The public is not exactly what you might call enthusiastic about the coatings industry. In fact, most people probably do not even think about the coatings industry at all. Sometimes this can be a good thing, because it allows you to go about your business without too many people poking their noses in your affairs. However, flying under the radar like this has its disadvantages too, because it makes it difficult to find skilled personnel. Especially younger people often want to work in exciting jobs or in a field where they can find a higher meaning, such as fighting climate change and poverty. Working in coatings can be meaningful too, but it takes quite a lot of explaining to get that message across.

It is therefore imperative not only to offer good working conditions but also to invest in the continuous education of those who have already joined our industry. This is important for ensuring your staff have the right skills set as well as for retaining the loyalty of your experts by giving them the opportunity to learn and grow.

We are confident that our seminar programme can go a long way towards helping you attain these goals and we trust that you will find the right one to suit your needs.

I LOOK FORWARD TO WELCOMING YOU TO OUR SEMINARS!

Jan Gesthuizen  | Editor  | European Coatings Journal
T +49 511 9910 219  | jan.gesthuizen@vincentz.net
### COLOUR TECHNOLOGY OF COATINGS | Stuttgart | Germany

| MODULE 1 | INTRODUCTION TO COLOUR TECHNOLOGY | 11 – 12 February 2019 | 04 |
| MODULE 2 | DEEPER INSIGHTS INTO COLOURIMETRY | 13 – 15 February 2019 | 05 |

### COATINGS INTENSIVE | Amsterdam | The Netherlands

| RADIATION CURING | 21 May 2019 | 06 |
| ENHANCING TITANIUM DIOXIDE EFFICIENCY | 21 May 2019 | 06 |
| DESIGN OF EXPERIMENTS | 21 May 2019 | 07 |
| PRACTICAL RHEOLOGY | 21 – 22 May 2019 | 07 |
| FLAME RETARDANT COATINGS | 22 May 2019 | 08 |
| WATER-BORNE COATINGS | 22 May 2019 | 08 |
| POWDER COATINGS | 22 May 2019 | 09 |
| WETTING AND DISPERSING ADDITIVES | 22 May 2019 | 09 |
| FUNCTIONAL COATINGS | 8 October 2019 | 10 |
| ANTICORROSIVE COATINGS | 8 October 2019 | 10 |
| POLYURETHANE COATINGS | 8 October 2019 | 11 |
| DISPERSION: THEORY AND PRACTICE IN COATINGS PRODUCTION | 8 October 2019 | 11 |
| COMPOSITION OF REACTIVE SEALANTS AND ADHESIVES | 9 October 2019 | 12 |
| BIOCIDES | 9 October 2019 | 12 |
| DIGITALISATION IN THE COATINGS INDUSTRY | 9 October 2019 | 13 |
| EPOXY COATINGS | 9 October 2019 | 13 |

### COATINGS TECHNOLOGY | Amsterdam | The Netherlands

| MODULE 1 | THE BINDER - BACKBONE OF A COATING SYSTEM | 18 – 19 November 2019 | 14 |
| MODULE 2 | THE COATING – RAW MATERIALS, FORMULATION, MANUFACTURING | 20 – 22 November 2019 | 15 |
COLOUR TECHNOLOGY OF COATINGS | MODUL 1

Colouristics is a demanding specialist field in the paints industry. This two-module consecutive seminar provides the perfect grounding for your work in this exciting area. Colours are much more than just red, yellow or blue. Anyone who works in the paint industry really ought to know a little more about them. And this module provides the foundation for exactly that. You will learn how colours are created and how the human perception of colour is derived. You will also find out what standard colour values are, how to avoid metamerism and what is the meaning of these terms in the first place. Colour measurement and possible problems will also be dealt with, including the influence exerted by the surface on the results of reflection measurements and the various types of measuring geometries.

YOUR KEY-LEARNINGS
• How are colours created? How does the human eye perceive colours?
• What is light: dispersion of light: additive and subtractive colour mixing?
• What are tristimulus colour values?
• What is metamerism and how can it be avoided?
• What is the CIE colour system?
• How does colour distance calculation work?
• How to measure plain colours?
• Which measurement geometry is used for which problems?
• What influence does the surface have on the results of reflection measurements?
• What is reflection, refraction, diffraction, interference, scattering, absorption?
• What is the Kubelka-Munk theory?

