

"Every **Great Thing** in  
**Our World** Only Happens,  
Because Someone Does **More**  
Than **One** Has to."

Hermann Gmeiner

## ALTANA Innovation Conference 2013

Our knowledge makes the difference

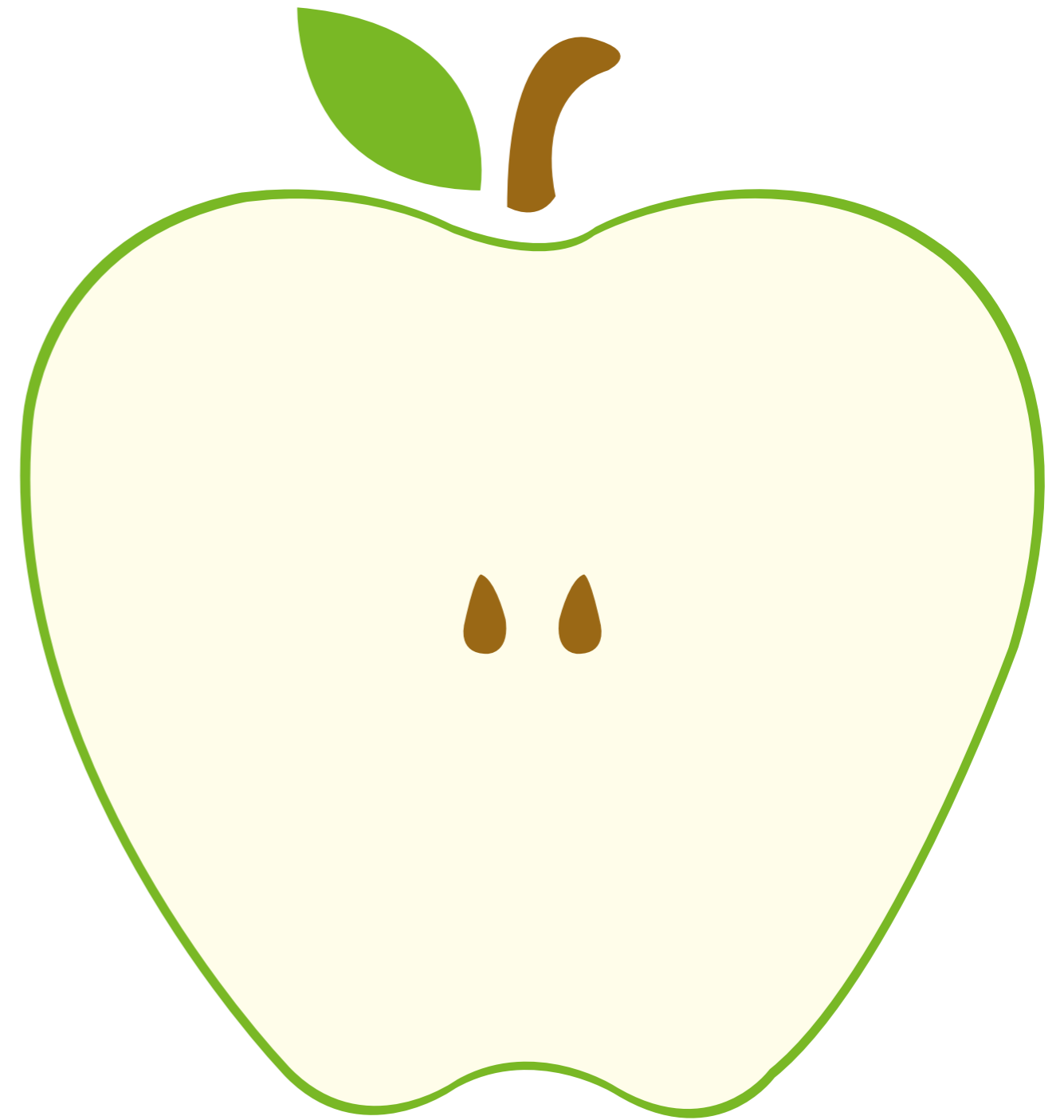




Our Core Competence Is Worth  
Being Protected – Like a Nut in Its Shell



Our Core Competence  
Is Hidden Inside – Our Inner Value



In This Way It Can Lead to Growth  
and Strength That Create Value



# "Core Competencies Are the Skills That Enable a Firm to Deliver a Fundamental Customer Benefit."

A key proposition for the meeting of 160 top-level researchers at this year's ALTANA Innovation Conference stresses how important core competencies are to ALTANA. Shortly before the event we met with Dr. Matthias L. Wolfgruber and Dr. Georg F. L. Wießmeier at the company's new platform laboratory for Industrial Biotechnology.







**Dr. Wolfgruber:**

As we can see, the ALTANA Technology Platform Industrial Biotechnology has established a sophisticated laboratory in the new BYK research building in Wesel. We're taking new roads here as, particularly for specialty chemical companies, operating a laboratory like this is certainly not business as usual.

**Dr. Wießmeier:**

I totally agree. I think the ALTANA Technology Platform Industrial Biotechnology has found a very good home at BYK, as we're seeing the most promising results in this area at BYK first. The task of Dr. Borup, the head of this platform, and her team is also to develop this technology, which is certainly new in our sector, for the other divisions ECKART, ELANTAS and ACTEGA.

**Dr. Wolfgruber:**

That's the mission of all our technology platforms. Over the medium and long term, this centrally controlled investment has to generate benefits for more than just a single division. And of course, this also applies for our other two ALTANA Technology Platforms, Nanotechnology and Printed Electronics.

**Dr. Wießmeier:**

One key task of the teams in the respective platforms is developing new core competencies. Core competencies are an extremely vital basis for the sustained success of our company. We have to continually observe these, and identify, acquire, develop and protect new ones.

**Dr. Wolfgruber:**

By building on the different competencies of the Divisions, the ALTANA Technology Platforms offer excellent opportunities for developing new core competencies – I see an excellent chance for using and realizing synergies here. Only true core competencies will enable us to differentiate ourselves in the market in a way that supports our growth targets.

**Dr. Wießmeier:**

You address an important point, the distinction between competencies and core competencies. We're in the com-





fortable position of having all our competencies available transparently in the Group thanks to the ALTANA Competence Map in the ALTANA Innovation Portal. However, it is vital to know which core competencies derive from specific, unique combinations of these varied competencies.

**Dr. Wolfgruber:**

As I see it, an important feature of a core competence is that it generates a fundamental benefit for our customers in multiple markets...

**Dr. Wießmeier:**

...and one that is difficult to imitate. In my view, that's an equally important criterion.

**Dr. Wolfgruber:**

If we take just these criteria, then it's easy to understand why acquiring new core competencies is no simple matter, which makes protecting them all the more important.

**Dr. Wießmeier:**

That's why our Patents department, supported by the ALTANA Patent Platform, is also an important focus of our activities and cross-divisional cooperation.

**Dr. Wolfgruber:**

Every researcher must be enabled to efficiently obtain an adequate overview of their research field to determine whether there is sufficient freedom to operate before we invest in a new project.

**Dr. Wießmeier:**

And of course that's particularly true for the three pillars of our ALTANA Technology Platform Industrial Biotechnology, namely bio-based raw materials, biocatalysis and bioactive surfaces. This is key because we want to build a new core competence in this area that is specific to our company.

**Dr. Wolfgruber:**

I'm really pleased to see that in addition to the broader presentation of our competencies in the poster session, which generated 80 posters, core competencies are a focus topic at this year's 6th ALTANA Innovation Conference.



**Dr. Wießmeier:**

In the run-up to the conference, a small, cross-divisional team worked intensively on this topic to flesh it out. In view of its great relevance, we then decided to offer a workshop at the conference, which was well-received. I'm also going to devote my conference talk to this important growth issue.

**Dr. Wolfgruber:**

Growth is the name of the game. Innovation is always an essential part of all growth components, such as venturing into new business areas, regional expansion, higher market penetration, exploitation of synergies and driving functional excellence.

**Dr. Wießmeier:**

Innovations based on our core competencies differentiate us over the long term and help our customers to differentiate themselves. I think that's an excellent basis for healthy growth.

We hope you enjoy your reading!



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

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



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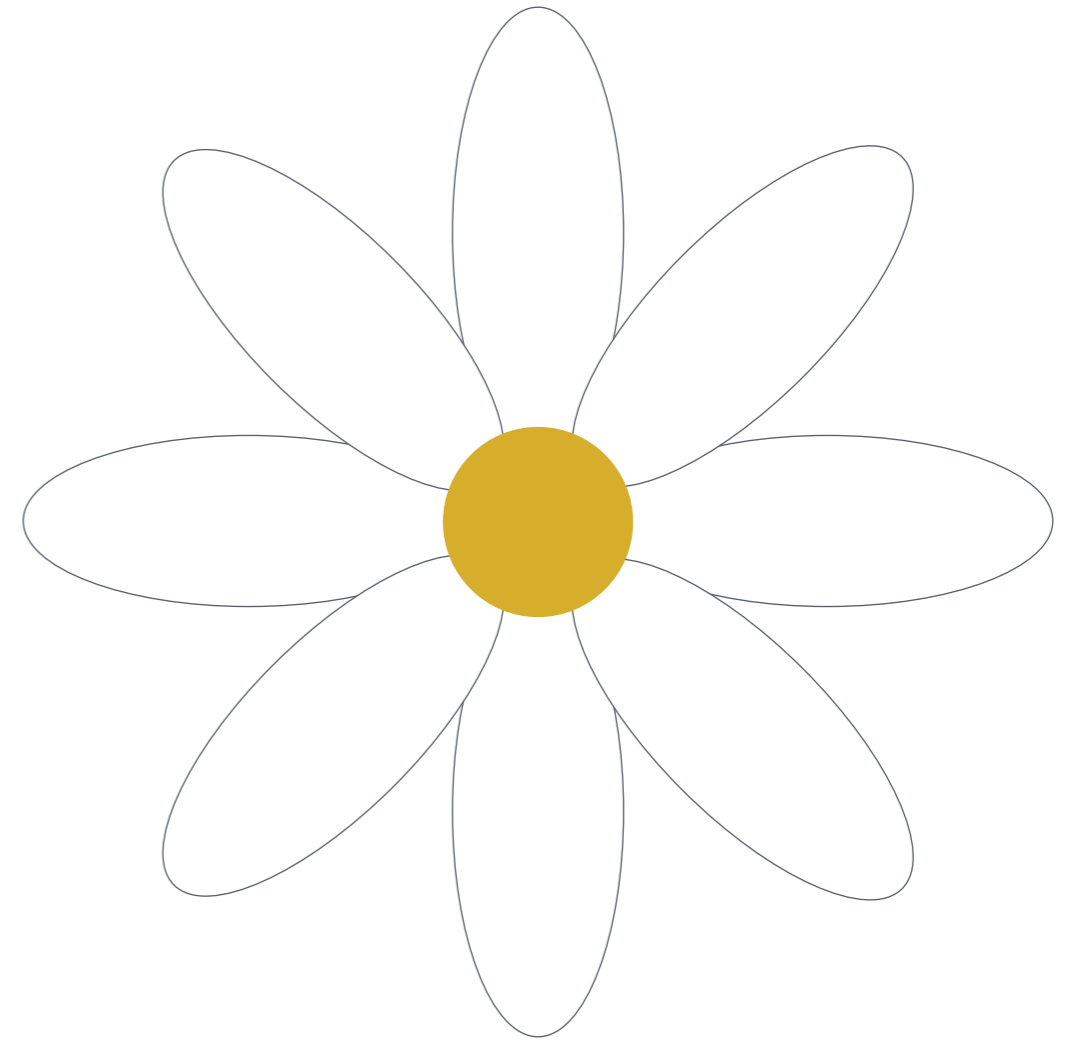
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**Agenda**  
Different Topics Flourishing



# 1st Day

## ALTANA Innovation Conference 2013

Wednesday, November 13th, 2013

09:00 – 09:15h

**Welcome Address / Opening Remarks**

Dr. Georg F. L. Wießmeier

09:15 – 09:45h

**CEO Keynote: ALTANA Strategy for Growth**

Dr. Matthias L. Wolfgruber

09:45 – 10:15h

**CTO Keynote: Core Competencies – The Inner Value of ALTANA**

Dr. Georg F. L. Wießmeier

10:45 – 11:15h

Digital Printing at ECKART Effect Pigments

**Digital Metallic Inks – The Step Beyond Color**

Dr. Stefan Engel (Introduction: Dr. Mark Stoll)

11:15 – 11:45h

Digital Printing at ACTEGA Coatings & Sealants

**Digital Printing in Graphic Arts – The New Normal**

Kurt D. Hudson (Introduction: Dr. Peter K. Jenkner)

11:45 – 12:15h

Digital Printing at BYK Additives & Instruments

**Current Status and Future Opportunities**

Albert Frank, Dr. Bernd Göbelt (Introduction: Dr. Jürgen Omeis)

13:30 – 14:15h

innosabi – Crowdsourcing for Identifying and Connecting

**Dispersed Intra-Organizational Knowledge for a New Era of Innovation Development**

Jan Fischer, Vincent Aydin, innosabi GmbH

14:15 – 15:00h

**Certego – Study:**

**Technology to Market-Process for the Polymeric Data Storage Technology**

Torsten Hupe, Certego GmbH

15:00 – 15:15h

**Introduction Poster Session**

Dr. Georg F. L. Wießmeier

15:30 – 18:00h

**Poster Session**

18:00 – 21:30h

Dinner Buffet

**ALTANA Innovation Award 2013 Ceremony**

Dr. Georg F. L. Wießmeier

Moderation: Dr. Stephanie Arzt, Dr. Anna-Maria Diehl, Dr. Matthias Eul, Dr. Robin von Hagen

# 2nd Day

## ALTANA Innovation Conference 2013

Thursday, November 14th, 2013

08:45 – 09:00h

### Opening Remarks / Introduction

Dr. Georg F. L. Wießmeier

09:00 – 09:45h

Division Overview:

ELANTAS Electrical Insulation

### ELANTAS Electrical Insulation – We Keep Tension Under Control

Dr. Horst Sulzbach

09:45 – 10:10h

### ALTANA Technology Platform Printed Electronics:

#### Status & Applications

Dr. Martina Weidner

10:30 – 10:55h

### Cross Divisional Feasibility Study Batteries and Energy Storage

Dr. Ralf L. Hoffmann, Dr. Robin von Hagen

10:55 – 11:20h

### Graphene – The New Wonder Material?

Alexandra Schneider, Angela Hullin

11:20 – 12:05h

Customer Presentation: Sun Chemical Corporation

### The Evolving Innovation Process at Sun Chemical

Dr. Russell Schwartz, Sun Chemical Corporation (Introduction: Fred Schulz)

