ECS 13

EUROPEAN COATING SYMPOSIUM MONS

PROGRAM

Mons
BELGIUM
September 11-13, 2013

UMONS
Université de Mons

Tuesday – September 10, 2013

18:00 **Registration**
18:00 **Get together drink**

Wednesday – September 11, 2013

08:00 **Registration**
08:45 **Welcome: J. De Coninck (ECS 2013 chair)**

1 Keynote lecture

09:00 **Session chair: T. D. Blake**

Coating Science and Technology: an Industrial Perspective
T. Lightfoot
E. I. duPont de Nemours & Company, USA **p. 2**

10:00 **Coffee break / Exhibition**

	2.1 Coating Flows 1 **Session chair: P. Schweizer**	2.2 Wetting 1 **Session chair: J. H. Snoeijer**
10:30	**Thin-film flows subject to external airflows** S. K. Wilson, C. Paterson, B. R. Duffy *University of Strathclyde, Glasgow, UK* **p. 6**	**High-speed dynamic wetting: models vs experiments** J. Sprittles, Y. Shikhmurzaev *University of Oxford, Oxford, UK* **p. 22**
10:50	**Stripe and pattern coatings of slot die coated battery electrodes – investigation of edge effects** M. Schmitt, P. Scharfer, W. Schabel *Karlsruhe Institute of Technology, Karlsruhe, Germany* **p. 9**	**Dynamic wetting failure in coating flows: the influence of the displaced fluid** E. Vandre, M. S. Carvalho, S. Kumar *University of Minnesota, Minneapolis, USA* **p. 24**
11:10	**Thin film coating of vertically aligned cylinders** D. Slade, S. Veremieiev, P. H. Gaskell *University of Leeds, Leeds, UK* **p. 11**	**Dynamics of dewetting in immersion lithography** M. Riepen *ASML Research, Veldhoven, The Netherlands* **p. 25**
11:30	**Analytical investigation of the behavior of five-roll coating systems with deformable rolls** B. Willinger, A. Delgado *Friedrich-Alexander University Erlangen-Nürnberg, Erlangen, Germany* **p. 14**	**Towards a predictive theory of wetting dynamics** D. Duvivier, T. D. Blake, J. De Coninck *University of Mons, Mons, Belgium* **p. 28**
11:50	**The fluid mechanics of reverse negative gap deformable roll coating** H. Benkreira, Y. Shibata, K. Ito *University of Bradford, Bradford, UK* **p. 17**	**Thermally-activated dynamics on rough surfaces: what is the activation area?** K. Davitt, M. S. Pettersen, E. Rolley *Ecole Normale Supérieure, Paris, France* **p. 31**

12:10 **Lunch break / Exhibition**

	3.1 Coating Flows 2 **Session chair: H. Benkreira**	3.2 Wetting 2 **Session chair: J. Sprittles**
14:00	**Bi-layer free-surface film and channel flow over patterned substrate** A. Abdalla, P.H. Gaskell, Y. C. Lee, S. Veremieiev *University of Leeds, Leeds, UK* **p. 34**	**Jet impact on an inclined plate: contact line versus hydraulic jump** A. Duchesne, L. Lebon, L. Limat *Université Paris Diderot, Paris, France* **p. 48**