YOUR LECTURERS
Dr. Stephan Gauss, Clariant | Germany
Dr. Uwe Hempelmann, Laxess Deutschland | Germany

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BOOK TIP Colour Technology of Coatings
COLOUR TECHNOLOGY OF COATINGS | MODULE 2

In the second module, you will move from the basics of colouristics to acquire the knowledge that will make you into a real expert. For example, you will learn what makes a substance a pigment and how its properties can be influenced. You will discover everything you need to know about the physical and chemical properties of plain and effect pigments and the colour formulation that works with them. You will also acquire in-depth knowledge about measurement technology, e.g. how to measure the "sparkle" of effect pigments or how to correct measurement errors in the event of colour differences.

YOUR KEY-LEARNINGS

• What makes a substance a pigment and how can its properties be influenced?
• How are pigments and dyes characterised?
• What are the physical and chemical properties of plain and effect pigments?
• Which measurement geometry is suitable for the measurement of effect pigments?
• How do you measure the sparkle of effect pigments?
• How does the colour formulation of solid and effect colours work?
• Can measurement errors be corrected for colour differences?
• What functions are available for formulating solid colours and effect colours?
• How do you get from colour sample to recipe?
• How can effect pigments be analysed with the aid of a microscope?
• How can measurement errors be avoided?
• Which statistical aspects of colourimetry are used?
• How can different measuring devices be adjusted to each other?

YOUR LECTURERS

Dr. Juan-Antonio Gonzalez-Gomez, BASF Colors & Effects | Germany
Norbert Mezger, Merck | Germany
Dr. Thomas Rentschler, Merck | Germany
Henrik Folkerts, Byk – Gardner | Germany

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BOOK TIP Special Effect Pigments
Radiation curing is often considered to be a niche technology. This is certainly true if you merely consider the tonnage produced. However, radiation curing is now well established in certain niche areas and has emerged as the go-to technology because it provides some big advantages. Examples here are its high throughput and the abundance of possible solvents. Your key-learnings will be how radiation curing works and which type of chemistry is important for this technology. You will also find out about the components and parts of a UV curing facility. We strongly encourage you to use this opportunity to become an expert in radiation curing and to make the acquaintance of remarkable colleagues from the European coatings industry.

**YOUR KEY-LEARNINGS**
- What is UV radiation?
- What do UV coating formulations look like?
- What are the advantages and disadvantages of UV curing?
- What role does the UV curing facility play?

**YOUR LECTURER**
Tunja Jung, BASF | Germany

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**BOOK TIP** Radiation Curing

Titanium dioxide is the most important pigment in the coatings industry. No other white pigment comes close to rivalling its efficiency or matching its outdoor stability and colouristic properties. However, while it may be a very efficient pigment, it is not exactly the cheapest ingredient in a formulation, and so it is no surprise that there is great economic value to be derived from optimising its usage. It is also important to know the differences between the various kinds of titanium dioxide pigments you will find on the market, when to use one instead of the other, and the role played by post-treatment of the pigments. You will take away a comprehensive overview of the most important pigment in the industry and how to use it properly and efficiently.

**YOUR KEY-LEARNINGS**
- What types of titanium dioxide are on the market and how do they differ?
- What impact organic or inorganic post-treatment can have?
- Impact of titanium dioxide on properties such as weatherability?
- The various kinds titanium dioxide pigments on the market and what they are used for?
- How photocatalytic self-cleaning works?
- What can be done to use titanium dioxide more efficiently?

**YOUR LECTURER**
Dr. Steven Ashdown, Venator | Great Britain

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**BOOK TIP** Titanium Dioxide
When developing a new coating, many factors influence the manufacturing process and the properties of the coating. In order to optimise a coating formulation, you as the coating developer need to coordinate the various factors. Not an easy task at all. Statistical design of experiments is a valuable help. The term "planning" is the be-all and end-all. Only with good and systematic planning you can save time and money and reach your goal in a more organised way. Statistical test planning creates a structure in the research and development of paints and varnishes and makes it possible to work purposefully and efficiently.

