

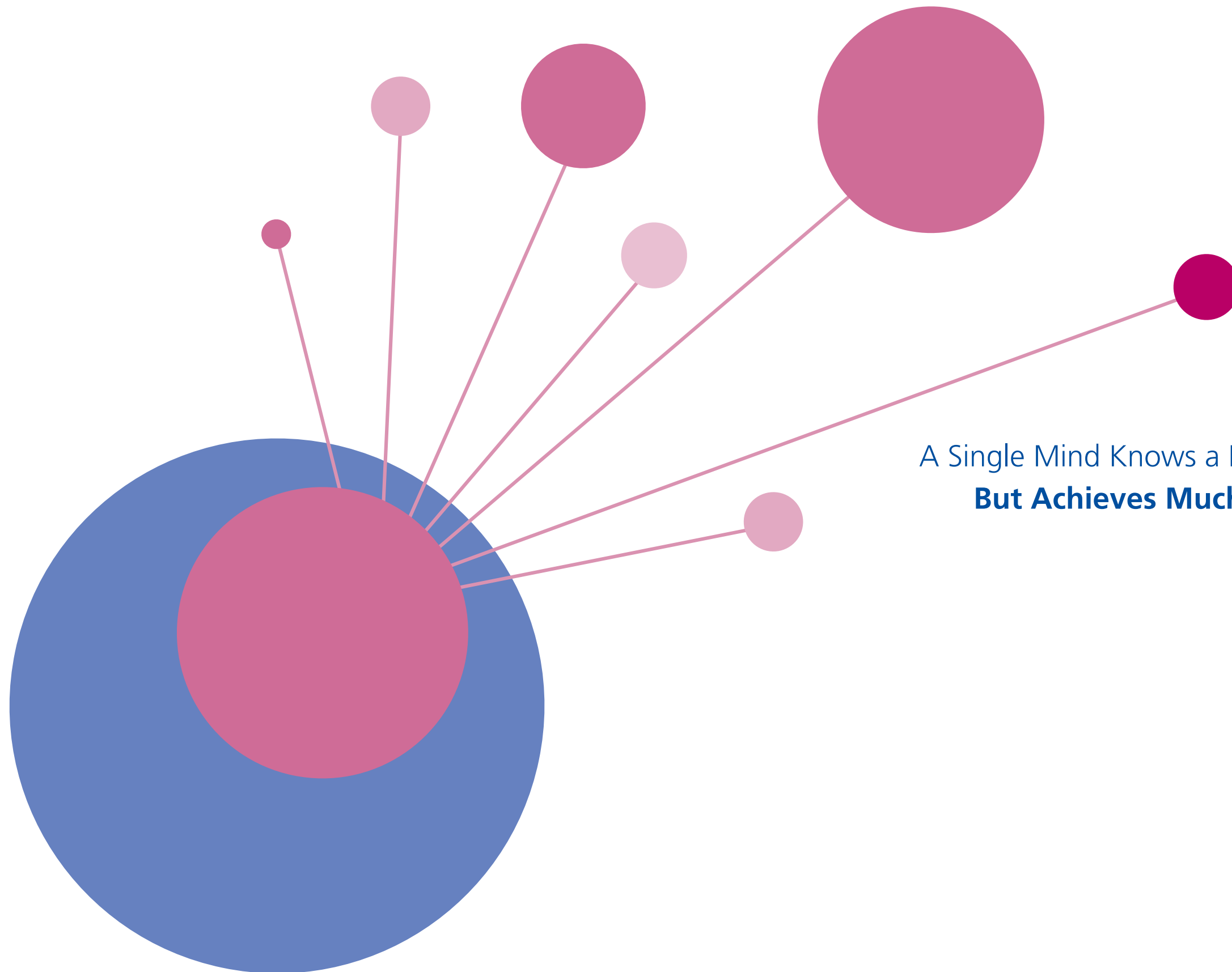
**"The Real Voyage  
of Discovery Consists  
Not in Seeking New  
Landscapes, But in  
Having New Eyes"**

Marcel Proust

## **ALTANA Innovation Conference 2012**

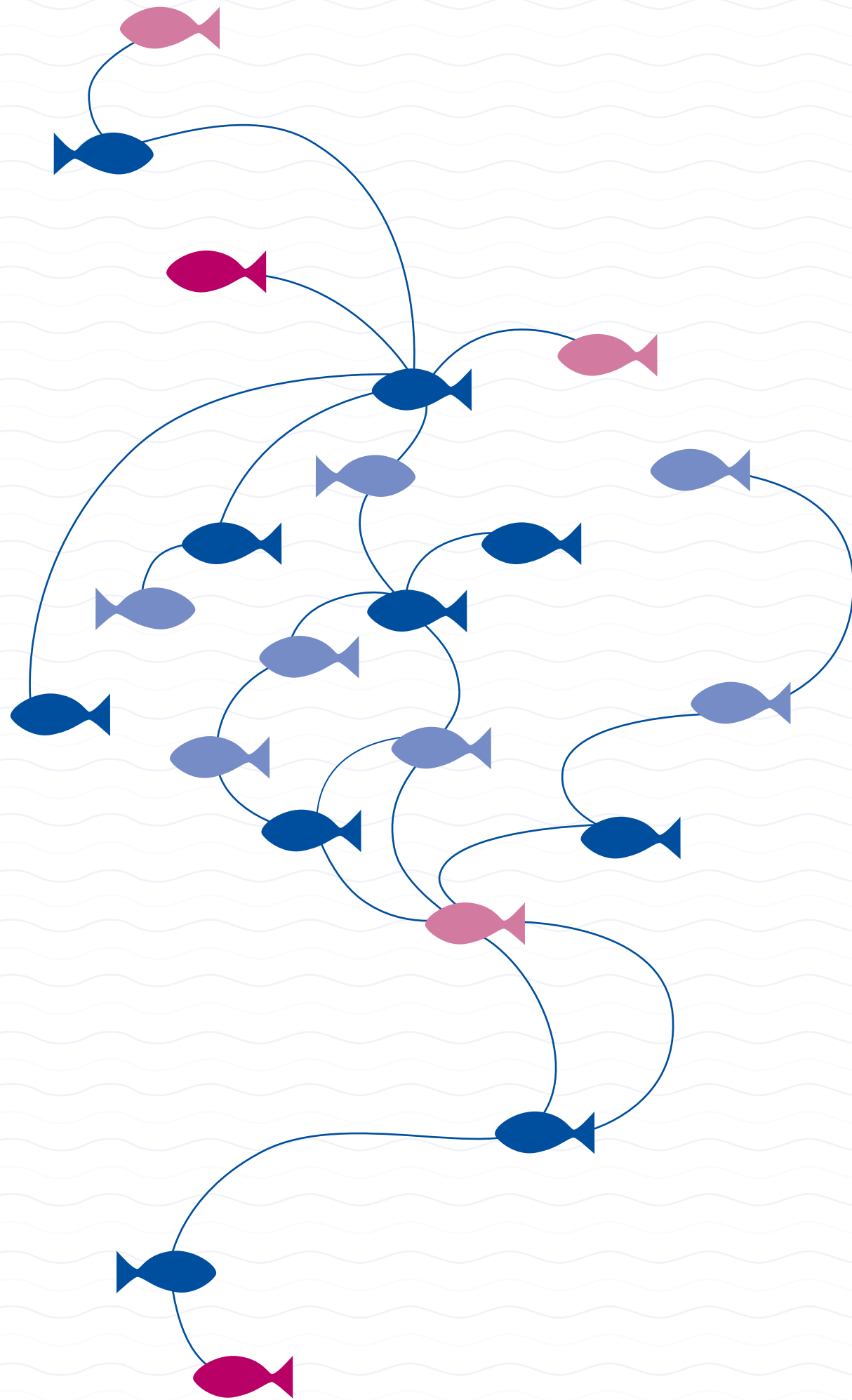
Our knowledge makes the difference



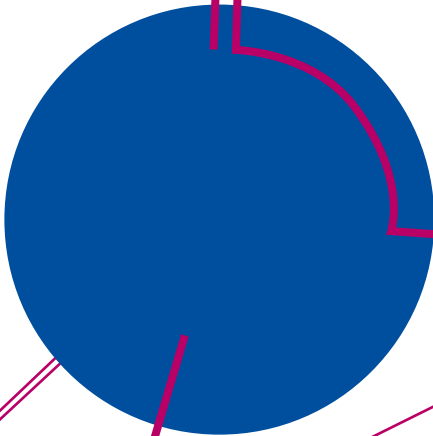


A Single Mind Knows a Lot.

**But Achieves Much More With an Open Mind.**

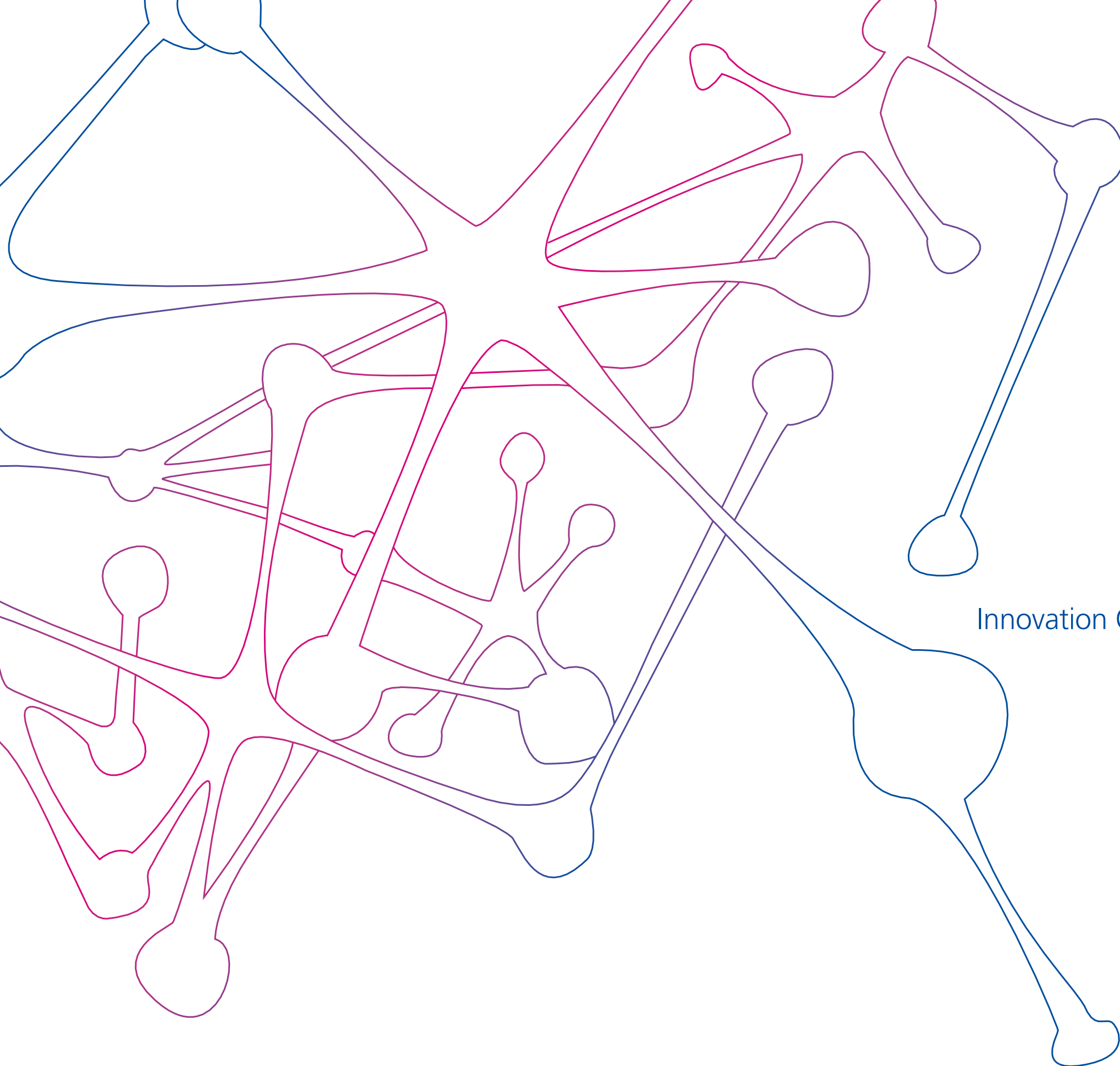


To Be Open-Minded Means  
**to Be Open for Knowledge.**



# Knowledge Is

# the Inspiration for Innovators.



Innovation Originates from the Variety of Connections.  
**Seeing Things in Different Ways.**



# "We Are Not Into Seeking New Landscapes but Into Having New Eyes"

Over 150 top-level researchers and innovators from ALTANA gathered at this year's ALTANA Innovation Conference for two days with a packed agenda offering many opportunities for face-to-face meetings alongside lectures, the poster session, workshops and a program of social activities. We accompany the initiators and patrons of the conference, Dr. Matthias L. Wolfgruber and Dr. Georg F. L. Wießmeier, as they visit the poster session together.



**Dr. Wolfgruber:**

This is already the fifth ALTANA Innovation Conference and I have the impression that the participants already know one another very well. As soon as the introduction was over they launched into intensive discussions in small groups in front of the many posters here. Our network is alive and working well.

**Dr. Wießmeier:**

I am delighted to see this, too. Our efforts over the last five years have really paid off. Now our researchers are in constant, lively contact with one another. They can start right away sharing thoughts and ideas about exciting innovation-related topics, or continue an existing exchange. The posters serve merely as aids for illustrating the ideas. The many exhibits that people bring along, which you can see here, also enable the participants to hold clear and effective discussions.

**Dr. Wolfgruber:**

Yes, very good. From nail polish with pearlescent effects to solar cells and all the way to pictures printed using electroluminescent inks – there are very many exciting and new developments to be seen. The enormous pool of knowledge that is present here is truly tangible. The conference is an excellent opportunity for forging new links and generating knowledge.

**Dr. Wießmeier:**

That's true. Every poster, every lecture and even the results from the workshops are stored in our Web-based ALTANA Innovation Portal, where they can be researched. Following its launch at the last conference, the ALTANA Innovation Portal has already definitely proved its worth and helps our innovators remain in contact with one another, find experts for dealing with specific questions, and publicize Innovation Challenges. You have already used it yourself.

**Dr. Wolfgruber:**

I'm delighted that the ALTANA Innovation Challenge "Green Chemistry" was taken up by the ALTANA Innovation Community with such great interest. This is a wide-ranging field that has huge relevance for us. Now we have a very good overview of the topic and its significance for our customers and our business.

**Dr. Wießmeier:**

Furthermore, we know which of our approx. 850 colleagues busy in R&D have already got to grips with it in more detail. A challenge offers a wonderful opportunity to network experts on a certain area. This can become the starting point for an ALTANA Technology Platform, such as Nanotechnology, Industrial Biotechnology or Printed Electronics, to name only the ones that already exist.

**Dr. Wolfgruber:**

The ALTANA Innovation Council currently uses this route via the portal for the topic of "Batteries & Energy Storage." This is another very interesting example. Using external knowledge is particularly important for this topic. We want to address the even more systematic use of external knowledge very intensively in the near future.

**Dr. Wießmeier:**

Exactly. There will be a workshop about this, which is already being prepared by means of an internal survey supported by the ALTANA Innovation Portal. Over the next two years, one participant from the Cross-Divisional Development Program Innovation will in fact work very intensively on the systematic use of external knowledge.







**Dr. Wolfgruber:**

A very large amount of external knowledge is available in our "information age" and so it is most important to filter out the knowledge that is relevant to us, and to categorize and evaluate it. I think that our corporate wikis provide a huge amount of help here. But it is also important to protect our know-how.

**Dr. Wießmeier:**

On this topic, let's take a look at the demonstration of the new ALTANA Patent Platform launched by our multidivisional expert network of patent officers – an outstanding tool.

**Dr. Wolfgruber:**

Yes, indeed. It now makes it possible to have an overview of all the patent applications that are relevant to ALTANA. It enables every laboratory manager to quickly see whether he or she has freedom to operate before making a larger investment in resources for a planned research project. The ALTANA Patent Platform is also certainly very useful when it comes to elaborating a suitable patent strategy.

**Dr. Wießmeier:**

It's important for the tool to be used intensively and effectively by all employees involved in the innovation process. This is the only way we can ensure the protection of our know-how – which is the lifeblood of our specialty chemicals company.

**Dr. Wolfgruber:**

I can see that during the last five years the ALTANA Innovation Community has achieved a great deal, and I hope that we will continue to improve in the field of innovation. Unlimited access to our knowledge for all relevant employees, playing an active role, and networking the Community members are all important requirements and top priority. This is the only way that we can keep up with the high speed of development in our field, and remain in the lead both on the market and in technology.

**Dr. Wießmeier:**

Knowledge really is a crucial point, because only very good education and comprehensive knowledge can guarantee that we are able to approach questions from the most varied perspectives and, if necessary, also to consider a paradigm shift – essential for innovation. For this reason, the slogan of this year's ALTANA Innovation Conference is "The Real Voyage of Discovery Consists Not in Seeking New Landscapes, But in Having New Eyes."

We hope you enjoy reading this brochure!

Dr. Matthias L. Wolfgruber  
Chief Executive Officer, ALTANA AG

Dr. Georg F. L. Wießmeier  
Chief Technology Officer, ALTANA AG

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# AGENDA

Innovation Captures Value.

