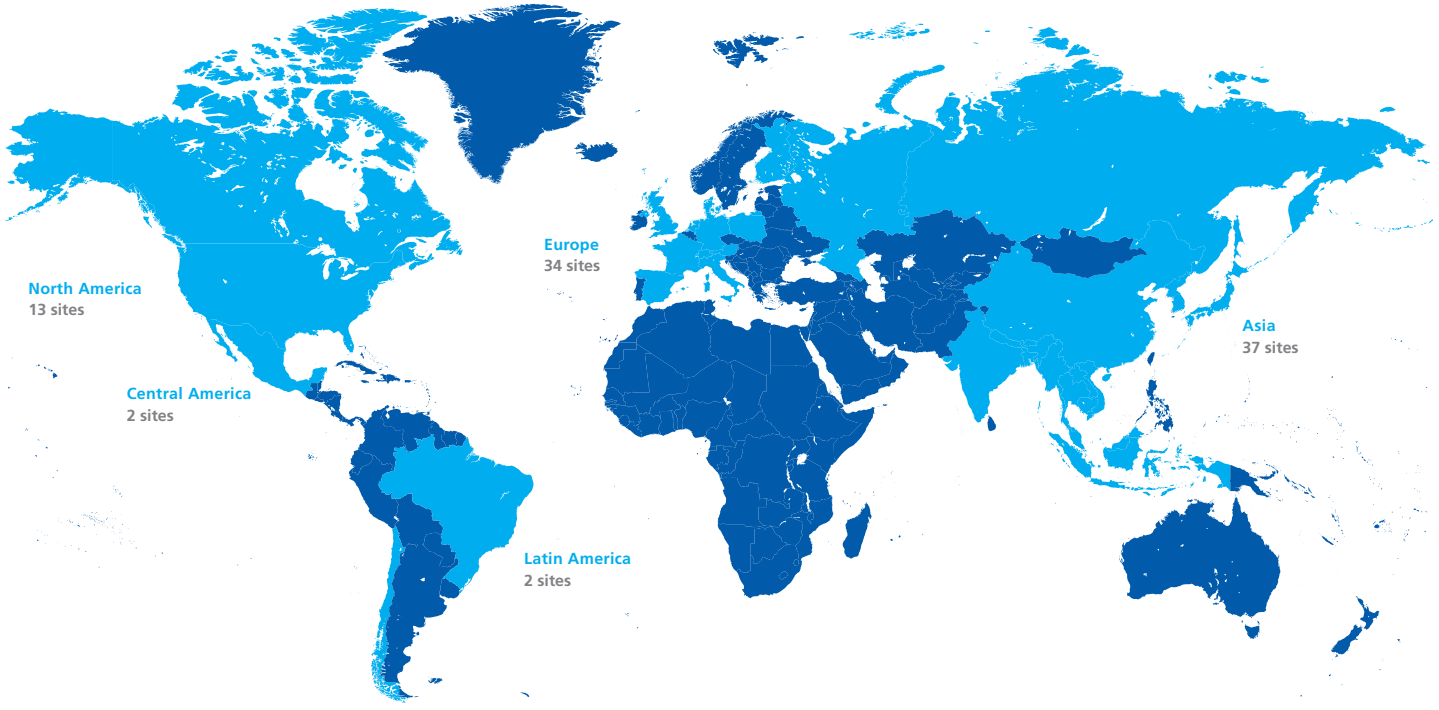

ALTANA

2012 sales: €1,705 million
Employees: 5,363
EBITDA 2012: €323 million
EBITDA margin: 19 %

BYK
Additives & Instruments

2012 sales: €618 million

Business lines

- Paint additives
- Plastic additives
- Industrial applications
- Measuring and testing instruments

ECKART
Effect Pigments

2012 sales: €341 million

Business lines

- Coatings and plastics
- Graphic arts
- Cosmetics and personal care
- Functional applications

ELANTAS
Electrical Insulation

2012 sales: €413 million

Business lines

- Primary insulation
- Secondary insulation
- Electronic and engineering materials

ACTEGA
Coatings & Sealants

2012 sales: €334 million

Business lines

- Converting specialties
- Graphic arts

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Management

Signs of change

ALTANA sent a signal through its top management that it is willing to change. At the end of 2012, each of the four division presidents took over the helm of another division. The reason for the extraordinary measure was to strengthen ALTANA's knowhow transfer and innovative ability by means of greater transparency regarding personnel and ideas.