14:20	**Film flow over periodic wavy inclined heated substrate** S. Veremieiev, A. Haas, M. Scholle, P. H Gaskell *University of Leeds, Leeds, UK* **p. 37**	**Modeling liquid drop receding motion on superhydrophobic surfaces** R. Rioboo, D. Duvivier, J. De Coninck *University of Mons, Mons, Belgium* **p. 52**
14:40	**Stability of multi-layer liquid curtains** D. Henry, J. Uddin, J.O. Marston, S.T. Thoroddsen, J. Thompson, M. Blyth *University of Birmingham, Edgbaston, UK* **p. 40**	**Dynamics of liquid contact line on visco-elastic gels** T. Kajiya, F. Golier, L. Royon, A. Daerr, P. Brunet, F. Lequeux, L. Limat *Université Paris Diderot, Paris, France* **p. 54**
15:00	**Viscosity dependency on liquid curtain stability** D. Eggerath *Kroenert GmbH, Hamburg, Germany* **p. 43**	**Straight contact lines on soft solids and broken contact lines on hard substrates** L. Limat *Université Paris Diderot, Paris, France* **p. 57**
15:20	**Thermocapillary deformation of thin liquid films by infrared irradiation** H. M. J. M. Wedershoven, C. W. J. Berendsen, J. C. H. Zeegers, A. A. Darhuber *Eindhoven University of Technology, Eindhoven, The Netherlands* **p. 46**	**Temperature effects on dynamic water absorption into paper** J. Songok, P. Salminen, M. Toivakka *Abo Akademi, Åbo, Turku, Finland* **p. 60**
15:40	**Coffee break / Exhibition**	
	4.1 Modeling **Session chair: S. Wilson**	**4.2 Wetting 3** **Session chair: G. McHale**
16:10	**Numerical simulation for dip-coating process in a two phase flow** M. Javidi, A. N. Hrymak *Western University, London, Canada* **p. 66**	**Wetting of superamphiphobic surfaces** H.-J. Butt, P. Papadopoulos, X. Deng, F. Schellenberg, C. Semprebon, M. Brinkmann, M. Ciccotti, L. Chen, D. Vollmer *Max Planck Institute for Polymer Research, Mainz, Germany* **p. 80**
16:30	**Analytical modeling of fluid penetration depth during slot coating onto porous substrate** X. Ding, T. F. Fuller, T. A. L. Harris *Georgia Institute of Technology, Atlanta, USA* **p. 69**	**Composite polymer surfaces: towards superhydrophobicity** I. Demnati, M. Amin Ali, R. Sevkan, R. Rioboo, J. De Coninck *University of Mons, Mons, Belgium* **p. 81**
16:50	**A predictive model for discrete cell gravure roll coating** N. Raske, R. Hewson, N. Kapur, P.H. Gaskell *University of Leeds, Leeds, UK* **p. 72**	**Young's equation at the nanoscale** D. Seveno, T.D. Blake, J. De Coninck *University of Mons, Mons, Belgium* **p. 84**
17:10	**New solution methods for coating flows based on first integrals of Navier-Stokes equations** M. Scholle, F. Marner, A. Haas, P. H Gaskell *Heilbronn University, Heilbronn, Germany* **p. 75**	**Contact angle hysteresis at the nanoscale** D. Seveno, T. Ondarçuhu, J. De Coninck *University of Mons, Mons, Belgium* **p. 87**
18:00	**5. Poster session - Belgian beer and cheese tasting**	
20:00	**Committee Meeting**	

Thursday – September 12, 2013

08:00	**Posters and coffee**
08:45	**Announcements**

09:00	**6 Keynote lecture** **Session chair: L. Limat** **Air entrainment by wetting and drop impact** J. H. Snoeijer *University of Twente, Twente, The Netherlands* **p. 92**
10:00	**Coffee break / Exhibition**

	7.1 Drying 1 **Session chair: M. Toivakka**	7.2 Wetting & Pattern Coating **Session chair: I. de Vries**
10:30	**Numerical and experimental investigation of the heat transfer coefficient distribution at target plate under an array of impinging jets with local removal of the spent fluid** P. Cavadini, P. Scharfer, W. Schabel *Karlsruhe Institute of Technology, Karlsruhe, Germany* **p. 96**	**Voltage-induced superspreading** G. McHale, C. V. Brown, N. Sampara *Northumbria University, Newcastle upon Tyne, UK* **p. 110**
10:50	**CFD modeling of dip coating with concomitant evaporation** J. Boeuf, S. Achmann *Roche Diagnostics GmbH, Mannheim, Germany* **p. 99**	**On the behaviour of a water droplet on a heterogeneous wettability surface** F. Mancio Reis, O. Gimeno Lopez, P. Lavieille, B. Schlegel, P.Raynaud, M. Miscevic *University of Toulouse, Toulouse, France* **p. 111**
11:10	**Investigation of surface deformation and flow structure in thin films due to Marangoni convection** P. Cavadini, P. Scharfer, W. Schabel *Karlsruhe Institute of Technology, Karlsruhe, Germany* **p. 101**	**Dewetting of liquids on chemically patterned surfaces** B. J. Brasjen, H. Gu, A. A. Darhuber *Eindhoven University of Technology, Eindhoven, The Netherlands* **p. 114**
11:30	**Experimental investigation on multicomponent mass transport during drying of quaternary polymer solutions** D. Siebel, W. Schabel, P. Scharfer *Karlsruhe Institute of Technology, Karlsruhe, Germany* **p. 104**	**Thin-film models of liquid displacement on chemically patterned surfaces for lithographic printing processes** S. K. Kalpathy, L. F. Francis, S. Kumar *University of Minnesota, Minneapolis, USA* **p. 115**
11:50	**Fundamental studies of stress development and cracking in particulate coatings** K. Price, A. McCormick, K. Wood, W. Wu, L. Francis *University of Minnesota, Minneapolis, USA* **p. 107**	**The wettability properties of the substrate in the nanoparticle patterning using driven evaporating menisci** D. Noguera-Marín, C. L. Moraila-Martínez, M. A. Cabrerizo-Vilchez, M. A. Rodriguez-Valverde *University of Granada, Granada, Spain* **p. 116**
12:10	**Lunch break / Exhibition**	