13:00 – 13:15h

### Introduction Break-out Sessions

Dr. Georg F. L. Wießmeier

13:15 – 15:15h

### Break-out Sessions (1 – 13)

### 1 Nanotechnology (Network Meeting)

Dr. Michael Berkei

### 2 Biotechnology (Network Meeting)

Dr. Birthe Borup

### 3 Printed Electronics (Network Meeting)

Dr. Martina Weidner

### 4 Core Competencies

Dr. Christine Schilling, Dr. Oliver Bedford

### 5 Food Contact & Good Manufacturing Practice

Dr. Michael Becker, Dr. Holger Hein

### 6 New Business Development at ALTANA AG

Dr. Anette Brüne, Dr. Ulrich Hirth

### 7 Impact of Raw Materials

Günter Stevens

### 8 External Knowledge – Acquisition, Absorption & Usage

Dr. Matthias Eul, Dr. Stephan Roth

### 9 Green Chemistry

Dr. Gerald Kirchner

### 10 3D-Printing / Rapid Prototyping

Dr. Anna-Maria Diehl, Tristan van Vuuren



# 2nd Day

## ALTANA Innovation Conference 2013

Thursday, November 14th, 2013

**11 Growth Innovation Leadership "Using Frost & Sullivan to Grow Your Business"**

Simona Ionescu, Frost & Sullivan

**12 KAM 1: Digital Technology / Printing**

Kurt D. Hudson, Dr. Stefan Engel

**13 KAM 2: Key Account Management at ALTANA AG**

Detlev Lindner, Dr. Teresa Ramos

15:30 – 17:15h

**Presentation of Break-out Session Results**

Moderators

17:15 – 17:30h

**Closing Remarks**

Dr. Georg F. L. Wießmeier

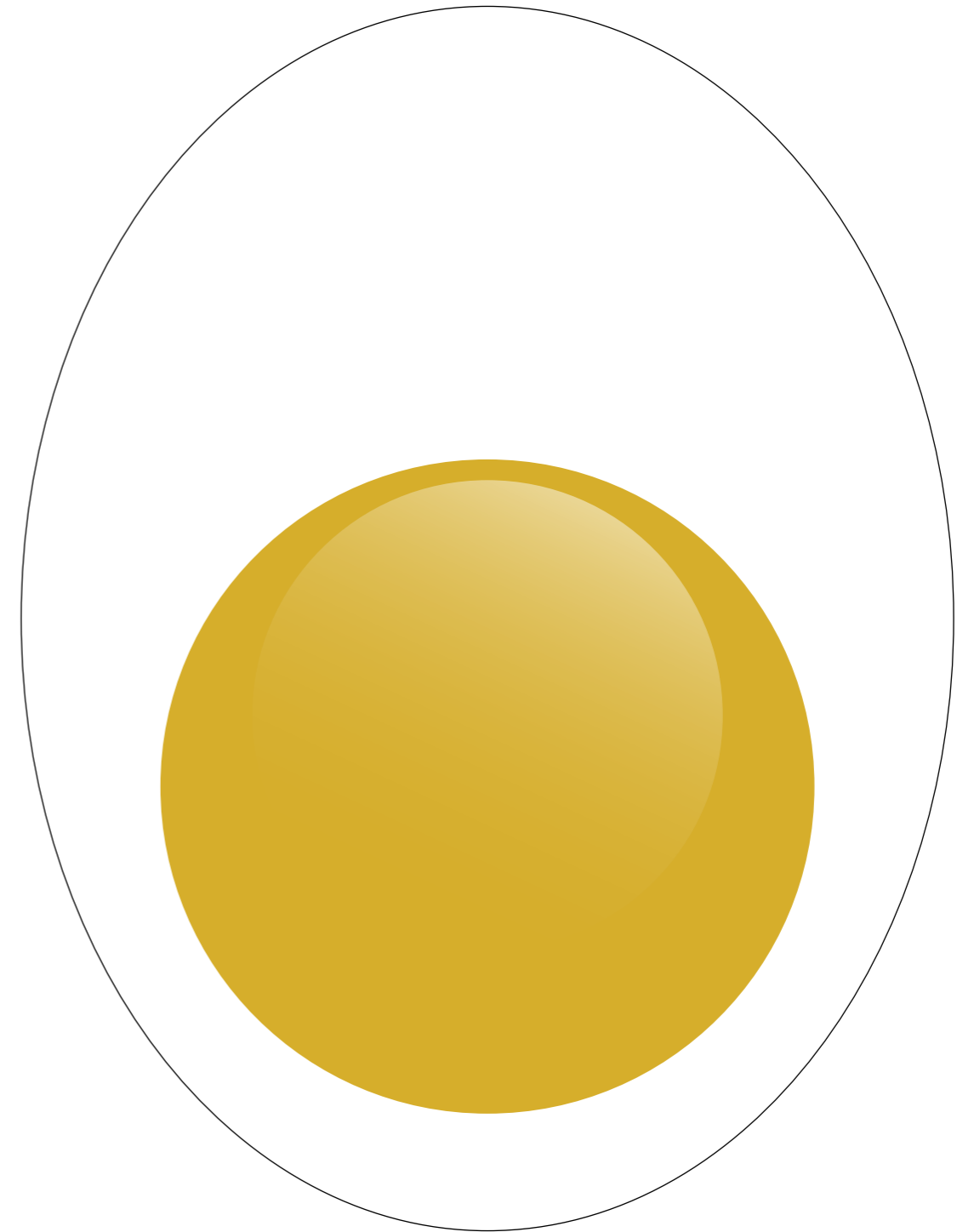
17:30 – 22:00h

**Social Event / Farewell Dinner at Veltins-Arena, Gelsenkirchen**

Ruhr Area: Industry Changes – Passion Remains

Christian Lippert

**Innovation at ALTANA – Part I**  
Growth Is the Name of the Game



# CEO Keynote: ALTANA Strategy for Growth

Growth is ALTANA's overarching objective – now and in future. By 2020, ALTANA will double the size of its business. And in order to achieve this ambitious target, expenditures on R&D will rise to 200 million euros per year, as compared to 109 million euros in 2013. At the same time, the number of people employed in R&D should grow from 944 to around 1,500.

Dr. Matthias L. Wolfgruber



Growth is the name of the game – this is what our business at ALTANA boils down to. In a specialty business like ours, innovation is the lifeblood of growth. From there, it follows that if growth is our overarching objective, we have to feed innovation and excel at it.

ALTANA has an impressive 35-year history of double-digit growth. This growth can be measured not only in sales and profit, but in jobs and knowledge too. In fact, our growth has always had multiple dimensions.

ALTANA was a small spin-off from battery manufacturer Varta when Herbert Quandt founded it in 1977. Back then, the company's value was the equivalent of 215 million euros; to date the cumulative value created adds up to 10 billion euros – a compounded annual growth rate (CAGR) of 11 percent.

Sales in 1977 amounted to 24 million euros. In 2013 they reached a total of 1,765 million euros. In other words: We have achieved a CAGR of 13 percent!

ALTANA has grown in terms of jobs as well: from 259 employees in 1977, this figure rose to more than 5,700 in 2013. At the same time our markets changed as well: in 1977 most of our products were sold within Germany, only 49 percent abroad. Today, 85 percent of our business is international. We have become a truly global business.

ALTANA's history of growth is a success story, without a doubt. But if you take a closer look at its development, you will find that growth was neither linear nor steady. On the contrary, growth at ALTANA came in spurts.

This is due to many different factors. Internal factors, for example portfolio measures, play an important role. But external factors, for example economic conditions, loom large too. Still, one of the biggest drivers of our growth are acquisitions. As an integral part of our growth strategy, acquisitions make up 5 percent of the CAGR, with organic growth amounting to a 4 percent average growth rate per year. What becomes obvious is that organic growth has slowed down a bit lately, mainly because of economic trends.

In Europe, in particular, our growth has been less dynamic in recent years due to the debt crisis.

### Accelerating organic growth

But developments like these are no excuse for us. We have to look out for other ways to grow, branching out into new businesses, for example, or entering new markets. Most importantly, we need to accelerate ALTANA's organic growth.

When analyzing the history of ALTANA, another layer becomes apparent: the overall corporate structure. In 1977, the company was completely different from today's company. This is the result of our continuing process of rebuilding and reorganizing the company, of exiting businesses like baby food or pharmaceuticals, and acquiring others, for instance the clay-based additives business, which we have taken over just recently. In all, we transformed a "manage the conglomerate" enterprise into a tightly focused specialty chemicals business.

Now we can focus exclusively on growing specialty chemicals. And I am convinced that in less than 10 years from now, in 2020, our sales will reach 3.5 billion euros, twice as much as in 2013. And the number of employees will almost double, too. It will rise to around 10,000.

These targets may sound ambitious and the road ahead will certainly not be smooth. In fact, it will be quite steep, but not impassable.

There is an assortment of different tools at our disposal to pave our path to growth, all of which we need to employ. We can expand into new business areas and we can expand into new regions. Moreover, we can increase our market penetration. Optimizing our portfolio and exploiting synergies are further tools we need to employ.

Finally, we can improve our operational and functional excellence. That's why we started the ALTANA X program. Improving operational excellence in future will make us more competitive, which in turn will help us to grow.



### The role of innovation

Where does all this leave innovation? Innovation is and always has been an essential part of all these growth components for many reasons. First and foremost, it makes us competitive. It enables us to differentiate ourselves, thus helping to fight commoditization. By the same token, it also helps our customers to differentiate themselves, especially in markets which don't show particularly high-volume growth, like the coatings market, for example. With our innovations, we help our customers to gain a larger market share. That's how we become their preferred partner.

On another level, innovation also creates new market niches for ourselves, for our customers, or for both.

To sum up, innovation earns us a larger slice of the market and the competitive edge we want. It helps us to grow and to achieve our strong position as leaders in attractive markets.

Success, however, does not come without perils, especially if you are accustomed to success. One of the greatest risks we face is linear thinking: the assumption that what has worked well in the past will also work well in the future. Many market leaders have operated on this assumption – and some have paid dearly for it.

Peril number two stems from a lack of willingness to take risks. This attitude often comes with the desire to secure what you have. The more successful you are, the more difficult it becomes to take risks. Peril number three comes from an attitude that resists change.

### The future challenge: more investment

Having gained a strong and competitive market position does not mean that we no longer face strategic challenges. The fact is, and this might seem like good news at first glance, all ALTANA divisions command strong positions in attractive markets and generate more cash than they invest.

My conclusion from that is: We're not investing enough. The reason is not that we don't want to invest or lack the money. The reason is we need more ideas and proposals for growth. Let me make this clear: When we talk about new ideas,

we are talking about investments that generate a return themselves. What we need therefore is initiative and entrepreneurial thinking across all divisions. We don't have to change our business model to reach this target – we can continue to build on the solid foundation we have already.

Our overall aim is to differentiate our specialty businesses and gain leadership in innovative, service-driven lines of business. To do that, we need to exploit our strengths. These are based on the combination of three types of know-how: formulation, chemical synthesis and application.

With this goal in mind, we will step up our spending on innovation. By 2020, we will invest 200 million euros a year, as compared to 109 million euros today. This also means increasing the number of people working in R&D. From 944 now, the figure will rise to around 1,500 in 2020.

With our know-how sharing tools and other support platforms, we have already invested heavily in optimizing our internal knowledge exchange and using external knowledge more effectively. Controlling tools are improving our decision-making, and we are fully committed to further strengthening regional R&D capacities.

### Combining market pull with technology push

But investing in innovation is not just a question of money or spending. More importantly, it is a question of the approach we take. In the future, our approach must be more holistic than in the past. We need to balance our innovation activities more with our market and customer-facing activities. In fact, we need to strengthen our efforts to create the market pull before we start pushing more and more technology into the markets.

This holistic approach entails quite a few other changes, too. Besides strengthening market-facing capabilities, we need to improve cross-functional and cross-divisional activities. Cooperation agreements with customers, especially within group account and key account management, become imperative in that context. When it comes to new business development, the question is: Are we decisive enough? My plea is: Be bolder, take bigger chances and concentrate on a few very promising opportunities rather than on a hundred possibilities! Be more decisive and don't be afraid of failures. It's inherent in innovation that not every project succeeds. But, provided you have given it your best, failures add to our knowledge.







Innovation is also a key element for market penetration. The major focus rests here on our group and key account management. In 2012, GAM/KAM sales made up 20 percent of total sales. The average growth rate amounted to 12 percent per year.

Our target growth rate in this sector is 15 percent per year. In order to achieve that, we need to apply more resources and leverage ALTANA's capabilities more effectively, increasing the number of joint projects with our group and key accounts. Our success in our absolute largest markets – Europe, North America and China – depends on this strategy.

#### Localization

Driving organic growth by means of regional expansion is another important area we have to focus on. We expect the highest market growth in China, India, South East Asia, Latin America and Mexico. Consequently, we need to start a process of regionalization there, which includes building local competence, local value chains with products and services, and more local decision making in general. Parallel to the sales and marketing efforts we will step up our investments in local R&D.

Investments play an important role in external growth, too. With our bolt-on strategy we acquired more than 30 companies in the past ten years. In future, this strategy will help us to consolidate our position in existing markets and enable us to access adjacent markets and technologies. We will also use acquisitions to improve our position in Asia and America.

Some people believe that the company's size does not matter as long as you are a leader in your market. That's true to some extent. Still, I believe that size does matter, because it gives us greater economies of scale. This is particularly important in the labor market when we want to attract talent. The bigger we are, the more attractive we become as an employer. I would therefore argue that, since size makes us more competitive, it is also a growth factor.

#### Growth depends on people

As I noted above, our growth strategy rests on different types of investments. But first and foremost, growth depends on people. This is why we've launched programs like the DP's, CDDPI, and ALTANA X. We put a lot of money into training, networking and bringing people together. I am convinced that this kind of investment is the best there is, and we will continue to do this.

Because at the end of the day, growth depends on each and every one of you. It requires courage and commitment. You have to stand up for your ideas and fight for them.

That's my encouragement to you. And that's why I say: Let's keep the fire burning!



**Keeping the Fire Burning**  
In This Way It Can Lead to Growth



# CTO Keynote: Core Competencies – The Inner Value of ALTANA

ALTANA's competitive advantage depends on the Group's core competencies, developed within the four business units. In order to create new business and achieve our growth targets, however, a paradigm shift is necessary. We need to adopt a cross-divisional approach and perceive ALTANA as a portfolio of core competencies rather than as a portfolio of business units.

Dr. Georg F. L. Wießmeier



With our target of 3.5 billion euros in sales in 2020, growth expectations are high at ALTANA. The innovation community aims to support this growth target. But how can we achieve our goal? To answer this question I will focus on the inner value of ALTANA. By this, I am referring to the core competencies of our Group. These competencies are the basis of everything we do, every day.

In order to demonstrate what I understand by core competencies, I would like to introduce the metaphor of a tree. Within this tree, core competencies represent the roots of growth, providing the competitive advantage. Our core products stand for the trunk; the end products are the tree's branches and leaves. This metaphor can be applied to illustrate the unique character of every ALTANA division.

#### Definition of core competence

Two Harvard economists, C.K. Prahalad and Gary Hamel, were among the first to provide a definition of core competencies back in the 1990s. This definition is still applicable today. According to their concept, core competencies not only stem from technology. Rather, they grow from the coordination, integration and harmonization of diverse skills, which, besides technology, also include production, marketing, and service.

Core competencies make a company unique. They are the engine for business development and the company's growth. As a result, they require communication, involvement and working across all organizational boundaries.

Finally, core competencies are characterized by an interesting feature. Rather than diminishing with use, they grow. The more often you employ them, the stronger and better these competencies become.

Core competencies must meet three criteria. The first criterion Prahalad and Hamel call "value creation" or "customer value": The competence must provide a significant contribution to the perceived customer benefits.

The second they name "uniqueness" or "superiority to competitors". This refers to the superior quality of the end product, which makes it difficult for competitors to imitate it.

For us this means: We always have to move one step ahead, in order to stay ahead in our business. Being a leader and staying a leader, requires dynamics.

The third criterion is "accessibility" or "expandability": the competence should provide access to a variety of markets and product arenas. For us this means: the broader the competence's application, the better for our business.

#### Competence examples from ALTANA

Having explained the concept of core competencies, I would like to give some examples from our Group. The first is ECKART, and here I am relying on the work of Dr. Oliver Bedford and Dr. Christine Schilling.

If you picture ECKART as a tree, its roots – the competencies – are atomizing, milling, encapsulation and physical vapor deposition. The core products, the trunk, are granular powder, encapsulated pigments and non-encapsulated pigments.

These three product types represent the entire business of ECKART. From this trunk, four branches grow, the Business Lines Cosmetics, Coatings & Plastics, Functional and Graphic Arts, with the end products, e.g. Metalure or Hydrolan, as leaves.

Capturing the company's unique character, the tree metaphor shows the very smart combination of different technologies ECKART employs plus the value chain the company provides. Starting with atomizing and milling, the company is able to carry out all the steps needed to produce their final product – effect pigments.

Another example of core competencies stems from BYK Instruments. The company has a very smart set of five competencies: psycho optics, optical design, mechanical design, electronics hardware and software. From these grow four types of measurement products: effect, color, appearance and gloss measurement, serving a broad variety of different markets.



The end products stand out due to their excellent design and complex algorithms. To imitate a BYK-mac is practically impossible.

BYK Additives, on the other hand, is quite a different story when it comes to competencies. Looking at that division, you will find its core competencies are not all related to technology. Of course, there is polymer synthesis, application technology and the scale-up and production know-how.

But there are other, very strong, unique competencies, too. These are technical marketing, e. g. the sampling and the seminars BYK offers. Then there is the analytics and finally, regulatory compliance. Just take REACH. By pushing the issue, BYK helped our customers. In fact, they turned a difficult task into an advantage for them. REACH, therefore, is a very good example of how to shape a new core competence.

From all these competencies gathered at the business units, we have extracted an ALTANA Competence Map for the entire Group. The map can be found in the ALTANA Innovation Portal. There you can look up what is behind the polymer synthesis competence, for example.

#### Future perspectives

What can we learn from all these examples? The answer is clear: We need to find an appropriate definition for core competencies for ALTANA.

Next, we should then identify our existing core competencies. This shouldn't be difficult, as we have already taken inventory of all the competencies with our map. By the same token, it is mandatory that we monitor our competence map continuously. If we acquire a new business, for example, it might be necessary to amend our inventory. In the long run, our competence map will turn into a strategic tool, which can be used to build our competence agenda. This agenda is necessary because we need to define the competencies we have to build in order to achieve our growth targets.

Deploying our competencies is the most important task ahead of us. It requires a cross-divisional approach. I am not sure whether, after six years of working together in the



ALTANA innovation community, we are aware of all the competencies that are at our command within our Group. That is why we need to enforce working with the Innovation Portal, to reinforce the cross-divisional approach.

Finally, we need to protect our competencies and defend our leadership. For that, we have to take a look at our competitors and compare their competencies with ours.

