



11th

Advanced Coating Fundamentals Symposium

**The Latest Advances
in Coating Research
and Development**

11-13 October 2010

held at PTS (Papiertechnische Stiftung)
Munich, Germany

- Hear the latest in coating fundamentals and new technologies
- Meet and interact with coating experts from around the world

Key Topics

- Advanced Fundamentals for Printing
- Liquid Interactions with the Coating Layer
- Sustainable Barrier Coatings
- Sustainable Coating Components
- Optical Control
- Coating Layer Structures
- Advanced Understanding of the Curtain Coater

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11th Advanced Coating Fundamentals Symposium

The 11th Advanced Coating Fundamentals Symposium serves as a forum for knowledgeable coating professionals to present to their colleagues findings and leading edge developments relating to coating fundamentals, paper surface treatment, converting, and printing operations to their colleagues.

The Symposium includes presentations around the following topics:

- Advanced Fundamentals for Printing
- Liquid Interactions with the Coating Layer
- Sustainable Barrier Coatings
- Sustainable Coating Components
- Optical Control
- Coating Layer Structures
- Advanced Understanding of the Curtain Coater

Sponsorship Opportunities

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View the prospectus at www.tappi.org/10acf or contact Ria Van den Bogaert, ria@vandenbo.com, +32 (2) 569 8905.

Symposium Leadership

Reinhard G. Sangl

Technical Programme Co-Chair
PTS

Joachim Schoelkopf

Technical Programme Co-Chair
Omya Development AG

Conference Planning Committee:

Lars M. Jarnstrom

Karlstad University

John Kettle

VTT Technical Research Centre of Finland

Alonzo K. Osgood

Sappi

Janet S. Preston

Imerys

Nick G. Triantafillopoulos

OMNOVA Solutions

David J. E. Vidal

FPIInnovations

Keynote Presentation

“Natural Systems for Bioinspired Designs: An Introduction to the Physics of Coloured Appearances in the Biological World”



Peter Vukusic, Associate Professor Natural Photonics and Bioinspiration at the University of Exeter School of Physics

Dr. Vukusic runs a large research group at Exeter University School of Physics and its work comprises discovery, characterization, and technological application of the unique optics and photonics systems that have evolved naturally in animals and plants. His work is frequently featured on scientific programmes on the BBC and *National Geographic*. He lectures regularly on the science of light and colour to schools and international audiences.

In 2004, Vukusic was awarded the L'Oreal Art and Colour of Science International Prize, and in 2007 he was chosen as the Institute of Physics' National School's Lecturer. In 2001 he was awarded a 5-year Personal Fellowship from the BBSRC and in 2003 was appointed permanent lecturer at the University of Exeter School of Physics.

Advanced Coating Fundamentals Dinner



Tradition and folklore will surround you at the Symposium dinner, Tuesday, 12 October, in the lager cellar at the Augustinerkeller. Since 1812, the Augustinerkeller has been one of the

most popular Bavarian restaurants in Munich.

In the 1800s, it was popular to visit the beer garden to observe the “beer bull”, which brought the beer kegs up from the cool storage in the deep cellar of the premises. Although this process was stopped in 1891, the outside facade of the beer garden is exactly as it was back then.

Join us for fun and fellowship with your colleagues from around the world. Transportation provided.

Cancellation Policy:

If you find that you must cancel, your full registration fee will be refunded if TAPPI's Registration Department receives written notification (fax acceptable at +1.770.209.7206) by 13 September 2010. Please note: there will be a 50% refund for all written cancellations made after 13 September 2010 but no later than 5 business days prior to the start of the conference (4 October 2010). Understandably, after this time, no refunds can be issued. Substitutions, however, will be accepted any time without a penalty.

Refund:

100% - Cancellation received by 13 September 2010.
50% - Cancellations received after 13 September 2010 but no later than 4 October 2010
NO REFUND - Cancellations received after 4 October 2010, but substitution permitted.

Meeting Centre

PTS (Papiertechnische Stiftung)
Hess Strasse 134
80797 Munich, Germany

Hotel Information

Hotel Vitalis Munich
Kathi-Kobus-Str. 22
80797 Munich, Germany
www.daniel-hotels.com
Phone: +49 89 120 08-0
Fax: +49 (89) 129 83 82
info@hotel-vitalis.de

Special room rates have been arranged at the hotel. Single rooms are €93 plus tax. Make your reservation by 1 September 2010 to receive this rate.