	8.1 Drying 2 **Session chair: T. Lightfoot**	8.2 Pattern Coating 2 **Session chair: H.-J. Butt**
14:00	**On the lifetime of evaporating droplets** J. M. Stauber, S. K. Wilson, B. R. Duffy, K. Sefiane *University of Strathclyde, Glasgow, UK* **p. 118**	**Implementation of a hybrid tool to fabricate patterned thin film** M. Brown, T. A. L. Harris *Georgia Institute of Technology, Atlanta, USA* **p. 128**
14:20	**Fast evaporation of spreading droplets of colloidal suspensions** K. L. Maki, S. Kumar *University of Minnesota, Minneapolis, USA* **p. 121**	**Air-jet induced deformation, rupture and dewetting of liquid coatings on partially wetting substrates** C. W. J. Berendsen, J. C. H. Zeegers, A. A. Darhuber *Eindhoven University of Technology, Eindhoven, The Netherlands* **p. 130**
14:40	**Natural convection in confined geometries: enhancement of colloidal transport** L. Daubersies, B. Selva, J-B. Salmon *CNRS/Bordeaux 1, Pessac, France* **p. 122**	**Phase separation and control of interface position by surface coating** M. M. Torregrosa, V. Yasnou, A. Mialdum, V. Shevtsova *Université Libre de Bruxelles, Bruxelles, Belgium* **p. 131**
15:00	**Active control of evaporative solution deposition by modulated infrared illumination** J. A. Vieyra Salas, J. M. van der Veen, J. J. Michel, A. A. Darhuber *Eindhoven University of Technology, Eindhoven, The Netherlands* **p. 125**	**Creation of functional composite coatings by cold-spray technique** V. Yasnou, S. Yurkevich *Université Libre de Bruxelles, Bruxelles, Belgium* **p. 132**
15:20	**Simultaneously monitoring film formation and drying kinetics of latex dispersions** B. Schmidt-Hansberg, C. Eichholz, F. Kleine Jäger *BASF SE, Ludwigshafen, Germany* **p. 126**	**Deformation of thin liquid films by non-homogeneous static surface charge** C. W. J. Berendsen, K. (C. J.) Kuijpers, J. C. H. Zeegers, A. A. Darhuber *Eindhoven University of Technology, Eindhoven, The Netherlands* **p. 134**
15:40	**Coffee break / Exhibition**	

	9.1 Materials **Session chair: J. De Coninck**	9.2 Coated Electronics 1 **Session chair: P. Scharfer**
16:10	**En route to easy-to-clean and scratch resistant coatings** D. Dewulf, J. Bosmans, H. Van den Rul *Sirris Smart Coating Application Lab, Diepenbeek, Belgium* **p. 136**	**Large scale coating and drying processes for polymer solar cells** L. Wengeler, F. Buss, P. Scharfer, W. Schabel *Karlsruhe Institute of Technology, Karlsruhe, Germany* **p. 144**
16:30	**Self-healing, anti-corrosive coatings** S. Scharf, V. Stenzel, J. Nieradzik *Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Bremen, Germany* **p. 139**	**Influence of drying conditions on the component distribution in particle-polymer composites coatings** S. Baesch, P. Scharfer, W. Schabel *Karlsruhe Institute of Technology, Karlsruhe, Germany* **p. 147**
17:15	**A glimpse of the historic city of Mons that boasts three UNESCO World Heritage Sites**	
19:00	**ECS Symposium Dinner**	