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A light closure saves a weighty resource

Resource protection and material efficiency protect the environment and improve the profitability of production processes. For example, with a special sealant enabling lighter crown caps to be manufactured.

16 Resource efficiency
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Safety

Safety pays off

The risk of accidents occurring cannot be avoided completely. Safety at the workplace is extremely important at ALTANA. All of the company's new building and refurbishment measures reduce the risk of accidents. An example is ACTEGA Rhenacoat's new warehouse complex, which offers greater fire and soil protection and makes many transport drives superfluous.

26 Operational safety
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Environment

Working in an award-winning building

Energy efficiency is one of the most important contributors to sustainability. Two new ALTANA buildings distinguish themselves by their efficient use of energy. The architects attached special importance to low primary energy consumption, as well as to sustainable construction materials and a natural room climate.

36 Sustainable construction
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Human resources

Creating values playfully

The ALTANA Group supports its employees in diverse ways. To be able to contribute to a long-term increase in the company's economic value, staff members need to be able to think entrepreneurially and understand financial mechanisms. To this end, ALTANA relies on value management and the so-called value creation indicator AVA (ALTANA Value Added).

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Social responsibility

A class act of support

Social commitment is a matter of course for the ALTANA Group and its staff. We continually support social projects for children and youth as well as scientific and technical training at schools and universities in different countries. Of particular importance is helping people in need, such as school children in Cancún, Mexico.

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Dear Readers,

Sometimes you need only a little to achieve more. Our researchers prove this time and again, for example, when they develop new additives for coatings. The dose may be small, but it makes a decisive contribution to optimizing the properties of the product. Often, it is precisely these properties that give our clients an edge over their competitors. This is our understanding of specialty chemistry and customer orientation. And it is with this mindset that we have occupied leading positions in our target markets with respect to quality, product solution expertise, innovation, and service, based on our aspiration that "We want to be leading in everything we do."

But you can only be a leader in the long run when you recognize different interests and needs and bring them into harmony. On a corporate level, this means social responsibility, environmental protection, safety, and profitability have to go hand in hand. Ultimately, it is the interplay between them that creates sustainable value – for our clients, staff, owner, and the environment in which ALTANA operates. This is exactly why we fully support the objectives of the UN Global Compact initiative.

In this year's Sustainability Report, we focus on what this means in concrete terms. We do not only want to talk about sustainability, but to create facts. In the process, it becomes apparent that not only on the product level but in many respects often a small impulse suffices to achieve a big effect. The result is always more than the sum of the individual parts. Yet the individual plays a key role. Sometimes all that's needed is a change of perspective.

We brought about such a change of perspective, for example, by rotating our division presidents in November 2012. On the reporting date of November 1, not only the presidents' areas of responsibility changed. Rather, this impulse aims to spawn more cross-divisional exchange and to strengthen our innovativeness, thus creating new perspectives for all of our employees in the long run.

Invariably, a key prerequisite for sustainable and thus successful developments is the willingness of each individual to accept change and act responsibly. I would like to thank all of our staff for their commitment and dedication, which has made the ALTANA Group a sustainable employer, business partner, and neighbor. Each and every day, they help us achieve more for ALTANA and our environment – even if only through a small impulse.

I wish you pleasurable reading.

Dr. Matthias L. Wolfgruber
Chief Executive Officer

Dear Readers,

It is my pleasure to present the third ALTANA Sustainability Report to you. It is important to us to take responsibility and actively shape the future. A key aspect of this is environmental protection. But the wellbeing of our staff and social commitment are also close to our heart. This year's Sustainability Report gives you insight into our understanding of sustainability. Learn how we create social, economic, and environmentally related values in this framework.