YOUR KEY-LEARNINGS

• Statistical design of experiments – what is it?
• What is the classical approach to statistical design of experiments (planning, data analysis, etc)?
• Why is planning so important?
• What role does statistical design of experiments play in the development of paints and coatings?
• How can a new product be developed purposefully and efficiently?
• How do coatings formulators benefit from statistical design of experiments?
• How can statistical design of experiments be used to optimise products and processes?

YOUR LECTURER

Dr. Theo Wember, Freelance Statistician specialising in technical statistics | Germany

SEMINAR FEES

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BOOK TIP Design of Experiments for Coatings

The science of flow and deformation. This is usually how experts define rheology. But more important than the definition of this particular field of physics or physical chemistry is its practical value to the coatings industry. To understand rheology is to have inside information about both the flow behaviour of a liquid and the deformation behaviour of solids. Knowledge of how to influence rheological properties and naturally of how to measure them is key to developing paints and coatings that match your customers’ needs. In this seminar you learn about the rheological properties of paints, gain an insight into the methods used to measure viscosity and learn how to create rheological requirement profiles. This will help you to formulate better paint systems in the future.

YOUR KEY-LEARNINGS

• Why is rheology so important?
• What role does rheology play in the dispersing process?
• How does rheology change during the formulating process?
• How can the viscosity be determined inexpensively, quickly and reliably?
• How can flow behaviour in water-borne systems be controlled?
• How can rheological additives be used selectively and effectively?
• Which rheological additives should be used for which application?
• How do various binders affect flow behaviour?

YOUR LECTURERS

Frank Abschlag, Elementis | Germany
Dr. Klaus Oldörp, ThermoFischer | Germany

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BOOK TIP The Rheology Handbook
Large conflagrations are relatively rare in Europe. However, they do happen and there can be personal injuries and deaths too. One reason such fires in Europe are so rare is the strict fire regulations. But even though these are strict, they cannot cover all eventualities. In this seminar you will learn how to contribute to fire safety and how flame retardant coatings can have life-saving properties. You will also learn about various different technologies currently employed and how the underlying chemicals work. And, of course, you will gain a comprehensive overview of current European fire standards and regulations.

**YOUR KEY-LEARNINGS**

- Why do we need flame retardants?
- What different types of chemical flame retardants are there?
- How do various flame retardants work?
- Which halogenated flame retardants are still permitted?
- Which flame retardants are available to form insulating layers and how do they work?
- Which fire protection coating is suitable for which substrate?
- Which components are key to a formulation?
- What are the latest trends in fire safety coatings?

**YOUR LECTURERS**

Dr. Adrian Beard, Clariant Produkte (Deutschland) | Germany
Dr. Klaus Bender, Clariant Produkte (Deutschland) | Germany

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**BOOK TIP** European Coatings Handbook

The transition from solvent-borne to water-borne polymer dispersions is anything but new. Yet the changeover is far from complete and not easy to achieve. The properties of water-borne systems are quite different from solvent-borne systems. Governments and public opinion are increasingly pushing for reduced VOC levels. Sometimes a high-solids system will do the job, but often that is just not enough. You will get a comprehensive overview of the regulations governing water-borne coatings and explain why even water-borne systems are often not totally free of organic solvents. Discover which raw materials are ideal for water-borne coatings and the current technology trends.

**YOUR KEY-LEARNINGS**

- VOC, REACH and other regulatory influences on coatings development
- Does water-borne really mean totally solvent-free?
- What to watch out for when increasing the water content of a coating?
- Which raw materials are best suited to this type of coating technology?
- What to watch out for when developing a new water-borne coating
- Where have water-borne coatings become established and where is still need for important action, and why?
- The current focus of technological development

**YOUR LECTURER**

Martha Meyer, MCP Europe | Germany

**SEMINAR FEES**

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**BOOK TIP** Additives for waterborne coatings
Powder coatings are considered to be one of the most environmentally friendly ways to protect or to optically enhance any kind of substrate. Apart from the environmental advantage that no VOC is needed, powder coatings often offer a combination of economy and good mechanical properties such as scratch resistance. In recent years, powder technology has spread into other application areas. Advances in reducing curing temperatures are opening up new applications all the time. This seminar will help you understand the basics of powder coatings and enable you to start working on your own formulations. You will learn the difference between thermosetting and thermoplastic powder coatings, which binders are used and which parameters influence the properties of powder coatings.