# 1st Day

## ALTANA Innovation Conference 2012

Wednesday, November 7th, 2012

9:00 – 9:15h

**Welcome Address / Opening Remarks**

Dr. Georg F. L. Wießmeier

9:15 – 9:45h

**CEO Keynote: (Ex)change to Succeed – Being Static Is the End of Innovation**

Dr. Matthias L. Wolfgruber

9:45 – 10:15h

**CTO Keynote: Knowledge Is Key**

Dr. Georg F. L. Wießmeier

10:45 – 11:30h

Introduction & Highlights Division ECKART Effect Pigments

**"Magic Effects Based on Magnetic Pigments"**

Dr. Sebastian Höfener, Dr. Ulrich Schmidt (Introduction: Dr. Mark Stoll)

11:30 – 12:15h

Introduction & Highlights Division ACTEGA Coatings and Sealants

**"TerraCross® – Novel UV Hybrid Coatings for the Graphic Arts"**

Dr. Antonius Dikmans (Introduction: Dr. Peter K. Jenkner)

13:30 – 14:15h

Introduction & Highlights Division ELANTAS Electrical Insulation

**"Innovation Challenge Wire Enamels"**

Dr. Giovanna Biondi (Introduction: Dr. Horst M. Sulzbach)

14:15 – 15:00h

Introduction & Highlights Division BYK Additives & Instruments

**"From High Solid to True Solid – A Paradigm Shift in BYK's Technology"**

Dr. Frederik Piestert (Introduction: Dr. Jürgen Omeis)

15:00 – 15:15h

**Introduction Poster Session**

Dr. Georg F. L. Wießmeier

15:15 – 18:00h

**Poster Session**

18:00 – 21:30h

Dinner Buffet

**ALTANA Innovation Award 2012 Ceremony**

Dr. Georg F. L. Wießmeier

Moderation: Tristan van Vuuren, Dr. Stephanie Arzt, Dr. Anna-Maria Pütz

## 2nd Day

# ALTANA Innovation Conference 2012

Thursday, November 8th, 2012

8:45 – 9:00h

### Opening Remarks / Introduction

Dr. Georg F. L. Wießmeier

9:00 – 9:45h

Division Overview:

ECKART Effect Pigments

### Effect Pigments – Improve the Emotion, Add the Function

Dr. Mark Stoll

9:45 – 10:30h

Customers View:

### Innovations at AkzoNobel

Dr. Dick C. van Beelen (Director of Open Innovation, AkzoNobel, the Netherlands)

10:50 – 11:15h

### The ALTANA Innovation Portal: A Digitized Competence Map and More

Tristan van Vuuren

11:15 – 11:40h

### New Business Approaches: Printed Electronics in Application

Dr. Martina Weidner

11:40 – 12:00h

### Value of Innovation – AVA, IRR, NPV: What for?

Oliver König

13:00 – 13:15h

### Introduction Break-out Sessions

Dr. Georg F. L. Wießmeier

13:15 – 15:15h

### Break-out Sessions (1–12)

#### 1 Nanotechnology (Network Meeting)

Dr. Michael Berkei

#### 2 Industrial Biotechnology (Network Meeting)

Dr. Birthe Borup

#### 3 Printed Electronics (Network Meeting)

Dr. Martina Weidner

#### 4 Batteries & Energy Storage (Network Meeting)

Katharina Hesping, Jim Wittig

#### 5 Intellectual Property –

#### How to Use the ALTANA Patent Platform for Your Own Benefit (Workshop)

Klaus Burger, Dr. Wolfgang Pritschins

#### 6 Products for the High-End Packaging Market – Synchronization of the ALTANA Portfolio (Workshop)

Dr. Sascha Stempel

#### 7 R&D Challenges to Meet Food Contact Regulations (Workshop)

Dr. Michael Becker, Dr. Holger Hein

#### 8 How to Use External Knowledge More Efficiently (Workshop)

Dr. Stephanie Arzt, Dr. Anna-Maria Pütz, Dr. Florian Raubacher

#### 9 NMR Spectroscopy Live (Workshop)

Werner Pettau

#### 10 Green Chemistry (Network Meeting)

Oliver Marx, Dr. Gerald Kirchner



## 2nd Day

# ALTANA Innovation Conference 2012

Thursday, November 8th, 2012

### 11 KAM 1: How to Serve the Global Mid-Markets (Workshop)

Dr. Teresa Ramos, Albert Frank

### 12 KAM 2: New Horizons of Functionality (Workshop)

Oliver Bedford, Lothar Biecker

15:35 – 17:00h

### Presentation of Break-out Session Results

Moderators

17:00 – 17:15h

### Closing Remarks

Dr. Georg F. L. Wießmeier

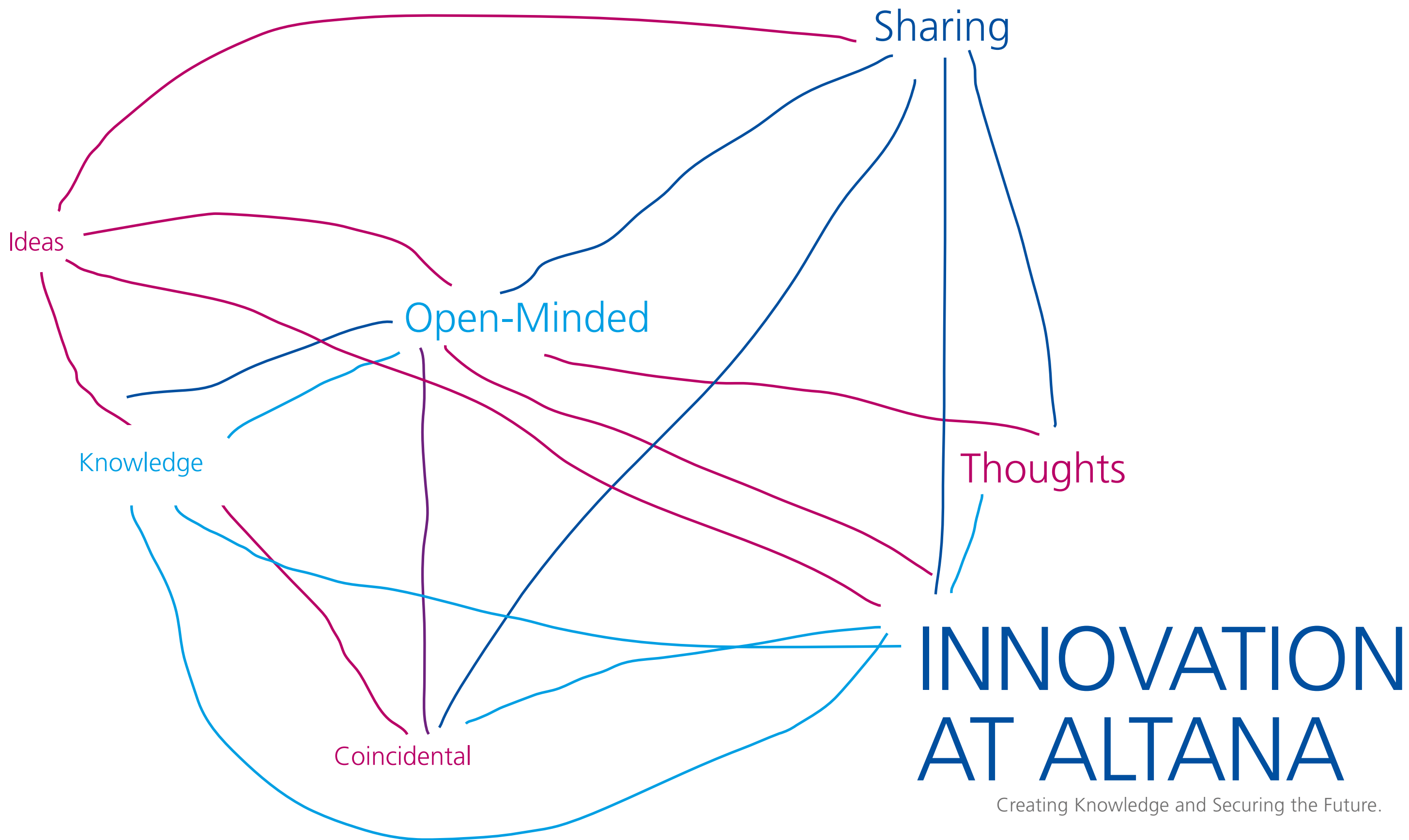
17:15 – 17:30h

### Mercator: Building a View of the World on Other People's Knowledge

Werner Pöhling (Duisburg Cultural History Museum)

17:30 – 22:00h

### Social Event / Farewell Dinner



# CEO Keynote: (Ex)change to Succeed – Being Static Is the End of Innovation

The history of ALTANA is a history of changes. That has made us so successful over the years. Embracing the idea of change is the challenge we face, if we want to stay on our track of innovation and growth. This requires an attitude of openness, flexibility, and a readiness to appreciate new ideas and to exchange.

Dr. Matthias L. Wolfgruber

ALTANA has been an extremely successful company for many years now. When it comes to growth, its track record is exceptional. 2012 has proven to be another profitable year again. What are the drivers behind this success story? My conclusion is quite simple: Success in business, growth in particular, depends on successful innovation. That, in turn, is based on change which relies on exchange and building knowledge.

When analyzing successful innovation, it helps to look at companies that failed. Many big names who were market leaders in their day are now extinct – for a very simple reason: their inability to change and adapt. They were technology leaders and thought they would remain in that position forever. But in the long run, markets and technology bypassed them.

Looking at these companies, you can identify one of the biggest threats to success. It's an attitude of inflexibility, of being set in your ways, of not being able to think outside the box, or to take a fresh look at things. But this is what innovation is about. In other words: innovation is about change.

If you look at our history, you will find many changes. Despite the continuity we experience, it is fair to conclude that ALTANA's history is a history of changes. Let me give you a few examples to illustrate the changes we have mastered as ALTANA. Not only do they concern our portfolio, they concern ownership and strategy, internal processes and attitudes as well.

**Once we were a public company,** listed at New York Stock Exchange and part of the German blue chip index. Today we are fully private.

Once we had a very mixed portfolio. Today it is extremely focused. Let me stress this: By no means did our portfolio only grow organically. It is the result of continuous shaping and planning efforts. If you compare the ALTANA of 1977, when Herbert Quandt established the company and part of which was a small chemical business, to the ALTANA of 1995 and the ALTANA of 2012 – you will perceive significant and dramatic

changes. In 1995, Milupa, the baby food brand which is now part of Danone, was sold. Eleven years later, in 2006, we divested the pharmaceutical business. On the other hand, we acquired new brands and companies which contribute to our identity today as a specialty business.

We exited businesses when we realized that we would not be the best parent or couldn't be leaders in that particular field. And we invested when we felt we could differentiate our business and achieve substantial growth. All these efforts have resulted in today's highly successful specialty portfolio.

**Once we did little R&D.** Today we consider it a strategic investment into the future, with expenses and manpower in this field growing fast and above market average. Today we spend 5–6% of our budget on R&D. In 2012, this amounted to about 100 million euros. About 15% of our employees worldwide work in R&D.

Once we had very little cooperation and collaboration between group companies and even occasional competitive situations within the group. Today we share a common identity and a set of values which allow us to work together effectively and cooperate on specific platforms.

By the same token, we remain decentralized as individual brands. Each division operates as closely to its markets as possible. This business model I consider as one of the key factors for success in the specialty business.

**Together we created profitable growth and value over the years.** So we have every reason to look back proudly on our history and the changes we mastered. But the story doesn't end here. Markets keep changing and so do customers and consumers all over the world. Technologies develop, competition grows. All this means we have to keep pace and keep evolving continuously. This is a huge task, no doubt. What does it require? First of all, it requires a specific attitude. This I will call a willingness to face change.



As a company and as individuals we must be prepared to accept change as an ongoing process that accompanies us daily. Once we understand that, our attitudes will adapt accordingly, creating an atmosphere of openness and flexibility within the ALTANA Group. It is this atmosphere in which the desire to learn new facts or develop new skills will grow and the readiness to take on new tasks and responsibilities will expand. Based on this, we can build more relationships and collaboration within the group.

**Most importantly, this atmosphere of openness and flexibility** will help to create a new mobility within the group. When the need arises, we expect staff and colleagues to switch functions or tasks, to move within the division they work in, or even move between divisions. We will foster this mobility, because it helps everybody to take a new look at routines, and it enables them to learn new facts or transfer their know-how to other departments or divisions. In the long run, flexibility and mobility will pay off in terms of innovation – that is the main reason why we are fostering it.

**In order to reinforce our concept of continuous change** we started at the top, rotating the management team. Dr. Christoph Schlünken is now in charge of the Additives & Instruments business at BYK, while Dr. Wolfgang Schütt takes on responsibility for ECKART, Dr. Guido Forstbach for ELANTAS, and Dr. Roland Peter for ACTEGA.

These four will act as role models for the change that we ask everyone to contribute to. Together we will take a fresh look at things. We will develop new perspectives on our business and technologies, thereby creating new opportunities for innovation and growth.

Often, people associate change with a threat. But let me assure you: change as such is not threatening at all. It's a chance to create our future as a company and a chance to create long-term value. It helps our divisions to take one step after the other on our road to success. That's why we ask you to embrace the idea of change. In fact, living change actively can be quite fulfilling. Change poses threats only to those who resist the idea completely.



**Ultimately, our goal is to create more synergies.** By that we are not referring to cost synergies. As far as procurement, IT, and many other functions are concerned, we have created many synergies in the past. Now, with future growth and future innovations in mind, we are talking about sharing knowledge and know-how within the group, creating growth contribution and growth synergies. Sharing will enable us to create new synergies and apply these to the innovations to come.

Last year, we talked a lot about the ALTANA identity and the values attached to it. We did this in order to move closer together and to develop a common understanding of our company that we can share worldwide across all divisions. Our concept of change adds a new feature to the ALTANA identity. It will enable us to work even more closely together than before, drawing on the knowledge and the capacities that are intrinsic to our company. It is the starting point to create new value.

Working together closely does not mean that we will give up our business model as a decentralized group. We will not turn into a big, inflexible tanker. That is definitely not our goal. Rather, we want to remain flexible, move fast in order to make decisions, and empower employees on all levels to make decisions. This is an important part of the ALTANA identity.

**Innovation is the name of the game in the specialty chemical business.** I have said this before, but I would like to stress this again. And by innovation I mean successful innovation. It is fully in line with our values, our overall philosophy and our business model. We live it and we breathe it.

Successful innovation is what we have to work on – constantly and perpetually. It arises out of the values we share as ALTANA. These values are openness, trust, empowerment to act, and appreciation. What do these values translate to, when we talk about innovation and change? Let us take a closer look.

First of all, openness stands for the ability to share, actively and enthusiastically. We share information, knowledge, and know-how with colleagues, within the company, and across divisions. This is daily routine at ALTANA.

Trust is the second key value for ALTANA. It plays an important role for change, since change requires trust – in colleagues and seniors alike. Without trust successful cooperation is impossible and close cooperation is what we desire. Therefore, we ask you to trust your new leaders and your new seniors. We all have to trust each other.

Our third value is the empowerment to act. Last year, when we talked about the ALTANA identity, we were very proud of this concept, because it opens new possibilities. The concept of empowerment addresses those who have a management or a leadership position and the Innovation Community in particular. Empower your team to cooperate in a spirit of openness and trust. Encourage them to work together directly within the team, between divisions, between regions, and across all levels.

Our fourth value we call appreciation. With this concept, we refer to the ability to appreciate new or different ideas, concepts, or positions from colleagues or other regions openly without judging them immediately. Appreciation is the start for an open exchange which, as I mentioned earlier, is the key driver for success. So when we talk about change and innovation, we are also talking about appreciation and exchange.

The ALTANA Innovation Conference provides you with ample opportunity to exchange – two days to discuss new ideas extensively with colleagues from all over the world. But this conference is not all there is to exchange at ALTANA. Over the last five years, our CTO Dr. Wießmeier and the Innovation Community have developed many tools and platforms, for example our Innovation Portal, which enable us to exchange, year round, day in and day out, across all divisions and across the globe.

We ask you to use these ALTANA tools and platforms actively. Don't just browse them once in a while passively. Only with active contributions from all of you can we manage an exchange that is a benefit to all of us. So please don't hesitate to share your ideas, skills, and knowledge actively within the Innovation Community, making use of the ALTANA Innovation Portal. Exchanging knowledge and know-how is not only an internal affair. We can also resort to external and internal wikis, where you can find a lot of information. The younger generation is more prone to use these sources and to share information via the Internet and Intranet. But these sources are available to all of us. With the ALTANA Innovation Challenge tool, you can share very specific questions with a larger community.

Besides the ALTANA Innovation Portal, we have also developed the Cross Divisional Development Program Innovation, CDDPI in short, to task cross divisional networking and exchange.

As Dr. Wießmeier always emphasizes, we cannot rely solely on our internal platforms. We must also make stronger efforts to use external data and information. There is so much knowledge available in the world today. You can find it in the academic world and in other companies. Our suppliers can provide knowledge to us, and so can our customers, and their customers, too. All we have to do is know where to search for the knowledge we are looking for. But once we've captured it, we can use it to our benefit and to the advantage of ALTANA. (Ex)change to succeed.



# CTO Keynote: Knowledge Is Key

## Harnessing Internal and External Knowledge More Effectively

ALTANA is a player in globally networked, highly competitive markets characterized by rapid development. Within this challenging environment, we are not only called to preserve our corporate value for investors and employees, but also to increase this value sustainably, and to remain the market and technology leader by ensuring we stand out from the crowd. To this end, we are harnessing our own knowledge as well as, increasingly, knowledge from external sources.

Dr. Georg F. L. Wießmeier



### Connecting information and knowledge

An important prerequisite for maintaining competitiveness is ensuring that the knowledge of our employees – which every business believes is the most valuable of all – is readily available for use by everyone within our organization. This is essential if demanding requirements are to be satisfied efficiently. There is practically no value whatever in isolated knowledge. However, if our employees communicate just like brain cells, and function freely, this knowledge can be released and used in a purposeful way. A single, isolated brain cell, on the other hand, is not going to achieve much and cannot normally safeguard a company's competitive edge. Every individual in the company is called on and has the ability to make a useful contribution to creating added value. But how is this possible? How, for example, can employees in China or Japan know who in the company has the necessary expertise to solve their problem?

### A knowledge community is evolving: The ALTANA Innovation Community and the ALTANA Innovation Portal

Over the past few years many departments at ALTANA have worked together to improve the preconditions for this and to create new ones. Today, the ALTANA Innovation Community is made up of approx. 300 employees worldwide who are very closely connected via a network and at least half of whom meet every year for the ALTANA Innovation Conference, our central networking event. The participants meet face-to-face and discuss technical and strategic challenges while identifying new fields of business and also finding enough time to enjoy each other's company. This helps the ALTANA Innovation Community to grow a little closer together every year; the building of networks thrives on personal contact. All the information made available from the ALTANA Innovation Conference and the knowledge which was pooled there will be made available to the entire ALTANA Innovation Community via the ALTANA Innovation Portal. Furthermore, cross-divisional ALTANA Technology Platforms have already been established for strategic topics of particular importance such as nanotechnology, industrial biotechnology and printed electronics. These platforms are home to expert networks which already contain a wide spectrum of specialist knowledge and expertise. The expert networks, which are coordinated by a designated platform manager, can be accessed by the ALTANA Group's entire workforce. Currently, new expert networks are being set up on the topics of batteries and energy storage systems, and digital printing technology, to name just two. New areas of knowledge such as these can be dis-

played in a structured manner, in the shape of wikis in the ALTANA Innovation Portal. A dedicated and secure interface also gives access to external experts, and thus every member of the community can carry out research and add to the knowledge base. This system makes the expertise available to everyone who needs access to it.

The Cross-Divisional Development Program Innovation (CDDPI) was founded with the aim of intensifying the networks. The CDDPI is an employee development program which offers participants the chance to work on projects of strategic relevance in any division for a period of six months at a time. Parallel to this, participants work on a cross-divisional project over two years, e.g. the development and implementation of the ALTANA Innovation Portal. The CDDPI generates employees with strong network connections, who are knowledgeable about the differing cultures both in the divisions and in the various regions, thereby enriching the ALTANA Innovation Community. All the expert networks mentioned utilize the ALTANA Innovation Portal to gain information from across the globe, and to cultivate the sharing of experience via the forums. The ALTANA Innovation Portal is also a means of inviting the whole ALTANA Innovation Community to participate in the ALTANA Innovation Challenge.