At a time when resources are becoming ever scarcer, we place particular emphasis on efficient use of material. A special sealant for crown corks that helps companies produce them using less raw material is just one of many examples. At first glance, this may seem to be only little. But with lighter crown corks alone one of the world's largest brewery groups can save several thousand tons of steel a year, protecting resources and making production more efficient. ALTANA can make big things happen even with little innovations.

ALTANA's success largely depends on competent staff. For entrepreneurial action to pervade all levels, our employees have to understand all steps of our operational processes. Working hand in hand only functions when everyone has the same goal: generating sustainable growth. The ALTANA Added Value (AVA) seminar gives non-specialist staff insight into business management approaches. On the basis of sound knowledge, these employees can scrutinize processes and make suggestions for improvement. ALTANA creates values for long-term success buttressed by the entire workforce.

We focus on solutions and it is particularly important to us that our solutions are sustainable in the long run. When we design a new building, for example, we do not only think about short-term expenses. Rather, we want to provide relief to the environment. By equipping our buildings with state-of-the-art technology, we can make a long-term contribution to climate protection. This is not only good for the environment but also cuts costs.

Our values and standards apply at all of our sites worldwide. As a result, our clients everywhere can rest assured that the ALTANA Group stands with its name for sustainable business and management. In dialogue with our customers, we want to continue the trusting cooperation. Our partners can depend on us as a company representing long-term and value-oriented growth. This includes thinking about a shared future. We are striving for solutions today that concern the challenges of tomorrow.

Dr. Andreas Diez
Vice President Environment, Health and Safety

1 rotation x 4 division presidents

> 5,000 employees with new perspectives

Signs of change

When the decision was announced, most of those present were surprised. During the annual Global Management Meeting, Dr. Matthias L. Wolfgruber, CEO of ALTANA, announced that all four of ALTANA's divisions would have new presidents. The heads of each of the four divisions – BYK, ECKART, ELANTAS, and ACTEGA – took over the helm of another respective division on November 1, 2012. It was an extraordinary measure serving one main goal: We want to be leading in everything we do.

With the rotation at divisional president level, ALTANA sent a signal through its top management that it is willing to change. ALTANA stands for innovation and flexibility. Change has always characterized the company's history and made a key contribution to its success.

Strengthening knowhow transfer and innovativeness

The rotation of the division presidents is also intended to lead to an increased willingness to change on other levels. The company's ability to change must be coupled with a willingness to change on the part of every single employee, so that we can continue down our successful path. "This realignment of the divisions' presidents will provide ALTANA with new growth prospects and help further enhance the use of potential synergies," said Dr. Matthias L. Wolfgruber, CEO of ALTANA, after the announcement was made. "And we are firmly convinced that great transparency with respect to personnel and ideas will strengthen the knowhow transfer and ALTANA's innovative ability."

Areas of responsibility passed on (clockwise from top left to right): Dr. Wolfgang Schütt to Dr. Guido Forstbach, Dr. Guido Forstbach to Dr. Roland Peter, Dr. Christoph Schlünken to Dr. Wolfgang Schütt, Dr. Roland Peter to Dr. Christoph Schlünken.

What does the rotation mean in concrete terms? The former division president of BYK, Dr. Roland Peter, became the president of ACTEGA, formerly headed by Dr. Guido Forstbach, who in turn switched to ELANTAS. From ELANTAS, Dr. Wolfgang Schütt went to ECKART, while the latter's previous president, Dr. Christoph Schlünken, took over the leadership of BYK. Changes in the responsibilities of managers have long been commonplace, an important element of every organizational and managerial development. But it is unusual for all of the presidents of a company's divisions to swap their posts at the same time.

Keyword: rotation

(Job) rotation is usually a temporary, planned change of jobs to promote the employee's personal development and provide diversified training and experience. The aim of this on-the-job training method (which was introduced in the 1950s) is for everyone involved to gain new knowledge and skills. The rotating employee passes on the knowledge he or she has acquired to the new department, and, conversely the employees of the new department pass their knowledge on to the person rotating.