#### Competencies and new business

Core competencies are drivers for growth and business development. This gives rise to a number of questions which we need to ask ourselves. Starting from the matrix of existing and new competencies and markets, respectively, the first question concerns existing competencies: Can we leverage them better by combining them differently? Which new products can we create by redeploying or recombining competencies? Where can we employ competencies that are available within the Group?



The next set of questions has to do with new competencies: Which competencies do we need to build, protect and defend our position in the markets we are in currently? This is a very challenging question, indeed, but not as challenging as this one: What new competencies do we need to participate in exciting new markets?

Entering new markets, you have a choice. Either you acquire new competencies or you recombine existing ones from different divisions. To illustrate what it means to recombine existing competencies, Dr. Hoffmann and Dr. von Hagen will present their feasibility study on battery and energy storage later on.

The upshot of their analysis is: We can combine the activities related to batteries and energy storage going on in different parts of the Group and we can make more out of them by using synergies. I would go even further: This is a field where we can build a new core competence.

The study results mounted in a decision. We implemented the topic of energy storage as a cross-divisional approach at ALTANA. It is not a platform yet, but it might become one later. The first step we took was to establish a lab, hosted by BYK. Its task is to test our materials and get fast results. Possibly it might even produce prototypes. Establishing a new lab is quite an investment, but we think it was a smart investment. It will help us gain our own knowledge on this promising topic.

Secondly, we asked our colleagues from Corporate Development to help us identify external competencies we might need to acquire, in order to speed up the process.

#### Pooling competencies in a platform

Another example of pooling core competencies from different parts of the Group is the Platform Printed Electronics, which is hosted by ELANTAS in Hamburg.

What we are doing with this platform is to combine existing competencies to form a new core competence. The competencies the platform makes use of come from different divisions of ALTANA; they concern printing and graphic arts know-how as well as expertise regarding industrial networks, nano-dispersing additives, and special varnishes.

So far, we have invested a lot in this platform and the investment has proven successful. For example, we have shown that we can print electroluminescent displays on paper. Currently, we are discussing how to advance the platform further.

#### Paradigm shift

Extending the achievements from these platforms and projects, we face a completely new situation. It requires a paradigm shift, which won't be easy for us to perform because it touches the heart of ALTANA: our structure as a Group of decentralized, independently operating, successful companies. My suggestion is this: In addition to our very successful approach of decentralized divisions we should shift our paradigm and for that, we need to free up our thinking.

New business in addition requires a cross-divisional approach. We shouldn't think in terms of the individual business unit's competencies only, but in terms of ALTANA competencies. Let





me give you an example from the field of printed electronics: It is not only conductive pigments we should think about, but also conductive inks! They can be used in systems which print energy supplies, for example fully printable batteries or fully printable photovoltaic systems.

However, creating such new product systems involves many risks, one of them being the market. As our current experience with printed electronics shows, we have to teach the

market, i.e. the printing houses, how to employ our new products and create a new market for themselves.

#### Conclusion

To conclude my explanations, core competencies describe the inner value of our company. They are bound in people. From this, five messages follow:

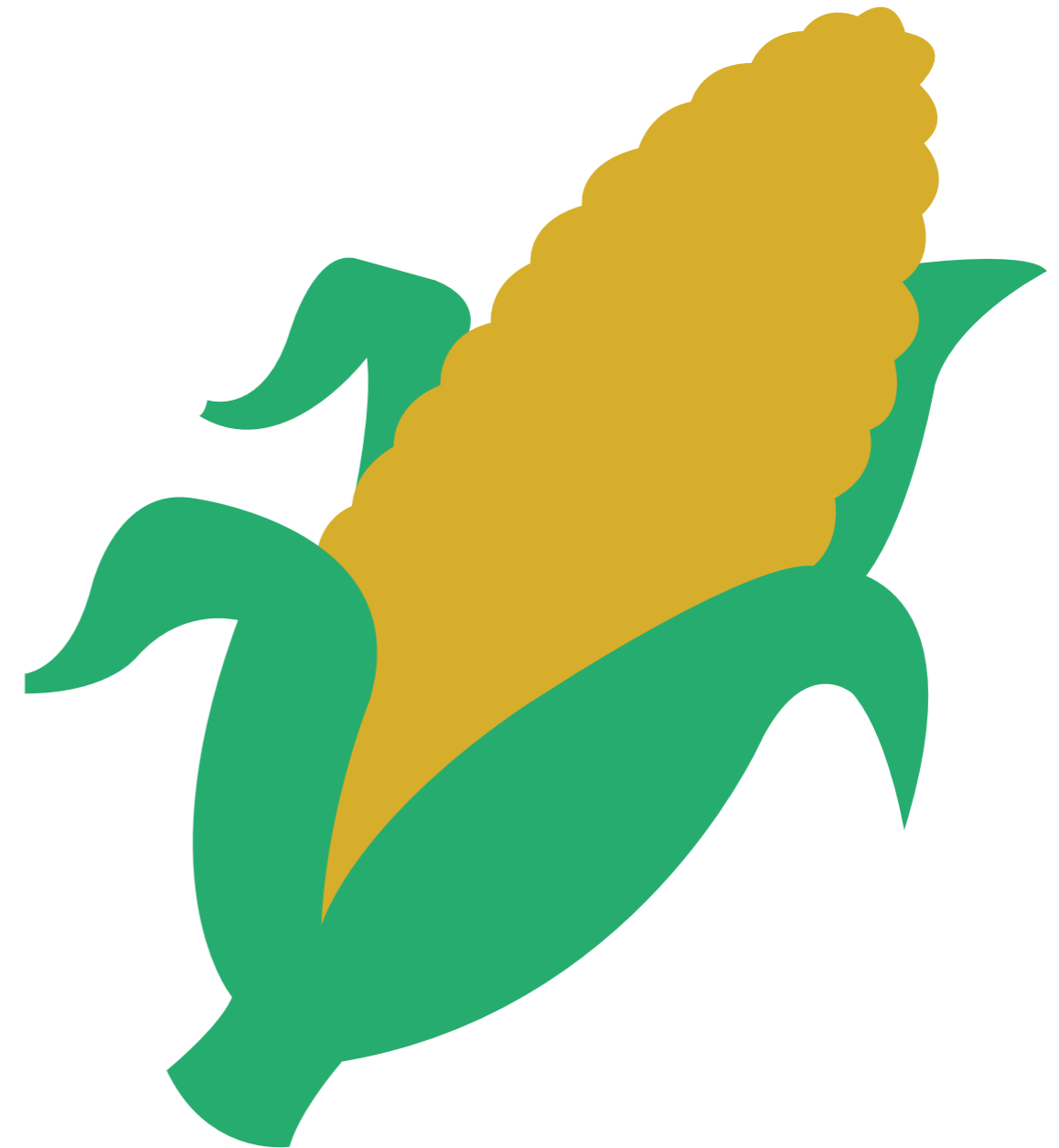
- To secure sustainable growth and value capture, ALTANA should first of all be seen as a portfolio of core competencies, not as a portfolio of business units only.
- Core competencies are cross-divisional, not business unit only.
- To occupy new competitive space, we can either combine core competencies differently or acquire new ones.
- Do not only think about money as a resource, think about competencies, too. You need to fight for access to core competencies the same way you fight for budget.
- When assessing and rating our competitors, we should not only analyze their performance and their pricing. More importantly, we should observe their core competencies carefully.



Doing all this will help us create new core products and new business areas. The end result will be a range of completely new product systems.

Coming back to the tree metaphor, the concept is thus: By capitalizing on its core competencies, no matter in which business unit they are located, ALTANA will be able to grow and branch out. It is not primarily the business units that count in this context. What counts the most are people – you – who put their heads together to form a new trunk and a new tree to evolve new, beneficial ideas.

**Focus Topic Digital Printing**  
Unfolding Beneficial Ideas,  
Unfolding Our Inner Value





## Focus Topic Digital Printing

Digital Printing was chosen as technical focus topic of this year's ALTANA Innovation Conference. Three divisions provide their view on this very important future growth area which becomes more and more important in the printing industry.

# Digital Metallic Inks: The Step Beyond Color

Providing innovations for the printing industry requires more than the ability to master technological challenges. In fact, a shift in focus is necessary, as ECKART has learned. The company's digital printing team now considers market development as its prime task. This involves communication with many different players within the market.

Dr. Stefan Engel (Introduction: Dr. Mark Stoll), ECKART

In response to the general trend towards replacing traditional printing technologies through digital processes, ECKART is pursuing a special development program for metallic inks used in digital printing. These activities, centered in the Business Line Graphic Arts, department BGA-DP, have resulted in a series of ink products ranging from solvent-based to UV-curing inks and suited to the most commonly used industrial inkjet technologies.

The technological challenges were huge. Back in 2006, most ink makers thought it was impossible to create inks with metallic particles without ruining their print heads. Development faced two challenges: first, to produce metallic pigments small enough not to endanger the print heads. Second, to create ink formulations that keep the highly reactive pigments chemically stable and in suspension within liquids of extremely low viscosity.

In 2007, ECKART founded a special department with a team of four employees within the Business Line Graphic Arts. The Digital Printing Department (BGA-DP) has its own lab and print rooms, including equipment.

### Ultrafine pigments

Common metallic pigments and inkjet color pigments differ in size by a factor of 100. Achieving the right particle size in metallic pigments without sacrificing optical properties required the application of innovative pigment preparation procedures. The first milestones were achieved by the ECKART Technicum. The resulting pigment preparations were good enough for use in robust print heads, providing material for a spectacular printing demonstration at drupa 2008.

Further development in the digital lab resulted in ultrafine pigments as small as 700 nm in mean diameter. They are suitable for high-resolution print heads, providing extremely good reflection up to gloss levels of 650 GP.

The stabilization of highly reactive ultrafine aluminum particles in solvent-borne and especially in UV-curing inks was another achievement of the lab. The team proved their production feasibility in many batches. These activities also generated important spin-offs in the form of new milling technologies. Another important achievement is the know-how transfer regarding stability. The know-how gained in the development of digital UV inks is now also used for other

products. By the same token, the new digital department benefited greatly from exploiting synergies with the already established R&D departments.

In addition to the decorative metallic sector, inkjet printing is used to create functional applications. These are rapidly becoming a more important market. The first conductive ink prototypes were developed in close association with the ALTANA Technology Platform Printed Electronics. External test results generated huge interest in the industry, especially among market and technology leaders like Bosch, Airbus, Dräxlmeier, Würth, and others.



### Shift of focus

Having mastered many of the technical challenges, we had to learn that the market is still not prepared to absorb significant amounts of metallic ink. Our conclusion from that is: it is not enough to provide an ink and enable printers to produce metallic prints. More importantly, we need to examine the entire digital print workflow, from the designer's contribution to the post-processing of the finished prints.

The communication has to involve designers and brand owners, printing and creative software providers, hardware manufacturers, printers, and end users. Inkjet printing is an emerging and rapidly growing industry that earns high margins. In many cases, partners are not easy to approach because they do not see the necessity of dealing with niche markets.

Consequently, our focus has shifted towards market development. Adopting a new strategy, we have entered into a number of partnerships with major players in the industry. This is generating a sharply growing interest in ECKART's Jetfluid product line of metallic inkjet inks.





# Digital Printing in Graphic Arts: The New Normal

A thorough analysis of the digital printing value chain helped ACTEGA to establish new routes to market. Today the company provides digital support products to the industry which build efficiency in operations and enhance the performance of digitally printed media in defined application niches.

Kurt D. Hudson (Introduction: Dr. Peter K. Jenkner), ACTEGA



Commercial acceptance of digital printing technology has come of age. What was once an outlier in terms of utilization and quality, is today challenging traditional analogue printing. Digital printing is now advanced in terms of image reproduction delivery time, new press sales and even total cost for volume work.

As digital print technology advances at an accelerating pace into analogue printing markets, traditional routes to market for consumable products such as coatings, adhesive, primers and inks are no longer optimal pathways. To provide a foundation for the development of new route-to-market strategies, it is necessary to understand current and emerging digital technologies. Market and cost drivers play a role, too. Finally, the value of key suppliers of digital printing and finishing equipment has to be determined.



Technology developments in the area of digital printing have been steady over the past twenty years, with exponential developments now upon us due, in part, to critical mass of installations and demand. What are the technologies shaping the future of digital printing? What are the basic digital technologies growing most rapidly? What are the opportunities and obstacles brought by the various printing technologies to suppliers of print process consumables? Such questions frame the discussion leading toward growth in the face of fundamental market changes.

Market forces drive market trends, which in turn drive printing trends and needs. As with all evolutionary processes, printers will respond with the technologies and tools that are best adapted to meeting the variety and customization needs of brand owners in the new environment; this favors ever more personalized packaging and advertisement. The presentation explores the interaction between the market forces and printing production trends. It includes cost models and forecasts for digital printing growth.

How are we prepared to meet the digital present and future and what are we doing today to position ourselves within the digital printing landscape? The digital printing value chain reveals several potential areas of competence intersection for continued supply of ALTANA products into the digital printing

arena. Although some opportunity intersections are fraught with route-to-market barriers, closer investigation into other competence intersections reveal existing capabilities and even existing products.

Through a thorough understanding of the various digital printing technologies and the products used during the printing and finishing operations, models can be generated for each of the relevant value steps through the digital printing value chain. For each relevant step there are always market leaders. How do ALTANA graphic arts business units rank in comparison to pinnacle competitive references? Models plotting relative technical competence and market experience provide a clearer insight to the relative strength of us as a company. At the same time, they provide a certain degree of confidence in our ability to compete and succeed in the digital printing arena.

An initial step in positioning products for sale into the digital printing arena was to have each business unit organize existing best-in-class products in the areas of overprint varnishes, primers and adhesives. Guidelines were established to determine relative performance and physical attributes of these best-in-class products. In addition, existing data regarding performance of these products in conjunction with digitally printed products was captured and organized. The term "Digital Support Products" was coined as these products are not digital inks, but rather enhance the performance of digitally printed media in defined application niches. In essence, the Digital Support Products build efficiency in the operations of printers and converters and enhance the value of digitally printed products. Therefore, ALTANA is now seen as providing innovative, cost-effective application solutions and continues to build a reputation of excellence within the digital print market.

Recent achievements in the area of Digital Support Products include a variety of activities. We have been specified by major brand owners for high value packaging. Secondly, we immersed our products in the operations of key digital press manufacturers by acting as solutions providers for specific applications. Thirdly, we convinced key finishing equipment manufacturers to use our products at major printing industry trade expositions.

Moving forward, the business units of ALTANA will continue to define and refine the framework of digital printing, in order to establish and build the ALTANA Digital Printing brand. We will continue to carry on developing relationships with key manufacturers of presses, finishing equipment and converting equipment. As the end goal, we seek to expand opportunities for existing and new ALTANA products in this growth arena of Digital Printing.





# Digital Printing: Current Status and Future Opportunities

In 2017, the inkjet market will grow to an estimated 25 million euros worldwide. BYK aims to achieve a share of 12 percent of that market. As inkjet applications have to meet demands different from those for standard coating systems, the company established a special inkjet lab in 2012.

Albert Frank, Dr. Bernd Göbelt (Introduction: Dr. Jürgen Omeis), BYK



In 2010, BYK decided to enter the market of additives for inkjet applications. We focused on wetting and dispersing additives for solvent-borne and UV industrial inkjet systems. In 2011, the newly created BYKJET series was presented to inkjet customers at the European Coatings Show. By 2012, worldwide sales had already reached nearly 2 million euros, equivalent to 8 percent of the total market share. The target for 2017 is a market share of 12 percent, based on an estimated total market of 25 million euros. To reach this target, BYK established a special inkjet lab in 2012.

## Characteristics of inkjets

The requirements for additives used in inkjet applications differ substantially from those for standard coating systems. This is due to the many requirements inkjets have to fulfill. They must feature high color strength plus high gloss, while providing transparency and low haze at the same time. Pigment concentrates and final inks need to have a low viscosity in order to provide easy and fast filtration as well as excellent jettability. Lastly, both pigment concentrates and inks should demonstrate outstanding long-term storage stability without any agglomeration, color or viscosity shift. BYK offers a large variety of products from different product groups for the use in inkjet inks. The most important class are wetting and dispersing additives. In order to showcase their superior qualities and performance, application results of BYKJET-9151 and DISPERBYK-2200 were presented at the ALTANA Innovation Conference 2013.

The main advantage of the two additives is their versatility in application. BYKJET-9151 is suitable for water- and solvent-borne as well as UV-curing systems. DISPERBYK-2200, on the other hand, can be used in solvent-borne and UV-systems.

