compared DMTA and creep experiments were also performed; the increase of storage modulus, the shift of the master curve at higher times (i.e. lower frequencies), the reduction of creep compliance evidenced the stabilizing effect of nanofiller in the polyethylene matrix.
Moreover, thermooxidation study by TGA confirmed the beneficial effect of pyrogenic silica on HDPE nanocomposites.

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Biosketch

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Nanofilled Polypropylene Fibers.

Luca Fambri[1], Denis Lorenzi[1], Giuseppe Ferrara [2], Gabriella Sartori[2]
[1]University of Trento; [2]Lyondellbasell Ferrara

Abstract

Polypropylene fibers have many practical uses, like the production of carpets, furniture, packaging, construction and industrial materials, etc. This work will focus on the nanofiller modification of an isotactic polypropylene (iPP) produced by Lyondellbasell Industries (melt flow 25 g/10min, 2.16Kg, 230°C) tipically used in the non-woven market for agriculture, geotextile and roofing applications.
In order to change the polymers properties while keeping the processability during the spinning process, four different nanofillers were selected. Three organic modified cationic clays Cloisite 15A from Southern Clay Products (CLO), Dellite 67G (DEL) and an experimental sample from Laviosa Chimica Mineraria; and one synthetic hydrotalcite Perkalite F100 from Akzo Nobel (PER) were used to prepare an initial masterbatch with 5% of nanofiller and PP-g-MA as compatibilizer with a single screw extruder. Final pellets containing 0.3% by wt. of nanofiller were produced with a twin screw extruder.

Monofilament were spun by using a single screw commercial extruder (Friulfiliere Estru 13) with a single-hole die (1 mm diameter) at various collecting rates. Spinnability and drawability of iPP and nanofilled iPP fibers were compared after mechanical testing.
The higher the collection rate, the lower the fiber diameter, the higher the drawing, and the higher the strength and the lower the deformation at break. The total draw ratio DR was defined as the ratio between the die-section and the fiber section at the break. The maximum attainable properties can be evaluated from the plot of mechanical properties S vs. the inverse of the total draw ratio 1/DR, by extrapolation at infinite draw ratio according to following eq.

$$S = S_\infty - k\ 1/DR$$

where S_∞ is the intercept of the straight line and represents the predicted maximum attainable value. Maximum attainable strength of 2.37$\pm$0.35GPa and 2.44$\pm$0.24 GPa can be extimated for iPP and iPP-PER respectively. Similar data for iPP-CLO (1.44$\pm$0.10 GPa) and iPP-DEL (1.34$\pm$0.05 GPa) fibers, but lower value and correspondent higher relative deviation (0.94$\pm$0.15 GPa) in the case of experimental nanofiller. TEM micrography evidenced the nanofiller dispersion.
In conclusion, all the prepared nanofilled iPP could be easily processed, showing in some cases a higher drawability with respect to pure iPP.

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Biosketch

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Application of Raman spectroscopy for study of atmospheric plasma treatment of wool fibers

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Abstract

Atmospheric plasma treatment of textiles offers a valid ecological friendly alternative to the conventional chemical textile finishing (anti-shrinking of wool, optimisation of dying processes etc). This technology is of big interest for CIVEN-NANOFAB, especially for the specific industrial applications.

Micro Raman spectroscopy is becoming a valuable analytical technique in the polymer science, complementary for the IR characterisation. Micro Raman spectroscopy of fibers is a non destructive analysis that provides excellent fingerprint spectra not only of the fibers surface, but also of the inner cuticola layers of the wool fibers. It performs a rapid non destructive analysis of the oxidative processes in treated fibers, without cutting them. We have applied this advantageous analytical method for the qualitative investigation on chemical composition of the wool fibers that have been treated with atmospheric plasma.

Main interest in our analysis was concentrated for the inner cuticula layers of the wool fibers, in function of the energy of the applied atmospheric plasma treatment. There were monitored the stretching vibrational modes of disulphide (510cm^{-1}) and of cysteic acid (1045 cm^{-1}) contents of plasma treated wool fibers, at the different depth of cuticula layer. The micro Raman studies have demonstrated the gradual penetration of the atmospheric plasma (oxidation) effect into the cuticula of the fibers, and also the ongoing spontaneous oxidation process of the surface of fibers in the post treatment period.

Biosketch

Dr. Illya Kulyk (PhD) has obtained Diploma of Physics at the Kharkov State University (Ukraine) in 1983. In the period until 1992 he worked in the stuff of Institute for Low Temperature Physics and Engineering of the Ukrainian Academy of Sciences (Kharkov, Ukraine) in the field of basic research of electrical nano-contacts behaviour under electro magnetic irradiation (PhD thesis).

