Successful COSi premiere

The first Coatings Science International conference in Noordwijk

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The eagerly awaited first conference of Coatings Science International (CoSI), the successor to the venerable Athens conference, was held in Noorwijk, Netherlands, from 28 June to 1 July.

96 participants from 16 countries:
The plenum of the first Coatings Science International conference in Noordwijk

As CoSI's own mission statement puts it, CoSI will seek not to be "just another coatings conference", but rather to become Europe's leading coatings, science and technology conference.
This goal was also stressed by *Prof. Rolf van Benthem* (TU Eindhoven), who in his capacity as chairman of the CoSi Organisation Committee, delivered the welcoming address to the conference participants. CoSi, he said, had set itself up as a non-profit-making enterprise aimed at "facilitating the exchange of pre- and post-competition scientific knowledge and to bring together academic and industrial coatings scientists to boost the innovative strength of the global coatings community".

Good questions and equally good answers

Expectations were thus high - especially, of course, since the organization Committee felt obliged to continue the positive traditions established by the Athens Conference, an authority in its time (1974 to 2004).
Participants, speakers and organisation committee members were unanimous: the conference met its own high standards. The quality of the papers was praised all round and the intensity of the debates was also memorable. As one speaker put it, "There were very good questions, and equally good answers."

Academia and industry

The attendance of 96 participants from 16 countries delighted the organisers. One fly in the ointment: with 41 participants from the Netherlands (Germany: 16, USA: 13, Belgium: 8, Sweden: 5, UK and Spain: 2 each, other countries: 1 each), including a strong showing from the hosts, TU Eindhoven, the conference was not quite as international as its goal of speaking with a global voice would have dictated. However, this did not detract from the buoyant mood and the numerous debates during the conference.
The bringing together of academia and industrial paints research also paid dividends: around 40 academics were counterbalanced by around 60 industrial researchers, the latter mostly represented by coatings raw materials producers (approx. 30) and coatings producers (approx. 20).

Noordwijk the venue in upcoming years, too

The van Oranje hotels in Noordwijk provided a very pleasant backdrop to the proceedings. When the conference was over, the committee elected to hold it there again on future occasions. Minor irritations to do with sighting and acoustics in the slightly undersized conference room will have been eradicated by next year, the organisers said.

Interdisciplinary mix

The scientific programme with its 33 technical papers and 14 poster contributions was a highly interdisciplinary mix that illuminated the chemistry, physics and mechanics of a wide sweep of different coatings systems. The speakers, hailing from universities and other research institutes (15), coatings raw materials producers (10), paints producers (5) and several end users (Ford, Scania, Ikea), represented an interesting diaspora of research approaches and viewpoints.
A random and, indeed, incomplete selection of highlights from the conference program is presented below.

UV clearcoats as protection against photooxidation

Mike Nichols (Ford Motor Company) kicked off the conference with a detailed study of the diffusion of molecules in

weathered automotive UV topcoats. He found that hindered amine light stabilisers (HALS) undergo extensive diffusion from topcoat to basecoat and that this has a strong influence on UV resistance. "This is a surprising result," said *Nichols*, "because that doesn't happen in heat-curing clearcoats." He added that oxygen diffusion is roughly one order of magnitude lower in UV coatings than in heat-curing systems. UV coatings might therefore protect deeper layers against photooxidation.

Readily dispersible carbon nanotubes

The incorporation of carbon nanotubes into organic binder matrices might yield coatings of extreme thermal and electrical conductivity - however, these coatings may only contain tiny amounts of such nanotubes if they are not to become too highly coloured or too expensive. *Prof. Joe Keddie* (University of Surrey) reported on several successes at generating aqueous nanotube-acrylate composites that have only slight optical absorption. The secret here was that the dispersibility of the nanotube is greatly improved by modification with polyvinyl alcohol.

"Innovation Award" for new 2-component PUR car refinishes

Pieter J.A. Geurink (Akzo Nobel Car Refinishes) presented a "completely new design of waterborne 2-component car refinishes" that is notable for its very rugged application parameters. This development has three mainstays: a polyol emulsion component which is stabilised internally by sulphonate species, minimization of the air content in the coating through optimum choice of binder and solvent, and delayed curing to allow residual air enough time to escape. The last of these was controlled via the catalyst package - with intermittent blocking of the tin catalyst by thiol components proving especially useful. The Organisation Committee was very impressed with this presentation and honoured Geurink with the conference's Innovation Award.

Science Award: Low-VOC and cobalt-free alkyd systems

The Science Award for the best scientific presentation went to *Fabrizio Micciche* (Agrotechnology and Food Innovations bv), who has developed new VOC-reduced alkyd coatings that dry quickly and have a low viscosity and whose binder and reactive diluent components are based completely on renewable raw materials. Further, Micciche demonstrated a new catalyst system based on iron and manganese which first studies have shown to be a suitable replacement for cobalt in solventborne and waterborne alkyd systems.

"High standard of questions and answers": Speaker George Pilcher, Akzo Nobel Coatings, USA, and questioner Godwin Berner, Ciba Spezialitätenchemie, Switzerland

Supporting alkyd drying with thiol resins

Rob Klaasen (Akzo Nobel Decorative Coatings) is also doing research on cobalt-free alkyds. He showed that, when the alkyd resin is combined with a polyfunctional thiol resin (approx. 10%, expressed in terms of the alkyd resin), alkyd curing can be substantially boosted by an additional free-radical thiol-ene curing mechanism without the need for cobalt catalysts. Thiol-ene curing can be effected either by a photocatalyst (BAPO) or by means of colourless catalysts that contain vanadium.

Active enzymes in coatings

Novel functional coating systems were the topic discussed by *Melinda E. Wales* (Reactive Surfaces Ltd), who illustrated ways of incorporating active, functioning enzymes into coating systems. Thus, using a biocatalytic coating additive in commercial latex paints, she generated surfaces that can decontaminate themselves of certain chemicals (such as nerve gases) and, what's more, for a prolonged period of time. The method of incorporating the additives into the coating lends itself to different enzyme systems.

Ever more perfect is not necessarily better

Controlled free-radical polymerisation and its scope for generating defined polymer architectures on an atomic scale are currently the subject of highly intensive research that will also benefit coatings raw materials, and especially polymeric wetting and dispersing agents. *Bernd Göbelt* (Byk-Chemie) made an important comment in this regard. Extremely narrow molar mass distributions, such as those permitted by laboratory methods, do not necessarily lead to the best product properties. Wider distributions showed better compatibility and wetting properties - "Ever more perfect is not necessarily better", he said.

The conference proceedings will be published in future editions of the journal Progress in Organic Coatings. In addition, selected papers will also be printed in the European Coatings Journal.

The next CoSI conference takes place in Noordwijk from 27 to 30 June 2006. A call for papers has already gone out. For more information, visit: www.coatings-science.com