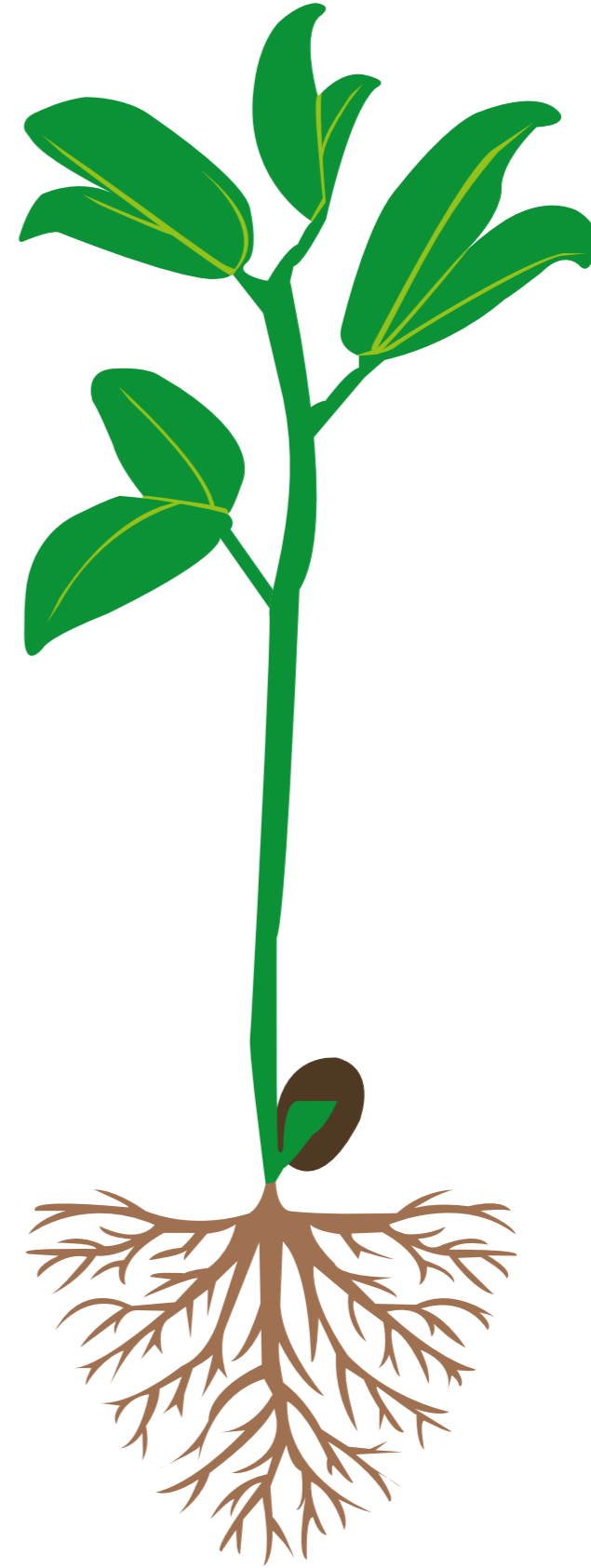
## Fast-growing market

The market for inkjets is expanding rapidly. Besides standard applications, a number of interesting new applications are coming into focus. These include digital instead of analogue printing of ceramic tiles.

In Europe, this shift is almost completed. Likewise, the field of digital textile printing is becoming more and more important.



**Young Entrepreneurs Invited**  
Growing Beyond to Achieve More



## Young Entrepreneurs Invited

This year for the first time ALTANA invites young entrepreneurs to present their business idea. One selection criterion for the invited lecturers is the relevance of their idea for ALTANA's innovation approach. This year entrepreneurs from two start-up companies were invited.

# Crowdsourcing for Identifying and Connecting Dispersed Intra-Organizational Knowledge: A New Era of Innovation Development

innosabi offers Open Innovation software platforms and supplementary consulting services. We help companies engage passionate customers and integrate them into innovation processes in order to sustain brand engagement, enhance revenues and respond to trends faster. We design and develop virtual places, win the right participants and convert the dialogue into precise product- and service-concepts. Our software helps to make this process efficient, transparent and fun.

Jan Fischer, Vincent Aydin, innosabi GmbH



Open Innovation has revolutionized organizations' innovation processes across industries and will continue to do so. Especially the B2C sector immensely profits from the methods Crowdsourcing and Co-Creation, allowing the involvement of customers into early phases of product development. The advantage lies in identifying, accessing and incorporating extra-organizational dispersed knowledge that a firm itself does not possess and which is very costly or impossible to acquire and transfer, known as "sticky information", such as customer desires regarding upcoming trends. Especially the heterogeneity in regard to backgrounds and peculiarities of said customer knowledge is highly valuable. In a next step connecting these knowledge bearers and fostering communication and cooperation between them yields promising results in the form of newly composed knowledge leading to innovative solutions. Customers' ability to contribute to innovation challenges is only surpassed by their willingness to do so. Being given the opportunity to have a share in the success of an innovative process through their participation makes customers feel appreciated and strongly connected to an organization and its offerings.

Successfully addressing Crowdsourcing projects therefore rests on three key components the solution seeker can draw on once they have been properly established. First a community needs to be readily available looking to take on said task – as stated the heterogeneity in terms of backgrounds and expert knowledge is key here. Second does this community need to be supported in their joint endeavor of pursuing a mutual goal. This support should be provided in the form of established processes and methods implementing a framework that mutual collaboration can rest on. Finally

a technology in the form of an innovation tool incorporating and representing these processes is essential for providing the common ground for joint collaboration on innovation challenges.

Exploring the methodological background behind B2C Crowdsourcing will then draw attention to the applicability of this concept to inter- as well as intra-organizational innovation and knowledge sharing challenges. Naturally there already is a community of employees pertaining to respective organizations willing and able to jointly collaborate on innovation challenges. For inter-organizational cooperation these would be separate firms or respective departments thereof. In the case of intra-organizational knowledge and solution sharing, the community looking to take over innovation challenges consists of single departments and their individual experts. In order to fully utilize the power of Crowdsourcing for addressing intra-organizational knowledge and solution sharing challenges, a firm now needs to properly implement a respective framework for providing guidelines for communication and collaboration.

Modern innovation platforms provide the ideal starting point for fostering cooperation between departments and the connection of dispersed knowledge their belonging experts hold. Their ability to contribute to innovation challenges lies in their respective expert status as a bearer of specific knowledge pertaining to a certain field. Organizations can profit from employing innovation platforms developed based on Crowdsourcing methodologies in order to identify, access and combine these individual experts. Enabling and fostering communication and cooperation between individual parties can then help achieve sustainably higher success rates in innovation management.

Crowdsourcing has become a proven and successfully utilized tool in the B2C environment and has been the origin of groundbreaking innovations in a variety of industries, yielding novel results in product categories such as high-pressure cleaners, nail polish, mustard, or shower gel. We outline what lessons organizations can draw from successful B2C Crowdsourcing and how to apply these techniques and methods to intra-organizational innovation goals using real-life case examples. Accordingly we address challenges in overcoming internal barriers and give an outlook into the prosperous future of knowledge management supported by Crowdsourcing.





# Certego – Study: Technology to Market-Process for the Polymeric Data Storage Technology

The Polymeric Data Storage Technology developed by Certego GmbH is a highly efficient data storage system which is applied in different industries: Products and goods in pharma & life science, automotive & industry, cosmetics and luxury goods are equipped with a novel identifier providing data-based security functions and applications.

Torsten Hupe, Certego GmbH



Increasing demands for individualized products in a global environment require new ways in process management: Data available locally with the product allow characterizing this item at any stage of its product life cycle (PLC) while at the same time components are secured against a rising number of counterfeit attacks. In addition specific industries like the pharmaceutical sector are facing new requirements by regulatory authorities asking for a better quality of information for doctors, pharmacists and patients.

The optical medium provides local storage capability for individual items: product related data, 1:1 linked to each component or packaging provides authentic information, ensured by its non-visible characteristics and cryptographic functions.

Core of the proprietary storage technology by Certego is a light-sensitive high-tech polymer for storing information in analogue and digital format: The optical medium is composed of molecular chains which are individually aligned in the process of writing. The procedure is derived from the DVD industry, allowing the secure and reliable storage of data in high volumes, which could not be handled for packages and labels in the past. The material is characterized by high mechanical robustness, resistance against humidity, electro-magnetic fields and temperatures up to 160° C.

The modular system consists of the medium and the corresponding reading units according to specific customer applications. Reading information is supported by compact electronic reading devices, smart phone applications or easy to use decoder cards.

Being attached to an automotive entertainment unit in a prominent use-case the data storage label provides storage capacity for more than 100 specific technical parameters of this component. The information becomes relevant e.g. during spare-part exchange and in conjunction with warranty processing.

As the media provides space for content in 'any format' there are unlimited applications providing improvements in processing and significant competitiveness for supplier and producing companies in the automotive industry. Flexible IT allows upgrading new functions in order to target ever changing market demands and new business opportunities.

## Field of applications (examples)

### Warranty Seal

- Local data storage for more than 100 technical parameters relevant for adjusting and calibration tasks in a complex system environment
- Warranty label, enhancing the processing of complaints by decentralized information, thus reducing cost, increasing quality and customer response
- Add-on business-offering, e.g. provisioning of service instructions in different languages

### Supply Chain Label

- Reliable production and service workflow by secured communication links, e.g. confirming when parts are activated or exchanged
- Seamless data flow by on-site data: comprehensive information on assembly parts interconnect supply chain partners and third parties (referring to "Industry 4.0")
- Reliable 1:1 assignment between individual components and complementary corresponding data (e.g. manuals, software updates)

### Product Protection

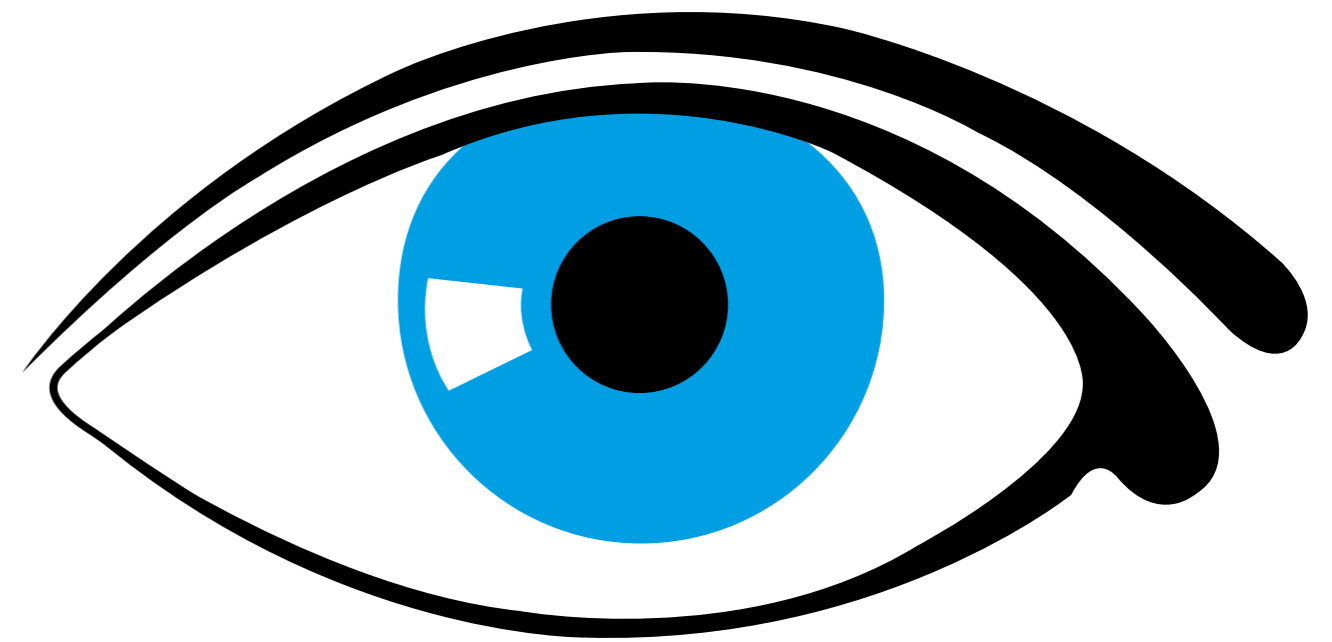
- Effective, IT-based protection ensuring 100% identification of automotive components which are targeted by counterfeits
- Flexible in concept, considering users and experts at different level
- Cost reduction of up to 90% compared to conventional anti-counterfeiting measures



Source: Certego GmbH



**Impressions**  
Experience Moments of Value Creation



























# ALTANA INNOVATION CONFERENCE 2013

Our Growth and Success Is Based on Innovative Work Behavior. Innovative Work Behavior Is Based on Belief in Innovative Self-Efficacy. Our Belief in Innovative Self-Efficacy Makes Us Do ...





...

M



R

E

Than One Has to.



**Innovation Honored**  
Rewarding Valuable Results





## Core Competencies and Innovative Work Behavior – Our Inner Values

As in previous years, the CTO opens the ALTANA Innovation Award Ceremony with a speech on the theme of the year – followed by the eagerly awaited announcement of the winning team.

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

Ladies and Gentlemen! It is my great pleasure to welcome you to the ALTANA Innovation Award Ceremony, which is brought to you by alumni and members of the Cross Divisional Development Program Innovation, which are: Dr. Arzt, Dr. Diehl, Dr. Eul, and Dr. von Hagen. For the 5th time now we are honoring the team with the most successful innovation of the year. I express our gratitude to all the teams who have applied for the award. The applications were of a very high quality. All these colleagues shown here on the screen have made an extra effort.

For my speech today I have chosen two topics: core competencies and innovative work behavior. Both are important. I will relate core competencies to shifting paradigms, and innovative work behavior to social cognitive theory. You are, no doubt, wondering how these topics can be related.

Therefore, let me begin with core competencies. Last year in this very same spot, here on stage, I talked about paradigm shifts, seeing things from a different point of view: The glass was neither half empty nor half full. It was twice the size it needed to be!

**ALTANA Innovation Award 2013 Applicants**

- Team ACTEGA 1:** Dennis Kötter, Brian Hoffert, Nadine Kretzer, Michael Lauer
- Team ELANTAS:** Dr. Mark Altmann, Dr. Klaus Jentert, Michael Jöns, Paul Steiner
- Team ALTANA:** Ingo Böhler, Guido Linsmeier, Thorsten Böhler, Frank Storz
- Team BYK:** Petra Lenz, Dr. Marc Helm, Dr. Hans-Joachim Lauthmeier
- Team ECKART:** Hermann Böhm, Dr. Oliver Stark, Dr. Erik Schmalzer
- Team ACTEGA 2:** Frank Kampouris, Tim Kottmann, Marcel Oberburg, Thorsten Koppitz

Today, in the morning session, I talked about a paradigm shift in relation to core competencies, which is crucial for innovation, hence for growth and value capture.

So, where are we today, and in which direction should we be shifting? Nowadays, my perception is, that generally we still see ALTANA as a portfolio of business divisions and, within the business divisions, as a portfolio of business lines. How about shifting this paradigm?

How about seeing ALTANA instead and in addition as a rich portfolio of core competencies, open to the entire Group?

And as the motto of this ALTANA Innovation Conference states... "Every great thing in our world only happens because someone does more than one has to" (H. Gmeiner). So, please give them all a round of applause! We will announce the winners in a moment.

This paradigm shift could give us an additional boost. The same applies on how to view our competitors. Don't we tend to monitor their products and price performance when we ought to have a closer eye on their portfolio and development of core competencies?



As the saying goes, core competencies are key! Therefore, I can only repeat: we have to carefully identify, acquire and develop, deploy, protect and defend our core competencies across all organizational and human silos. Only then will ALTANA be able to enjoy sustainable growth from year to year, like a strong tree.



To grow a tree to a certain height and size – representing our overall sales –, bearing all the leaves and fruits – representing our products –, it needs a solid trunk with an increasing diameter and circumference – representing our core products –, grounded on firm and expanding roots – representing our competencies. Using this metaphor to keeping the importance of core competencies in mind could help us shape our innovative work. To remind you of this metaphor you will receive a slice from an old olive tree. The year rings reveal the tree's annual growth. However, is it all about growing trees? Is that sustainable enough?

An old Chinese proverb – which, by the way, is a favorite of Jörg Bauer's, Head of Human Resources – says: "If you want 1 year of prosperity, grow grain, if you want 10 years of prosperity, grow trees, if you want 100 years of prosperity grow people!"

Growing people on the soil of our values enables them to develop their potential, to develop innovation. This boosts sustainable growth for the next decades – or, let's say, for the next 100 years to borrow from the Chinese proverb. This brings me to my second topic: innovative work behavior. What makes someone innovate and be motivated to perform?

Innovation and motivation to perform: two major drivers of our common corporate culture. "Innovation is a risky and uncertain undertaking. Innovative work behavior is bound to especially challenging and complex tasks, enfold-ing a broad variety of cognitive and social activities, such as generating, promoting, discussing, modifying, and ultimately implementing creative ideas" (Kanter 1988). Why make such great and uncertain efforts? Maybe we should ask all past win-



ners and today's winners of the ALTANA Innovation Award. The simplest answer to this question could be: "That is what you are paid for, that is why ALTANA has hired you. People and culture are crucial and pivotal, our most valuable treasures. We think that besides the technical skills you should be a competent social worker with strong social skills".