11th Advanced Coating Fundamentals Symposium

Tentative Technical Program. *Subject to Change.*

Paper #	Time/Session/Title	Authors
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Monday, 11 October 2010

12:00-13:00h

Session 1	Opening Session and Keynote Address Session Chair: Reinhard Sangl, PTS “Natural Systems for Bioinspired Designs: an Introduction to the Physics of Coloured Appearances in the Biological World” – Dr. Peter Vukusic	
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13:00-14:00h

Session 2	Poster Session Session Chair: Reinhard Sangl, PTS	
	Sealant Resins Based on Ethylene Copolymers Containing Biosourced Modifiers	<i>Donna Visioli and J C Chen, DuPont</i>
	Microstructure Formation on Paper Using Inkjet Coating	<i>Kazutomo Dougome, Toshiharu Enomae and Akira Isogai, University of Tokyo</i>
	Determining a Size Distribution-Defined Particle Aspect Ratio for Platy and Rod-Like Coating Particles	<i>Daniel Gantenbein, Joachim Schoelkopf, Patrick Gane and Peter Matthews, Omya Development AG and University of Plymouth UK</i>
	Starch Nanocrystals for Ecoefficient Barrier Coating: Influence of Formulation & Process Parameters	<i>D. Le Corre, Julien Bras, A. Dufresne, Grenoble</i>
	Control Interfacial Properties in Paper Surface	<i>Arne Krolle, BYK-Chemie</i>
	Fabrication of Particulated Model Surfaces with Controlled Roughness Using Different Deposition Methods	<i>Petra Hansson and Agne Swerin, YKI; Lisa Skedung, Per Claesson and Mark Rutland, YKI, Royal Institute of Technology; Esben Thomann, Royal Institute of Technology; Joachim Schoelkopf, Omya Development AG; Patrick Gane, Omya Development AG, Aalto University</i>
	Optical Properties of Diffuse Coatings Under Partially Coherent Illumination	<i>David Haefner, Sergey Sukhov, Janghwan Bae and Aristide Dogariu, University of Central Florida; Deqiang Ma and Douglas Carter, KaMin</i>

14:00-14:30h

Break at PTS

14:30-15:45h

Session 3	Good Reasons for Research - Sustainable Components Session Chair: John Kettle, VTT	
3.1	Nano-fibrillated Cellulose as a Coating Agent to Improve Print Quality on Synthetic Fiber Sheet	<i>Hitomi Hamada, National Printing Bureau of Japan; Douglas Bousfield, University of Maine</i>
3.2	Specialty Biobased Monomers and Emulsion Polymers Derived from Starch	<i>Steven Bloembergen, Ian J. McLennan and John van Leeuwen, ECOSYNTHETIX; Do Ik Lee, Western Michigan University and Scientific Advisor to ECOSYNTHETIX</i>
3.3	Can Starch Be Used in Topcoating?	<i>Anthony Hiorns, IMERYS Minerals</i>

15:45 - 16:15h

Break at PTS

16:15 - 17:05h

Session 4	Advanced Understanding of the Fundamentals of Optical Control Session Chair: Anthony Hiorns, Imerys	
4.1	Modelling of Brightness Decrease of Coated Cartonboard as an Effect of Calendaring Microroughness and Effective Refractive Index Aspects	<i>Erik Bohlin and Caisa Johansson; Karlstad University; Ludovic Coppel, INNVENTIA, Per Edström, Mid Sweden University</i>
4.2	Understanding the Particle Size/Shape Ambiguity and its Impact on Optical Responses of Particulate Composites	<i>Thomas Kohlgraf-Owens and Aristide Dogariu, University of Central Florida; Deqiang Ma and Douglas Carter, KaMin</i>

Evening Free

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Tuesday, 12 October 2010

09:00-10:15h

Session 5	Advanced Understanding of Liquid Interactions with the Coating Layer Session Chair: Joachim Schoelkopf, Omya Development AG	
5.1	Adjustable Wetting Properties of Paperboard by Liquid Flame Spray Process	Milena Stepien, Jarkko Saarinen and Martti Toivakka, Abo Akademi University; Hannu Teisala, Mikko Tuominen, Jurkka Kuusipalo, Mikko Aromaa and Jyrki Mäkelä, Tampere University of Technology
5.2	Liquid Absorption and Evaporation in a Coating Studied by Near Infra-Red Probe Spectroscopy	C.-M. Tåg, Forest Pilot Center Oy; M. Juuti, VTT Technical Research Centre of Finland; Kimmo Koivunen, Aalto University; Patrick Gane, Aalto University, Omya Development AG
5.3	Optical Reflectance as a Function of Liquid Contact Time and Penetration Depth Distribution in Coatings with Mono and Discretely Bimodal Pore Size Distributions	Kimmo Koivunen, Aalto University; Patrick Gane, Aalto University, Omya Development AG