Friday – September 13, 2013

08:00 **Posters and coffee**

08:45 **Announcements**

09:00

10 Keynote lecture

Session chair: M. Riepen

The future of coating

I. De Vries

Holst Centre/TNO, Eindhoven, The Netherlands **p. 150**

10:00 **Coffee break / Exhibition**

	11.1 Materials & New Topics **Session chair: P. Lambert**	11.2 Coated Electronics 2 **Session chair: M. Müller**
10:30	**Temperature dependent mechanical properties of hard ZnO thin films deposited onto polymer-based sub-layers** C.-H. Sacré, P. Guaino, L. Libralesso, A. Favache, T. Pardoen *CRM Group, Liège, Belgium* **p. 154**	**Clean4Yield. Enabling high yield R2R production of printed electronics** J. Gabel *Holst Centre/TNO, Eindhoven, The Netherlands* **p. 166**
10:50	**Self-coverage of Leidenfrost droplets** L. Maquet, P. Colinet, F. Moreau, S. Dorbolo *University of Liège, Liège, Belgium* **p. 155**	**Effect of drying temperature and drying rate on battery electrode properties** M. Baunach, S. Jaiser, P. Scharfer, W. Schabel *Karlsruhe Institute of Technology, Karlsruhe, Germany* **p. 169**
11:10	**Microrheology for the analysis of viscoelastic properties of materials for coatings** C. Tisserand, R. Ramsch, M. Fleury, P. Bru, G. Meunier *Formulaction, L'Union, France* **p. 157**	**Multilayer slot coating for electronic products** H. Döll *TSE Troller AG, Murgenthal, Switzerland* **p. 172**
11:30	**Electrically charged droplets: tuning of surface tension** M. Brandenbourger, D. Robert, H. Caps, N. Vandewalle, S. Dorbolo *University of Liège, Liège, Belgium* **p. 158**	**Large area inkjet printing for OPV and OLED applications using non halogenated ink formulations** T. M. Eggenhuisen, M. J. J. Coenen, T. W. L. Slaats, H. Gorter, J. Sweelssen, P. Groen *Holst Centre, Eindhoven, The Netherlands* **p. 175**
11:50	**Efficient and faster time-to-market using Hansen Solubility Parameters** F. Ruttens *Agfa-Labs, Mortsel, Belgium* **p. 161**	**Evaluation of different concepts for defined interfaces in solution pro-cessed multilayer small molecule OLEDs** K. Peters, P. Scharfer, W. Schabel *Karlsruhe Institute of Technology, Karlsruhe, Germany* **p. 178**
12:10	**From fundamental properties to applications of surface-activity investigations: the kinetics and thermodynamic aspects** H. Razafindralambo *University of Liege, Liège, Belgium* **p. 162**	**Photoluminescence microscopy for in-situ characterization of particle segregation in drying latex/graphite coatings** M. Yamamura, D. Morimitsu, Y. Mawatari, H. Kage *Kyushu Institute of Technology, Fukuoka, Japan* **p. 179**

12:30 **Lunch**

End of symposium

List of Posters

(A prize will be offered for the poster judged the best by the Scientific Committee)