Is this correct? No, this can neither be the real motivation nor the answer to my question. Obviously, what I did, I asked myself about my own motivation to innovate and to perform. Then, one day this fall, still with this question and my findings in mind, I gathered with some bright students at St. Gallen University to discuss and challenge our ALTANA innovation approach in general.

It was there that I met Dr. Nadin Fischer (née Dörner) from the Institute of Technology Management in St. Gallen. Her PhD thesis deals precisely with my question.

This thesis is the first study – and, what's more, a very recent study – to systematically investigate innovative work behavior based on Bandura's social cognitive theory. The title is: "Innovative Work Behavior: The Roles of Employee Expectations and Effects on Job Performance". "Social cognitive theory provides a framework for understanding, predicting, and changing human behavior. According to social cognitive theory, people hold two expectations concerning behavior: The first relates to expectations concerning one's ability to perform a particular behavior, that is (i.e.), self-efficacy. The second encompasses the expected outcomes of that particular behavior." (Dörner 2012). Self-efficacy therefore is the key to answering our question why someone engages in innovation.

Self-efficacy plays the pivotal role in the context of innovation. More specifically, and according to Dr. Fischer, innovative self-efficacy is a person's belief in their capabilities to produce innovative outcomes.

"Innovative self-efficacy", and again I quote Dr. Fischer, "is supposed to influence people's initial decision to engage in innovative work behavior, their degree of persistence and effort expenditure when they face difficulties in the course of action, and the effective use of the competencies they possess regarding innovative work behavior".

Earlier studies found that employees who display innovative work behavior are likely to run the risk of conflicts with co-workers who want to prevent innovative change or that innovative work behavior is related to stress reactions on the part of the respective employees.



However, with her very systematic, survey-based study, Dr. Fischer discovered that innovative work behavior positively influences innovative task performance. Furthermore, she discovered that innovative-self efficacy is a key personal characteristic for innovative work behavior that can be shaped.

So, the next interesting question therefore is: What are the antecedents, the major drivers of innovative self-efficacy and how can we at ALTANA influence them in a supportive way? First of all, our own personality is certainly one of the major drivers. We can develop our personality by experiencing performance accomplishments but also by experiencing failure. With development dialogues, talent evaluation processes, and different management development programs, we offer support in developing personality with regard to skills, capabilities, and competencies.

The Cross Divisional Development Program Innovation (CDDPI) is one good example. I can only encourage you to make active use of this provision.

Secondly, it transpires that co-worker exchange very much supports innovative self-efficacy. If we want to develop our personality, we need role models, we need examples for vicarious experiences! High-quality relationships provide a safe and supportive network based on trust from which to receive feedback and experience encouragement from other members, and to master the challenges of innovative work behavior. The ALTANA Innovation Community offers these high-quality relationships, very much supported by the ALTANA Innovation Conferences and the ALTANA Innovation Portal. However, high-quality relationship implies proactive action – "give and take" not simply "take"! Thirdly, forming high innovative self-efficacy beliefs needs leadership and organizational support. In a work environment where innovation is encouraged and valued throughout the whole organization, employees will have plenty of opportunities to observe people that successfully engage in innovative work behavior (Bandura 1986, cited in Dörner 2012).

Encouraging innovation means, that leaders believe in the capabilities of their team members, that they motivate them to take entrepreneurial risks, empower them to act and, at the same time, let them know and experience that failure is not the end of their career. Certainly, this is not meant to be a "free ticket" for failing all the time.

So what do we offer in this regard? First and foremost, our basic ALTANA values of openness, trust, empowerment to act, and appreciation very much support innovative self-efficacy and hence innovative work behavior. No wonder, these values have been called for by all our employees in all parts of ALTANA. You should expect them of your leadership team but also apply them if you are in a leadership role. Good leaders communicate high performance expectations and express confidence in their followers' ability to meet these expectations at the same time (Eden 1992, cited in Dörner 2012).



In this regard, I very often encounter the phrase "This idea or that idea needs top management attention and support". I can guarantee you: at ALTANA innovation has top management attention and receives top management support in many ways. I think that there is a clear message from our board, Dr. Matthias L. Wolfgruber and Martin Babilas, and from the ALTANA Innovation Council that if there is a good, well thought out idea that you want to pursue, there will be personal, organizational and financial support.

Relying on our core competencies and backed up by your innovative self-efficacy belief, you will certainly have to fight for your idea – but this is part of innovative work behavior. However, it might be that this only happens if one is ready to go that extra mile, to do more than one has to.

Now let's return to our Innovation Award, to the people who proved their innovative work behavior, and let me hand you back over to my team here on stage. Thank you very much.

Coming to a conclusion, I wish to state that, in my opinion, all the antecedents for innovative self-efficacy are well covered within our company. However, it is up to us to take advantage and feel free to engage in "thinking in alternative ways, searching for improvements, figuring out new ways to accomplish tasks, looking for new technologies, applying new work methods, and investigating and securing resources to make new ideas happen" (Dörner 2012).



# Nominations for the ALTANA Innovation Award 2013

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 submitted for the ALTANA Innovation Award. The ALTANA Innovation Council nominated the top two teams and their projects as nominees for the ALTANA Innovation Award 2013. Here is a brief description of the nominations.



#### Team (from left)

Dr. Majdi Al-Masri · Dr. Klaus Lienert · Michael Glomp · Paul Osman

**ELANTAS** Beck's research team developed VOC-free impregnating resins by applying a technically elaborate process. One problem with normal UP resins (unsaturated polyester resins) is that they contain styrene or vinyl toluene – substances that react during the curing process and are very toxic. They are VOCs (volatile organic compounds), that is, they are carbon-based substances that are gases at room temperature. If human beings breathe these substances in, they can fall sick for long periods. ELANTAS actually developed two solutions to this problem.

**Monomer-free (MF) resins.** In a chemical procedure, the ELANTAS researchers dissolved long chain, unsaturated polyester-ester polymers (which are UP resins) in a short chain UP polymer. However, this method is quite tricky for developing products with a prescribed viscosity. Viscosity is a measure of how thin or thick a fluid is. The higher the viscosity, the thicker the medium. This solution cannot satisfy all customer requirements because the MF resins are too viscous for many areas of application.

**Acrylic systems.** Supplementing the existing product portfolio, "acrylic systems" is the name given to a product family with a lower viscosity. Among other things, the developers had to find a recipe for a substance that was highly resistant to breaking, but also malleable. Achieving these properties in combination with temperature resistance and excellent technical characteristics was just one of the challenges that the researchers tackled successfully during the development process. The products developed in this project offer VOC-free solutions satisfying all customer requirements. ELANTAS has been marketing the acrylic technology under the name "ELAN-protect" since 2012, while MF resins are marketed separately. Dr. Majdi Al-Masri, Dr. Klaus Lienert, Michael Glomp, and Paul Osman have thus helped to ensure that ELANTAS can continue consolidating and extending its leading position in the future.



#### Team (from left)

Frank Kamphuis · Tim Kammer · Marcel Altenburg · Timo Kondziela

**ACTEGA's** research team developed special coatings for "in-mold labeling" (IML) on plastic containers. The new development allows a film with any kind of structure or printing to be inserted into an injection molding tool that is then filled with liquefied plastic to produce the type of container required. The individual processing steps are carried out at such high speed that the technology used ranks among the most complex procedures in the packaging industry. Precise working at speeds like these, however, poses new challenges for the printers and packaging manufacturers.

The researchers on the ACTEGA team quickly realized that standard coatings were not going to fulfill the demanding requirements – so here they would need to take a completely new development approach. A team of experts formed specifically for this purpose developed a solution by combining product and process innovations. During their research, the group used new raw materials and innovative formulation strategies. Not least the good interplay between technology and marketing led to what can now justifiably be called a resounding success. Today ACTEGA Terra is a European market leader in IML coatings on a market that continues to grow dynamically and promises a great future for the product group.



**Celebrating Innovation**  
Appreciating the Ideas Resulting  
from Our Innovative Work Behavior





















**TIMO KONDZIELA &  
MARCEL ALTENBURG &  
FRANK KAMPHUIS &  
TIM KAMMER**



## ACTEGA Wins

This year again, researchers and developers from the ALTANA Group met in Wesel in November for the ALTANA Innovation Conference. This was also the setting for the presentation of the ALTANA Innovation Award.

Host of the ceremony: Dr. Georg F. L. Wießmeier, Chief Technology Officer at ALTANA, making his dinner speech



Along with the host and Chief Technology Officer (CTO) Dr. Georg F. L. Wießmeier, a team of presenters guided the guests through the evening's entertainment.

The presenters were former and active participants in the Cross Divisional Development Program Innovation (CDDPI): Dr. Anna-Maria Diehl, Dr. Stephanie Arzt, Dr. Matthias Eul and Dr. Robin von Hagen.

### Award for coating Innovation

This year's coveted ALTANA Innovation Award went to ACTEGA. Dr. Georg F. L. Wießmeier presented the trophy to the project team comprised of **Frank Kamphuis**, **Tim Kammer**, **Marcel Altenburg** and **Timo Kondziela** on the first evening of the Innovation Conference, to honor their development of special coatings for "in-mold labeling" (IML) on plastic containers. The new development allows a film with any kind of structure or printing to be inserted into an injection molding tool that is then filled with liquefied plastic to produce the type of container required. The individual processing steps are carried out at such high speed that the technology used ranks among the most complex

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A key slogan for the meeting of the 160 researchers stresses how important core competencies are to ALTANA. The drive for innovation is doubtless a major factor here. "ALTANA's culture of innovation is really put into practice at events such as the ALTANA Innovation Conference," Dr. Georg F. L. Wießmeier continued. "We owe our leading position first and foremost to our desire to continually perfect our products and develop new ones, so that we can meet the needs of our customers and exceed their expectations." He praised all the teams that had shown such dedication in entering for the ALTANA Innovation Award 2013. He drew special attention not only to the winning team but also to the team from ELANTAS, which was also nominated.

*"Core competencies are the skills that enable a firm to deliver a fundamental customer benefit."*

### Technical innovation by ELANTAS

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### Regional Innovation Conferences in the Americas and Asia from 2014

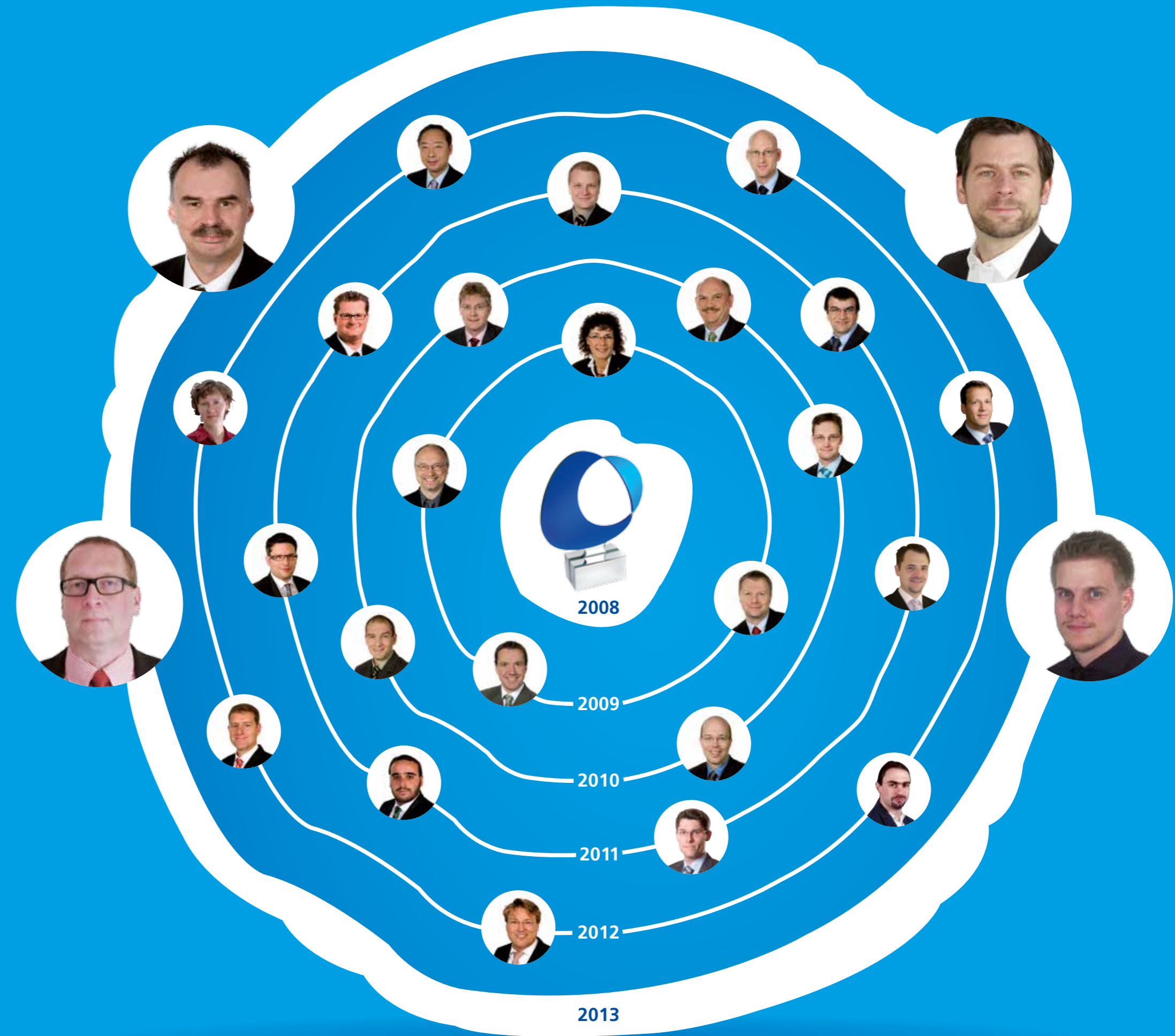
The ALTANA Innovation Conference celebrates its sixth anniversary in 2013 and has some innovations in store. Next year, the first regional Innovation Conferences will be held in America and Asia, and will take place every two years. In the future researchers will meet for biennial global Innovation Conferences in Wesel. This is intended to enhance the exchange of information and views between the divisions, and the drive for innovation in the regions.



**Congratulating the winners (from left):** Dr. Peter K. Jenkner, CTO ACTEGA, Dr. Georg F. L. Wießmeier, CTO ALTANA, Timo Kondziela, winner, ACTEGA Terra, Frank Kamphuis, winner, ACTEGA Terra and Dr. Matthias L. Wolfgruber, CEO ALTANA



Are The Winners 2013!

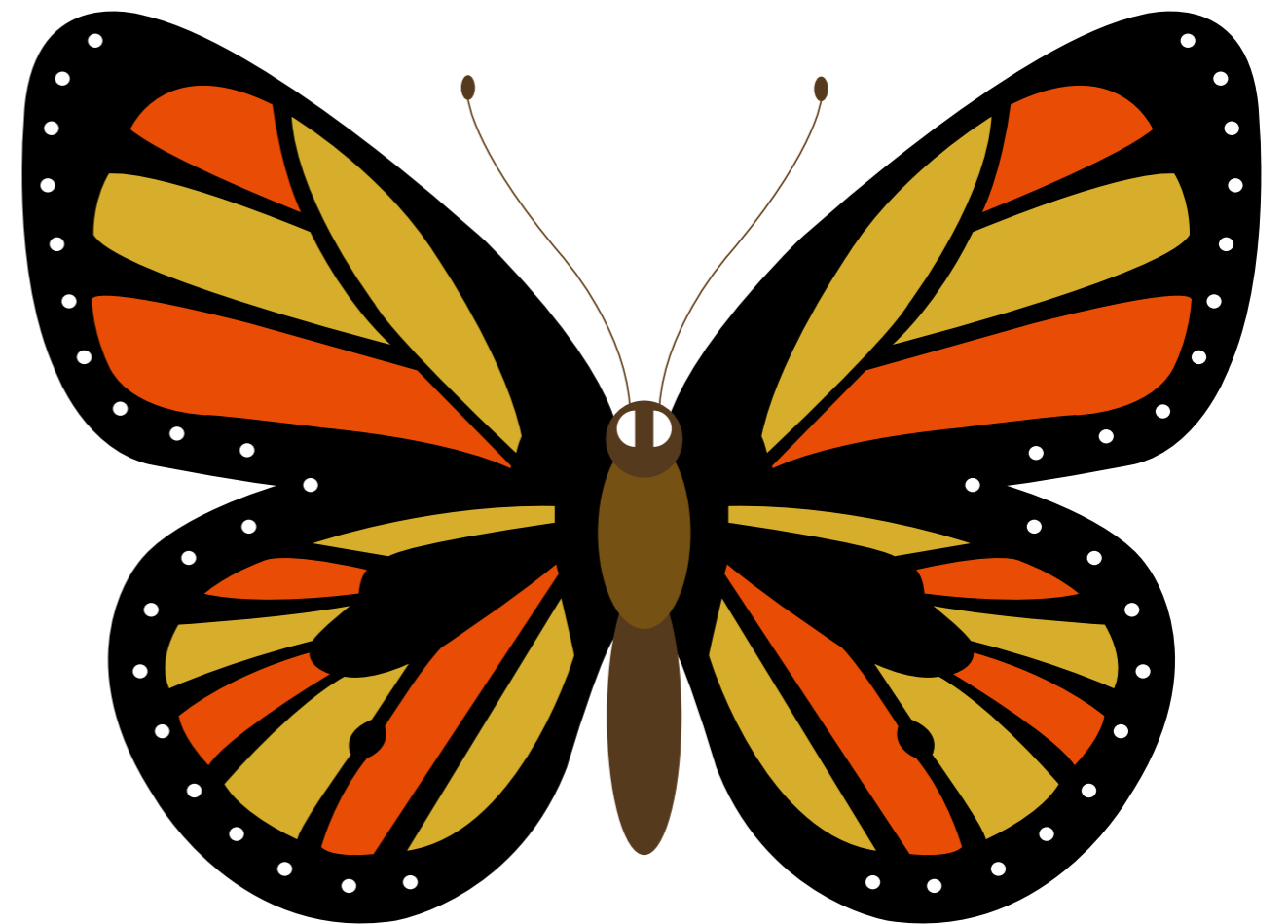




**Please Scan to See All the  
Former Winners in Motion**



**Success Stories**  
Looking Back on Progress





## ALTANA Innovation Award Success Stories

In this new section of the brochure we want to learn what happened with the projects and teams we have awarded years ago. The first success story is about a family of extremely thin, high-quality metallic pigments. This was the first innovation to receive the ALTANA Innovation Award back in the year 2009.