10:15-10:45h

Break at PTS

10:45-12:00h

Session 6	Paper with the Customer - Advanced Fundamentals for Sustainable Barrier Coatings Session Chair: Wolfgang Bauer, Institut für Papier-, Zellstoff- und Fasertechnik, Technische Universität Graz	
6.1	Effect of Pigment Volume Concentration and Drying Aspects on the Enzyme Activity of Clay Coatings	Kristin Johansson and Lars Järnström, Karlstad University; Hanna Christophliemk, Tampere University of Technology; Leif Jönsson, Umeå University
6.2	Superhydrophobic Paper Coating Containing Non-Conventional Clay	Behudin Mesic, Scion; Christian Kugge, CSRIO; Lars Järnström, Karlstad University
6.3	Predictions of Barrier Properties of Filled Polymer Layers	Tyler Seekins and Doug Bousfield, University of Maine; Deqiang Ma and Doug Carter, KaMin

12:00-13:30h

Lunch at Hotel

13:30-15:10h

Session 7	Paper with the Customer - Advanced Fundamentals for Printing I Session Chair: Patrice J. Mangin, Centre Intégré en Pâtes et Papiers (CIPP)	
7.1	Effective Thermal Conductivity of Liquid Saturated Coatings and their Liquid Vaporisation Behaviour	Philip Gerstner and S. Veikkolainen, Aalto University; Patrick Gane, Aalto University, Omya Development AG
7.2	The Role of Ink Component Diffusion During Absorption into Inkjet Coatings	Taina Lamminmäki, John Kettle and Pasi Puukko, VTT Technical Research Centre of Finland; Cathy Ridgway, Omya Development AG; Patrick Gane, Aalto University, Omya Development AG
7.3	A New Method to Determine the Water Retention of Coating Colours and its Impact on Mottling of Coated Papers	Erich Zeyringer, Sappi Gratkorn
7.4	Influence of Plasma Coating on Fluid Absorption into Pigment-Coated Paper	Maiju Pykönen, Roger Bollström, Martti Toivakka and ja Pedro Fardim, Åbo Akademi University; Kenth Johansson, Ytkemiska Institutet AB; Göran Ström, Innventia AB

15:10 - 15:40h

Break

15:40 - 17:20h

Session 8	Paper with the Customer - Advanced Fundamentals for Printing II Session Chair: Nick Triantafillopoulos, OMNOVA Solutions	
8.1	Impact of Coating Surface Properties and Print Impression on the Non-uniformity of Sheetfed Offset Prints	Göran Ström and Michael Karathanasis, Innventia AB; Janet Preston, Imerys Minerals Ltd.

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8.2	Response to Isopropanol or Ionic/Non-ionic Surfactant in the Competitive Imbibition of Water and Alkane into Calcium Carbonate Structures	<i>Cathy Ridgway and Joachim Schoelkopf, Omya Development AG; Patrick Gane, Omya Development AG, Aalto University</i>
8.3	Press Conditions Define Heatset Piling Tendency	<i>Eija Kenttö, J. Kiuru, A. Peltosaari, A. Sneck, K. Koivumäki and S. Passoja, VTT Technical Research Centre of Finland</i>
8.4	Influence of Ink Chemistry and Surface Energy on Flexographic Print Quality	<i>Wing Luu and Douglas Bousfield, University of Maine; John Kettle, VTT, Technical Research Centre of Finland; Joseph Aspler, FPInnovations</i>

Advanced Coating Fundamentals Dinner at Augustinerkeller (transportation provided)

Wednesday, 13 October 2010

9:00 - 10:15h

Session 9	Advanced Understanding of Coating Layer Structures I Session Chair: Tony Lyons, Imerys	
9.1	Distribution of Latex during Drying in Confined Geometries	<i>Nathanael Black, William Unertl and Douglas Bousfield, University of Maine</i>
9.2	Consolidation of Coating Colours – Experimental Studies	<i>Heikki Pajari and Hanna Koskela, VTT Technical Research Centre of Finland</i>
9.3	Dynamic Aspects of Crack Development in Coating Layers	<i>Peter Rättö and Joanna Hornatowska, Innventia</i>

