

RADTECH EUROPE 15 CONFERENCE
EXPLORES UV/EB NOW



If proof were needed, this year's RadTech Europe Conference in Prague (CZ) certainly proved how dynamic and diversified the world of radiation curing is today. For the benefit of some 440 delegates, 60 speakers addressed the plethora of chemistries, technologies, and applications that today employ UV and EB curing, in an intense and wide-ranging programme -- in a new, more technically-focused format, and held at a new location. The formal agenda was partnered by a parallel exhibition featuring leading technology providers -- incorporating a small theatre where exhibitors could introduce their latest products -- which provided an excellent context both for delegate networking and for business discussions.

New location

Prague's Clarion Congress Hotel was the chosen hub, which proved to be an ideal combination of spacious first-class conference/exhibition facilities with – on site – the comforts of an international hotel. The change of venue was just the outward demonstration of the new face of the conference, which was headlined *UV/EB Now: new place, new format, new applications*. RadTech Europe's President, David Helsby, RAHN AG (CH), explained the association's mission as 'to create an event that, in every respect, provides real value for the delegates.'

Proceedings commenced with the members-only RadTech Europe General Assembly, which was, says David Helsby, 'lively, very well attended, and proof of the commitment of the members of the existing working groups. We're keen to create new working groups, and will welcome members' proposals on potential appropriate subjects, as well as offers of participation from willing members!'

Conference keynote

Following the AGM, conference chairman Dawn Skinner of Heraeus Noblelight America LLC (UK) opened the plenary conference session. It featured a challenging, thought-provoking keynote from Lars Sonderegger of behavioral

management specialists Quantonomics (CH) on the key topic of the most effective routes to innovation and value creation.



He showed how our current digitally-enabled era has only added complexity to our decision making, leaving us with less time to actually define appropriate solutions to life challenges. He advocated developing a strategy, based on behavioral science, on how you, your team, and everybody in the company interacts. ‘The

human brain is a social brain, with biological wiring which works better when it collaborates with other people,’ he explained. We need to get connected *in person*, as well as digitally, because the chemistry of person-to-person contact is different from that involved in making contact via mobile phones or videoconferencing. Facial expressions, posture, talking, listening, simply being together, all combine to create an environment that is the basis for learning, sharing, defining real needs and wants and, of course, ultimately mapping the path to innovation. ‘The higher the alignment is, the higher will be the innovation and therefore success rate!’, he emphasized.

US market overview

It was time to review innovations and developments in the US market, and Gary Cohen, of RadTech North America (US) explored the many innovations in the radiation curing market which are creating the expectation of a CAGR for the industry of more than twice US GDP for the next three years, and a growth rate of more than 7% over the next two years for the current up-and-coming applications – 3D printing, inkjet, and fingernail decoration.

European market overview

The world total for radiation-cured finished products today is an estimated 520 thousand metric tonnes, David Helsby said, as he began his evaluation of European market developments. He confirmed that the DACH region is still Europe’s largest consumer of UV/EB technologies, representing 42% of the market. Identifying major trends, he examined the raft of regulatory compliance requirements, observing

that those of the end-user companies – eg Nestlé, TetraPak, and IKEA – are in fact stronger than the formal EU legislation. What, he wondered, ‘will come next in the way of requirements and regulations?’, and how will the unpredictable issues – crude oil prices, raw material costs, freight, interest rates, currency – affect the industry?

Award winners

The plenary session concluded with RadTech Europe prize presentations conducted by the President. The long-established, prestigious Paul Dufour Award for the best conference paper was awarded to Sandra Schlögl of the Polymer Competence Center, Leoben (AT) for her paper on the formation of 3D structures in offset printing techniques by UV induced ink foaming. Simone Radl, also from the Polymer Competence Center, Leoben, was presented with the RadTech Europe Advanced Development Award 2015, for her ground-breaking presentation on smart photoswitchable composite materials for self-healing and recycling strategies.



Parallel programmes

An impressive succession of parallel programmes then split the delegate base into different streams for the remainder of the three days, covering advances in photochemistry and polymerization; developments in printing technology; HSE and the safe use of UV/EB; advances in UV LED technology; 3D printing; innovations in applications; developments in coatings and formulations; innovations in chemistry and materials; and advances in UV/EB equipment and process control.

‘The depth and diversity of the subjects addressed by the expert speaker base are testimony to an industry that is a real centre for innovation and growth,’ said David Helsby. ‘The more technical face of the conference has unquestionably created huge interest – as the considerable growth in the delegate base, spanning industry and academe, confirms.’

Legislative matters

Legislation – particularly REACH – figures strongly in the radiation curing industry's agenda today. Dr Didier Vanhoye of Sartomer (FR) (a company which is a member of the REACH Polymerisable Acrylate Resins and Derivatives Consortium) -- provided an update on tier 1 and 2 registrations of (meth)acrylic monomers, their evaluation, the main remaining issues prior to tier 3 registration, and potential industry impacts. Legislation around hazardous goods transportation, packaging materials for food contact and UV inks for food packaging, mercury exemption status under RoHS, and Bisphenol-A were also discussed in an informative session chaired by Andy Boon of Sun Chemical (UK).

Photochemistry and photopolymerization

The key areas of photochemistry and photopolymerization brought together a number of specialist papers from European experts. Joint chairmen Xavier Allonas, Université de Haute Alsace (FR), and Prof Marco Sangermano, Politecnico di Torino (IT) introduced in-depth studies of aspects of photoinitiators, photopolymerization, and the use of CTAs.