P1	S. Baesch, P. Scharfer, W. Schabel *Karlsruhe Institute of Technology, Karlsruhe, Germany*	**Measurement of component distribution for dried polymer-particle composites**
P2	S. Baesch, M. Baunach, W. Schabel, P. Scharfer *Karlsruhe Institute of Technology, Karlsruhe, Germany*	**Temperature distribution on a coated substrate as indication of local drying phenomena**
P3	M. Boix, S. Eslava, G. Machado, E. Saiz, J. de Coninck *University of Mons, Mons, Belgium*	**ATR/FTIR measurements of protein adsorption on calcium phosphate films**
P4	B. Bourdon, P. Di Marco, R. Rioboo, M. Marengo, J. De Coninck *University of Mons, Mons, Belgium*	**Enhancing the onset of pool boiling by wettability modification on nanometrically smooth surfaces**
P5	D. W. Pilat, P. Papadopoulos, D. Schäffel, D. Vollmer, R. Berger, H.-J. Butt *Max Planck Institute for Polymer Research, Mainz, Germany*	**Characterizing surfaces by the Force Required for Moving a Liquid Drop on a Solid Surface**
P6	T. Chiba, S. Kawabe, I. Kudo, A. Saito *Konica Minolta, Inc., Tokyo, Japan*	**Experimental investigation of water-based simultaneous multi-layer coating to produce nanometer scale multi-layer film**
P7	B. J. Brasjen, A. A. Darhuber *Eindhoven University of Technology, Eindhoven, The Netherlands*	**Selective deposition of liquids on chemically patterned surfaces**
P8	I. Demnati, F. Errassifi, M. Boix Alberich, J. De Coninck *University of Mons, Mons, Belgium*	**Adsorption of human serum albumin onto calcium phosphate coatings: Dependencies on surface energies**
P9	G. Doyen, D. Seveno, J. De Coninck *University of Mons, Mons, Belgium*	**Immersion lithography: dynamics of the contact line**
P10	M. Ferrari, F. Cirisano, L. Liggieri, F. Ravera, E. Guzmán *Istituto per l' Energetica e le Interfasi, Genova, Italy*	**Superhydrophobic surfaces for protection and friction reduction in marine environment**
P11	S. V. Flores-Arévalo, R. E. Ramírez-García, M. Arroyo-Ortega, Z. Nagamedianova *Vitro Technology, García, México*	**Evaluation of the abrasion resistance of anti-reflective thin films on automotive glass**
P12	J. Gabel, P. Groen, J. Valeton, T. de Wild, M. van Dongen *Holst Centre/TNO, Eindhoven, The Netherlands*	**Practical approach to the determination of polar and disperse components of the surface tension of printing inks**
P13	E. Gosselin, O. Denis, J. Conti, A. Van Cauwenberge, E. Noel, J. De Coninck *University of Mons, Mons, Belgium*	**Spectroscopic biosensor for mycotoxins in complex media**
P14	C. Guyot, R. Rioboo, J. De Coninck *University of Mons, Mons, Belgium*	**Solidification of a supercooled drop of water**
P15	S. Didari, T. A. L. Harris *Georgia Institute of Technology, Atlanta, USA*	**Microfluidics of penetration into the fibrous porous media**

P16	S. Lim, K. Hyun Ahn, M. Yamamura *Seoul National University, Seoul, Korea*	**The mechanism of latex migration in battery slurries during drying using fluorescence microscopy**
P17	K-H. Yang, P-C. Ho, K-M. Chang *Industrial Technology Research Institute, Chutung, Taiwan*	**Improved GZO thin films properties with a thin ZnO buffer layer by atmospheric pressure plasma coating**
P18	F. Khelifa, S. Ershov, Y. Habibi, R. Snyders, P. Dubois *University of Mons, Mons, Belgium*	**A versatile approach for the grafting on free radicals generated during plasma polymerization**
P19	C. Laval, J-B. Salmon, P. Poulin *Laboratory Of the Future (LOF) UMR 5258, Pessac, France*	**Filmification of piezoresistive organic formulation on textured surface**
P20	B. Manning, J-P. Meheu *Capacitec, Creteil, France*	**New Capacitance Electronics Technology For Maintaining Slot Die Coater Gap Uniformity in the Lab and in Production**
P21	S. Michotte, M. Poelman, M-G. Olivier, J. Christophe, C. Buess-Herman *Materia Nova, Mons, Belgium*	**Cyanide-free silver electroplating for connectic applications**
P22	C. Motte, M. Poelman, M. Fedel, F. Deflorian, M-G. Olivier *Materia Nova, Mons, Belgium*	**Corrosion protection and self-healing ability offered to galvanized steel by incorporation of cerium modified nanoclays in a water based silane treatment**
P23	R. Ramsch, G. Brambilla, C. Tisserand, G. Meunier *Formulaction, L'Union, France*	**Determination of critical concentration of polymer** **thanks to microrheology**
P24	S. Rossi, A. Quaranta, L.Tavella *University of Trento, Trento, Italy*	**Vitreous enamel coatings with luminescent properties**
P25	M. Schmitt, M. S. Carvalho, P. Scharfer, W. Schabel *Karlsruhe Institute of Technology, Karlsruhe, Germany*	**Break-up phenomena in multilayer slot die coating of lithium-ion batteries**
P26	D. Seveno, T.D. Blake, J. de Coninck *University of Mons, Mons, Belgium*	**Predicting the wetting dynamics of a 2-liquid system**
P27	F. Ünal, A. Topuz *Yildiz Technical University, İstanbul,Turkey*	**The Effect Of Powder Size On Boronizing of Ferritik GGG40.3 Ductile Iron**
P28	S. M. Yoon, J. Jo, D. W. Kim, H. Jang, Y. Jang and J. S. Go *School of Mechanical Engineering, Pusan National University, Busan, Korea*	**Thin Film Super-capacitors using Spray Coating Method**