### The knowledge community is being challenged: The ALTANA Innovation Challenge

As opposed to the employee suggestion scheme in which every employee can submit ideas for corporate improvement, the approach used in the ALTANA Innovation Challenge is to pose a query to the ALTANA Innovation Community. This can harness the knowledge of the entire community to respond to a certain question. The ALTANA Innovation Portal is also used as a platform for this purpose. A suggestion can be posted on the forum and all the participants can read it and make comments. This means that everyone can see who in the ALTANA Innovation Community has an opinion or knowledge on this issue. This can lay the foundation for establishing a new expert network. The first ALTANA Innovation Challenge was posed by Dr. Wolfgruber on the topic of "Green Chemistry." Each challenge is active for two months and is then closed and evaluated. All the participants who made contributions to the challenge are informed about the results and kept up to date on further steps. This feedback is an integral part of the challenge. As well as answering the questions posed from an ALTANA perspective, the outcomes of the ALTANA Innovation Challenge "Green Chemistry" flow directly into the ALTANA platform on industrial biotech-

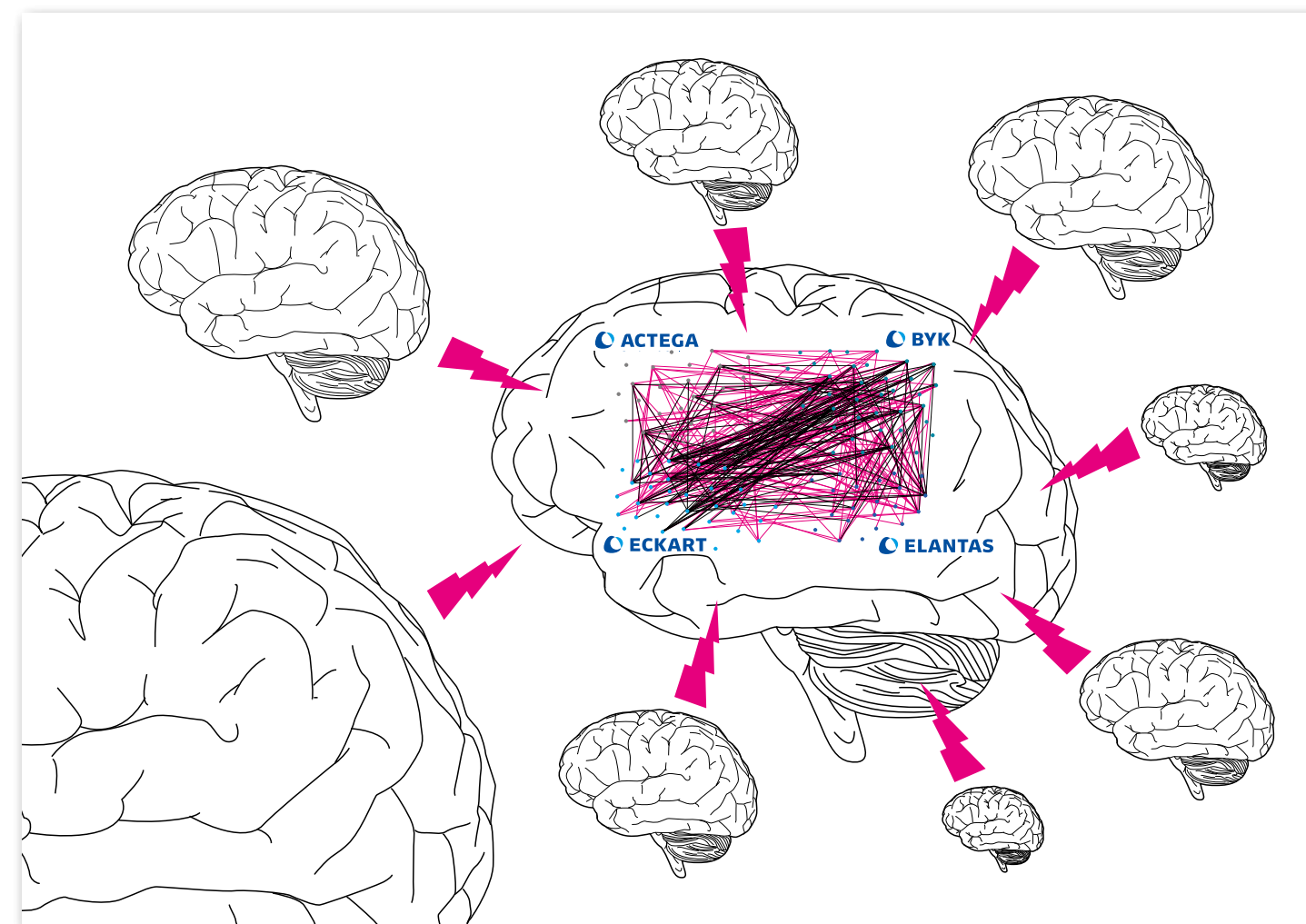




nology. We have also set up a network of experts for this topic. A further challenge has been mounted on the topic of "batteries and energy storage systems." The purpose of this challenge is to evaluate the subject which could potentially lead to the development of a new ALTANA Technology Platform. In this case, the challenge was set by the Project Manager, Katherina Hesping. We realized that we only have a few experts in the area of batteries and energy storage systems at ALTANA and we therefore need to involve external experts more. The other side of the coin is that ALTANA increasingly provides experts who share experience and knowledge with cooperation and business partners. "Open Innovation" are the keywords here.

#### Drawing on external knowledge: Involvement in Open Innovation communities

This approach has long been in use in the consumer area (Business to Consumer, known as B2C): consumers can be surveyed by manufacturers regarding their opinions or wishes concerning existing products or new product ideas via dedicated Internet platforms. Examples of this can be found in the automotive, cosmetics, and food sectors, and in principle the whole Internet community can act as product consultants or providers of ideas. Evaluating "idea competitions" of this kind is a large and complex task. This approach is not suitable for the Business to Business (B2B) sector and especially not for ALTANA, which operates in a highly specialized area. ALTANA requires very specific expert advice. This is why we, at ALTANA, use the established approach of acquiring specific external knowledge via external expert networks, and in dialog with business partners, customers, customers of our customers and suppliers, universities and research institutions, and increasingly with companies in other sectors. The Internet means that both we and our competitors can access unlimited sources of information. External knowledge is a new raw material. However, it is becoming harder and harder for our company to acquire relevant, correct, and validated information. For this reason, a larger group of employees led by Dr. Florian Raubacher (BYK, Patents), Dr. Anna-Maria Pütz, and Dr. Stephanie Arzt (both CDDPI) worked intensively on this topic at the most recent ALTANA Innovation Conference and will do so again at the next one. The ALTANA Innovation Community will gain another key priority area for its work from the results of this working group. Alongside the existing tools of our company's accessible external and internal wikis for providing structured information, we will work on further methods of researching and selecting knowledge effectively. In this context, we will acquire specialized know-how for exploiting external knowledge to promote the success of our company. But all this is only possible because the internal prerequisites have been fulfilled over recent years, namely that an intact network of active and committed employees and the comprehensive ALTANA Innovation Portal have been created. I would like to thank everyone for the exceptional dedication they have demonstrated while working on these issues and for their future efforts.



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# TECHNICAL PRESENTATIONS KEY INNOVATION PROJECTS

Innovation Is Based on an In-Depth Understanding of Matter.



# Magic Effects Based on Magnetic Pigments

ECKART Cosmetics presents microscopically small soft iron flakes for nail polish, which can be orientated by externally applied magnetic forces. The spectrum of effects is nearly unlimited. An outstanding element is the accompanying three-dimensional look, which makes the pattern appear alive.

Dr. Sebastian Höfener, Dr. Ulrich Schmidt (Introduction: Dr. Mark Stoll), ECKART



Color cosmetics is a very fast-moving field of business, and thousands of new formulations are introduced into the market every year due to the continuous demand for novelties. Alongside eye, lip, and face applications, nail polish is an important sub-segment which accounts for approximately 20% of the new products launched. In 2011 more than 7,000 nail polish products were launched onto the market, and by July 2012 some 6,000 new variants had already appeared on the shelves – reflecting the dynamics of this market segment with an above-average growth rate.

Unprecedented effects are of particular importance in the creation of niche products which will be regarded as a "must have" and enable brand owners in particular to access the high-price luxurious nail polish segment. Using unique raw materials, leading cosmetic brands are not only able to generate value for their target consumer groups, but also clear the way for followers in the mass market by arousing consumers' attention and desire.

Consequently, nail polish formulators and designers are constantly looking for new raw materials that help them create products with a unique selling proposition in the consumer market. Hence, any eye-catchers like crackle, matte, liquid metal, or the recently introduced caviar-nails look are of huge interest for spicing up products. Consequently, unconventional and so far unknown effects are required to create a real "blockbuster."

With this specific target in mind, ECKART set out to develop something unique – an effect pigment with the typical metallic gloss and light-dark travel, but with the additional benefit of orientation even in weak magnetic fields.

The key to success was the combination of a new starting material – soft iron powder – with ECKART's expertise in producing high-quality effect pigment flakes using milling technology. Thanks to the very

low heavy metal content of soft iron powder, and by using cosmetically approved solvents for pasting, the special products Silverdream Polaris 90 WM and Silverdream Polaris 60 IL were designed. While Silverdream Polaris 90 WM consists of pure iron flakes wetted with medical white oil, Silverdream Polaris 60 IL is additionally corrosion-protected by a dense silica coating to meet the demands of more aggressive acidic nail base systems. These two innovative products dedicated to nail polish use have turned out to have hit the bull's eye in respect of key customer desire. They even adjusted their existing nail polish formulations to present "magnetic" nail polish with optimum performance. Such nail polish is typically sold as a package that comes along with a magnet applicator allowing the consumers to create a fancy pattern themselves – a further benefit, as the trend moves away from nail art salons towards do-it-yourself!

Meanwhile, magnetic nail polish has become a "must have," especially among teenagers. Numerous tweets and posts on Twitter, Facebook, and other social media such as YouTube about product experiences and application hints for magnetic nail polish demonstrate the dynamics of this launch in the market, and the tremendous impact on consumers' mood. Interest groups and fans of this particular unique product appeared and made magnetic nail polish a hot topic in the new media landscape. The following quote shows how enthusiastic consumers are about magnetic nail polish: "An up-and-coming nail polish trend that is slowly pushing shatter polish out of the spotlight, magnetic nail polish offers a unique design and new options for creativity that no other nail polish has been able to achieve before. Magnetic nail polishes contain iron powder that forms dark, wavy shapes when affected by a magnet. The possibilities are endless!"

The first part of this presentation focused on the development and technical background of magnetic iron flakes and has demonstrated the specific properties of this as yet unrivalled product. The second part was dedicated to the nail polish niche market and its peculiarities. The positioning of the unique product Silverdream Polaris in the nail polish market and ECKART's contribution to setting one of the most distinctive nail polish trends of the year 2012 was highlighted.



# TerraCross® – Novel UV Hybrid Coatings for the Graphic Arts

TerraCross: a UV-curable water-based varnish that effectively brings together two technologies. With this crossing the strengths of water-based and UV (ultraviolet) coatings can now be combined and consequently offer a great opportunity to improve production processes and printing products. Crossover!

Dr. Antonius Dikmans (Introduction: Dr. Peter K. Jenkner), ACTEGA

Over the past few decades, both water-based and 100% UV overprint varnishes (OPVs) have become standards of the coatings business and have been applied successfully in the graphic arts industry. Each coating technology has its own advantages and limitations which are not necessarily inter-related. In general, such varnishes exist to protect the printed product, guarantee security, enable fast further processing, and enhance visual or sensual aspects (matt, gloss, haptics) of the substrate. Water-based overprint varnishes are typically used to coat "conventional" oil-based inks, known in offset printing as "wet-in-wet," but can also be applied to pre-dried inks (solvent or water-based), which is a "wet-on-dry" method on the printing machine. The water-based OPV requires physical drying, which causes a loss of approximately 60% of its content; the machines are equipped with hot-air or infrared units to accomplish this. On the other hand, a 100%

UV OPV necessitates exposure to UV radiation to attain full curing or drying, but the film thickness is much greater since no loss of volatile material occurs. Since the 100% UV systems have problems with wet conventional inks, they are normally utilized for wet-on-dry printing techniques.

Other fields that apply coatings, for example the wood industry, have recently started using UV-curable water-based varnishes with some success. In this case, the varnish is applied, physically dried, and then cured with UV irradiation. However, the equipment and methods are vastly different from those used in the graphic arts. The machines are inherently slower in speed, apply larger films, and have extremely long drying times making it difficult to directly transfer this technology. Could this be a method for the graphic arts? Is this the best of both worlds or possibly the worst?

ACTEGA Terra recently supported a project to develop a water-based UV-curable overprint varnish, the aim of which was to ascertain the feasibility or know-how, properties, advantages, and market for such a product. The project moved on into the advanced stage and a partnership was established with a well-known raw materials supplier who has an extensive knowledge of the water-based UV market. Experimental parameters were set and an extensive screening of binders, monomers, and additives was completed, thus leading to the first lab prototype, a UV-curable water-based matt OVP. This prototype matt coating was tested against standard water-based matt varnishes and showed some remarkable improvements. Upscaling plus several trials on a printing machine verified the lab results. TerraCross represents a new UV-curable water-based coating technology platform which can bridge the gap

between the other two incompatible systems, providing solutions where water-based and 100% UV systems have reached their limits. Regarding the basis of TerraCross, this hybrid coating is comparable to a traditional water-based varnish in that it undergoes physical drying via utilization of hot air, is dry to the touch, and has similar wetting abilities. The full profile of characteristics comes into effect during the irradiation with UV light. While in other industries, UV-curable water-based coatings have proven to be a viable alternative, this product is now the first of its kind that can be successfully applied from the coating unit of an offset printing machine.





# Innovation Challenge: Wire Enamels

Enamelled wires are at the heart of electrical devices and essential for systems to perform correctly. The complex technology behind their production from resin tailoring to coating build design allows magnetic wires to acquire excellent properties in terms of mechanical, thermal, electrical, and chemical behavior, and to cope with application-related challenges arising from the continuous change of the technological landscape.

Dr. Giovanna Biondi (Introduction: Dr. Horst M. Sulzbach), ELANTAS



People are surrounded by thousands of electrical devices that enable them to live different moments of the day in the current modern style. What makes the electrical devices work is electrically insulated magnetic wire. Wire enamels, after proper curing, confer on magnetic wire the necessary electrical insulation which renders them functional. Continuous development is a must to render them "optimal" for special application trends.

## Historical outline

Historically, the first wires used for electrical devices were insulated with fibrous materials such as cotton or cellulose and impregnated with natural products. Such wires were characterized by poor physical properties and were mechanically damaged during winding. At the beginning of the last century they were gradually replaced by enamels based on synthetic resins, which made it possible to cover the copper wires directly without the aid of fibrous materials. The new technological approach allowed motor development and manufacturing to accelerate dramatically. Due to the faster winding speeds needed for mass production, the industry started demanding wires with better properties such as flexibility, and thermal and chemical resistance. A new generation of wire coatings evolved as an answer to the challenges faced by motor manufacturers.

## Current scenario

Nowadays, global production of wire enamels is around 200,000 metric tons (MT) per year. The enamels employed are approximately 30% polyesterimides (PEI), 20% polyurethanes (PU), 18% polyesters (PE), 10% tris(hydroxyethyl) isocyanurate (THEIC)-modified PE, 10% polyamide-imides (PAI), 7% polyvinylformals (PVF), 4% self-bonding resins and 1% others. Chemically, PE resins are synthesized by condensation of diols, like ethylene glycol, or triols, such as glycerine, with diacids or their reactive derivatives, mainly terephthalic acid (TA) and its derivative dimethyl terephthalate (DMT). The polyesters produced by this method have relatively low molecular weights. During application onto the wire in a high temperature oven, the enameling machine, volatile monomers such as ethylene glycol are removed allowing the polymer to increase its molecular weight through transesterification. Among triols, THEIC, a "specialty" monomer for enamels, plays a special role conferring increased thermal and aging resistance on PE and PEI. In general, polyester wire enamels offer a good combination of flexibility, peel strength, adhesion and cut-through adequate for making thermal class 155 or 180 enamels at relatively low cost. PEIs are comparable to PE wire enamels in many ways. They basically differ in the imide component



which is usually obtained from the condensation of an aromatic diamine such as methylene diphenyl diamine (MDA) with two moles of trimellitic anhydride (TMA). This moiety confers good thermal properties on the polymer and puts it in the thermal class 180 or 200.

PAI is chemically obtained by reaction of a diisocyanate, most commonly methylene diphenyl diisocyanate (MDI), with TMA in a solvent such as N-methylpyrrolidone (NMP). PAI resins are generally much more abrasion-resistant and chemically resistant than PE and PEI enamels and are characterized by the highest thermal values; adhesion and flexibility are, however, reduced. A typical wire construction used in motors and electric devices worldwide involves the use of either PE or PEI and PAI enamels as the base coat and topcoat in an average ratio of roughly 80:20. This combines the flexibility, adhesion, and low cost of PE and PEI enamels with the abrasion resistance, chemical resistance, and thermal, properties of PAI.

The general composition of a PU wire enamel consists of a blocked polyisocyanate adduct, a 2-polyester polyol, catalyst, solvents, and additives. The decomposition of urethane groups at high temperature is the reason for the solderability of PU wire enamels. Polyurethane wire enamels offer a unique combination of flexibility, coating speed, adhesion and solderability, and are used for enameling both ultrafine wires and intermediate size wires. PVF is one of the oldest resins used in wire enamels today. It is used primarily for its excellent oil-resistance properties and proven application lifetime in transformers. A small but growing segment of the wire enamel market is self-bondable coatings including polyamides, phenoxy, epoxy, and polyvinyl butyral resins. Applied as the top layer, they enable manufacturers to wind the electrical component without carrying out an impregnation step.

## Application challenges

Since natural resins were replaced by enamels based on synthetic resins, wire enamels keep evolving due to continuous changes of the technological landscape. Current industry trends of merging electronic controls with electrical components, e.g. in energy-efficient motors with variable-speed drive controls, lead to demand for products with lower hardness and higher thermal resistance that maintain their electrical characteristics during changes of frequen-

cy and temperature. The improving performance of modern enameling machines and the demand for saving energy leads to an increasing need for enamels that cure in a short period of time at moderate temperatures ("fast enamels").

Continuous miniaturization of electrical devices requires enamels with excellent surface performance in terms of leveling, lubrication, and abrasion-resistance.