Only those who change stay true to themselves

In spite of all the changes taking place, ALTANA has retained that which has proven itself – the decentralized positioning of the divisions. It is this market-oriented structure, not least, that has made us flexible enough to react quickly to changes. With all of the transformations, which initially involve personnel changes exclusively, we aim to preserve the continuity that is needed in the field of specialty chemicals and that has made us the global market leader in many areas.

Company

ALTANA develops, produces, and distributes high-quality innovative specialty chemical products for coatings manufacturers, paint and plastics processors, for the printing and cosmetics industries, as well as for the electrical and electronics industry. The globally active corporation is headquartered in Wesel, Germany. ALTANA is composed of four business divisions: BYK Additives & Instruments, ECKART Effect Pigments, ELANTAS Electrical Insulation, and ACTEGA Coatings & Sealants.

For ALTANA, innovation is the most important key to further growth. With a disproportionately high share of research and development expenditure of around six percent of sales, ALTANA ensures itself a technological edge and offers its clients unique products and services. New developments are realized together with clients and in proximity to them. More than 50 laboratory and research sites worldwide offer customers innovative solutions in the fields of surface protection and surface refinement at their respective locations. More than every fifth ALTANA employee worldwide works in research and application technology.

ALTANA has a dual management and supervisory structure. The Management Board has two members, who are appointed by the Supervisory Board for a term of five years. The Management Board members manage the Group independently and are fully committed to the interests of the company. Together with the presidents of the divisions and selected heads of central functional areas, the Management Board forms the advisory Executive Management Team.

The Supervisory Board of ALTANA has twelve members, half of whom are elected by German Group employees in accordance with the German Codetermination Act. The other six members are elected by the Annual General Meeting. The new Chairman of the Supervisory Board is Dr. Klaus-Jürgen Schmieder, who took over the post from Dr. Fritz Fröhlich. Supervisory Board members serve terms of five years. The Supervisory Board monitors and advises the Management Board on its management activities. With the exception of the Deputy Chairwoman of the Supervisory Board, Susanne Klatten, and the employee representatives, all Supervisory Board members who are elected by the Annual General Meeting, along with the Chairman of the Supervisory Board, are independent. For more information on the company, please visit www.altana.com.

Acquisitions and divestments

In May 2012, we acquired the casting resins business of the Italian Marbo Group, thus strengthening the electronic and engineering materials areas of ELANTAS. In December 2012, we continued to expand BYK in the U.S., acquiring the wax additives business of Chemical Corporation of America (ChemCor). The latter's wax products are waterbased and thus support our strategy of reducing VOC emissions. BYK-Cera products can be manufactured at ChemChor's Chester site, reducing transports. Moreover, ALTANA purchased a new technology for encapsulating enzymes to develop environmentally friendly additives.

As regards divestments, ECKART sold its pearlescent pigments business for cosmetics based on natural mica to Sudarshan Chemical Industries, India. The business includes all products under the brand names Prestige and Flonac-C produced by ECKART in Pori, Finland. In the future, the products will be produced based on synthetic mica, which will replace a raw material extracted in surface mining in India. The new raw materials will significantly reduce water consumption in Pori. The sale affected 55 employees, whom we supported in their search for new jobs. In addition, a social plan was drawn up. 15 employees were affected by the closing of our ACTEGA Colorchemie site in Bonn.

ELANTAS Deatech and ELANTAS Camattini merged. They have operated under the name ELANTAS Italia since January 2012. Within the framework of the "Dolomiti" project, processes and methods were analyzed with the goal of optimizing workflows and making them leaner. At the same time, SAP was implemented and the environmental management system was certified (see Management section).

Management

With the help of the central function Corporate Environment, Health & Safety (EH&S), ALTANA ensures that occupational safety, environmental and health protection, as well as the key performance indicators and goals defined by the Executive Management, are achieved. The head of Corporate EH&S reports directly to the Chief Executive Officer. Corporate Communications is in charge of social responsibility matters (sponsoring, donations, etc.), while the Human Resources department (HR) is responsible for other social issues. These functions also report directly to the CEO.