**YOUR KEY-LEARNINGS**
- What is the difference between thermosetting powder coatings and thermoplastic powder coatings?
- What curing reactions are used in powder coatings?
- Which binders are used?
- How are powder coatings made?
- In which application areas are these systems used?
- Which parameters influence powder coatings properties?

**YOUR LECTURER**
Dr. Emmanouil Spyrou, Evonik Resource Efficiency | Germany

**SEMINAR FEES**
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**BOOK TIP** Powder Coatings Chemistry and Technology

There are additives that are so important and essential that they deserve their own seminar. Wetting and dispersing additives are undoubtedly among them. Even in very low concentrations they have a great influence on the properties of coatings. If you are not familiar with them, you have a major knowledge gap that should be closed as soon as possible. In this seminar you will learn how wetting and dispersing additives work, how they determine the correct amount to be added and how the additives interact with fillers and pigments.

**YOUR KEY-LEARNINGS**
- Which properties of coating formulations can be influenced with wetting and dispersing additives?
- How to use – and not to use – wetting and dispersing agents?
- When is controlled flocculation useful and when should deflocculation be used?
- How to choose the correct wetting and dispersing additive and add the right amount of it?

**YOUR LECTURER**
Petra Lenz, Byk-Chemie | Germany

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**BOOK TIP** Understanding Additives
Coatings should no longer just look good and protect against corrosion. As good and important as both properties are, many customers want more. Many of these requirements can be described by the term "functional coatings". Popular buzzwords that are often used here are anti-ice, anti-graffiti, self-healing or the often-mentioned shark skin. Some of these properties have already been well researched and established on the market, others still have practical hurdles to overcome. This seminar will show you which functional coatings belong to which of these categories. You will also learn the mechanisms behind the various modern functionalities and the role nanotechnology plays.

**YOUR KEY-LEARNINGS**

- What is the role of nanotechnology?
- Which coating systems are suitable?
- How do I get an anti-ice effect?
- Which functional coatings are already marketable?
- How does self-healing work?
- What is a sharkskin paint?
- How do I specifically control functions?
- Can a paint have more than one function?

**YOUR LECTURER**

Dr. Gesa Patzelt, Fraunhofer Institute for Manufacturing Technology and Advanced Materials | Germany

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**BOOK TIP**

Functional Coatings

Imagine jumping into a car and accelerating from 0 to 100 km/h in 5 seconds. Driving a sports car is surely the ultimate in pleasure, especially, if you can do it every summer. It is not amazing, though, how the underbody doesn’t fall off and rust doesn’t start showing its ugly face on the bonnet! Well, you can thank the finish for that. The same goes for coatings for wind turbines, ships, bridges, window frames and other metal objects. Corrosion does not move as fast as a car! But what is corrosion in the first place? And what are the demands that the various paints and or rust protection must meet? This seminar will also include a discussion on what is meant by proper surface treatment, leaving you to drive away in a good mood when it’s finished.

**YOUR KEY-LEARNINGS**

- How does corrosion occur?
- What types of corrosion are there?
- What surface preparation is necessary for an endurable coating?
- Which ingredients does a coating comprise of and what are their roles?
- What are the current trends in anticorrosive coatings?
- What distinguishes water-borne from solvent-borne systems?
- How do self-healing coatings work?

**YOUR LECTURER**

Dr. Peter Plagemann, Fraunhofer Institute for Manufacturing Technology and Advanced Materials | Germany

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**BOOK TIP**

Anticorrosive Coatings
When customers want really high-performance coatings, the right system to use will very often be based on polyurethane technology. This type of coating is known for its durability, flexibility and many other key characteristics. Consequently, polyurethane coatings can be found in nearly every type of application: automotive, furniture, flooring and every other type of coating that calls for a premium product. This seminar will give you all the knowledge to start working on polyurethane formulations. For example, you will learn all the key facts about polyisocyanate hardeners, the various polyols that are used and the combinations of raw materials to use for achieving desired properties.