# Printable Mirrors for Luxury Packaging

In 2006, ECKART and BYK joined forces to optimize the milling process for metallic pigments. The result is a family of extremely thin, high-quality effect pigments for high-end applications. It was the first innovation to receive the ALTANA Innovation Award – and proved to be a true business success.

Winners of the ALTANA Innovation Award 2009 and congratulators (from left: Dr. Peter K. Jenkner, CTO ACTEGA, Dieter Pröbß, ECKART, Dr. Stephan Roth, ECKART, Dr. Jürgen Omeis, CTO BYK, Bärbel Gertzen, BYK, Dr. Stefan Trummer, former CTO ECKART, Dr. Wolfgang Pritschins, BYK, and Dr. Georg F. L. Wießmeier, CTO ALTANA).



The first team to receive the ALTANA Innovation Award was a joint group of ECKART and BYK researchers and managers. Together they had developed a new manufacturing process for effect pigments which resulted in a new group of pigments, MIRRORGOLD and PLATINVARIO.

While ECKART focused on the milling process itself, BYK developed a special additive to be used in the process. It helped to optimize the effect pigments features considerably.

That was back in 2009. Four years later, we are taking a look at the innovation again to see what business successes it delivered.

### The innovation

The packaging is attractive and the paper a mirror-like gold. It looks really classy – yet if you peel off the adhesive strip,

the golden printing ink comes off with it. And that does not look good. This kind of effect is bad for the image, especially with branded products in high-quality packaging, for example high-end perfumes or expensive cosmetics.

MIRRORGOLD and PLATINVARIO do not flake off. The special advantage of these effect pigments is that the extremely thin metal particles (mean thickness ~ 30 nm) create an absolutely sharp and brilliant image – a mirror-like effect – because they arrange themselves horizontally to the substrate within the layer of paint or coating. This allows the surfaces already printed in gold or silver to be overprinted, for instance with lettering or another ink, which is a key requirement for printing inks used in packaging for high-end branded articles.

The two highly brilliant pigment types have yet another important advantage over other effect pigments. They have a

much longer shelf life, i.e. twelve months instead of only six. This is due to the additive used in the manufacturing process.

### The success

"In the four years, since we received the award, our sales of these high-quality mirror-effect pigments are in the millions of euros," says a delighted Dieter Pröbß, Global Head of R&D Technology & Process Development. Now the developing team wants to score again: The manufacturing process is to be expanded to cover more applications.

"We are in close contact with the major brands in the food and cosmetics industries," Dr. Stephan Roth, Senior Project Manager, adds: "This means that if necessary, we can provide direct support in the implementation of their design ideas."

### The new goals

The aim is to increase the proportion of effect pigments in the market for printing inks. At present it is around two percent. "Every new gold or silver-colored area on the label or packaging of a branded product increases our sales considerably," Pröbß points out.



Alongside the mirror-effect pigments, ECKART also uses the newly developed additive for manufacturing all its finer pigments that are sold in Asia. There it is added after the traditional milling process, to improve the shelf-life of the products. That now gives ECKART pigments a major competitive advantage on the Asian market.

### Further development for migration-free applications

Pröbß and Roth want to apply the procedure to more additive recipes. To start with, they are planning to use an additive for stabilizing mirror-effect pigments in environmentally friendly, water-based coatings. After that they want to create an additive to render all of ECKART's pigments that are suitable for food packaging migration-free.

In fact the pigments already satisfy the legal food compatibility requirements in all the regions where they are used. But now the aim is to ensure that no substances of any kind can migrate from the packaging into the food, which adversely impact on its quality or affect the health of consumers. Initial tests for the new additive are already under way, Roth explains. It should be ready for market launch in 2014.



Find out details about the joint innovation by ECKART and BYK here

**And This Is Your Chance**  
to Become a Future Winner

**ALTANA  
INNOVATION  
AWARD  
2009  
2010  
2011  
2012  
2013**

**2015  
IS CALLING  
FOR YOUR  
INNOVATION!**

**Share knowledge! Capture value! Lay down a marker!**

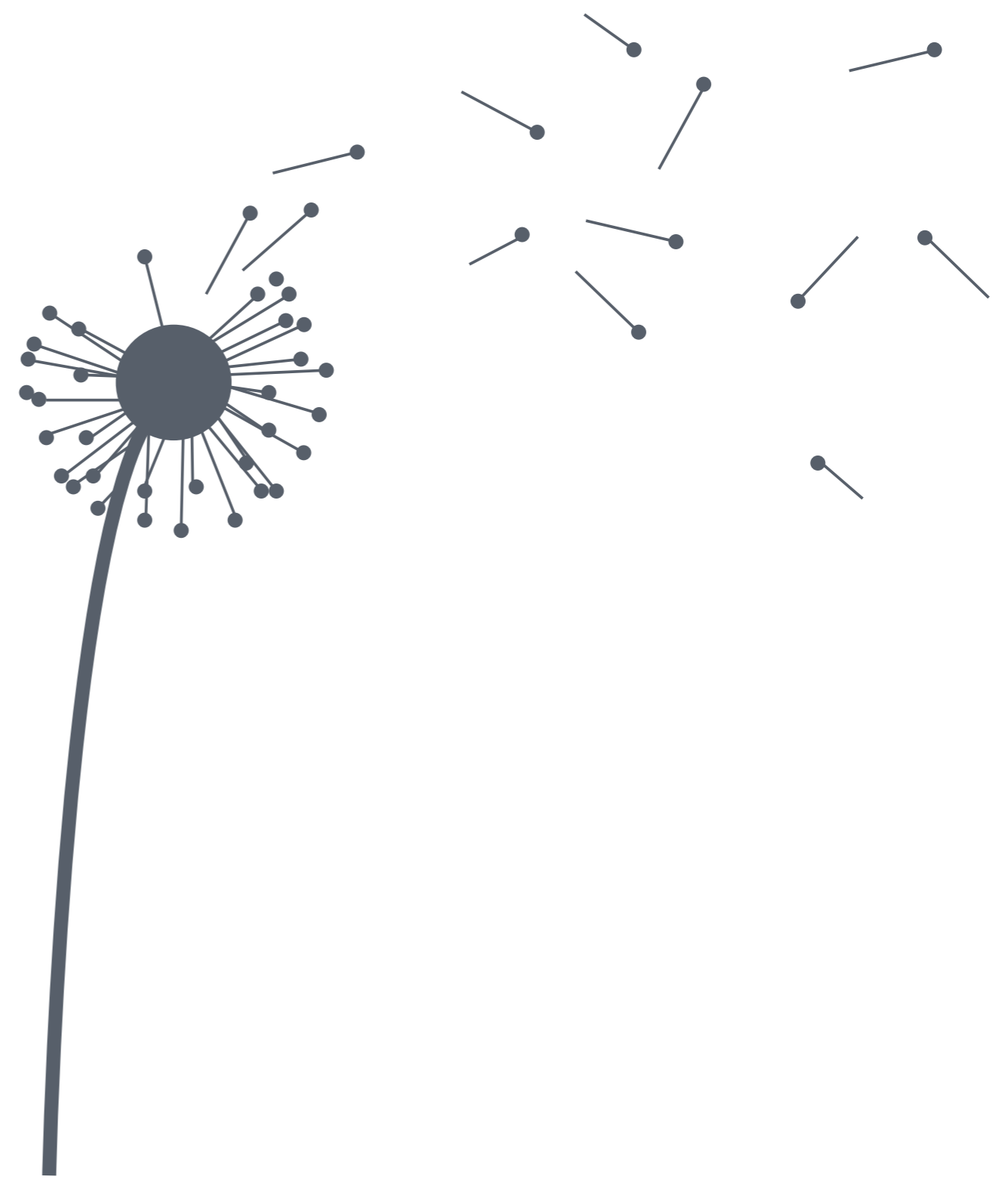
Submit your application for the ALTANA Innovation Award 2015 to [innovation@altana.com](mailto:innovation@altana.com) by September 15th, 2015!  
Application forms and more details are available on [www.altana.intranet/AIA](http://www.altana.intranet/AIA). I wish you every success!

  
**Dr. Georg F. L. Wießmeier**  
Chief Technology Officer

 **ALTANA**



**Innovation at ALTANA – Part II**  
Passing on Knowledge to Find  
New Grounds for Growth



## 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 ELANTAS.

# ELANTAS Electrical Insulation: We Keep Tension Under Control

ELANTAS produces liquid electrical insulation materials for the electrical and electronics industry. Our business consists of three business lines: Primary Insulation (PI), Secondary Insulation (SI), and Electronic and Engineering Materials (E&EM).

Dr. Horst Sulzbach, ELANTAS

### Primary Insulation

Primary insulation describes the wire enamel applied directly to the electrical conductor. The wire enamel is applied to the metal wire concentrically in several consecutive coating operations by means of a thermal coating process known as enameling. The wire enamel is a varnish that consists of organic components (pre-polymers) that polymerize during the baking, forming an impermeable, duroplastic electrical insulation layer. Apart from the basic electrical insulation, wire enamels have to fulfill further requirements such as high thermal and mechanical stability, flexibility, moisture resistance, and long service life of the insulation.

### Secondary Insulation

Secondary insulation (SI), also referred to as impregnation, is applied to the finished electrical device to protect the motor, transformer, or generator against abrasion. This heat-cured coating also increases the mechanical stability of the electrical winding and protects the device from environmental influences such as moisture. The impregnation is applied via a trickle, dip or dip-and-roll process.

However, today impregnation is increasingly performed using a vacuum process (VPI process) in order to completely eliminate any air that might be trapped. Trapped air bubbles reduce heat dissipation, air being a good heat insulator. In addition, they can cause disruptive electrical charges in high-voltage applications, which can destroy the insulation.

As an alternative to heat curing, UV light curing can be employed; this creates very highly cross-linked and impermeable impregnating layers. SI coatings are usually either unsaturated polyester resins (UPs) with styrene or vinyl toluene as a reactive thinner or UPs without volatile organic substances (monomer-free or MF resins). Epoxy or alkyd resins can be employed, too.

### Electronic and Engineering Materials

E&EM describes applications in which electrical and electronic components are embedded or completely encapsulated in a protective polymer. Many electrical devices such as sensors, instrument transformers and induction systems require special properties, such as improved heat dissipation, outstanding



mechanical stability at high vibrational forces and noise reduction. Often, environmental influences must be excluded completely. These properties are obtained by embedding or completely encapsulating the device with an insulating material. Depending on whether the mold is removed after casting or becomes a permanent element of the cast part, the process is referred to as casting or potting insulation.

A second business within E&EM is printed wiring board (PWB) coating. Thin coating layers are applied to protect the PWB from harmful environmental influences. The process is known as conformal coating.

The ELANTAS group, with headquarters in Wesel/Germany is a genuine "global player" with more than three quarters of its sales generated outside of Europe. The ELANTAS group has operations in Germany, Italy, India, China, Malaysia, USA, and Brazil. In 2013 ELANTAS had achieved sales of 414.6 million euros.





# ALTANA Technology

## Platform Printed Electronics: Status and Applications

The market for printed electronics is extremely diverse, with most segments promising high returns. Thanks to its technology platform Printed Electronics (PE), ALTANA is well positioned to participate in this growing industry. First achievements range from printing organic transistors to creating electroluminescent displays.

Dr. Martina Weidner, ECKART

In 2011, ALTANA established the technology platform Printed Electronics (PE). It conducted research and development on inks with different functions, optimized for printing applications and curing conditions as well as for electrical performance. Two years later, in 2013, the first products were launched. Among them are conductive and dielectric inks as well as an ultra-violet (UV) curing ink set for electroluminescent (EL) displays.

As for applications in printed electronics, the platform succeeded in printing organic transistors, EL displays, batteries and organic photovoltaics (OPVs). The function, set-up and use of printed EL displays and printed batteries are described below.

### Structure of EL displays

EL displays serve as background illumination in technical equipment. A typical display consists of four layers of inks on a transparent substrate. The first layer is a transparent conductive ink, the second is a luminescent ink containing doped ZnS, with the dopant determining the color. The third layer consists of a dielectric ink. The last layer, also a conductive ink, forms the backside electrode. If an AC/DC voltage is applied to the two electrodes, electrons are accelerated in the luminescent layer, producing the display's light.

### Structure of printed batteries

Printed batteries are the main energy source for printed electronics displays, RFIDs and sensors in consumer packaged goods or graphic arts items. ALTANA is currently intensively researching inks for these batteries, and initial printing trials have been successful.

Usually, printed batteries are produced in two steps. In the first step, a conductive ink is printed onto a foil substrate. Then, an active layer is applied, consisting of an anode ink on one half (e.g. zinc ink) and a cathode ink on the other half (e.g.  $\text{MnO}_2$ ). In the second step, a mat of fibers wetted by an electrolyte such as potassium hydroxide (KOH) is laminated between the two halves of the substrate.

As soon as the two active materials are connected via an external circuit, the zinc is oxidized at the anode to  $\text{ZnO}$ .



The  $\text{MnO}_2$  in the cathode takes up the freed electrons and is reduced to  $\text{MnO}$ . The constant flow of electrons creates a voltage, which can be used to power electrical appliances like displays or sensors.

### Markets for printed electronics

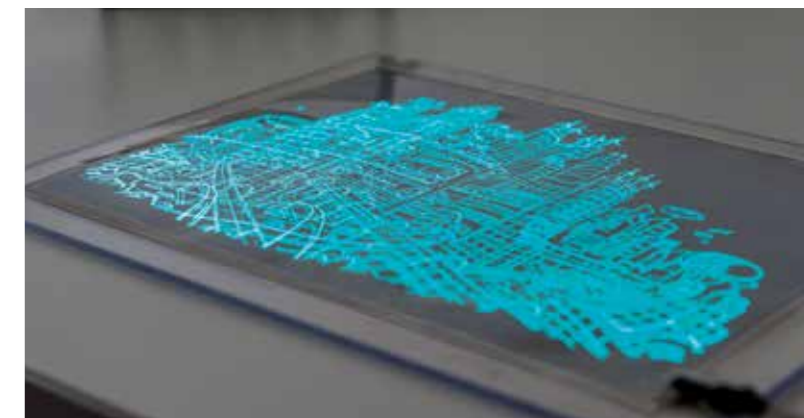
The market for printed electronics consists of two segments, the electronics industry and the printing community. The electronics industry can be subdivided again into conventional electronics industries and organic electronics.

In the conventional electronics industry, printing electronics is a well-established technique used to reduce the production costs and weight of electronic components. The market for inks has existed for several decades and includes conductive inks (e.g. for screen heaters), dielectric inks for capacitors and printed electroluminescent inks for automotive interior lighting.

These days, screen printing is primarily used to apply the inks. However, digital printing techniques are becoming more and more important. The conventional electronics industry is an interesting market for ALTANA because it is already generating profits. On the other hand, given the tough competition, ink performance has to meet the highest standards.

