

"Profound understanding is required"

Dutch Polymer Institute (DPI) supports the coatings industry in many ways

Coatings continue to evolve, with customer demands and constant shifts in fundamentals driving developments. Dr. Harold Gankema, Programme Coordinator for High-Throughput Experimentation and Coatings Technology, and Prof. Claus D. Eisenbach, Scientific Programme Chairman for Coatings Technology, explain how the DPI works and supports the coatings industry.

What is the mission of the Dutch Polymer Institute (DPI)?

Dr. Harold Gankema: The DPI, a public-private partnership, pursues a basic research programme of strategic technological relevance in polymer science and engineering. This "virtual" institute has been open to non-Dutch companies and institutes from the very beginning. The mission of the DPI is characterised by a multidisciplinary 'chain-of-knowledge' approach. The successful design of novel and/or improved polymeric materials and products requires a profound understanding of various disciplines. Thus DPI creates a scientific basis for polymer and coatings research which can be used by industry to improve existing products and stimulate novel developments.

What is your current research focus?

Prof. Claus D. Eisenbach: The Coatings Technology (CT) research area is concentrating on scientifically challenging research projects aimed at exploring novel coatings materials and technologies and at developing fundamental insights into the structure-properties relationships of coatings. It thus prepares the coatings industry for future challenges. The pre-competitive research effort is aimed at achieving sustainability, improving the quality of life and creating economic growth. Thus the research programme is based on three pillars: renewable raw materials, novel and environmentally friendly coatings technologies; functional (smart) coatings; durability and testing of coatings.

Do you have projects in the area of renewable raw materials and is it possible to formulate high-performance coatings with those materials?

Gankema: There are currently three projects underway to study the feasibility of applying sustainable, renewable resources in coatings technology without compromising the final coatings (film) properties. We're focusing on bio-based building blocks and raw materials for replacing materials originating from petrochemistry, and using them in novel coatings technologies. Systems include polycarbonate powder coatings and waterborne polyurethane dispersions as well as starch-based perform-

ance coating materials. The results are promising in that coatings have already been obtained which match and/or improve properties of pure synthetic-based coatings.

What kind of trends are you seeing in smart coatings?

Eisenbach: Smart coatings are capable of responding to an external stimulus, e.g. light, temperature, pressure, pH, odours, gas, etc. The stimulus causes a change in the coating's properties which may be permanent or reversible. Coatings which heal themselves after mechanical damage, and others which have light- or moisture-induced self-cleaning properties are of particular interest and have already been studied. Research into protective coatings which adapt to environmental and/or service conditions is at the embryonic stage, but such systems, along with tailored coatings in medical diagnostics (e.g., test strips) and implants, seem to be achievable in the future. The same is true of coatings with special optoelectronic and electronic properties for use in electronic devices and information technology. ◀



Prof. Claus D. Eisenbach, DPI, NL



Dr. Harold Gankema, DPI, NL

In search of new polymer developments?

You'll find interesting information in session 1,
Monday 29 March 2011, 14.00 - 14.30 h

"Metal-free 'click' chemistry
methodologies as functionalization tool
for polymer coatings" by Prof. Filip Du Prez,
Ghent University