**YOUR KEY-LEARNINGS**

- Which polyisocyanates are relevant to paints and how do they influence the binder?
- What are the characteristic properties of the various polyesters, polyethers, polyacrylates and other polyols and what is important in their selection?
- Which isocyanate/polyol combinations are suitable for which applications?
- What is important in the formulation of 1-pack and 2-pack polyurethane systems?
- What properties can be achieved with polyurethane hybrid systems?
- Which aspects need to be considered in the formulation of radiation-curing polyurethane coatings?
- How are PUR coating powders and dual-cure systems formulated?

**YOUR LECTURER**

Dr. Ulrich Freudenberg, Covestro | Germany

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**BOOK TIP** Polyurethanes

If any process deserves to be called the key factor in coatings manufacturing, it is surely dispersing. Pigments that settle down in a paint can instead of staying in suspension be extremely annoying. To achieve this and other key properties, there are many parameters that need to be considered during the dispersion process: correct wetting, mechanical destruction, stabilisation of the flocculation, and heat management. A good dispersion will only be obtained if all of these points are addressed properly. This seminar will show you how the various parameters are inter-related and how they can be influenced. It will also feature practical examples of various coating and ink applications to illustrate the most important lessons.

**YOUR KEY-LEARNINGS**

- How to incorporate pigments and fillers into a coating?
- What are the fundamentals of pigment wetting and stabilisation?
- How do pigment wetting and dispersing additives work?
- What are the different classes of pigment wetting and dispersing additives?
- What are the different concepts for colouring a coating: direct grind, tinting and full mixing?
- How to formulate a pigment grind and a pigment concentrate?
- How to choose the right pigment wetting and dispersing additive?

**YOUR LECTURER**

Dr. Hans-Joachim Jacob, Ystral | Germany

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**BOOK TIP** Dispersing Pigments and Fillers
Adhesives and sealants surround us in our daily lives. They are used in high-tech applications such as aeronautics and in architecture and can also be found in the hands of children as they learn to express their creativity. This seminar will familiarise you with the most important types of adhesives and sealants, focusing on the composition and ingredients, their chemical structures and functional groups. After attending this seminar, you will be able to clearly work out the properties conferred by each type. With the aid of practical formulation tips, you will be able to analyse guide recipes and patent examples and learn how to calculate key recipe parameters step by step. This seminar will help you approach formulating confidently and competently!

YOUR KEY-LEARNINGS

- How do adhesives and sealants set?
- What is adhesion and how do adhesion promoters work?
- What is the chemistry behind dispersion adhesives and what distinguishes them from reactive adhesives?
- Which types of adhesive sealants are used in the automotive industry?
- What is so special about sealants for multi-pane insulated glazing?
- What are polyurethane construction sealants?
- How do I formulate adhesives and sealants?
- How are specific properties controlled via the formulation?
- How are adhesive bonds tested?

YOUR LECTURER

Dr. Matthias Popp, Fraunhofer Institute for Manufacturing Technology and Advanced Materials | Germany

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BOOK TIP

Formulating Adhesives and Sealants

All applications of biocides in paints and varnishes are covered by the Biocidal Products Ordinance which regulates the marketing and use of biocidal products on the European market. On the one hand, the increasing complexity of the process is an obstacle to new marketing authorisation applications, on the other hand, the incipient cleansing of the market is also a driving force for the new development of safe formulations and products. In this seminar the legal background will be covered. In addition, the challenges of the current approval procedure as well as the possibilities of use in the product or in the treated product with the associated data requirements will be discussed in detail.

YOUR KEY-LEARNINGS

- What are biocides and where are they used?
- How do biocides work, where are their risks?
- What changes have been made to the Biocides Ordinance in Europe?
- What are new developments in handling and labelling of biocides and biocide-containing products?

YOUR LECTURER

Dr. Annette Bitsch, Fraunhofer Institute for Toxicology and Experimental Medicine | Germany

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BOOK TIP

Microbicides for Coatings
The manufacturing process for paints and coatings is very well established and quite efficient. However, “quite efficient” won’t be enough in the future. The digital revolution has already transformed many industries, and the coatings sector is next. This seminar provides an overview of how paints and coatings manufacturers can improve not only their manufacturing processes by using digital tools but also of where digitisation can improve R&D and communications with suppliers and customers.