Low tolerated failure ratios in modern electronic and electric industries drive the enamels manufacturers to provide products with reduced oxidative and thermal degradation. The increased use of renewable energies implies increasing needs for generators able to work for long periods in an environment of high temperature changes and varying moisture content, thus requiring enamels with increased temperature and moisture resistance. High-performance refrigerators in which the cooling liquids are more energy-efficient than the current ones (e.g. ammonia (NH<sub>3</sub>) vs. freon) indicate a need for components where wire enamels exhibit resistance to said liquids. As environmental regulations tighten, the need for improved solid wire enamels with less toxic solvents will also promote further innovations. REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) regulations limit the use of certain critical raw materials (e.g. some imported and not registered by ELANTAS), making it urgent to replace them with compliant ones. Oil price increases and restrictions on carbon dioxide (CO<sub>2</sub>) emissions will allow electric and hybrid cars to gain more and more automotive market share and therefore the demand for enamels with improved thermal and abrasion resistance will increase. In recent years ELANTAS has developed possible solutions to such application trends ranging from the application of nano-technology and enamel development, to additive tailoring and the introduction of new concept segments in the resin polymeric backbone. Some of them have given rise to products already tested and approved in the market, like thermal-resistant PAI Allotherm 602 BGM, self-lubricated Tongmid 595 MBL, and pulse-resistant Deatherm E 641 GL. Some others, such as development of abrasion-resistant enamels, are still under investigation and different synergies are being followed in the ELANTAS R&D laboratories to reach the goal.



# From High Solid to True Solid – A Paradigm Shift in BYK's Technology

Creating additives that enable their users to continually reduce the quantities of solvents they use, but without compromising the quality of opacity, is something the BYK Technology Platform has been working on since the 1990s. The third paradigm shift showing the way forward for the future has only just taken place, but new pilot projects are already being planned.

Dr. Frederik Piestert (Introduction: Dr. Jürgen Omeis), BYK

Even though wetting and dispersing additives are used in small amounts, they have a major impact on the properties of the coating formulation, e.g. color strength, viscosity, or transparency.

Wetting and dispersing additives are not only an important product group for BYK, but also a challenging topic for research activities. Due to changes in regulations for coating materials and also technical requirements, the market is demanding new wetting and dispersing additives which demonstrate even further improvements in properties and performance; these also have to be in line with various new regulations.

The reduction of solvent amounts to a bare minimum is required for high solid applications, and VOC-free (VOC: volatile organic compounds) products are also gaining in importance in multiple applications.

Different pigment or filler types require wetting and dispersing additives with multiple pigment affinic anchoring groups to ensure a perfect particle deflocculation and excellent stabilization. An efficient viscosity reduction combined with long-term storage stability of the pigmented coating system is one of the key requirements.

One new technological approach that BYK is successfully evaluating is based on hyperbranched polymers. Even though the theoretical description of these polymers by Flory et al. has been well-known since the early 1950s, this topic has recently generated sizeable interest in industrial research.

Based on this fundamental concept, three different directions are pursued at BYK:

- Modified hyperbranched polymers based on commercially available polyethyleneimines
- Core-shell type structures based on polyaminic cores and tailor-made hyperbranched polymeric shells
- Structures based on polyamidoamines with linear or hyperbranched shells



The first products containing hyperbranched building blocks were already established in the late 1990s. These products are based on commercially available polyethyleneimines as pigment anchoring groups. For the sterical stabilization of dispersed pigment particles, these products contain linear oligomers attached to the aminic core based on existing and well-established polyester and polyether chemistry.

These types of products are well-established in the market today. They demonstrate broad compatibility with different coating systems and also provide an excellent viscosity reduction with high pigment loadings. This makes these additives the first choice including for a couple of difficult coating formulations, for instance in TPA (thermoplastic acrylates) systems. One of the first solvent-free wetting and dispersing additives was developed using this technology. Nevertheless, these additives still have some limitations, especially in high-performance coating systems, such as epoxy systems.

The second approach for new additives based on hyperbranched polymers concerns the synthesis of tailor-made structures. This investigation, started about five years ago, today focuses on a large variety of different chemical lead structures with multiple unique building blocks for further developments. Alongside hyperbranched polyesters, other novel classes of hyperbranched polymers are under evaluation: e.g. polyethers and polyesteramides.

An initial product has been successfully launched in the market, based on this technology. It is specially designed as a high-performance wetting and dispersing additive for reactive coating systems, with an outstanding storage stability in the coating system. This additive solves the dilemma of 2K-epoxy coatings, which is that combining long-term storage stability of the coating formulation and excellent pigment stabilization is impossible. Such a product would never be feasible using conventional, linear polymers.

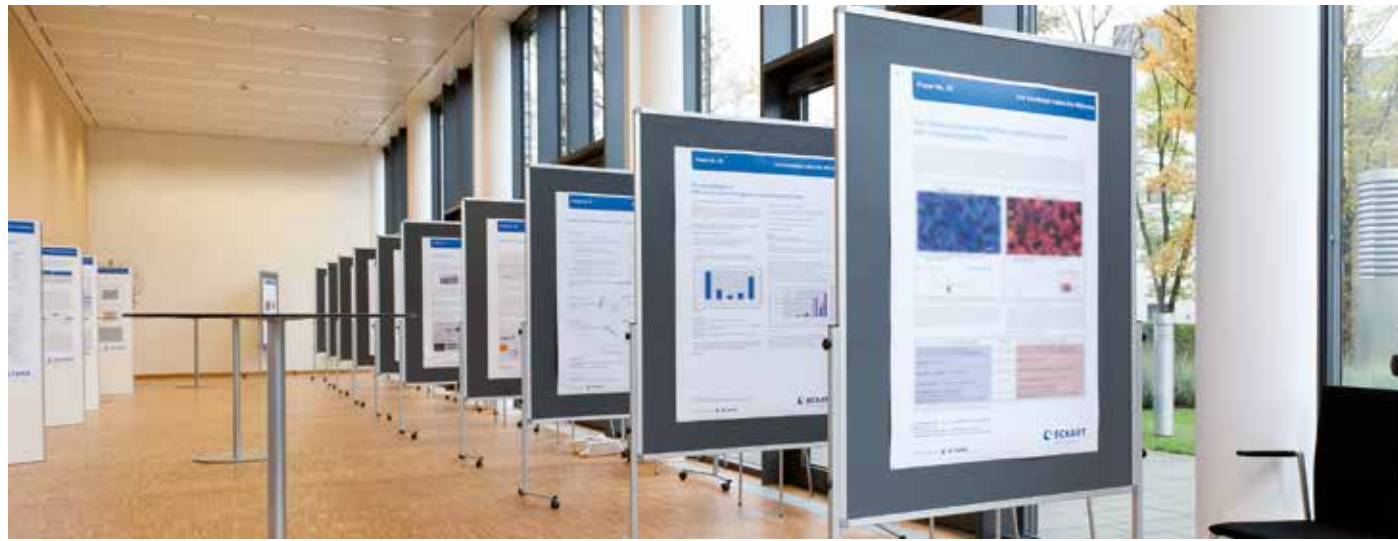
A third approach yielded real solid products using this technology. This is a paradigm shift for BYK's technology, since all products offered to the coatings industry are liquid. However, solid products with the benefits of hyperbranched polymeric architectures are an ideal extension of BYK's additive portfolio. Various pilot products are in the pipeline, the first example of such a solid product is ready to be launched in the market, showing high performance in viscosity reduction and pigment stabilization in multiple applications such as coatings, printing inks, or toners. The technological benefits from hyperbranched polymers, combined with the easy handling of a solid product, make this approach outstanding. With a solid wetting and dispersing additive in pellet or powder form, totally free of carrier fluids, there are almost no limitations for the formulators.

These three approaches have created an interesting and flexible new technology platform which will be further exploited for existing and new applications.

# IMPRESSIONS

Innovation Turns Visions into Value.





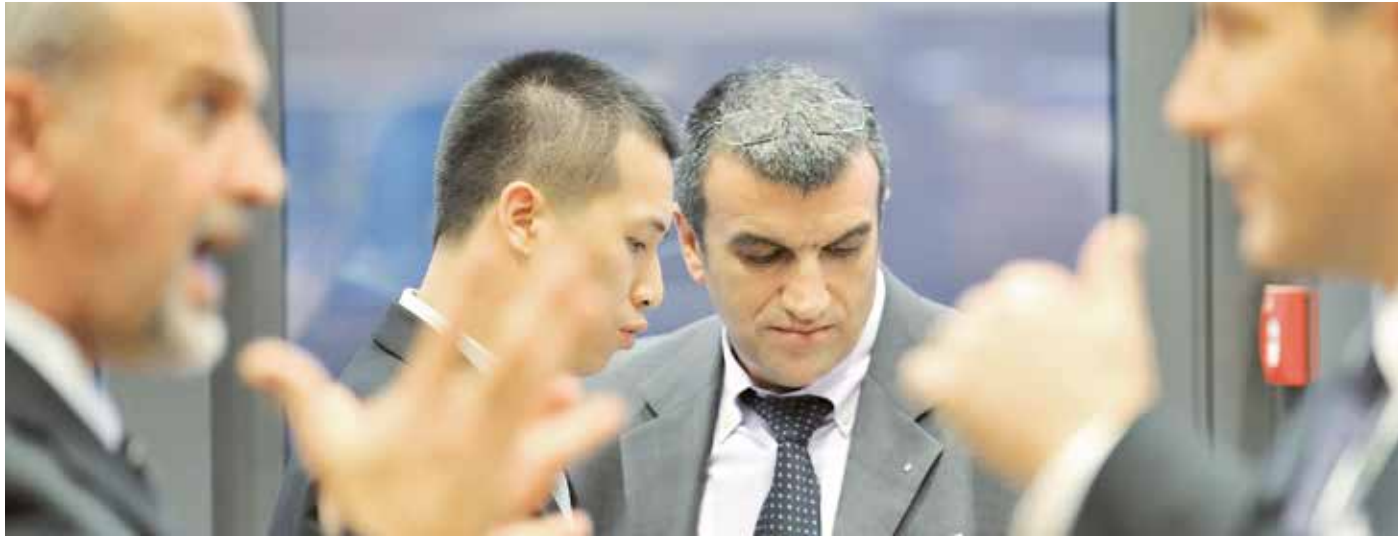
























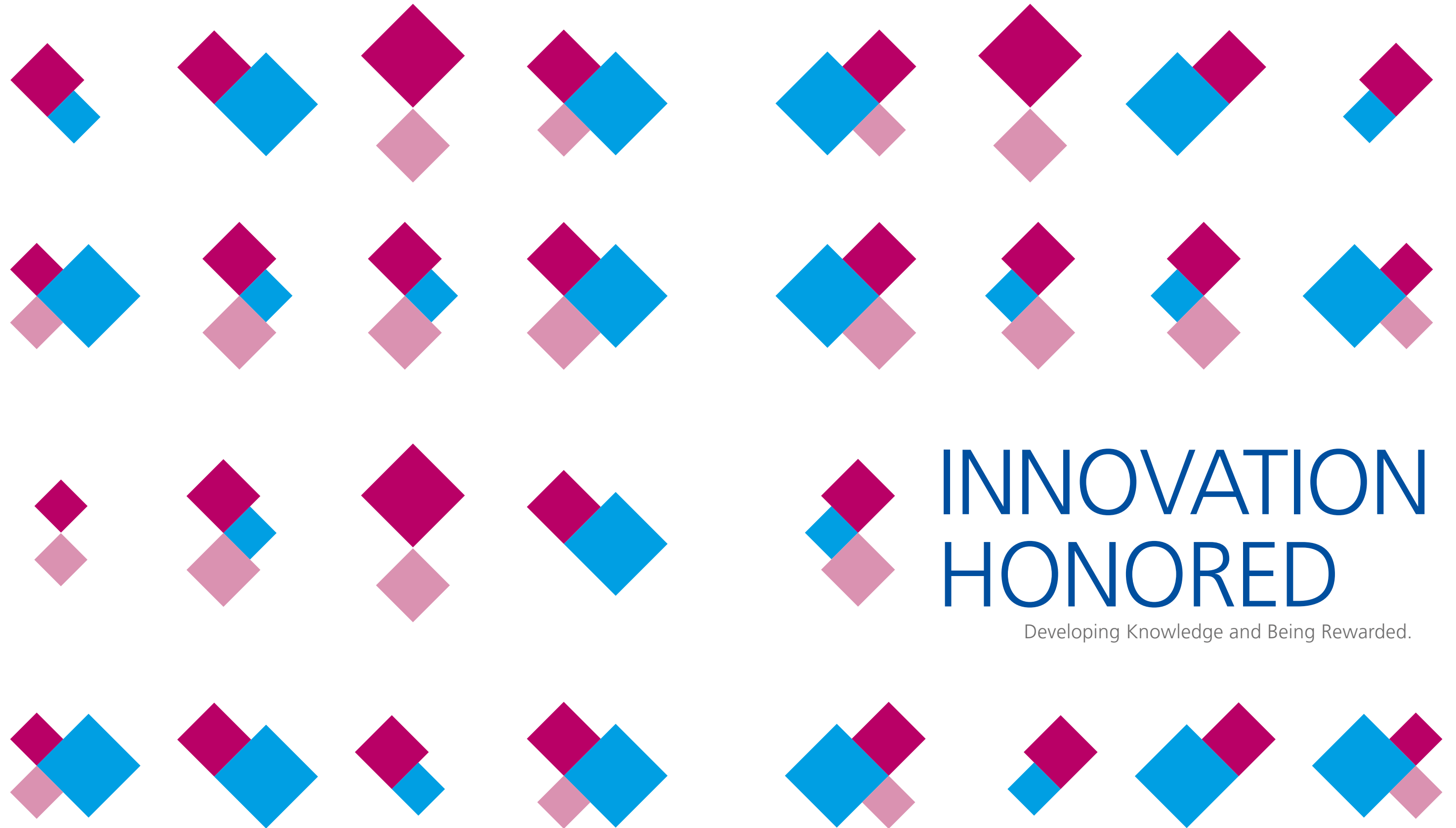
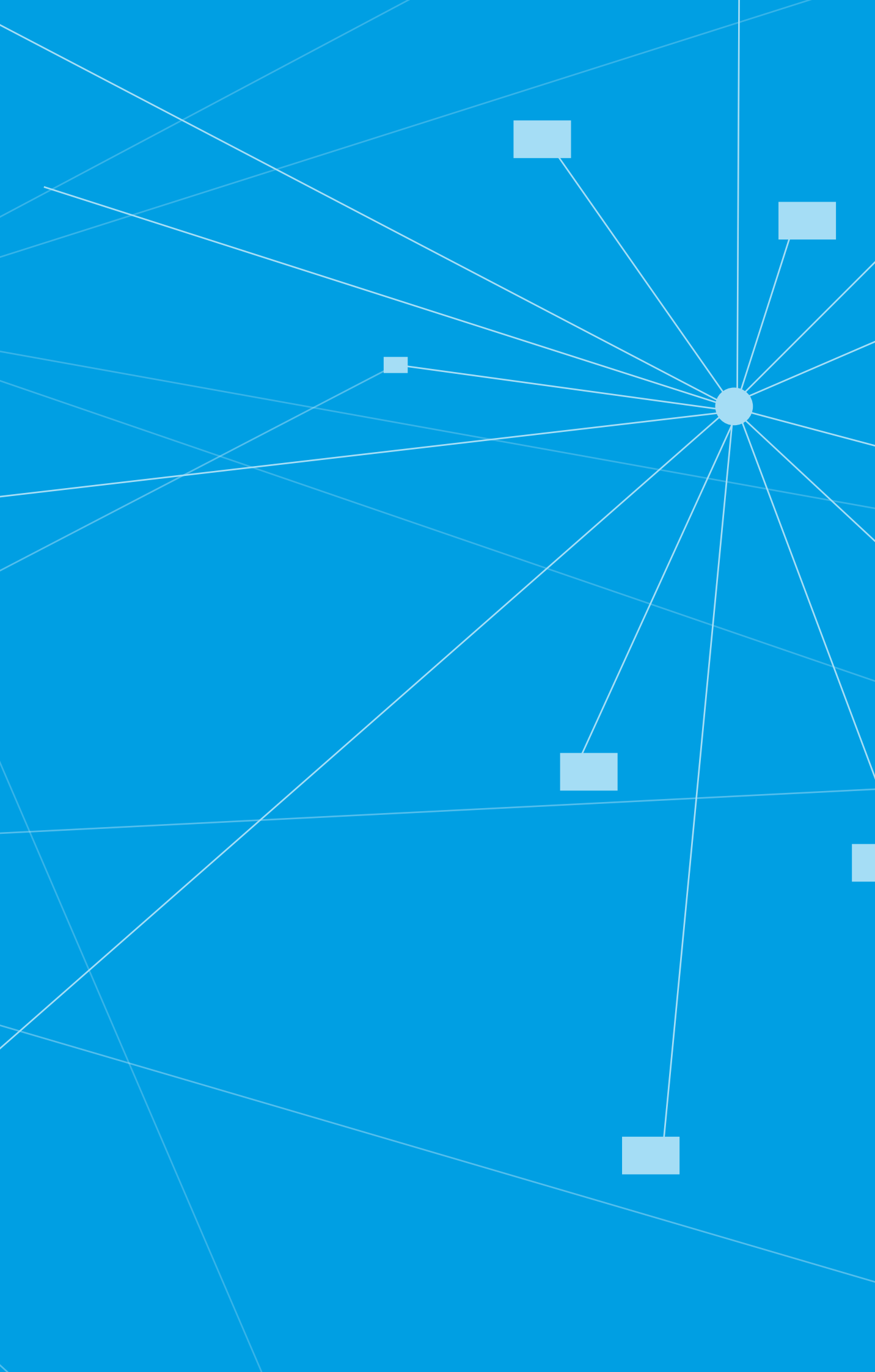
# ALTANA INNOVATION - CONFERENCE 2012

Knowledge Exchange Through Networking









# INNOVATION HONORED

Developing Knowledge and Being Rewarded.

# Innovation Needs Paradigm Shifts

Speech on the occasion of the ALTANA Innovation Award Ceremony.

Dr. Georg F. L. Wießmeier, CTO, ALTANA AG



**Good evening, ladies and gentlemen, and a big welcome to the nominees of the ALTANA Innovation Award 2012!**

It is my very great pleasure to speak to you on the occasion of the 4th ALTANA Innovation Award ceremony. Tonight it is time to lean back, enjoy, and honor the most deserving innovation in our company.

Innovation is changing our business day by day. The competition is very tough, and we have to move fast and stay flexible. There have been a lot of changes of late – not just externally but internally as well. Innovation requires change but not just from others – we have to change, too! We have to be flexible, we have to assume responsibilities which best suit our abilities, we have to change our point of view from time to time, we have to escape our paradigms – and it is change that helps us to overcome such paradigms.



An optimist says: "The glass is half full"; the pessimist says: "The glass is half empty." But how else do you think we can view this? No idea – you just have to leave the paradigm of optimism and pessimism. Come on! OK, I see what we need to do for the researchers here – let's do an experiment that you will remember – it is the simplest experiment you ever saw: "This glass is just twice the size it needs to be."



Change the paradigm and the glass is always entirely filled up. It can be that easy to see things from a different point of view – if you are prepared to leave your conceptual comfort zone and if you are willing to accept paradigm shifts.