In the period 1992-2002 he worked as the engineer of plasma deposition technology (sputtering) at Legnaro National Laboratory of Istituto Nazionale di Fisica Nucleare (Padova, Italy) in the field of technological applications of plasma assisted deposition processes. In the period 2003 - 2007 he worked in the private firm (Venice, Italy) in the R&D of the innovative materials and technologies for the packaging industry.

From 2007 Dr. I. Kulyk has established the novel research activity at CIVEN Association (Marghera - Venezia, Italy) for the research and industrial applications of the atmospheric plasma technology. Actually he is responsible for the specific CIVEN Project “Innovative technologies for the improvement of the properties of textiles and leathers”, and for the several NANOFAB industrial projects for atmospheric plasma industrial applications.

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Smart Rope - Improved safety of braided synthetic ropes due to integrated threadlike sensors

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Abstract

Within the german BMBF-funded project “Smart Rope” synthetic ropes with integrated load and wear sensors are developed. The project started in 2007 and has a duration of 36 months.

Ropes are employed in a variety of applications such as fixation of goods during transportation, on ships and for sports such as climbing and sailing. To ensure the safety of ropes they are usually inspected by eye, but there is no clear criterion for recognizing when a rope needs to be replaced. The aim of the project is the development of complete integrated monitoring systems that are based on threadlike sensors. The availability of those monitoring systems will increase the safety of braided synthetic ropes for the user and will enable the use of these ropes in new applications (e.g. in elevators).

During the project a special testing device for smart ropes was developed. With this device it is possible to simulate different load and wear cases while measuring their effect on the rope. Thus this testing device makes it possible to substitute expensive tests in real scenarios by laboratory tests with the testing device.

We thank the Bundesministerium für Bildung und Forschung (BMBF) for the financial support of the research project “Erhöhung der Funktionssicherheit von synthetischen geflochtenen Seilen und Leinen durch ein integriertes textilbasiertes Monitoringsystem – Smart Rope“.

Biosketch

Dipl.-Ing. Melanie Wipfler studied textile technology at Niederrhein University of Applied Sciences. After one year of development of protective garment for soldiers at Texplorer GmbH in Nettetal, Germany, she went back to university.
Since January 2008 she is working as a scientific researcher at the Institut für Textiltechnik of RWTH Aachen University, in the Smart Textiles / Joining Technology department. Mrs. Wipfler coordinates the BMBF-funded project Smart Rope.

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Comparison of different cross-linkers for the application of flame retardant nanoparticle additives on textile fabrics in finishing process

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Flame retardant additives on textile fabrics can act delaying or blocking the polymer combustion process. It is known that nanometric particles when dispersed homogeneously in polymer matrices can contribute to the enhancement of properties such as thermal, mechanical or fire resistance. They enable a considerable reduction of the loading rate as the interfacial area between the polymer and the nanofiller is greatly increased.[1] On the basis of their nature, flame retardant systems can either act physically (by cooling, formation of a protective layer or fuel dilution) or chemically (reaction in the condensed or gas phase). Flame retardants can be classified in two categories:
- Additive flame retardants: these are generally incorporated during the transformation process and do not react at this stage with the polymer but only at higher temperature, at the start of a fire;
- Reactive flame retardants: unlike additive flame retardants, these are usually introduced into the polymer during synthesis (as monomers or precursor polymers) or in a post-reaction process (e.g. via chemical grafting).
Unfortunately, there is not always great interaction between inorganic particles and polymeric materials.[2] The difference between surface energy of two materials causes a kind of repellence in their interfaces.[3] This problem is intensified by using nanoparticles because of their high specific surfaces. Consequently, surface modification of textiles with nanoparticles is not permanent; especially against washing. The aim of this study was to investigate the bonding of two flame retardant agents based on nanoparticles (boehmite and polyhedral oligomeric silsesquioxane) with cellulose and/or polyester matrices through suitable poly-functional binders, leading to a hybrid material. For cotton five cross-linkers have been chosen: two blocked isocyanates, DMDHEU (dimethyloldihydroxyethylurea), trimethylolmelamine (TMM), and other similar urea compound. For polyester textile fabric treatment PES resin, used as finishing carrier, was used. Also the influence of cross-linker on flame retardant properties of nanoparticles used was studied. The flame retardancy properties of the textile fabrics were evaluated by cone calorimetry. The results obtained showed that it is possible to modify the combustion properties of the two matrices by adding of these new nanoparticle-based additives. Regarding cotton, the heat release rate (HRR) of the combustion decreases and meanwhile the time to ignition (TTI) increases. On the contrary, in the case of PET the TTI decreases even if the HRR decreases.

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