**YOUR KEY-LEARNINGS**

- Why is digitalisation in the coatings industry necessary
- Which digital technologies are relevant?
- Implementation of digital tools in existing structures
- Managing digital transformation as innovation project

**YOUR LECTURER**

Alexander Madl, Chemical Technology Consulting | Germany

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Epoxy coatings are extremely versatile and are capable of meeting high demands while imparting mechanical and chemical resistance. So, it is of little surprise that they are often used in areas with quite harsh environments like industrial, marine, wind power or pipeline coatings. To create an epoxy coating that really lives up to these expectations it is fundamental to understand how to find the perfect combination of resin and hardener. Of course, the trend towards low-VOC solutions is also very present and water-borne systems are getting more and more important. Make sure you do not miss out on this seminar to learn all these and many more important facts on epoxy coatings.

**YOUR KEY-LEARNINGS**

- What can modern epoxy resin paints do?
- Which property profiles can be achieved and how?
- How do water-borne systems perform compared to solvent-borne epoxy paints?
- How can properties be optimised by a certain type of additives?
- What standards apply to epoxy coatings in the regulated heavy-duty corrosion protection?

**YOUR LECTURERS**

Dr. Martin Gerlitz, Huntsman Advanced Materials | Switzerland
János Hajas, Byk-Chemie | Germany

**SEMINAR FEES**

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**BOOK TIP** Epoxy Resins
COATINGS TECHNOLOGY | MODULE 1

Nothing determines your formulation’s properties as much as the binder. When you want to develop a new formulation, the binder is the first component to be scrutinised. This two-day course will give you comprehensive and detailed insights into the world of binders. You will learn how to choose the right binder and which task the various binders perform. You will discover how binders are classified and how they affect the mechanical properties of your coatings system as well as many other important properties. Naturally, this intensive course will also look at water-borne systems and give you an insight into the latest trends in binder technology.

**YOUR KEY-LEARNINGS**

- What is the composition of coating materials?
- Which tasks are performed by the binders/film formers?
- What are the major basic reactions?
- What is meant by monomer, polymer, oligomer, degree of polymerisation, molar mass, etc?
- How can a binder be classified by origin, delivery form and film formation?
- What are the most important types of binder and what do they do?
- What are the most important crosslinking reactions?
- How do binders affect the mechanical properties?
- How do water-borne polymer dispersions behave with regard to emulsion polymerisation, film formation, technical data and application areas?
- What recent developments have there been in binder chemistry and what do they offer?

**YOUR LECTURER**

Prof. Dr. Alex van Herk, University of Eindhoven an Institute of Chemical & Engineering Sciences Singapore | The Netherlands, Singapore

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**BOOK TIP** Acrylic Resins
COATINGS TECHNOLOGY | MODULE 2

Developing a good working formulation is anything but easy. Binders, fillers, additives and pigments all have to work together in perfect harmony. What is more, each and everyone of the ingredients can interact with the others – sometimes in a way you don’t expect. Of course, to a certain degree this is common in all development projects. But a sound and comprehensive knowledge of the typical properties of formulation ingredients will help you to reach your target faster and more efficiently. This seminar will teach you precisely how to accomplish this, along with typical processes involved in paint production, such as the dispersion process. After attending this seminar, you will have the necessary knowledge to master paint development all the way from the lab through to manufacturing.

YOUR KEY-LEARNINGS

• What are the key categories for binders?
• What to look out for when performing colour quality assurance and calculating recipes?
• What are the properties of nanoscale pigments and fillers and where are they used?
• Which coating features, functions and formulation characteristics occur in functional pigments?
• Which effects can be achieved with additives?
• What are the most important fillers and how can their coating properties be assessed?
• What are the most important recipe parameters and how do you develop a recipe for the various coating systems?
• How is a specification developed?
• How do solvents affect paint production?
• What comprises the dispersing process?
• What are the steps and procedures involved in paint production?
• How do paint properties influence the coating outcome?

YOUR LECTURERS

Wernfried Heilen, Heilen Consulting | Germany
Dr. Manfred Oppermann, Colorants Coatings Consulting | Germany
Prof. Dr. Thomas Brock, former University of Applied Sciences | Germany

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