But how does this translate into our world? I will give you one example: dry cleaning! How could we make dry cleaning greener – more sustainable? Maybe not everybody is aware that dry cleaning is quite a complex process involving chemical and physical processing stages, hazardous chemicals, and hazardous waste. As a consequence, there are plenty of levers for optimization: less energy, different raw materials, less waste. We should certainly optimize the process in these respects. But what else can we achieve? How about a paradigm shift? How else could we derive and drive an innovation here? Just think about the real reason for needing dry cleaning: it's dirty clothes! Hence we can shift our paradigm towards dirty clothes! Do you have an idea? Why not try developing a new, dirt-repellant fabric? Textiles would need less dry cleaning or only simple washing. That would be greener indeed! The paradigm "green" has thus been shifted. This paradigm shift can drive innovation in a different way than expected. If we make use of this, seeing things from a different perspective, living in a different paradigm,



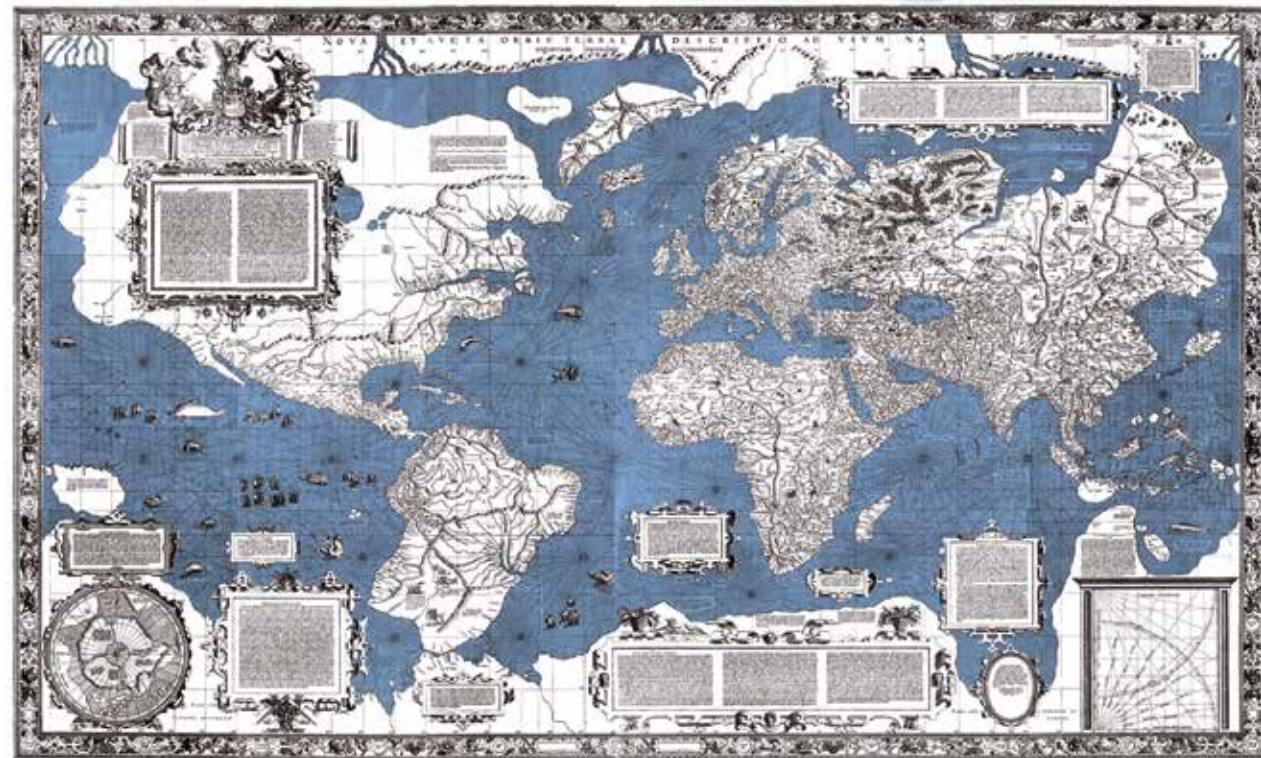
we can differentiate more easily. Why? Because suddenly major known trends like "greenness" obtain a new meaning. This is a new opportunity for us to acquire sustainable business. But how can we learn to shift paradigms – what do we have to change? Don't worry! There's not that much we have to change. On the one hand, internally we know each other. We are very well-connected. We know who knows what. We know how ALTANA works. We have established our "ALTANA innovation brain". On the other hand, we know our values. We have an identity. All well and good! But how about external information, external knowledge, and external views – inside out and outside in? Is there a blind spot? Can we improve our ability to see things better? For many years we have been living in the land of milk and honey – in the land of plenty when it comes to the availability of public information, public know-how, and the public view of things. But in this regard we are also living in an age of obscurity, of unclarity, of complexity. In recent years the ALTANA Innovation Community has established a strong internal knowledge base for our company. One important task for the next few years will therefore be to establish a similarly efficient facility in relation to external information, know-how, and perspectives. The major challenge is to identify and select relevant information, knowledge, or useful perspectives out of the wealth that exists. To cope with this challenge and to really understand matters at a deeper level, we will need, most of all, very good education. The slogan of all the ALTANA Innovation Conferences to date "Our knowledge makes the difference" remains as true and valid as before. Education is an ongoing issue for everyone who wants to be leading in everything they do. The ability to distinguish the relevant from the irrelevant and to gain new insights through external know-how will enable us to see things from a different perspective, to shift the paradigm. In former times, the polymaths were the people who drove both the scientific and the social world by their immense knowledge of matters – they had an overview of the knowledge of the world. There were only a few of them, and knowledge of the world was still limited. Nowadays, there are no polymaths in the classical sense anymore. There is too much knowledge to deal with – nobody can handle this on their own. The knowledge and the ongoing efforts to develop education in our areas of knowledge are of utmost importance for our company. To be as powerful and influential as a polymath, we have to continue to train and use our "ALTANA innovation brain". Furthermore, we have to establish external networks in a very pragmatic and systematic way. External knowledge that helps us to shift paradigms is still a huge and – let's be honest! – undiscovered treasure trove for us.

So, what can we learn from history? How did a polymath deal with obscurity, with unclarity, with complexity? How did they handle external knowledge? To answer this question, let me tell you about a famous historical person. This person was born exactly 500 years ago and lived in Duisburg for most of his life. You come into contact with the legacy of this person each day in just switching on your car navigation. The person I am referring to was Gerhard Mercator.



Gerhard Mercator

By the way, Duisburg's Mercator Hall was the location where we held our first ALTANA Innovation Conference five years ago. Sure enough, Mercator was a true polymath of the late Renaissance: Gerhard Mercator was a cartographer, geographer, geometer, mathematician, engraver, calligrapher, astronomer, and maker of scientific instruments and globes. But he was also a theologian, philosopher, humanist, astrologer, and publisher. His mapping technique literally changed the way people saw the world – Mercator changed people's paradigm of the world. The quality of his maps was the envy of generations of mapmakers, and his most famous invention – a projection of the world globe onto a map, the Mercator projection – is still used today for all kinds of navigation, be it at sea, in the air, or on land, and as GPS navigation in your car. If you want to see original Mercator maps tonight, please have a look at them over there. They are original maps from Germany and the Rhine region.



Mercator projection from 1569

But how could a single person of the late Renaissance with very limited mobility and without any computers, Internet, Google Maps, airplanes, satellites, etc., how could he draw maps with such extreme precision that was not matched either by his competitors or by his early successors? The answer is very simple: he relied on external information and knowledge – he relied on travelogues from the past and the present, and he made use of his personal networks with these travelers. I think that he had a big database, his own innovation portal. But was that smart enough? No, certainly not. Mercator was very skilled in evaluating and filtering relevant and useful data, because a lot of this data was incorrect, contradictory, and inconsistent. So he carefully compared all the information he could gather and removed inconsistencies as far as possible to build the most advanced maps of his age. This is exactly how we have to deal with obscurity, unclarity, and complexity in the land

of plenty, in the information age. It was in the year 1569 in Duisburg that Mercator first published his famous and wonderful map of the world, which you can still see on the wall behind me. He used his own projection, as mentioned before, the famous Mercator projection. Seafarers could use their magnetic compasses for navigation along straight lines. It was specially made for their purposes and no other map provided this feature.

However, on the map you can also see the limits in the very north and in the south. These limits are caused purely by a lack of information. But look at South America – this is a very famous flaw that is based on a very simple mistake made by the few travelers who had been there. The one who can tell me the cause of this flaw without using Google Search on his mobile phone will receive a special reward – we'll reveal the answer to this quiz question tomorrow. Mercator was a polymath, a single brain endowed with tremendous wisdom, knowledge, and know-how. However, as a single person he met his limits because of the lack of information or, rather, the lack of valid information that prevailed at the time. Compared to Mercator's situation nearly 450 years ago, we are in the favorable position of being able to access information easily. We can easily share this information. Hence, we should – and we must – jointly evaluate and utilize the information to gain new knowledge. To acquire new perspectives. However, like Mercator we will reach our limits at some point. However, although Mercator reached his limits, he was still ahead of his time. This is what is important: with his advanced knowledge, Mercator changed the way to see things; he shifted paradigms. That is what we should aim for: to be leading in everything we do.

Thank you very much for your kind attention.





# Nominations for the ALTANA Innovation Award 2012

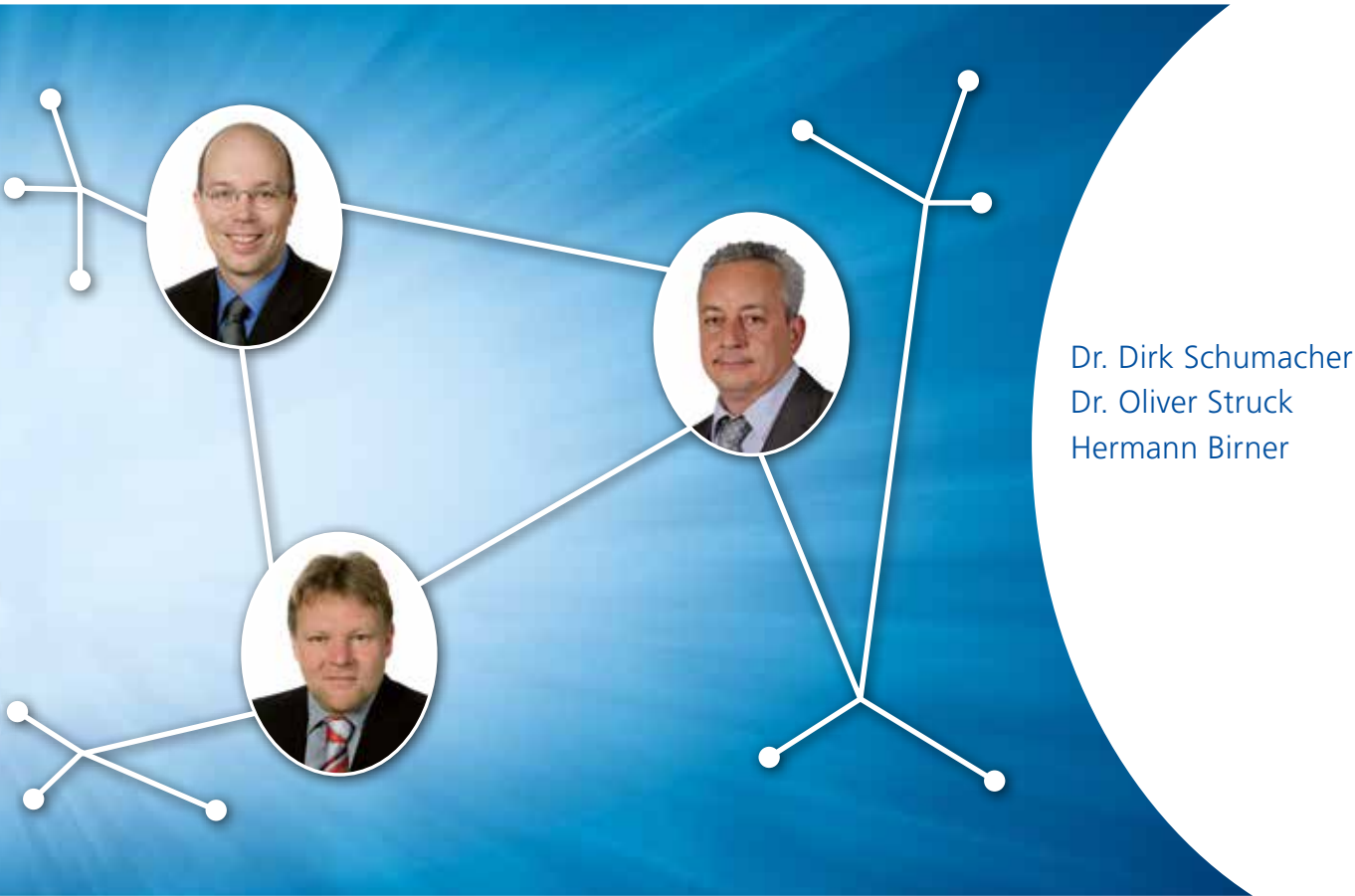
ALTANA stands out with its innovations that keep their users, our customers, one step ahead of the competition. This year our employees can be proud of their successes once again. They presented some great ideas and unorthodox solutions in the projects entered for the ALTANA Innovation Award. Nine projects were submitted, from which the ALTANA Innovation Council nominated the top two teams and their projects as nominees for the ALTANA Innovation Award 2012. Here is a brief description of the nominations.

## TEAM BYK

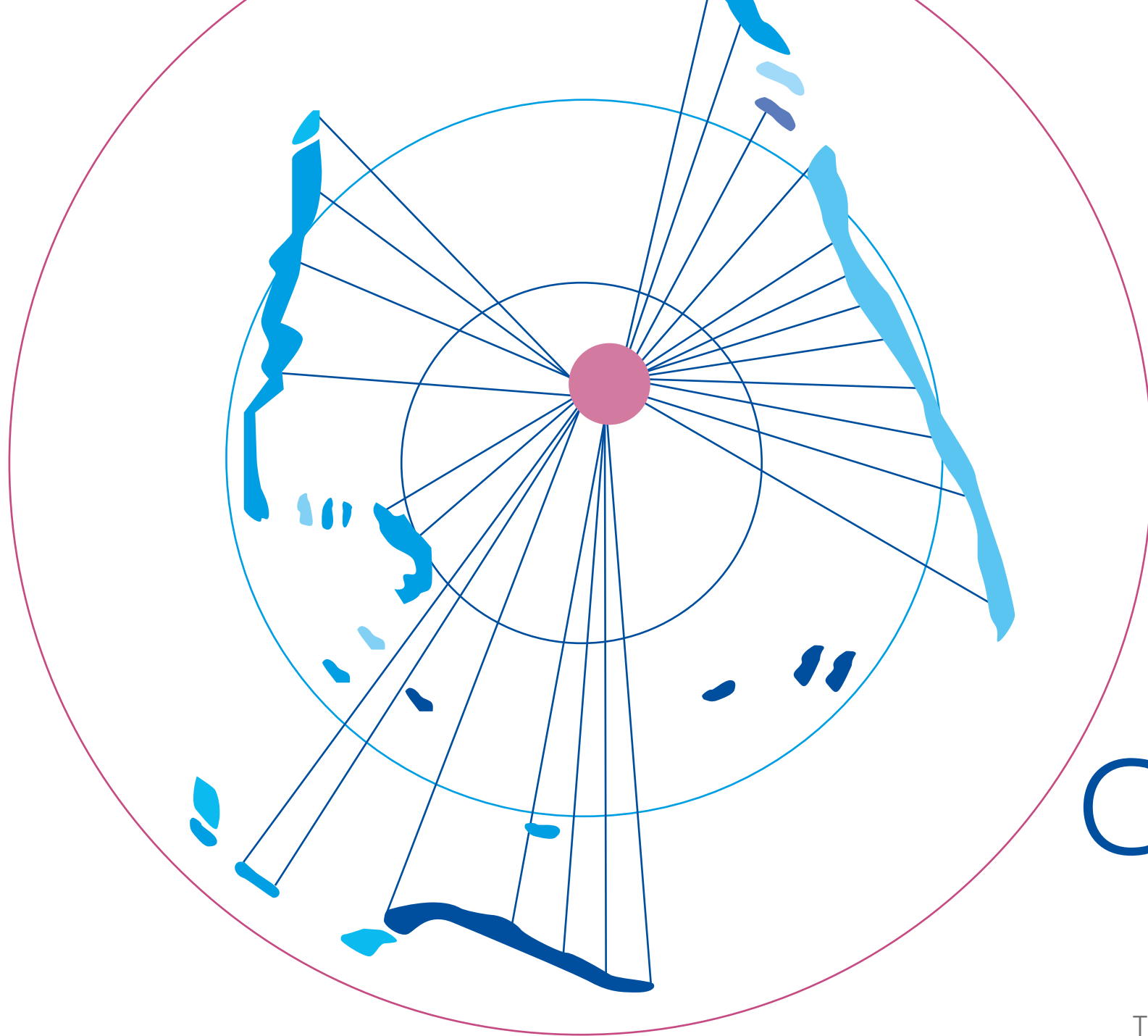


**BYK** has developed a new Technology Platform based on CRP (= Controlled Radical Polymerization) comb copolymers with quaternary ammonium structures as pigment affinic groups. Dispersants based on this structure are used in various high-end applications such as flat panel displays, automotive coatings, and inks for inkjet printers so that BYK can stay abreast of market trends and enter new application fields. The potential of this technology for other applications will be investigated in further marketing projects.

## TEAM ECKART



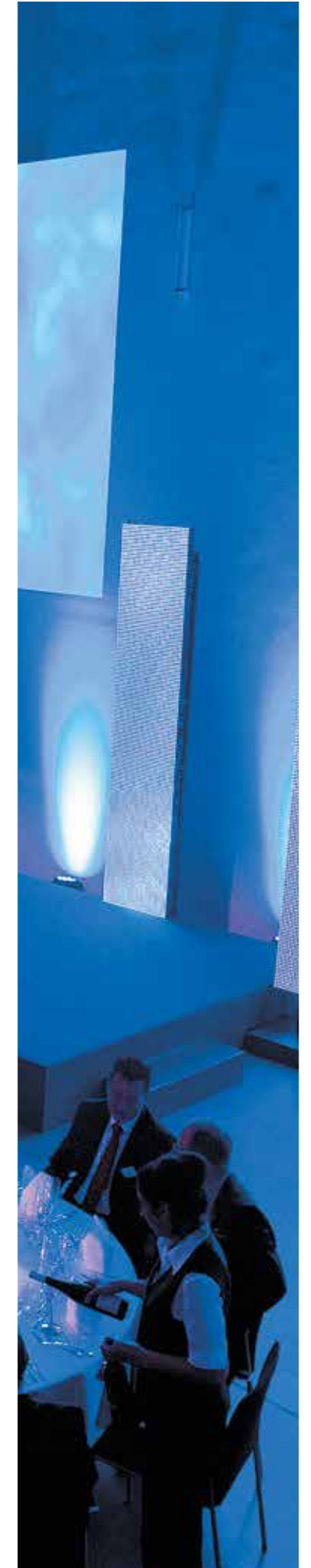
**ECKART** has embedded a platelet metal core in an inorganic matrix of silicon dioxide, followed by encapsulation with a special highly cross-linked polyacrylate layer. Due to this unique inorganic/organic double-coating technology, the "Powder Coating Ultra" (PCU) metal-effect pigments are exceptionally resistant to corrosion and chemicals. Therefore the PCU pigments will open up new high-end fields of application for metallic powder coatings, such as window and bicycle frames, outdoor furniture, roof coatings, and many others.