2012 sales: €1,705 million

Employees: 5,363

BYK-Chemie GmbH
BYK Asia Pacific
BYK-Cera
BYK Chemie de Mexico
BYK-Gardner
BYK Gardner USA
BYK Japan
BYK Kometra
BYK Solutions
BYK Tongling
BYK USA

ECKART GmbH
ECKART America
ECKART Asia
ECKART Benelux
ECKART France
ECKART Italia
ECKART Mexico
ECKART Pigments
ECKART Suisse
ECKART UK
ECKART Zhuhai

ELANTAS GmbH
ELANTAS Beck
ELANTAS Beck India
ELANTAS Isolantes Elétricos do Brasil
ELANTAS Italia
ELANTAS PDG
ELANTAS Tongling
ELANTAS Zhuhai

ACTEGA GmbH
ACTEGA Artística
ACTEGA Colorchemie
ACTEGA DS
ACTEGA Foshan
ACTEGA Kelstar
ACTEGA Rhenacoat
ACTEGA Rhenania
ACTEGA Terra
ACTEGA WIT

48 operative companies with 42 production sites and more than 50 laboratories worldwide

Via the Supervisory Board, employee representatives and the sole shareholder of ALTANA have the possibility of exerting influence on the company's sustainability management. The shareholder also has this possibility via the annual general meeting. The qualification of employees and committees at ALTANA responsible for sustainability issues is ensured by training programs, professional experience, seminars, and conferences. Environmental and safety targets are among the personal targets to be achieved by division presidents and other executives at ALTANA. They are taken into account in the determination of variable compensation components each year.

The companies of the ALTANA Group record essential environmental impacts within the scope of their environmental and energy management systems. These include resource and water consumption as well as waste volumes, VOC and CO_2 emissions, minor chemical-specific emissions below the applicable limit values in the wastewater at some locations, transports of raw materials and finished products by rail, ship, or truck, as well as impacts on biodiversity. Opportunities primarily arise from new products which reduce environmental impacts in the supply chain.

ALTANA's first energy management system (EMS) certified in accordance with the international standard ISO 50001 was set up at ECKART (see also page 13). The introduction was supported by a so-called energy team consisting of experts from the different departments headed by energy manager Siegfried Kreuzer. Thanks to energy savings measures, the CO_2 emissions of the Güntersthal site were reduced by approximately 500 tons in 2012. Like ECKART, BYK also has an energy manager, who in 2012 began implementing an energy management system fulfilling the requirements for certification. This included participation in the pilot project "Modular Energy Efficiency Model" of the Energy Agency NRW (the service provider to the German state of North Rhine-Westphalia in all energy-related matters), which supports the introduction of EMS. In the meantime, the implementation has been completed.

The advantages of an EMS, apart from cutting energy costs and reducing CO_2 emissions, include the reimbursement of ecotax and limited apportionment according to the German Renewable Energy Sources Act (EEG). Not least, it gives rise to a competitive advantage, as clients pay attention to their suppliers' energy efficiency.

Compliance

ALTANA introduced a Compliance Management System (CMS) in 2008. A manager was assigned to each area. These compliance managers, together with the Head of Internal Audit, form a so-called Compliance Committee, chaired by ALTANA's General Counsel, who in turn reports to the Chief Financial Officer. The Compliance Committee deals at the ALTANA AG level with various topics that are important for compliance.

Compliance-relevant topics at ALTANA

- Corruption and fraud
- Antitrust legislation
- Financial reporting
- Environment and safety
- Human resources (HR)
- Customs and foreign trade
- Data protection
- Information technology (IT)
- Tax

The compliance organization helps avoid conflicts of interest. Internal audits are carried out to check whether the compliance guidelines have been adhered to. In 2012, the Compliance Committee formulated targets for the company's compliance culture, risk assessment, and compliance program and improved the system. With its CMS, ALTANA also covers the topics of corruption, environment and safety, as well as discrimination, child labor, and collective agreements.