Developments in printing technology

Printing technology has been a key development arena for UV curing in recent years, and in the dedicated conference session chaired by Nick Ivory, Sun Chemical (UK), Sandra Schlögl's award-winning paper on UV induced ink foaming for the formation of 3D structures in offset printing was joined by explorations of EB-curable CI-flexo ink for sustainable packaging print; water-based UV inkjet; controlling the variables in UV LED curing in low-migration printing; UV LED curing formulations for inks and coatings; and the state of the art in UV inkjet print on food packaging.

UV LED

UV LED technology was the focus of the session chaired by Paul Kelly of Perstorp (UK), which attracted extremely high attendance – evidence of the considerable activity and interest in this particular field. Content spanned new resin and formulation developments; improved surface cure with deep-UVC LEDs; the impact on UV curing applications of advances in UV LED technology; developments in UV

LED equipment; and solutions to enhance the performance of UV LED and low-energy-curable systems.

3D printing

The session on 3D printing/additive manufacturing, chaired by Susanne Piontek, BASF Coatings (DE), opened with an overview of the history and status quo from the 3D Printing Association's membership director Ian Ferguson (UK). He asked: 'Will every home have a consumer 3D printer within the next ten years?', answering 'Some say yes!'. However, growth drivers in mainstream industry are now clear to see, he showed: on-demand manufacturing and speed to market, from idea to product, but some challenges remain –particularly achievable printing speeds and materials diversity. The conference session went on to record developments in different aspects of 3D UV inkjet printing and exciting advances in photopolymerization for human tissue engineering.



Innovation in applications

The field of medicine featured again in the session covering innovation in applications, chaired by Massimo Cattaneo of IGT Resins (IT). Photopolymerized adhesives for wound seals in biological tissues were the opening topic, and the session also covered a review of globally-competitive Russian radiation technologies, photo-cured encapsulant for photovoltaic panels; and smart 'photoswitchable' self-healing composite materials. Proving that radiation curing is not just a technology for today's technologies, the session closed with a paper on preserving 19th-century documents on paper by stabilizing the acid pH of the wood pulp.

Chemistry and materials innovation

Innovation in chemistry and materials are at the very heart of the radiation curing industry, and a dedicated session, chaired by Stephan Peeters of Allnex (BE)

documented several routes to future success. Papers covered the production of thermoset fibres using UV curing; a UV-activated hydrosilation reaction for silicone polymer crosslinking; UV switchable crosslinks in rubber materials; dual-cure polymerization of acrylates – successfully applied in the fabrication of carbon fibre composites using LED irradiation; renewable itaconic acid-derived binder vehicles used in radical UV/EB curing; and electron beam induced graft copolymerization.

Coatings and specialist formulations

Coatings and specialist formulations are also an area of particular current interest, and Christophe Vergé of Sartomer (FR) chaired a session that highlighted recent developments. Soft-touch coatings that are 100% UV-curable; self-replenishing hydrophobic coatings; a new photoacid generator for cationic polymerization of, eg, epoxides; a novel IR and UV hybrid irradiation process for photon delivery; and the outlook for UV/EB's role in automotive coatings were all discussed.

UV/EB equipment and process control

Finally, it is, of course, the combination of equipment and process controls that deliver a successful final result. The closing conference session, chaired by Dawn Skinner (UK), looked at some of the key advances, including the use of integrating sphere technology for uniform UV curing; achieving precise UV LED measurements; future directions for EB systems; low-dose EB irradiation using particle-based dosimetry; homogeneous seed treatment using a toroidal electron source; and Russian developments in the development and nuse of industrial accelerator technologies.

With such an extensive agenda of highly-relevant content, the RadTech Europe Conference 2015 made full use of the excellent facilities at the location, which enabled delegates to move from session to session easily and quickly. The mini-theatre in the exhibition area provided even more in-depth content, hosting a series of papers presented by university students.

Networking, socializing



Socialising and networking also characterised the event; and the conference arena hosted the 'afterwork party', with excellent live jazz, at the end of the first day, and breaks throughout the

formal programme. On the second evening, delegates enjoyed a delightful dinner at the glorious Plenszka restaurant in Prague's city centre.



Event sponsors

Europe's 2015 event for UV/EB curing was sponsored by many leading companies: gold sponsors Allnex, Arkema, BASF, BYK, DSM Coatings Resins, Dymax, Heraeus Noblelight, IGM Resins, Lambson, Rahn, and silver sponsors Nedap Light Controls, Opsytec Dr Groebel, PCT Engineered Systems, and Siltech. The event was also supported by media partners whose publications are key disseminators of news on the radiation curing industry, in many fields of application.

[Sidebar:]

An all-round success – the attendees' verdict

****Mark Macaré**, Secretary-General of RadTech Europe, commented on the 'new look' 2015 conference: 'We are delighted to see that our choices for the new format have paid off. Not only did the event attract nearly 40% more participants compared to the last edition, but it also garnered overwhelmingly positive feedback from the attendees.'

****David Helsby** agreed, saying: 'I have received a huge amount of feedback from people who really enjoyed this year's conference and found it exciting. The new format has certainly rekindled participants' interest '

****David Engberg, Perstorp AB (SE)**: 'Thank you for a very good conference. It was my first time, and I was extremely pleased with my visit. There were a lot of very interesting presentations that gave a very good insight on what is going on in the industry. I was also impressed with the openness of all participants and how easy it was to connect with people in an informal way -- and still be able to have very fruitful discussions!'

****David Harbourne, Heraeus Noblelight America**: 'Congratulations on a very successful Radtech Europe 2015. The new, rejuvenated, format was much appreciated by the participants.'

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