# CELEBRATING INNOVATION

The Epilog of Brilliant Thoughts.

















Celebrating



# BYK Scoops the ALTANA Innovation Award 2012

**The prize was awarded for high-performance CRP wetting and dispersive additives for sophisticated coatings applications.**

BYK's winning team developed a new technology platform based on CRP comb copolymers with quaternary ammonium structures as pigment affinic groups. Wetting and dispersing additives based on this structure are used in various high-end applications such as FPD, automotive coatings, and inkjet inks. With these products BYK is shaping important market trends and opening up new areas of application. The potential this new core technology offers for other applications will be exploited in a large number of marketing projects. The team comprised Dr. Bernd Göbelt, Mark Heekeren, Marcus Meichsner, Dr. Stefan Mößner, Markus Röbner, Sabine Stelz, and Akihiro Wakahara.

## **Presentation of Award during ALTANA's Innovation Conference**

About 160 top researchers and developers of the specialty chemicals group from all over the world gathered at the 5th international Innovation Conference to discuss technical and economic developments as well as future innovative trends. For ALTANA, innovation is the pivotal key to further growth. "The ALTANA Innovation Award and the ALTANA Innovation Conference are an integral part of our innovation culture. Having achieved a very high level of cross-linking of our Innovation Community, we are now explicitly going to focus on the use of external knowledge in Open Innovation Communities," said Dr. Georg F.L. Wießmeier, Chief Technology Officer of ALTANA. Both the cross-boundary cooperation and the financial success of our products illustrate ALTANA's innovation culture. Dr. Wießmeier warmly congratulated the winners from BYK, and the runners-up from ECKART for their nomination. "We would like to express our sincere thanks to all who took part for their hard work and commitment," he added.



## **ECKART also nominated**

Another hot favorite for the award was a team from ECKART. The ECKART GmbH nomination went to Hermann Birner, Dr. Oliver Struck, and Dr. Dirk Schumacher, who presented a new product family of ultra-stable metal-effect pigments for powder coatings. This was the Powder Coating Ultra group: PCU-Aluminum, PCU-Gold, and PCU-Aloxal.

With these new creations ECKART Effect Pigments have produced the first product family of ultrastable metal-effect pigments which meet the high technical demands for exterior powder coating applications. A large range of different metallic shades, e.g. silver, gold, copper, and champagne, with different particle sizes, can be realized in powder coatings for the very first time.

Powder coating applications in particular are a growing segment within the global coating market. The ecological advantages of the powder coating technology include a combination of solvent-free of VOC-free (volatile organic compounds) applications with a recycling rate of up to 98% of the powder coating over-spray, resulting in durable coatings. So far no metal-effect pigments are available on the market, which fulfill the demanding requirements of long-life exterior powder coating

applications. The new PCU family (silver, copper, gold, and champagne shades) of highly stabilized metal-effect pigments will open up new opportunities for environmentally friendly metallic powder coating applications which to date have only been partially realized with solvent-based coating technologies. As mentioned above this new technology is called PCU: Powder Coating Ultra. To the best of our knowledge there are no comparable products on the market combining an organic and inorganic barrier coating in metal-effect pigments. The advantage of this double-coating technology is a high chemical stability against both acidic and alkaline chemicals. Our powder coating customers use these double-coated metal-effect pigments even for very demanding exterior applications, such as window and bicycle frames, outdoor furniture, roof coatings, etc. Especially in Arab and Asian countries golden shades are very much part of the local culture.

More PCU-Gold and Copper products containing even finer pigments will be presented at CHINACOAT in November 2012 and at the European Coatings Show in 2013. The PCU-Gold product was already presented at the ALTANA Innovation Conference in 2011.



Winners of the ALTANA Innovation Award 2012 and congratulators (from left):

Dr. Bernd Göbelt (BYK), Dr. Jürgen Ormeis (CTO BYK), Dr. Georg Wießmeier (CTO ALTANA), Akihiro Wakahara (BYK Japan), Dr. Matthias L. Wolfgruber (CEO ALTANA), and Dr. Stefan Mößner (BYK).

Also on the BYK winning team (but not pictured): Mark Heekeren, Marcus Meichsner, Markus Röbner, and Sabine Stelz.



# Welcome to the Hall of Fame: Meet the ALTANA Innovation Award Winners of Past and Present

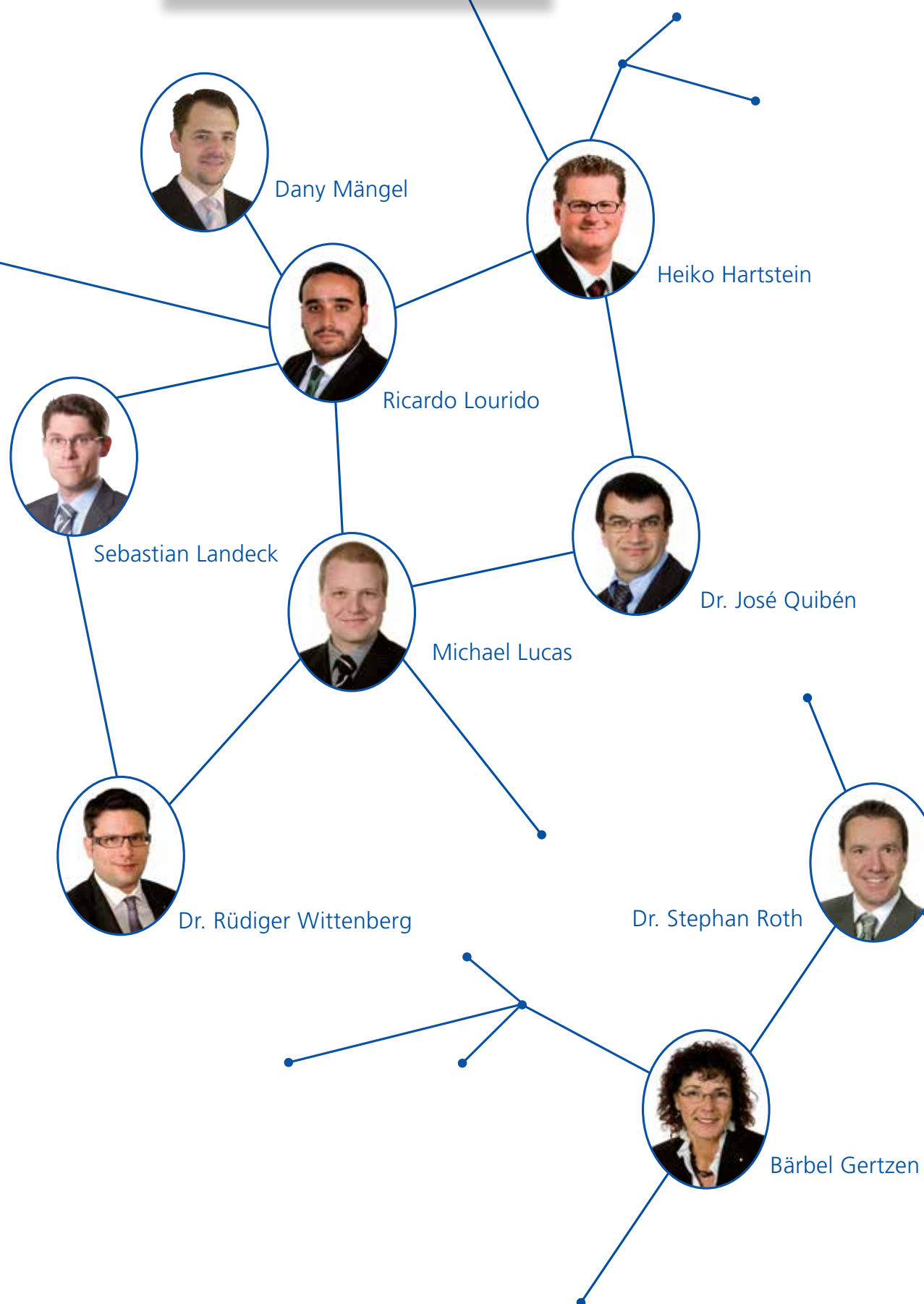
It is a great feeling to be shortlisted for the ALTANA Innovation Award, but it is even more exciting to actually win the award! The ALTANA Innovation Award is the most prestigious reward for innovative, brilliant, and fantastic ideas and solutions at the company. So let us have a look at the present and previous winners of the ALTANA Innovation Award.

The Winners!



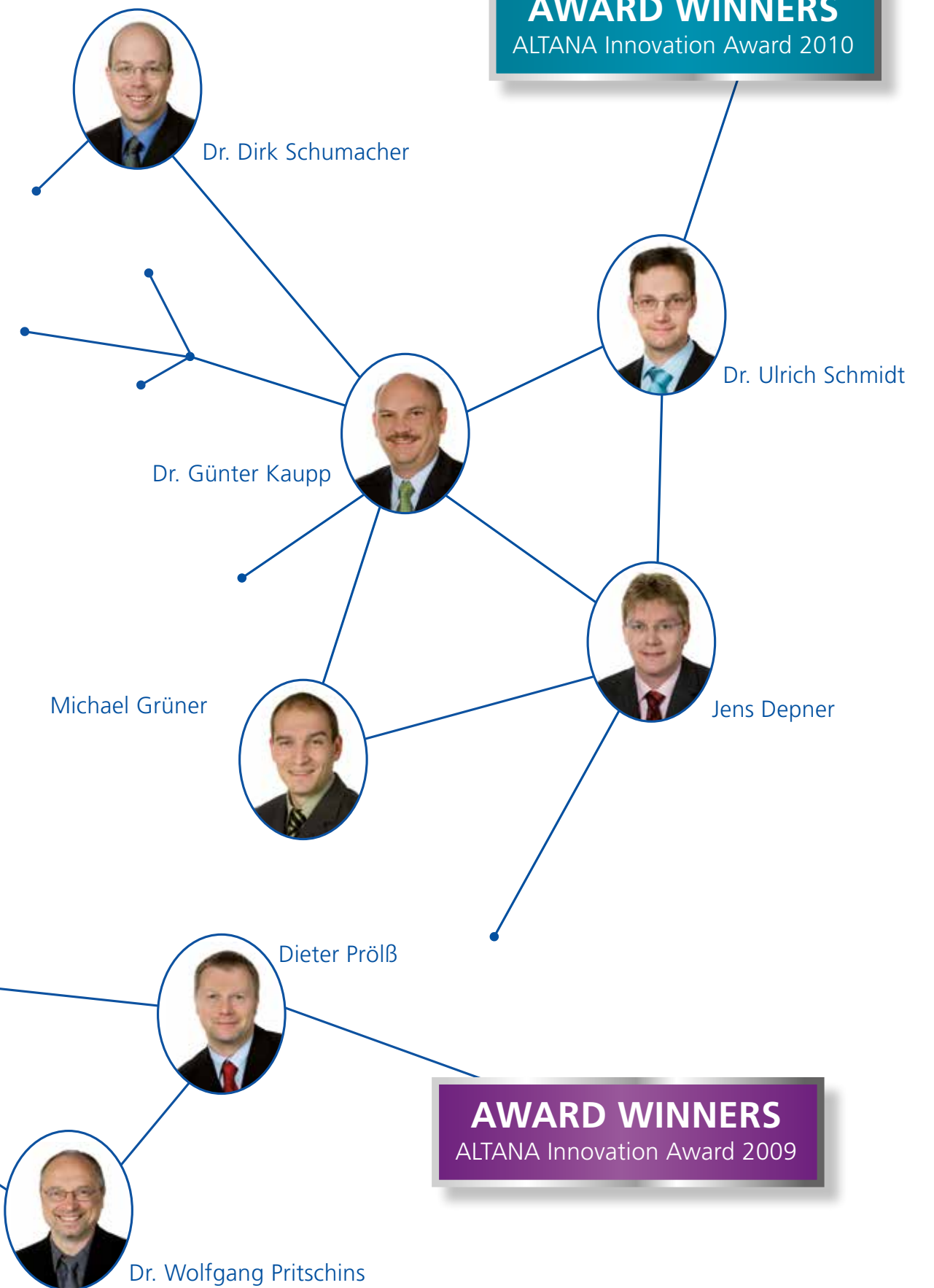
## AWARD WINNERS

ALTANA Innovation Award 2011



## AWARD WINNERS

ALTANA Innovation Award 2010



## AWARD WINNERS

ALTANA Innovation Award 2009

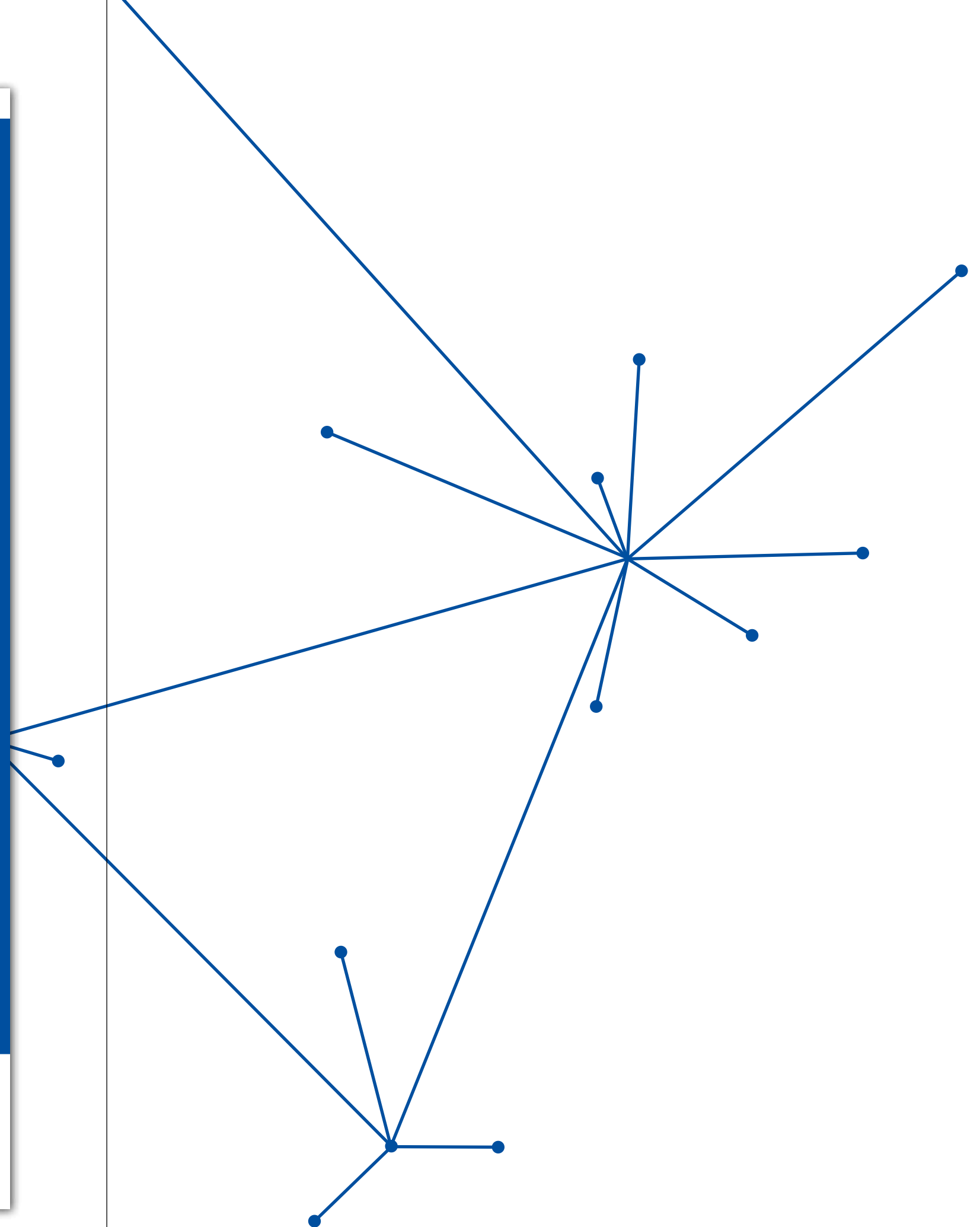


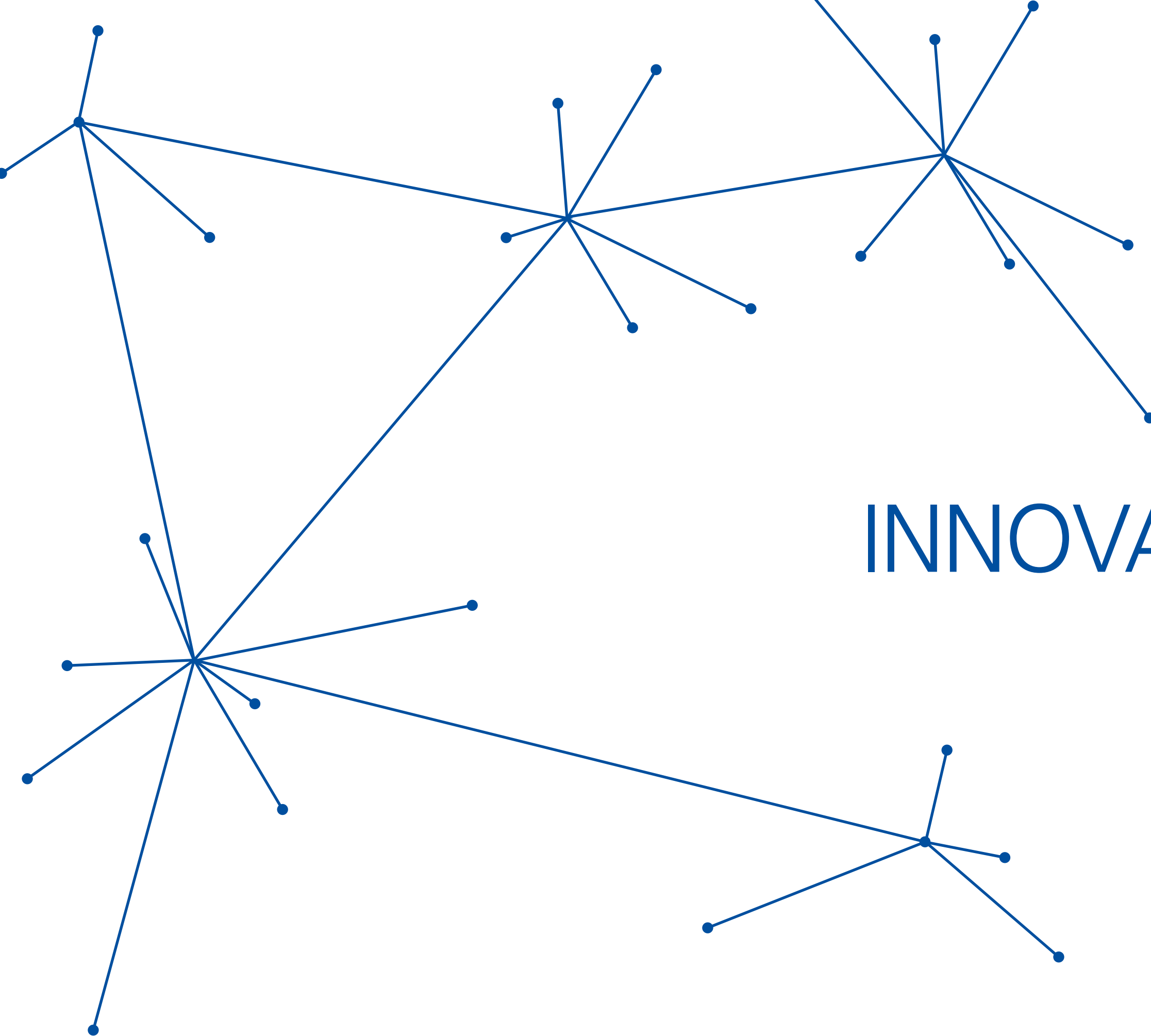
# LT N INNOV TION W RD 2013

## Good Innovation starts with A.

Submit your application for the next **ALTANA Innovation Award 2013** by **September 14th, 2013!**  
You can find more information on [www.altana.intranet](http://www.altana.intranet). We wish you every success.