10:15 - 10:45h

Break

10:45 - 12:00h

Session 10	Advanced Understanding of Coating Layer Structures II Session Chair: David Vidal, FPInnovations	
10.1	A Novel Approach to Quantify the Spatial Coating Layer Formation	<i>Johannes Kritzinger and Wolfgang Bauer, Graz University of Technology, Pekka Salminen, Styron Europe GmbH; Janet Preston, Imerys Minerals</i>
10.2	Cohesive Versus Adhesive Mechanisms of Failure in Paper Coatings - A Modelling Approach	<i>Parvez Alam and Martti Toivakka, Åbo Akademi University</i>
10.3	Stochastic Scattering Approach to Determine Effective Packing Structure in Diffuse Optical Coatings	<i>Sergey Sukhov, David Haefner and Aristide Dogariu, University of Central Florida; Deqiang Ma and Douglas Carter, KaMin</i>

12:00 - 13:30h

Lunch at Hotel

13:30 - 14:45h

Session 11	Advanced Understanding of Application Systems - The Curtain Coater Session Chair: David Guerin, Centre Technique du Papier	
11.1	Experimental and Theoretical Study of the Internal Flow in a Curtain Coater	<i>Philippe Martinez, Martine Rueff, David Guerin and Véronique Morin, Domaine Universitaire</i>
11.2	Model Analysis of a Multilayer Curtain Coating	<i>Yingfeng Shen, Annaleena Kokko, Hille Rautkoski and Pasi Puukko, VTT Technical Research Centre of Finland</i>
11.3	Characterisation of Curtain Coating Colours	<i>Annaleena Kokko, John Kettle, Hille Rautkoski and Yingfeng Shen, VTT Technical Research Centre of Finland</i>

14:45 - 16:00h

Session 12	Demonstration of Curtain Coating at the PTS Pilot Coater Facility	
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REGISTRATION FORM

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10ACF

1. WHAT TYPE OF COMPANY DO YOU WORK FOR?
(choose only one)

- Pulp and Paper/Paperboard Manufacturing (1)
- Tissue Manufacturing (5)
- Paperboard Packaging Integrated Converting Plant (4AD)
- Paperboard Packaging Independent Converting Plant (4AO)
- Tissue Converting (4C)
- Paperboard Packaging Headquarters (4AH)
- Independent Consultant: Eng., Tech., Prod., or Research (2)
- Mfg. of Machinery, Equipment, Chemicals or Supplies (7)
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- University Professor (9A)
- Full Time Student (9B)
- University Library (9C)
- Press (10A)
- Library (10B)
- Association (10C)
- Government (10D)
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- Printing/Graphic Arts (15)
- Allied to the Industry (12)
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- Agricultural (Non-Forestry) (17)
- Energy Product Company (19)

2. WHAT IS YOUR PRIMARY JOB FUNCTION?
(check one)

- Librarian – Corporate (A)
- Technical Research (D)
- Marketing & Sales (G)
- Corporate Management (B)
- Engineering (E)
- Traffic & Shipping (H)
- Production (C)
- Purchasing & Stores (F)
- Other Management & Administrative Personnel (I)
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3. WHAT IS YOUR PRIMARY INDUSTRY? (check one)

- Pulp Mill Only (P)
- Technical/R&D Facility/Headquarters (H)
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- Independent Operations or Converting Plant (O)
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- Energy Plant (Non-Integrated) (E)

4. HOW DID YOU HEAR ABOUT THE CONFERENCE?

- Brochure
- Colleague/Co-Worker
- Email
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- Other
- tappi.org Website
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5. WHEN CHOOSING A CONFERENCE THE MOST IMPORTANT FACTOR TO ME IS:

- Registration Fee
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Do you require special accommodations for handicapped access? Yes No

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Registration Fee (circle all that apply) • All fees are in US Dollars	On or Before 13 September 2010	After 13 September 2010
Member*	\$965	\$1450
Non Member	\$1,448	\$2,175
Single Day Registration – Member* Indicate day _____	\$530	\$800
Single Day Registration – Non Member Indicate day _____	\$796	\$1,195
Speaker, Full Conference	\$530	\$800
Group Discount – Member* (three or more attending from the same company, registrations must be received together)	\$725	\$1,090
Group Discount - Nonmember (three or more attending from the same company, registrations must be received together)	\$1,086	\$1,630
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