Basic elements of ALTANA's Compliance Management System

- Monitoring
- Culture
- Goals
- Risks
- Program
- Organization
- Communications

Since 2002, a Code of Conduct has existed at ALTANA that sets binding standards for the conduct of all managers and employees groupwide. At the end of 2011 and beginning of 2012, around 650 of the employees who have joined ALTANA since 2010 in German- and English-speaking countries learned about the Code of Conduct and Compliance via e-learning. Starting in August 2012, 450 Chinese colleagues followed suit. The program is also planned for all employees in Italy. Furthermore, 1,100 employees have received training in antitrust matters through e-learning.

Additional training took place regarding the topic of corruption, e.g. during ELANTAS and ACTEGA management meetings. Issues such as active and passive corruption, granting of undue advantages, fraud, and antitrust law were discussed. Within the framework of ALTANA's global procurement training, 70 purchasers received training in compliance-related matters. BYK Korea introduced annual compliance control by the HR manager (internal) and auditors (external).

In addition to sensitizing employees, control is important. Within the framework of internal auditing, matters such as assigning contracts to third parties and commission agreements were audited. In 19 internal audits in 2012, some potential for improvement was identified, for which we took the appropriate organizational measures. No cases of corruption were registered via hotlines or other channels. In the periodical inquiry made in March/April 2012 in all companies, no compliance violations in the form of discrimination and child

labor were registered. According to the estimates of local HR managers, adherence to legal and ALTANA specific rules and regulations is ensured everywhere. In regular visits to all sites, managerial staff also look into possible violations due to child labor, among other things.

Female employees at the Wesel site have established an ALTANA wide women's network. By the end of 2012, possible goals and activities had been developed. The project is being sponsored by the company. In the future, the women's network could deal with possible disadvantages encountered by women.

Guiding Principles

ALTANA's Guiding Principles, introduced in 2011, describe what the company stands for and – together with the Code of Conduct – provide orientation for responsible corporate action. To anchor the "ALTANA Identity" in the minds of all staff members, we held so-called Identity Workshops in 2011 and 2012. Among other things, various aspects of our corporate culture were discussed. On the Intranet, the lively discussion has been taken up in a section provided especially for this purpose and questions, which are combined under specific subjects, are answered. Here, questions such as "What is the precise importance of the individual values and management guidelines?", "How can the Guiding Principles be lived out interculturally?", and "How are the Guiding Principles seen from the outside?" are asked.

Audits

All sites certified in accordance with ISO 140001 (environmental management system) and ISO 50001 (energy management system) are subject to annual internal and external audits. Cross-audits, for which auditors from an ALTANA company investigate other sites, supplement our high standards. In 2012, ECKART's energy management system was certified for the first time according to ISO 50001 (see also page 10). ECKART, which as a result is the first company in the ALTANA Group to have a certified EMS, is the division with the highest energy consumption. For this reason, we have to deal with the resource energy in an especially sustainable way, in order to minimize the associated negative effects on the environment and to cut costs. The new EMS was incorporated in the existing integrated management system, certified in accordance with ISO 9001, ISO 14001, and OHSAS 18001. With the implementation, the processes of the environmental management system were also adapted and modernized.

ELANTAS Italia set up an integrated management system for quality, safety, and the environment (see also page 9). In November 2012, an audit was performed at its three sites by the Swiss Association for Quality and Management Systems (SQS), which undertook the certification of the entire company with respect to the international standard ISO 9001-14001. By achieving this goal, the Ascoli Piceno and Quattordio sites, as well as Collechio, which has been certified for some time, additionally managed to certify their environmental management systems.

BYK in Wesel also has an integrated management system. The first-time certification of the occupational health and safety management system based on the OHSAS 18001 standard by the German Social Accident Insurance Institution for the Raw Materials and Chemical Industry (BG RCI), was carried out in 2012. The auditors, who particularly praised the commitment to risk assessment and the good working climate, awarded BYK the "Systematic Safety" seal of approval.