As far as organic electronics are concerned, giants like Samsung, LG or Sony are pushing the production of light weight and flexible displays based on printed materials. For ALTANA, applications like these are also extremely interesting as they promise a high return. However, a lot of fundamental research has still to be carried out.

The second market segment is part of the printing community. Printers and converters have to be addressed, as do the brand owners whose products will contain the devices. Consumer packaged goods (CPG), point of purchase (PoP) solutions and graphic arts products are obvious candidates for the use of printed electronics. This segment is still in its infancy. Again, fundamental research is needed in order to satisfy the demands of future customers. They expect system solutions which support their production processes. Nevertheless, the market seems to be extremely interesting due to its large volumes.



# Cross-Divisional Feasibility Study

## Batteries and Energy Storage

Is ALTANA ready to meet the battery industry's demands? A cross-divisional feasibility study shows that based on its broad base of technological competencies, the Group is able to offer value added solutions. These range from special binder systems for coatings to sealing, encapsulating and specialty materials and include additives as well.

Dr. Ralf L. Hoffmann, BYK, Dr. Robin von Hagen, ALTANA

The growing future markets for renewable energy production, smart grid technology and electromobility are driving an increasing demand for efficient energy storage and conversion devices, such as lithium ion batteries, fuel cells and supercapacitors.

Manufacturing these devices demands competence in many fields. Know-how regarding homogeneous coatings, chemical resistant sealants and functional materials are among the critical requirements.

The battery industry strives not only to achieve a better product performance. It also aims to reduce weight/cost and to improve energy density. Ultimately, it wants to prolong the life cycle of batteries.

### ALTANA plans solutions with added value

As an innovative specialty chemicals company, ALTANA wants to contribute to the further development of these growing markets. It plans to offer outstanding solutions to the battery and energy storage industry, creating added value for its customers.

With its feasibility study "Batteries and Energy Storage", ALTANA aims to demonstrate the technical competencies of its four divisions in this field. Merging these diverse competencies and solutions can leverage significant synergies in a highly competitive environment. In the long run, this helps to market new products.

### The competencies of the four divisions

The feasibility study shows that the divisions can support the battery industry in many ways. Depending on their specific know-how, the divisions can improve individual products as well as the production process in general.

#### ACTEGA Coatings & Sealants

In collaboration with Miltec UV, the division developed energy- (UV- or electron beam-) curable electrode binder systems. By speeding up electrode production, these systems help to shorten the production line. As a result, costs in electrode manufacturing could be reduced by almost 85 percent. Additionally, the process becomes more environmentally friendly, as it eliminates harmful N-methyl pyrrolidone, traditionally used in electrode manufacturing.

#### BYK Additives & Instruments

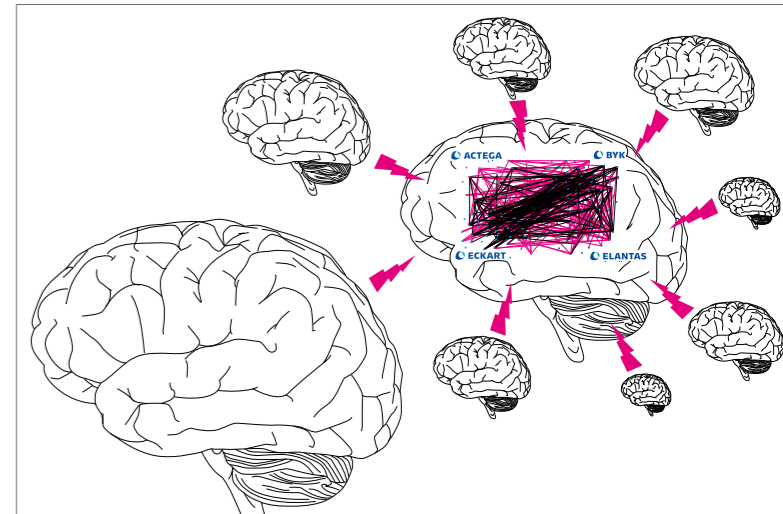
BYK additives are used to improve the dispersion of active materials as well as carbon black, graphite and carbon nanotubes. They can also upgrade the rheology and degassing properties of the coating slurry to improve the homogeneity of the electrode coating. BYK additives can also be utilized in the production of the ceramic or polyolefin separators to enhance their performance.

#### ECKART

This division produces metallic materials for battery applications and specialty glass materials for battery separators. Its competencies in surface treatment and its know-how regarding the synthesis of graphene or graphene/metal composites provide a further advantage: They have enormous potential to enhance battery performance and service life. Additionally, the metallic materials can be used in formulations for inks used to print batteries.

#### ELANTAS

As the market leader in primary and secondary electrical insulation, this division produces sealing and encapsulating materials for the battery industry. Their products possess high temperature-resistant and dielectric properties. The division's moisture- and chemical-resistant polymers offer marked advantages in the production of electrodes and separators. Alternatively, they can be used to seal the cells.





# Graphene: The New Wonder Material?

Since its discovery in 2004, graphene has been attracting a tremendous amount of attention on account of its exceptional mechanical, electronic, and thermal properties. Not surprisingly, experts foresee a huge market potential in the near future. Applying its comprehensive know-how in the production and stabilization of thin flakes, ECKART is establishing a new production method to address this new market.

Angela Hullin, Alexandra Schneider, ECKART



## The special characteristics of graphene

Graphene, the thinnest material known to science, consists of covalently bonded carbon atoms organized in a hexagonal lattice. The material exhibits a range of superior properties. In particular, it features the largest specific surface area ever measured. This is the essential criterion for using graphene in porous electrodes of batteries, supercapacitors, catalyst support of fuel cells or hydrogen storage. Moreover, due to its extremely high Young's modulus and intrinsic strength, the material can act effectively as a nanofiller in polymer composites.

Graphene also has a very high breaking strength – an ideal prerequisite for its use in wind turbine blades. In addition, graphene conducts electricity as efficiently as copper, making it a perfect candidate for flexible electronics, conductive inks, and antistatic composite materials.

Contrary to carbon nanotubes, graphene can be produced at ambient conditions. This paves the way towards large scale production and application. Although the graphene industry is still young, it is expected to grow extremely rapidly over the coming years. For example, Lux Research estimates that the graphene market will grow from \$9 million in 2012 (mainly for R&D purposes), to \$126 million in 2020.

Promising short-term applications of graphene range from low-cost electronics to high-end composite materials, e. g. coatings, energy storage devices, and lightweight composites. In the long run, the use of graphene in high-end electronic applications like displays and other electronic applications is conceivable.

## Business opportunities

Originally, scientists used the highly experimental Scotch tape method in order to produce graphene. In this process, single graphene sheets are exfoliated using adhesive tape.

In contrast, ECKART is exploring alternative, more scalable production processes to elevate graphene from the scientific level to commercial viability. Given our expertise and knowledge in delamination processes, we consider the production of graphene via liquid-phase exfoliation a promising new business opportunity. During this exfoliation process, graphite is delaminated by means of high-shear forces into high quality few-layer graphene. Most importantly, the resulting material is not oxidized.

This characteristic clearly differentiates ECKART compared to competitors employing a production method which involves oxidization.

Besides efforts to develop a large-scale industrial graphene production, the most important task now is the commercialization of graphene. This new material now needs to be successfully implemented in existing and new applications. Or, as Konstantin Novoselov, the British physicist and Nobel Prize winner of 2010, said: "Graphene has a potential to revolutionize many aspects of our lives simultaneously. Some applications might appear within a few years already and some still require years of hard work."



## Customer Presentation: Sun Chemical Corporation (The Evolving Innovation Process at Sun Chemical)

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. Russell Schwartz of the Sun Chemical Corporation.

Dr. Russell Schwartz, Sun Chemical Corporation



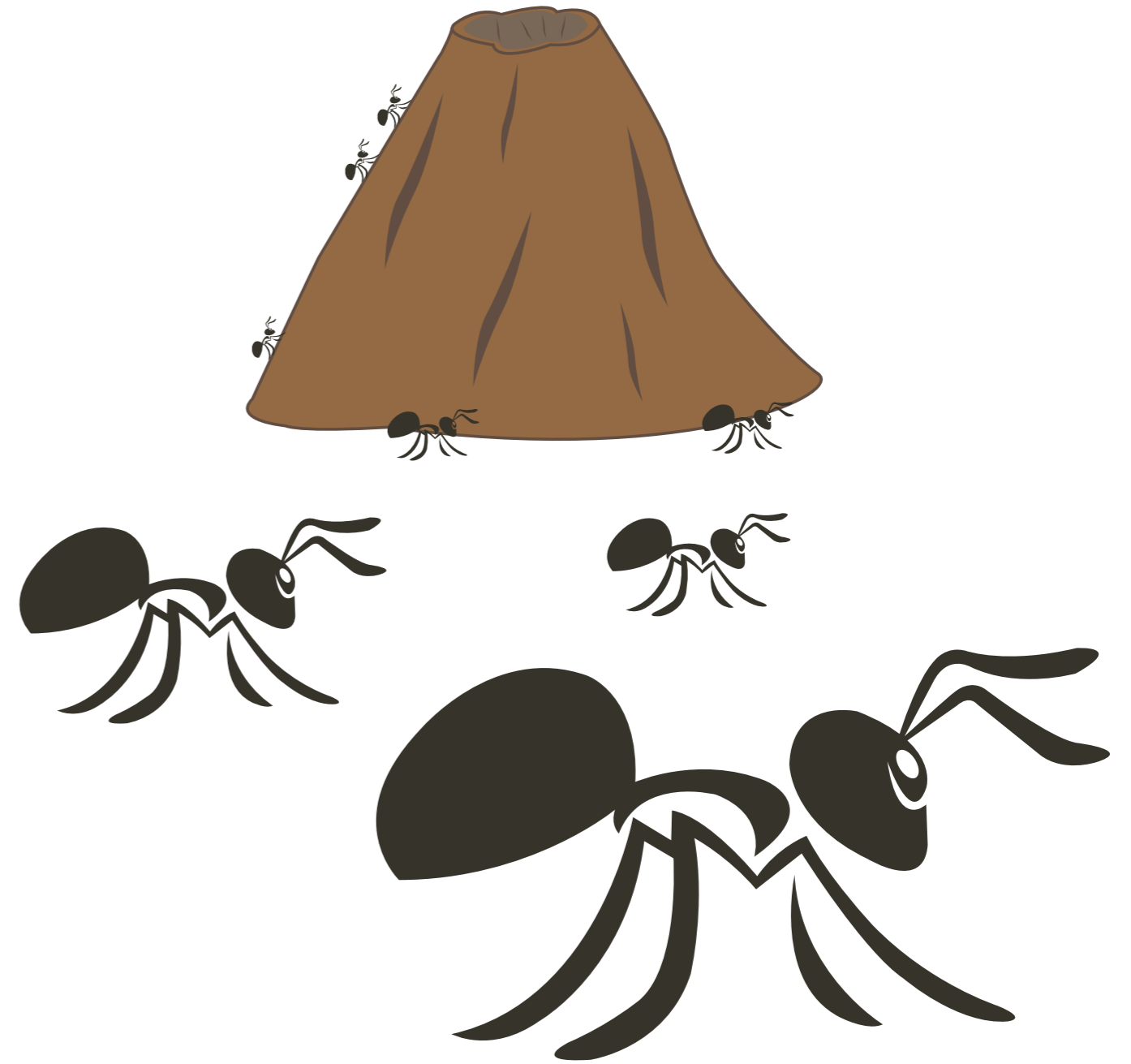
The innovation process has become a critical business process for most companies today due to a need to differentiate their products and services. The main driver for this differentiation is increased competition, which is due in large part to high efficiency, low cost web-enabled communication. Perhaps only through innovation can companies differentiate their products and services to create the customer value needed for sustained growth and prosperity. Sun Chemical and its parent company, DIC, invest heavily in R&D.

The technology philosophy and innovation processes being employed by Sun Chemical to help achieve its financial objectives and transform its businesses are based on driving interaction and communication. While this may seem obvious, the mistakes and missed opportunities caused by failure to respect the importance of information gathering and sharing may not be fully appreciated. The importance of effective communication and technology connectivity is the main theme of the presentation.





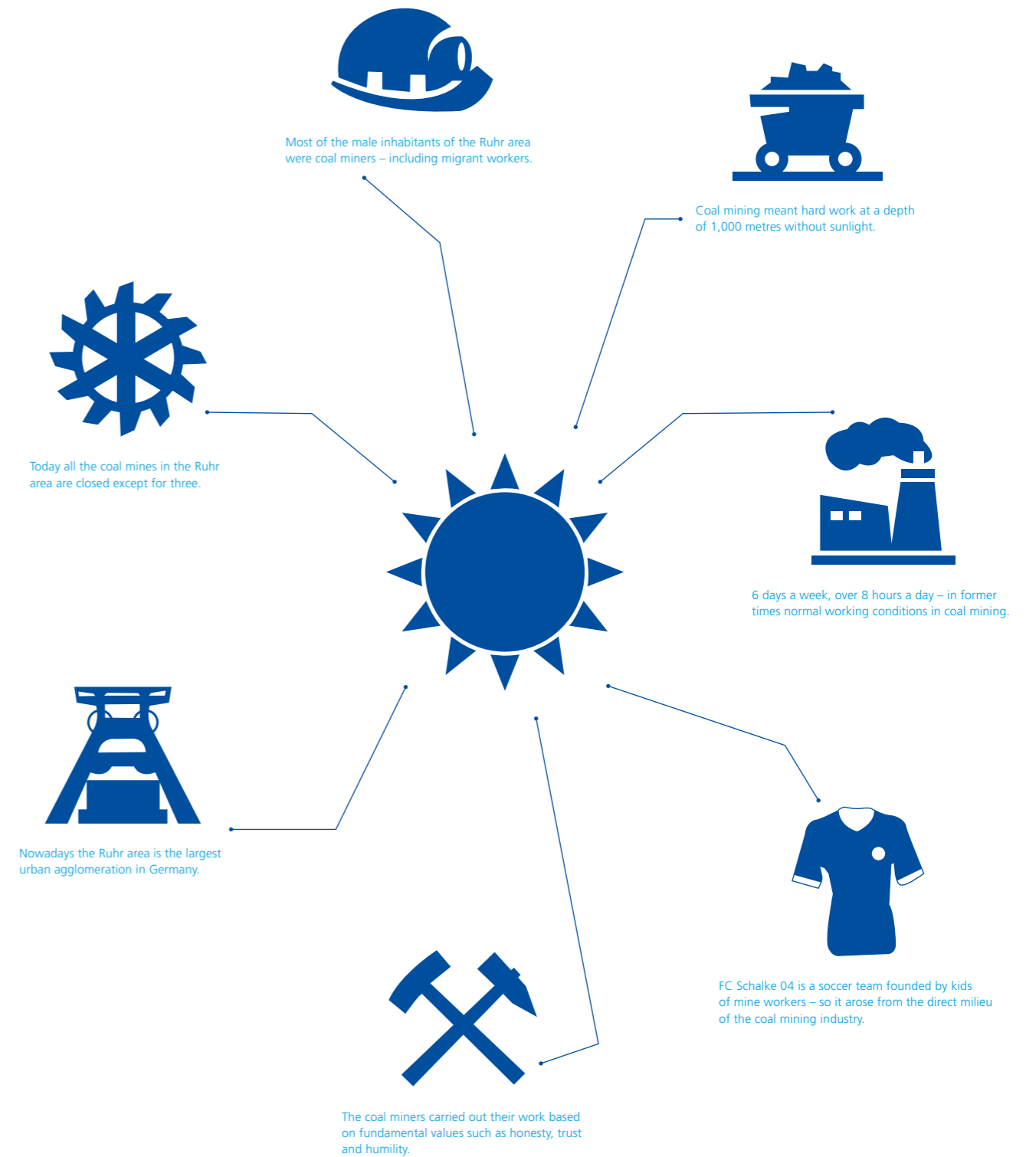
**Social Event**  
Split up to Meet Again in Future