Contact: Dr. Georg F. L. Wießmeier  
Corporate Innovation, Tel +49 281 670-10201 or e-mail: [innovation@altana.com](mailto:innovation@altana.com)





# INNOVATION

More Than Just R&D.



## Division Overview

It is very important for our innovators to know as much as possible about ALTANA. Therefore, each year one division will be presented in detail to the ALTANA Innovation Community. This year the focus is on ECKART.

# ECKART Effect Pigments – Improve the Emotion, Add the Function

ECKART is a world market leader in manufacturing effect pigments. This year the innovative products LaserSafe and iReflex were added to the company's broad product portfolio. As these products are of high quality and easy to use, they not only meet consumers' high functional demands, but also provide important added emotional value: that "must have" feeling.

Dr. Mark Stoll

Using effect pigments is an established method to catch end consumers' attention and spark desire. Effect pigments such as gold, silver, or pearl bring about a high-value perception. A high-value appearance of a product generates a subjective feeling and a change in attitude by consumers, and induces them to buy. Therefore, manufacturers across all industries use this psychophysiological process that is triggered by effect pigments to increase their sales. Effect pigments are of particular importance for creating products which are regarded as a "must have" and enable especially brand owners to access the highly priced luxury segments.

For this reason, effect pigments are widely used in a variety of applications. The most important markets are automotive, industrial, and powder coatings. In addition graphic arts, cosmetics, and functional applications represent a significant application area. Typical examples are cars, wheel rims, coated cans, coils, and wood. In the graphic arts industry major applications are flexible packaging, folded cartons, and labels. Also color cosmetic products such as eyeliners, lipsticks, and nail polishes or personal care products such as body lotions and detergents commonly use effect pigments.



In all these cases effect pigments are used in full shade or in combination with transparent pigments and/or dyes to achieve colored effects.

But even so, the final function of effect pigments is to generate emotions and influence the end user's purchasing decision. In today's Business to Business (B2B) processes the products are sold via their technical specifications. Production and new product development are geared by measurable physical properties such as particle size, thickness, particle size distribution, gloss, and sparkle.

Besides the optical applications, metal-effect pigments are also used for functional applications: aluminum flakes are used for lightweight concrete production and zinc flakes for corrosion inhibition.

## Properties and production

Metal-effect pigments consist of thin metallic platelets which act as small micro mirrors. Their characteristic appearance is brilliant and specular. The metallic effect is caused by a uniform reflection of light on the parallel aligned pigments in the application. Pearl luster-effect pigments imitate the effect of mother of pearl. Pearl luster is soft in appearance and has depth that seems to come from within the application. The color, luster, and color flop is caused by interference light effects – a combination of reflection and transmission of light on various layers within the pigments. The diameter of effect pigments ranges from approximately 2 µm to 100 µm and the ratio of diameter to thickness (aspect ratio) from 20:1 to 250:1.

## Metal pigments

The production of metal flakes consists of several steps: The metal or metal alloy is molten, and the liquid metal is sprayed through a fine nozzle to get a fine powder. The powder is ball-milled with steel balls to flake form pigments. To achieve fine pigments several milling steps might be needed.

Depending on the quality of the atomized powder conventional "corn flake"-type pigments with low thickness and jagged edges or "silver dollar"-type pigments can be achieved. In the case of "silver dollars" the atomized powder is only flattened in the mill. "Platinum dollar"-type pigments represent the latest generation of silver-effect pigments – they require gentle milling conditions to achieve extremely thin coin-like platelets with a very smooth surface topology.

After milling, the pigment dispersion is pumped into a filter press to increase the pigment concentration by removing main parts of the solvent – typically mineral spirit. The resulting press-cake is either used as a precursor for a variety of surface treatment processes or is packed straight.

The thickness of a corn flake pigment is in the range of a few hundred nanometers, a "silver dollar" pigment is typically thicker, but can also be as thin as 200 nm. A "platinum dollar" product can even be in the range of 20 nm. In comparison: a human hair has a thickness of 80.000 nm.



The physical vapor deposition (PVD) process is totally different to the milling processes. PVD pigments are achieved by a vapor deposition of aluminum on polyethylene terephthalate (PET) film followed by a stripping and particle sizing. The optical properties of metal pigments depend on shape, particle size, and particle size distribution. In terms of brilliance the following basic rule applies:

PVD ~ platinum dollar > silver dollar >> corn flake

The lower thickness enables a "smooth lay" in the application – visually to be seen as a "chromium-effect." Regarding particle size, a coarser pigment is typically more brilliant, as light is reflected on the surface of the pigment and scattered at its edges. But coarser pigments also exhibit less coverage. Metal pigments have large surface areas and oxidize easily. This is avoided by an addition of lubricants such as fatty acids during the milling process. The fatty acids are chemically bonded to the metal surface and thus protect it. But this basic fatty acid treatment is insufficient to protect metal pigments against chemical reactions, for example with water-in-water-based applications. Aluminum will cause gassing, whilst gold bronze pigments will change color. In the case of gold bronze pigments high temperatures also cause color changes. Consequently, for exterior applications, surface modifications are necessary.





A basic technology to avoid oxidation is an encapsulation with additives. This rather simple technology has proven to enable short-term stability but will not lead to long-term consistent appearance.

The most advanced technology is the stabilization via encapsulation with metal oxides, polyacrylates, or combinations thereof. To prevent gassing in water-based coating applications, encapsulations with chromium hydroxide or – the most modern approach – with silica dioxide is recommended. An after-treatment of the silica dioxide can guarantee a proper embedding of the pigment in the coating.

Pure acrylate coatings are used for high chemical resistance, a combination of silica dioxide and polyacrylate is used for outstanding chemical and weather stability. For gold bronze a glass-like silica layer offers good protection against aggressive chemicals. In combination with an additional polyacrylate layer outstanding weather resistance for external applications can be achieved.

#### Pearlescent pigments

In contrast to the production of metal pigments the manufacturing steps for pearlescent pigments are totally different. The basic material is a glass or synthetic mica flake onto which a coating of either titanium dioxide ( $\text{TiO}_2$ ) and/or hematite ( $\text{Fe}_2\text{O}_3$ ) is applied. The production of pearlescent pigments consists of the following steps:

The coating is achieved by the neutralization of titanium oxy sulphate ( $\text{TiOSO}_4$ ) or titanium oxy chloride ( $\text{TiOCl}_2$ ) in the aqueous dispersion of glass or synthetic mica flakes. After precipitation of the metal hydroxide, the water is removed in a calcination step to form the corresponding oxide. For  $\text{TiO}_2$  two modifications are possible: anatase and rutile. Due to the more stable crystal structure of rutile, modifications such as these offer a better lightfastness and durability. Variation of the sequence of the precipitated metal oxides leads to different pigment technologies.

The full color spectrum of silver, gold, yellow, green, red, and blue is available. Additional treatments with silicon dioxide enable weather-resistant grades. Inorganic surface treatments improve the application behavior and finally surface precipitated color pigments lead to two-tone color products.



#### Improve the emotion, add the function

In recent decades, ECKART has managed to become today's world-leading manufacturer of effect pigments. In order to maintain this position, new innovative products are essential. Key topics in new product developments are:

- Expansion of the achievable color space
- Improvement of the mechanical and chemical stability of the pigments
- Improvement of the ease of use

These activities are geared to improve the emotions delivered by our products.

But in addition – to become more independent from effect color trends – a significant number of R&D resources is allocated to the development of pigments that deliver functional properties. A recent example for such innovative products is ECKART's LaserSafe for plastics application. A special grade of fine aluminum particles has been developed for the incorporation into thermoplastic applications. These pigments can interact with laser light and the polymer, e.g. polyethylene (PE) or polypropylene (PP) becomes markable. Anyhow, the fine aluminum is visually not to be seen in the final application – so it hardly has any impact on the optical appearance. Typical applications are cap closures or ear tags for animals.

Another recent development is IReflex, white aluminum pigments for interior wall paints. Compared with other metals, aluminum shows the highest heat reflection properties, the so-called IR (Infra Red)-reflection. To make aluminum pigments suitable for wall paints, the color needed to be white in order to meet the end-consumer requirements.

IReflex pigments are simply stirred into transparent interior wall paints. The desired color shade can be achieved with organic color pigments. The paint can then be applied with all the usual application methods. IReflex reduces the heat absorption of the walls and the ceiling. It increases reflections, e.g. human body heat. The reflection of the heat from the wall results in an improved thermal comfort for the human body and thus to an increased well-being – the wellness factor is higher. The saving potential is enormous and can be as high as 22% of the energy used for the heating of the building. Due to the easy application to an interior wall IReflex is perfect for the modernization of existing buildings.

These two examples simply illustrate the direction of current developments. However, there are many more products to come in the near future!



# Customers View: Innovations at AkzoNobel

Customers invited: ALTANA spends a large part of R&D resources for the most important customers (key accounts). Therefore, the voice of our customers is certainly an integral part of the ALTANA Innovation Conference. We invite one important customer every year to present their company and their expectations. To listen to their needs is of highest importance. We need to develop a trustful and sustainable relationship. We need a deep understanding about their markets, their capabilities, their future developments. Therefore, we were happy to welcome Dr. Dick C. van Beelen, Director of Open Innovation at AkzoNobel from the Netherlands.

Dr. Dick C. van Beelen (Director of Open Innovation, AkzoNobel, the Netherlands)



AkzoNobel, the world's largest manufacturer of paints and coatings and a leading supplier of specialty chemicals, is undergoing a process of change in the way it is structuring and executing its innovation agenda. Coming from a strongly segmented business unit organization, over the past few years the common AkzoNobel innovation agenda has become much more structured and precise. One of the key elements defining this agenda is the Solution Promises, which describes the company's strategic technology vision, and which provides clear pointers towards the fields AkzoNobel is aiming at. Open Innovation (OI) is one of the tools to help realize this vision, by using the knowledge and skills of others in an effective manner. OI structures and processes have been built within AkzoNobel, as well as in a form geared towards the world outside the company. Through the use of examples, the presentation provided detailed information on how this has been done, and which results have been achieved.





# The ALTANA Innovation Portal: A Digitized Competence Map and More

ALTANA (almost) knows what ALTANA knows: at the ALTANA Innovation Conference the ALTANA Innovation Community every year presents a vast amount of new knowledge besides already existing information, knowledge, and know-how. To make all this easily available to everybody who needs to know we have established a powerful tool, the ALTANA Innovation Portal.

At the same time, the ALTANA Innovation Portal is the digital presentation of the ALTANA Competence Map. It displays the competencies, functions, technologies, and know-how of ALTANA in a compact overview. The Competence Map is supplemented by a variety of other applications, functions, forums, and areas for documentation and communication. The user group of the ALTANA Innovation Portal is the worldwide ALTANA Innovation Community, the leading researchers and experts, and the Management Board of the ALTANA Group. It enables them to exchange ideas, concepts, and to develop these collectively. These are the functions of the ALTANA Innovation Portal at a glance.

Tristan van Vuuren



## Landing Page

Here the users of the ALTANA Innovation Community obtain an overview of all new content such as articles, projects, responsibilities, and research topics. Members of the community are introduced.



## ALTANA Competence Map

Competencies of the ALTANA Group: information about the know-how, knowledge, and experience of technologies, applications, markets, and the solutions are presented here in a clear and easily accessed way. The search function for keywords and so-called tags allows specific descriptions of competences for defined tasks to be found at sites or in Divisions. What solutions do the Divisions and subsidiaries of ALTANA offer in particular markets? Here you will find both an overview and the relevant contacts and experts.



## Innovation Community Expert Profiles

One of the most important requirements that the future users have kept mentioning is the ability to find the right expert(s) for very specific technical areas. In the ALTANA Innovation Portal, all the experts are introduced to the ALTANA Innovation Community by means of extensive profiles of their respective competences and expert know-how and with the help of their contact data. This allows the users to find the right experts for their concern at any time via the search function.



## Innovation Platforms

The innovation platform section contains important documents about concept approaches to new technology areas, defined tasks, and projects. Here our experts discuss their challenge globally and exchange views.



## Internal and External Experts Wiki

Wikis are easy and flexible-to-use digital lexicons that are well-suited to developing articles on concepts or new topics quickly and comprehensively in collaboration with other users. The ALTANA Innovation Portal uses this tool in two ways:

- **InWiki** as an internal wiki system where important issues for the ALTANA Innovation Community can be developed
- **ExWiki** for exchanging informations with universities, external institutes, and experts as well as research networks



## Divisional Portals

In the Divisional Portals for ACTEGA, BYK, ECKART, and ELANTAS, the experts are able to exchange opinions within their particular Division and to work jointly on projects across sites.

## Innovation Library

Here the users will find links to key sites and sources as well as overviews of patents, memberships, and other tools of ALTANA that promote innovation at our company.



## Semantic Search

The semantic search is a central element of the portal. It goes beyond a simple, text-based search, as provided by current search engines and searches for keywords, so-called tags and other meanings with which the articles, pages, and profiles are enriched. The users themselves can enrich the portal with more and more knowledge by supplementing the articles and pages with important keywords. This technology represents one of the most modern and intelligent forms of facilitating searches on websites.

## Access to the ALTANA Innovation Portal

Because of the high sensitivity of the information provided, access is reserved for the members of the ALTANA Innovation Community and the Management Board. If you would like to have access to the portal or to certain areas, please get in touch with the Chief Technology Officer (CTO) of your Division.

## The ALTANA Innovation Portal

### Management of Information and Advancement of Knowledge in the ALTANA Group

With the ALTANA Innovation Portal, ALTANA is setting an important milestone in the management and development of the knowledge pool of the ALTANA Group. „The Innovation Portal allows us for the first time not only to document information but, in addition, to use it collectively and develop it specifically for tasks and issues,“ Dr. Georg Wießmeier, Chief Technology Officer of ALTANA, states. „Across all sites and Divisions worldwide, we can thus employ synergies in our knowledge and information in order to achieve good solutions and concepts as quickly as possible in areas so important to ALTANA, such as nanotechnology.“ The ALTANA Innovation Portal is therefore a major tool of ALTANA for exploiting potential in developing new subject matter and in gaining even more pace in the global competition. One important requirement is, of course, that the experts make deliberate use of the tool. To this end, the ALTANA Innovation Portal is being constantly refined in close dialog with the Innovation Community, so as to implement the latter's requirements in the best possible manner. The ALTANA Innovation Team has organized an editorial facility especially for the purpose. The members of the community may use this, for example, whenever they would like to make an additional contribution to the forums or write something new. They can simply submit their articles, suggestions, and materials to Innovation-Portal@altana.com. In this way, the content, functions, and provision of the portal can be further improved in an organic and well-structured way, thereby revealing the current state of knowledge, the competences, and the tasks that lie ahead on behalf of the members of the ALTANA Innovation Community.



# New Business Approaches: Printed Electronics in Application

Aiming for new businesses: ALTANA has established three technology platforms: Nanotechnology, Industrial Bio-technology, and Printed Electronics. The purpose of these platforms is to create new businesses utilizing synergies across the whole group. In the course of the conference Dr. Martina Weidner provided an overview of the strategic ALTANA Technology Platform Printed Electronics.

Dr. Martina Weidner



The four divisions occupy a leading position in their target markets with respect to quality, product solution expertise, innovation, and service. Products made by companies in the ALTANA Group are sold in over 100 countries and their quality has earned us an outstanding reputation amongst our customers as a valuable partner. The exchange of technology and know-how between the decentralized companies of the division as well as the corporate culture of ALTANA – focused on markets, service, and innovations – makes us a preferred supplier for very different industries worldwide. Our strength lies in offering customized solutions and specialty products that create added value for our customers.

In order to strengthen R&D efforts of its subsidiaries in the areas of future technologies the idea of ALTANA Technology Platforms was born. The ALTANA Technology Platform Printed Electronics was established in 2011 in order to combine the R&D efforts of the single divisions in this field, to facilitate the information exchange, and to use synergies.

Innovative product development is supported by high technical standards in the application laboratories. Therefore, the following measurement equipment and facilities are provided within the ALTANA Technology Platform Printed Electronics.

- Complete electrical characterization
- Surface analysis
- Screen, flexo, and gravure printing
- Standard ink tests
- UV inline curing, IR curing
- Clean room facilities
- Full assembly of organic field effect transistors (OFETs) and capacitors
- Metallization, spin coating
- Water permeability determination
- Climate stressing
- Temperature cycling
- Microscopy, SEM
- Particle size analysis
- Adhesion measurement equipment

Within ALTANA Printed Electronics is regarded as a future market. Considering this, the material and ink developments of our Divisions are predominantly focused on customized solutions. As application technologies and device designs are individualized and underlay constant advancements, the direct contact to customers and project partners is extremely important to us. Jointly, we can develop sustainable concepts for the success of your products. Our ALTANA Technology Platform Printed Electronics, as well as our subsidiaries, are always open for cooperation. The team is looking forward to working together with you.

# Value of Innovation – AVA, IRR, NPV: What for?

Capturing value: At the end and according to our understanding of innovation, innovation has to capture value for our enterprise. Therefore, it is essential that our innovators clearly understand their contribution to generate and capture value. How can they influence value capture already at the very beginning of the value chain? With support from the Controlling Community ALTANA has introduced a Net Present Value (NPV) approach to support optimization of the R&D project portfolio. Furthermore, we try to jointly develop tools to calculate Internal Rates of Return (IRR) for specific meaningful units of our business. Finally, we are aiming to link NPV and IRR to our value management (ALTANA Value Added = AVA). Concluding the presentation part of the conference, Mr. Oliver König highlights this important topic.

Oliver König

ALTANA creates value – not only for our customers and employees; we also need to create value for our shareholders. Value creation can be measured in different ways and is based on different key performance indicators. There is no doubt that our innovation activities form an important basis for ALTANA's success. But how can we measure the impact of innovation? How can we work towards transparency? We need to focus on these questions, because ALTANA allocates a significant share of resources and capital expenditure to R&D activities.

In recent years, ALTANA's performance was very successful. Sales and profits grew in line with our ambitious targets, and we were able to generate an attractive return on our invested capital. However, our past success is no guarantee for the future. We need to be aware of the things we got right, as well as the actions which did not conform to our expectations. This knowledge will enable us to maintain our performance at a high level or even to improve on it.

Identifying the different influencing factors for business success and measuring their share of value creation is no easy task. And especially adding transparency to the outcome of innovation activities is hard. In recent years, the ALTANA Innovation Community was able to increase the transparency of their important share of value creation.

Tools which can not only calculate and monitor actual sales figures and expectations, but also profitability and even cash returns, help to allocate resources and provide a feeling for how projects and project portfolios influence the overall business performance.

Additional instruments based on the analysis of R&D and product portfolios help to monitor the strategic success of innovation activities, and form an important basis for future strategic decisions.

Different instruments are used within ALTANA and our divisions, depending on the R&D organization, the existing resources, and the complexity level of innovation management.

But despite all these tools and methods, analyzing R&D costs still play a significant role in R&D Controlling. We believe that there is a high correlation between costs spent in R&D and future business performance, subject to the condition that we allocate the investments to successful projects. Yet by focusing on costs we understate the importance of innovation for ALTANA. We need to continue shifting the analysis spotlight from costs to benefits.

It is the task of the ALTANA Innovation Community to manage the project portfolio and take the respective decisions. But it is also the task of the controlling community to offer assistance, for instance through developing tools and methods to increase transparency. However, another relevant duty is to ask questions, i.e. regarding the allocation of resources, as well as questions regarding the expected outcome of activities. In the end, we all need to focus on value creation. It is our task to create value – and also to make it visible.





# WE ARE ALTANA

Many Entrepreneurs, One Identity, Worldwide.



# Research and Development

In 2012, we continued to expand our activities relating to the development of new products and services as well as new technologies. In the business year 2012, the Group invested a total of € 102.3 million in research and development activities, € 14.6 million or 17% more than in the previous year (€ 87.7 million). The ratio of research and development expenses to sales rose from 5.4% to 6.0%.

Employees in research and development

	2012	2011	2010	2009	2008
Additives & Instruments	331	316	300	286	281
Effect Pigments	240	251	241	228	231
Electrical Insulation	149	139	137	140	129
Coatings & Sealants	156	146	109	106	107
Holding	8	7	4	3	2
<b>Total</b>	<b>884</b>	<b>859</b>	<b>791</b>	<b>763</b>	<b>750</b>

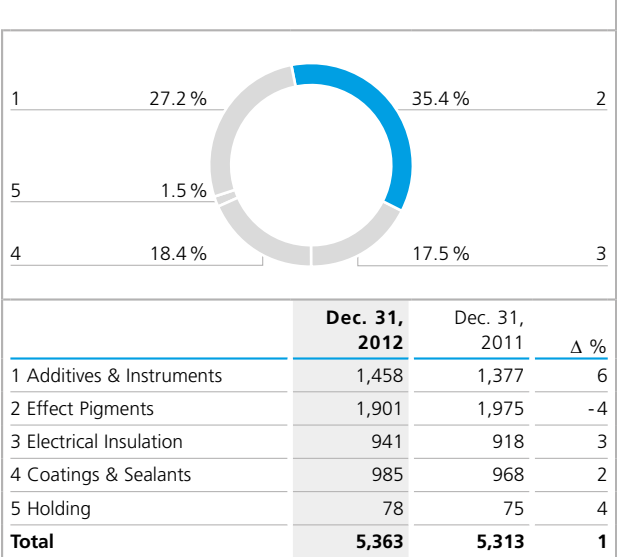
Research and development expenses

	€ million	% of sales
<b>2012</b>	<b>102.3</b>	<b>6,0</b>
2011	87.7	5,4
2010	82.0	5,3
2009	70.6	6,1
2008	72.1	5,4

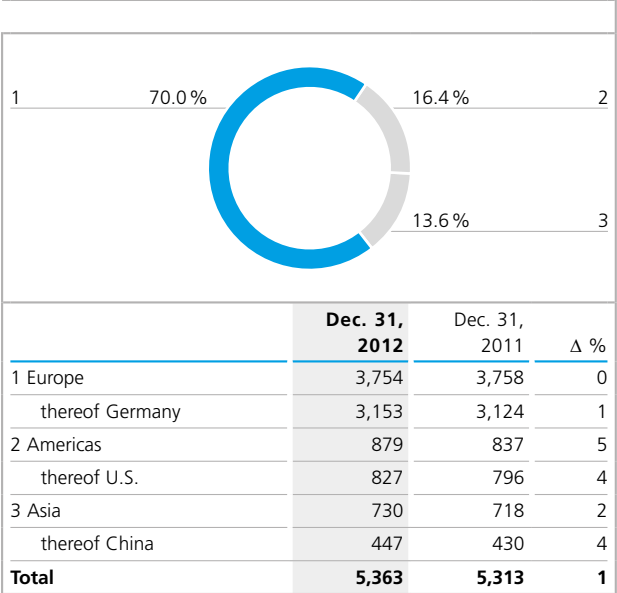
# Employees at ALTANA

The success of a company is borne by its employees. The employees of ALTANA are distinguished by a high level of commitment and skill. With their knowledge they constitute the real capital of our company. At the end of 2012, 5,363 people were employed at ALTANA throughout the Group. This is an increase of 50 employees on the previous year.

Employees by division



Employees by region



# In Which Areas Is ALTANA Active Today?

ALTANA					Sales 2012: EUR 1,705m Employees: 5,363	
Division	BYK Additives & Instruments	ECKART Effect Pigments	ELANTAS Electrical Insulation	ACTEGA Coatings & Sealants		
Business Lines	Paint Additives Plastics Additives Industrial Applications Instruments	Coatings Graphic Arts Cosmetics & Personal Care Plastics Industry Functional Applications	Primary Insulation Secondary Insulation Electronic & Engineering Materials	Converting Specialties Graphic Arts		
World Market Growth	~ 4%	~ 4%	~ 5%	~ 3%		
Global Market Position	Clear Leader	Clear Leader	Clear Leader	Top 2–3		

ALTANA develops and produces high-quality, innovative products in the specialty chemicals business. The company concentrates on producing a range of innovative, high-quality products for surface protection and surface finishing. These include wire enamels as well as products for protecting electronic circuit boards, food packaging, automobile paints, plastic surfaces, and lipsticks.

The ALTANA Group, with headquarters in Wesel, Germany, is a genuine "global player" with about 85% of its sales generated by international activities. The ALTANA Group has four divisions: BYK Additives & Instruments, ECKART Effect Pigments, ELANTAS Electrical Insulation, and ACTEGA Coatings & Sealants. All of these divisions occupy a leading position in their target markets with respect to quality, product solution expertise, innovation, and service.

ALTANA offers innovative, environmentally compatible solutions with the matching specialty products for coating manufacturers, paint and plastics processors, the printing and cosmetics industries, and the electrical and electronics industry. The product range includes additives, special coatings and adhesives, effect pigments, sealants and compounds, impregnating resins and varnishes, and testing and measuring instruments.

At present, the ALTANA Group has 42 production facilities and more than 50 service and research laboratories worldwide. Throughout the Group about 5,360 people work to ensure the success of ALTANA worldwide. In 2012, ALTANA achieved sales of more than EUR 1.7 billion. Its impressive earning power and high growth rate make ALTANA one of the most successful and innovative chemical groups worldwide.

## Clear and Highly Focused Business Model

Business Model Principles	
<ul style="list-style-type: none"><li>• Focus on growing niche markets</li><li>• Market leadership</li><li>• Only true specialty chemicals business</li><li>• In the value chain close to industrial customers</li><li>• Innovation and service orientation</li><li>• Decentral, flexible structure</li><li>• Global presence</li></ul>	
Clear value-added specialty strategy	Strategy development and active portfolio management
<ul style="list-style-type: none"><li>• High contribution margin</li><li>• High spending for R&amp;D and service capabilities</li><li>• Significant share of sales from new products</li><li>• Low capital intensity</li></ul>	To move all businesses into target range and to expand beyond existing business divisions



# What Makes ALTANA Unique?

We stand out because our workforce possesses comprehensive knowledge about customers, technologies, markets, applications, and processes. This knowledge residing in the minds of our employees is our true capital. It is made accessible, for example, through the ALTANA Innovation Portal and other corporate storage media and networks. We offer our customers highly specialized products and services, all of which require complex explanations. Making this explanatory information available is an important service that can be provided only by ALTANA. Listening to our customers is a decisive factor enabling us to offer this service.

ALTANA wants to create value by achieving sustainable above-average growth in sales and lasting high profitability. However, we can accomplish this only if we are the motor driving innovation on our highly focused and developing niche markets. As a consequence, ALTANA is either already the leader on all our target markets or wants to achieve this position soon.

The pursuit of a buy-and-build strategy for many years and successful portfolio management are part of our overall corporate strategy. The growth policy of ALTANA foresees acquisitions (and sometimes sales) of other companies as well as organic growth of the ALTANA Group itself.

## Three Pillars of Growth

Strategy for profitable growth		
Acquisition	Innovation	Market penetration
Bolt-on acquisitions in every division	New technologies	Regional expansion, especially in Asia, India and the US.
New portfolio expansion	New markets	Key account management
	Synergies between divisions	

## What Makes Us Attractive

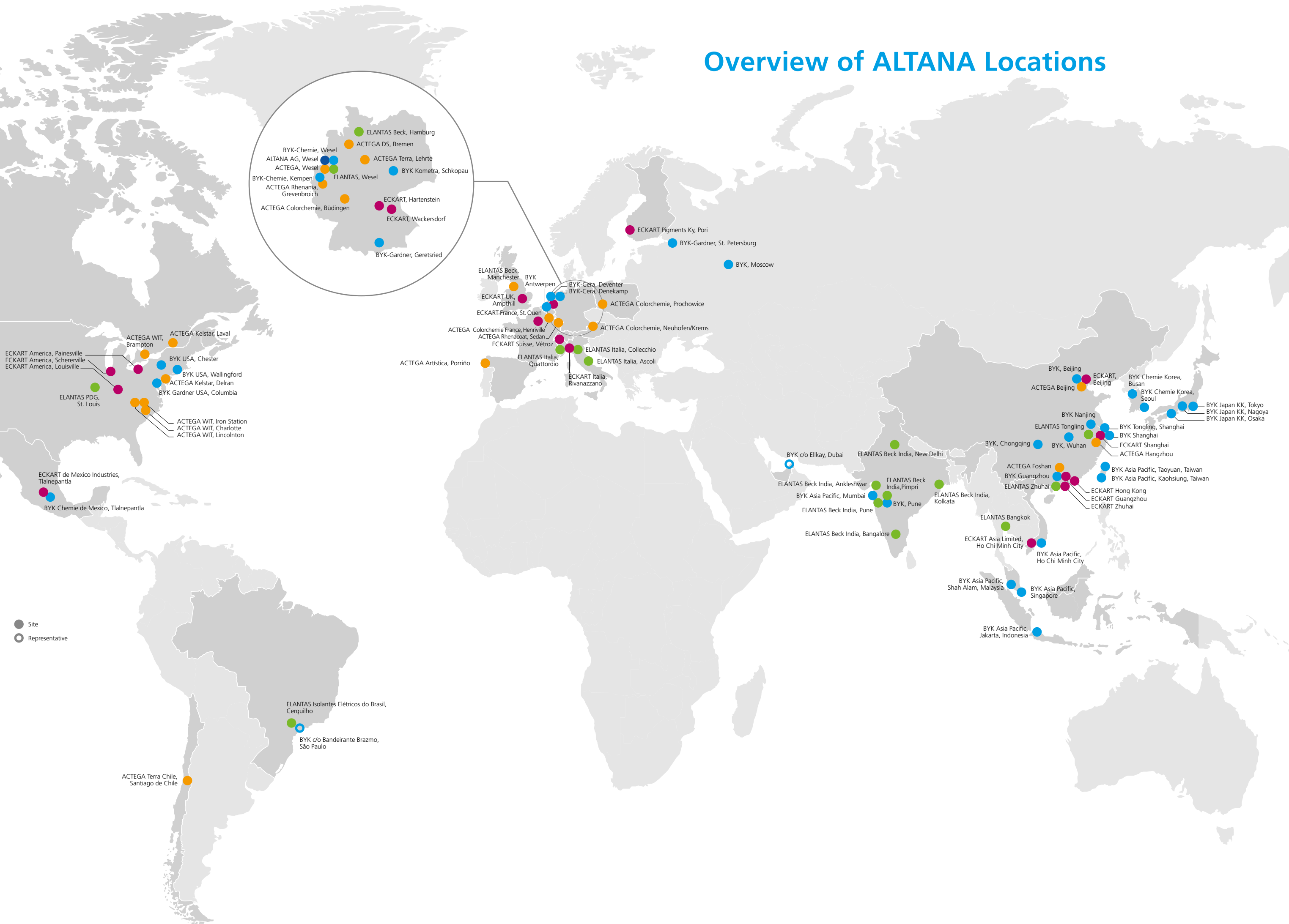
- 1 Sustainable, above-average sales growth and continued high profitability
- 2 Highly specialized products and services
- 3 Leading position in all target markets
- 4 Leadership in innovation in focused and developing niche markets
- 5 Global presence to ensure customer proximity
- 6 Long-term buy-and-build-strategy and successful portfolio management
- 7 Experienced management with excellent track record

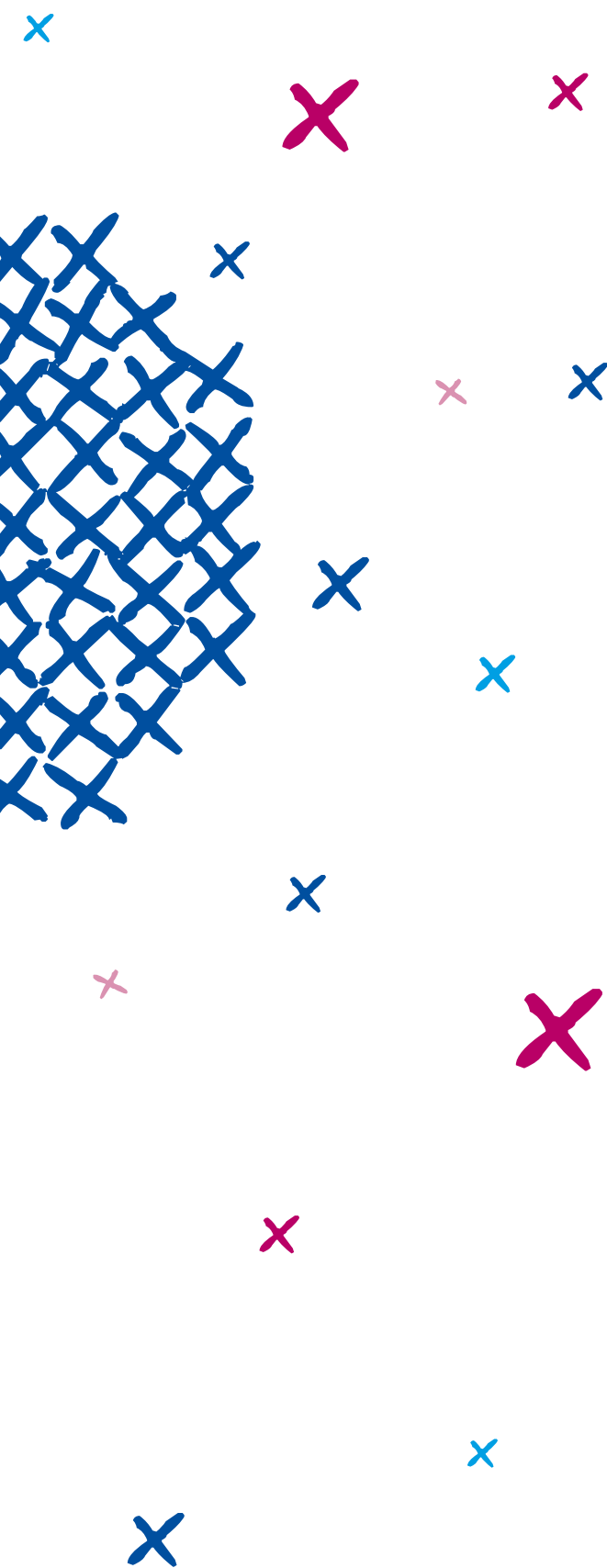
## Acquisitions (■) and Divestments (■)

Year	Company	Type
2003	Viking (EI)	Acquisition
	Schenectady (EI)	Acquisition
2004	Ranbar (EI)	Acquisition
	Watson-Rhenania (CS)	Acquisition
	Rhenacoat Coil (CS)	Acquisition
	Salchi-Rhenacoat (CS)	Acquisition
2005	Rembrandtin (CS)	Acquisition
	ECKART (EP)	Acquisition
	Kelstar (CS)	Acquisition
	Rhenania Coil (CS)	Acquisition
2006	Invex Brazil (EI)	Acquisition
	Rad Cure (CS)	Acquisition
2007	Bergen Materials (AI)	Acquisition
	Wolstenholme (EP)	Acquisition
2008	US Bronze Powders (EP)	Acquisition
	Dick Peters (AI)	Acquisition
	DyStar (AI)	Acquisition
2009	Water Ink Technologies (CS)	Acquisition
	Quadrant & Shimo (EI)	Acquisition
2010	Aquaprint (CS)	Acquisition
	ABB (EI)	Acquisition
	Polyurethane foam ad. (AI)	Acquisition
2011	Kometra (AI)	Acquisition
	WSAC (CS)	Acquisition
	Colorchemie (CS)	Acquisition
	Avery PVD Business (EP)	Acquisition
2012	Natural Mica Business (EP)	Acquisition
	Casting Resin Business Marbo (EI)	Acquisition
	ChemCor (AI)	Acquisition
	Coatzyme (AI)	Acquisition



## Overview of ALTANA Locations





Notes

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"The Real Voyage of Discovery Consists Not in Seeking New Landscapes, But in Having New Eyes"

Marcel Proust







ALTANA AG  
Abelstrasse 43  
46483 Wesel  
Germany

Tel +49 281 670-10201

[innovation@altana.com](mailto:innovation@altana.com)  
[www.altana.com](http://www.altana.com)