# Ruhr Area: Industry Changes – Passion Remains

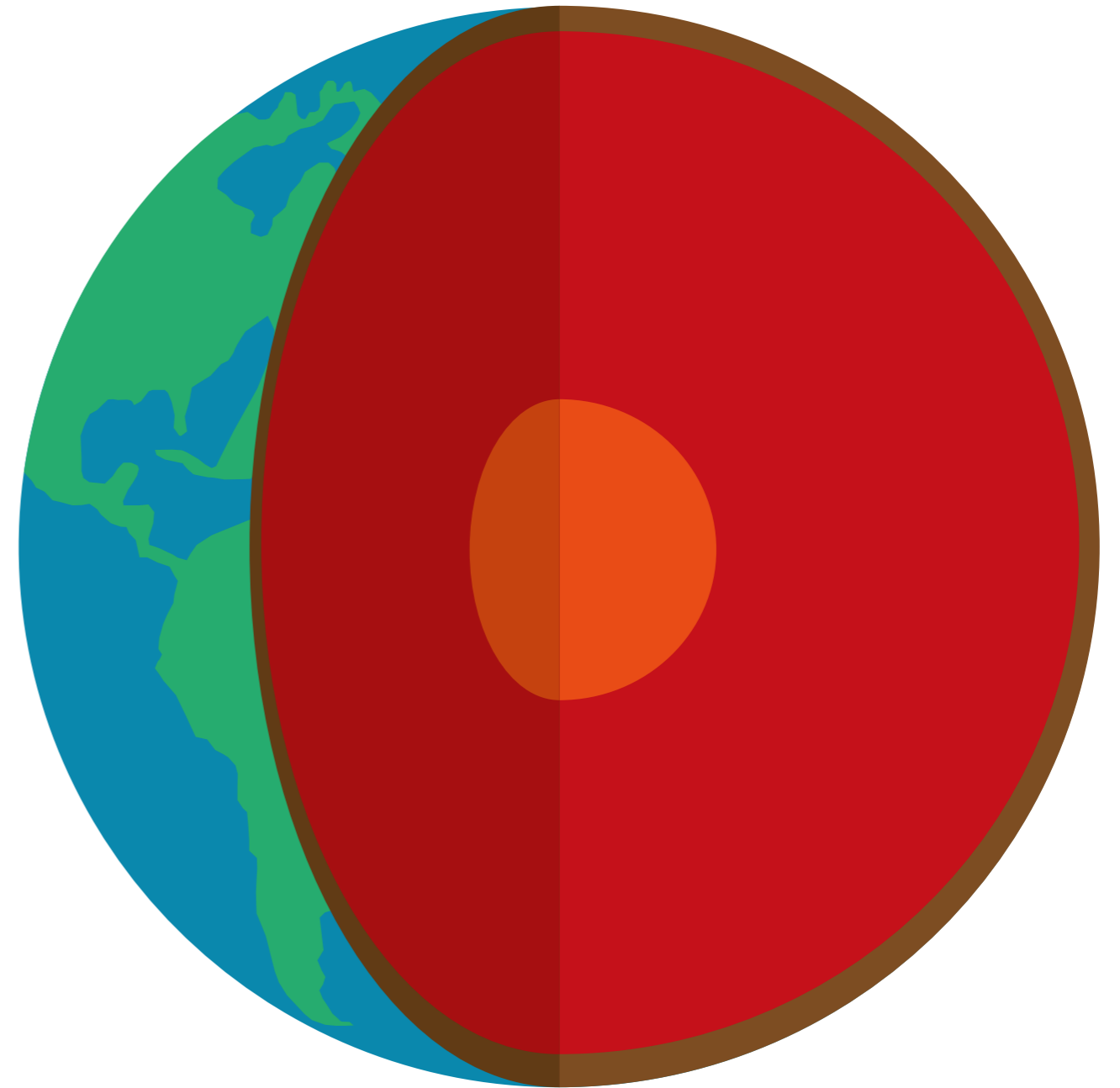
To introduce the evening event at the Veltins Arena, Christian Lippert gave a presentation on the Ruhr area through the ages. He described the region's transformation from farmland to coal mining and how it is now one of the most vibrant parts of Germany with a population of more than 5 million people, and a soccer team that upholds the core values of the long gone mining era: "Heart of Gold, Soul of Steel".

Christian Lippert





**We are ALTANA**  
Growth Occurs Around the World



# Research and Development

In 2013, we continued to expand our activities relating to the development of new products and services as well as new technologies. In the business year 2013, the Group invested a total of € 109 million in research and development activities, 7% more than in the previous year. The ratio of research and development expenses to sales rose from 6.0% to 6.2%.

## Employees in research and development

	2013	2012	2011	2010	2009
Additives & Instruments	381	331	316	300	286
Effect Pigments	247	240	251	241	228
Electrical Insulation	148	149	139	137	140
Coatings & Sealants	162	156	146	109	106
Holding	6	8	7	4	3
<b>Total</b>	<b>944</b>	<b>884</b>	<b>859</b>	<b>791</b>	<b>763</b>

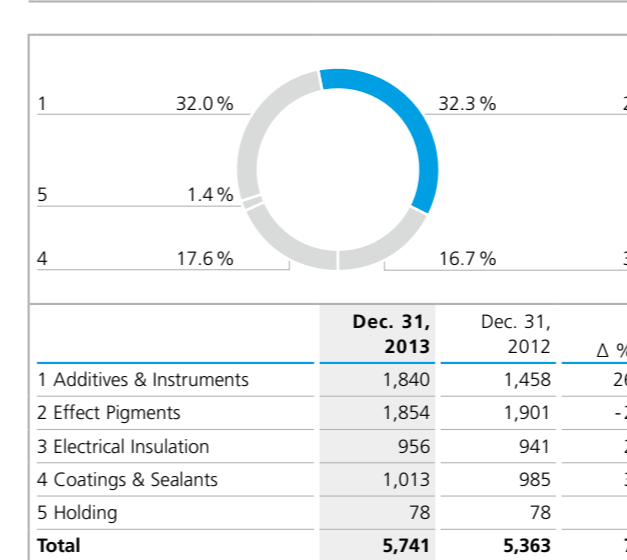
## Research and development expenses

	€ million
<b>2013</b>	<b>109.4</b>
2012	102.3
2011	87.7
2010	82.0
2009	70.6

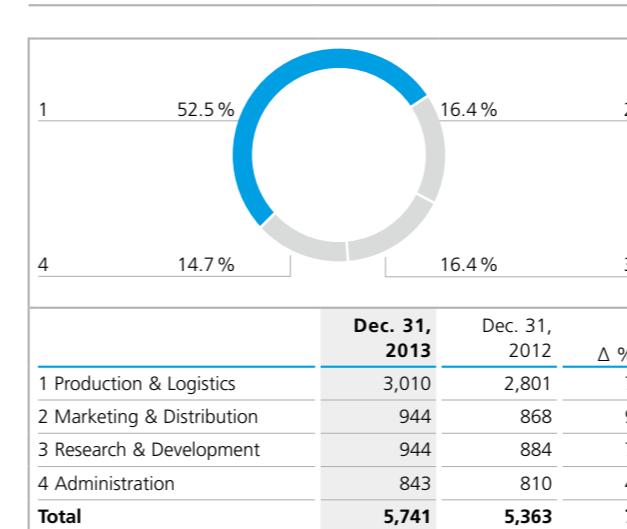
# Employees at ALTANA

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 2013, 5,741 people were employed at ALTANA throughout the Group. This is an increase of 378 employees on the previous year, primarily due to the acquisition of the rheology activities of Rockwood, today division BYK Additives & Instruments.

## Employees by division



## Employees by functional area





# In Which Areas Is ALTANA Active Today?

Sales 2013: EUR 1,765 m Employees: 5,741					
Division	<b>BYK</b> Additives & Instruments	<b>ECKART</b> Effect Pigments	<b>ELANTAS</b> Electrical Insulation	<b>ACTEGA</b> Coatings & Sealants	
Business Lines	Paint Additives Plastics Additives Industrial Applications Exploration Technology Oil/Gas Measuring & Testing 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%	~ 3%	~ 5%	~ 3%	
Global Market Position	Clear Leader	Clear Leader	Clear Leader	Top 2-3	

## 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?

## Three Pillars of Growth

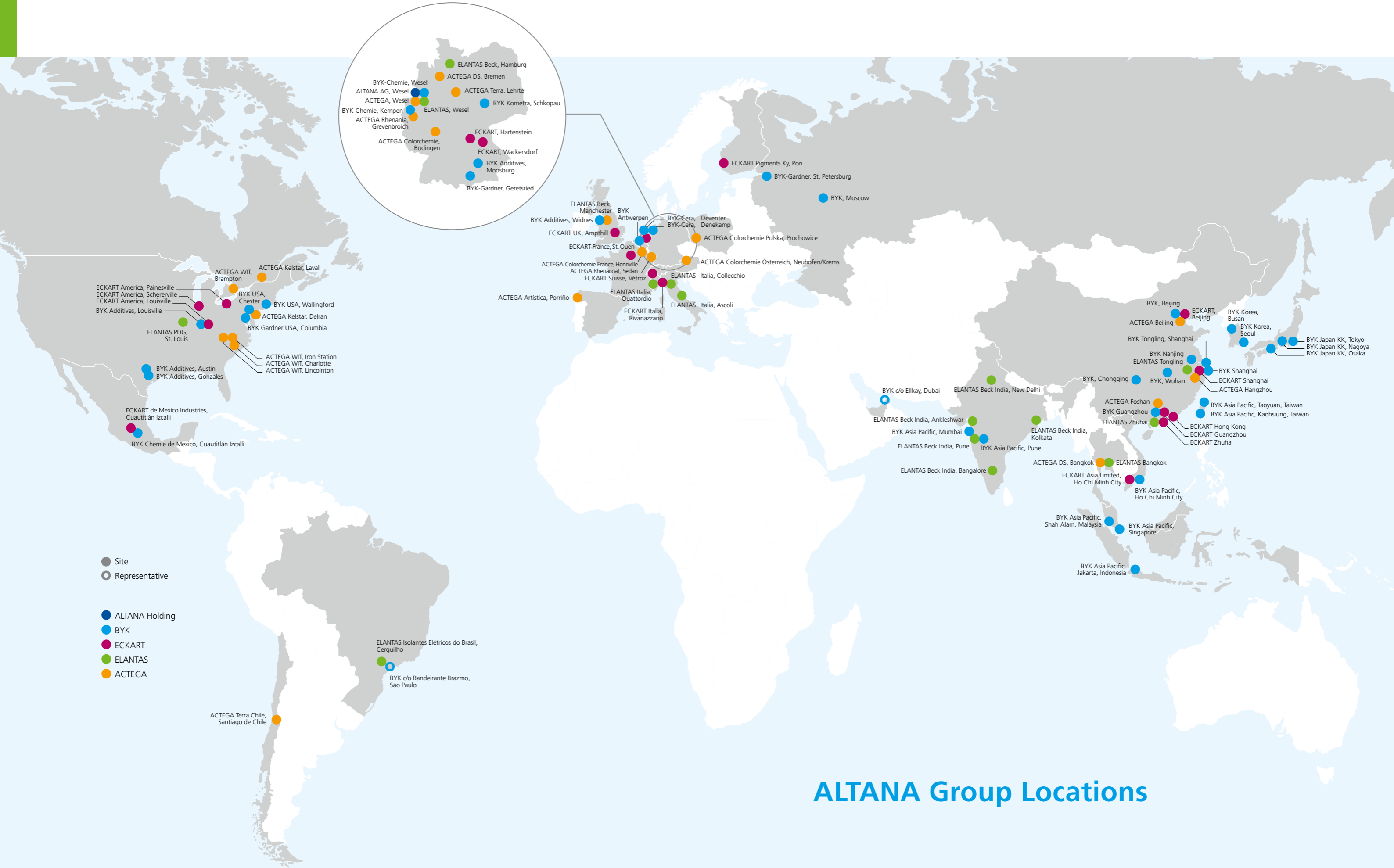
Strategy for profitable growth		
Acquisition	Innovation	Market penetration
Bolt-on acquisitions in every division  New portfolio expansion	New technologies  New markets  Synergies between divisions	Regional expansion, especially in Asia, India and the U.S.  Key account management

## 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

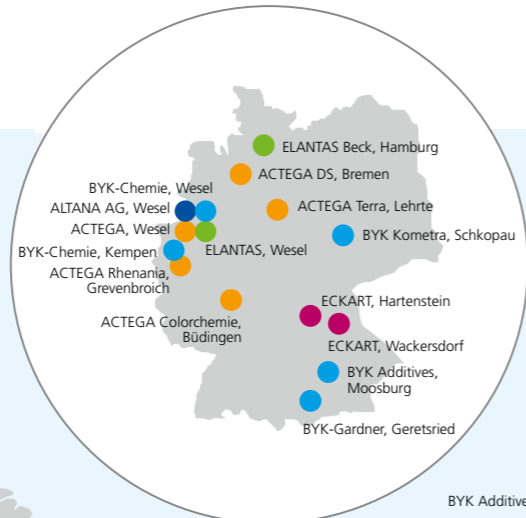
## Acquisitions (■) and Divestments (■)

2003	Viking (EI)		
	Schenectady (EI)		■
	Ranbar (EI)		■
2004	Watson-Rhenania (CS)		■
	Rhenacoat Coil (CS)		■
	Salchi-Rhenacoat (CS)		■
	Rembrandtin (CS)		■
2005	ECKART (EP)		■
	Kelstar (CS)		■
	Rhenania Coil (CS)		■
2006	Invex Brazil (EI)		■
	Rad Cure (CS)		■
2007	Bergen Materials (AI)		■
	Wolstenholme (EP)		■
2008	US Bronze Powders (EP)		■
	Dick Peters (AI)		■
	DyStar (AI)		■
2009	Water Ink Techn. (CS)		■
	Quadrant & Shimo (EI)		■
	Aquaprint (CS)		■
2010	ABB (EI)		■
	Polyurethane foam ad. (AI)		■
	Kometra (AI)		■
	WSAC (CS)		■
2011	Color Chemie (CS)		■
	Avery PVD Business (EP)		■
2012	Natural Mica Business (EP)		■
	Marbo (EI)		■
	ChemCor (AI)		■
	Coatzyme (AI)		■
2013	Rockwood Rheology (AI)		■
	Specialty Coatings Henkel (CS)		■
	Valspar Overprint Varnish (CS)		■
2014	Polypropylene Wax Emulsion DSM (AI)		■



# ALTANA Group Locations

- Site
- Representative
- ALTANA Holding
- BYK
- ECKART
- ELANTAS
- ACTEGA



- ECKART America, Painesville
- ECKART America, Schererville
- ECKART America, Louisville
- BYK Additives, Louisville
- ELANTAS PDG, St. Louis
- BYK Additives, Austin
- BYK Additives, Gonzales
- ECKART de Mexico Industries, Cuautitlán Izcalli
- BYK Chemie de Mexico, Cuautitlán Izcalli
- ACTEGA WIT, Brampton
- ACTEGA Kelstar, Laval
- BYK USA, Chester
- BYK USA, Wallingford
- ACTEGA Kelstar, Delran
- BYK Gardner USA, Columbia
- ACTEGA WIT, Iron Station
- ACTEGA WIT, Charlotte
- ACTEGA WIT, Lincolnton

- ELANTAS Beck, Manchester
- BYK Additives, Widnes
- ECKART UK, Ampthill
- ECKART France, St. Ouen
- ACTEGA Colorchemie France, Henriville
- ACTEGA Rhenacoat, Sedan
- ECKART Suisse, Vétroz
- ACTEGA Artistica, Porriño
- BYK, Antwerpen
- BYK-Cera, Deventer Denekamp
- BYK-Cera, BYK-Cera
- ACTEGA Colorchemie Polska, Prochowice
- ACTEGA Colorchemie Österreich, Neuhofen/Krems
- ELANTAS Italia, Collecchio
- ELANTAS Italia, Ascoli
- ECKART Italia, Rivanazzano

- ECKART Pigments Ky, Pori
- BYK-Gardner, St. Petersburg
- BYK, Moscow
- BYK, Beijing
- ECKART, Beijing
- BYK Korea, Busan
- BYK Korea, Seoul
- BYK Japan KK, Tokyo
- BYK Japan KK, Nagoya
- BYK Japan KK, Osaka
- BYK Tongling, Shanghai
- BYK Nanjing
- ELANTAS Tongling
- BYK Shanghai
- ECKART Shanghai
- ACTEGA Hangzhou
- BYK, Chongqing
- BYK, Wuhan
- ACTEGA Foshan
- BYK Guangzhou
- ELANTAS Zhuhai
- ECKART Hong Kong
- ECKART Guangzhou
- ECKART Zhuhai
- BYK Asia Pacific, Taoyuan, Taiwan
- BYK Asia Pacific, Kaohsiung, Taiwan
- ELANTAS Beck India, New Delhi
- BYK c/o Elkay, Dubai
- ELANTAS Beck India, Ankleshwar
- BYK Asia Pacific, Mumbai
- ELANTAS Beck India, Pune
- BYK Asia Pacific, Pune
- ELANTAS Beck India, Bangalore
- ELANTAS Beck India, Kolkata
- ELANTAS Beck India, Ho Chi Minh City
- ACTEGA DS, Bangkok
- ELANTAS Bangkok
- ECKART Asia Limited, Ho Chi Minh City
- BYK Asia Pacific, Ho Chi Minh City
- BYK Asia Pacific, Shah Alam, Malaysia
- BYK Asia Pacific, Singapore
- BYK Asia Pacific, Jakarta, Indonesia

- ELANTAS Isolantes Elétricos do Brasil, Cerquihio
- BYK c/o Bandeirante Brazmo, São Paulo
- ACTEGA Terra Chile, Santiago de Chile









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