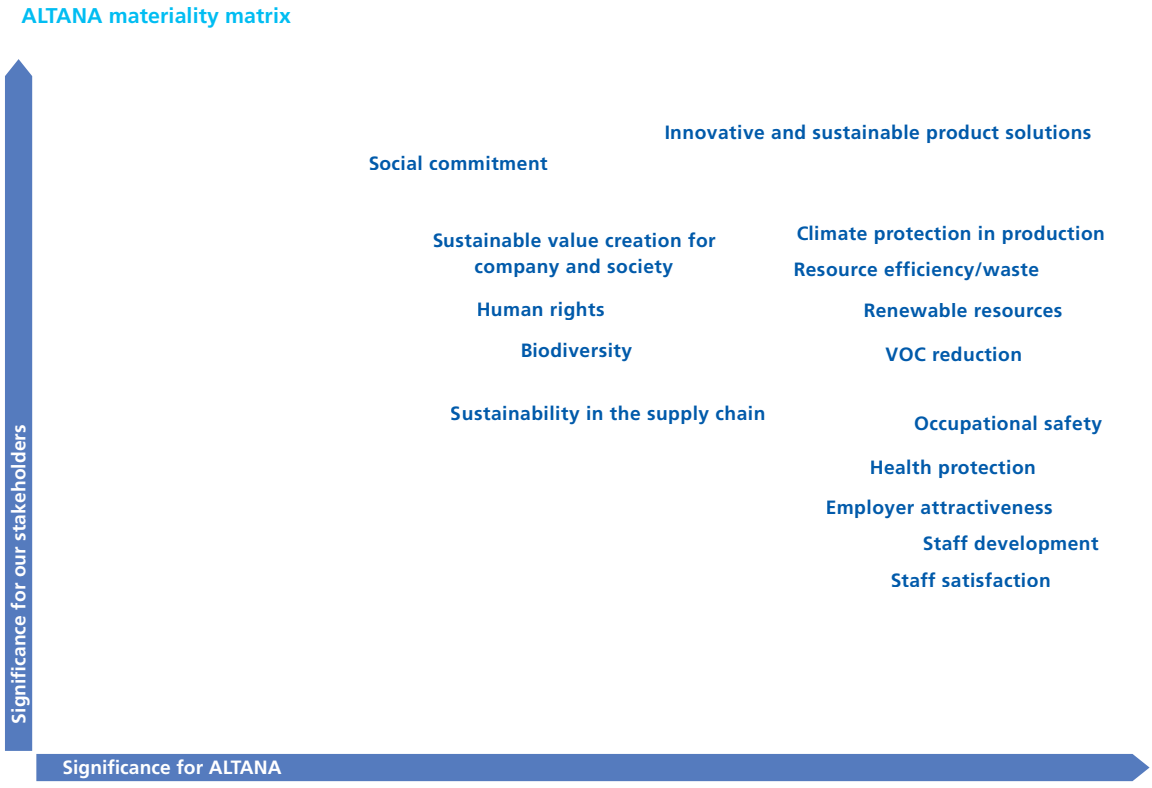
Certification of ACTEGA Colorchemie

ACTEGA Colorchemie started 2012 with the successful certification of its environmental management and quality management system. The audit organization Dekra's preparation for the audits in compliance with ISO standards 14001 and 9001 at five sites had begun back in April 2011. As a first measure, the Integrated Management Systems Working Group was founded and Gerhard Kasper, the Head of Environment, Health and Safety of the site in Neuhofen, Austria, was appointed to lead the group. Kasper was assisted by an experienced external consultant. Thanks to the support of the management representatives of the other four sites, Alicja Dyrdowska and Monika Witkowska (Poland), Claudia Klampfl (Germany), Eva Hiery and Bruno Dehnhardt (France), and Richard Mayrhofer (Germany), work began after the size of the project, the costs, and the timetable had been defined. Until then, the individual sites had had different experiences with management systems.

Stakeholders

To strengthen public trust in the safety of our plants and products, ALTANA maintains close dialogue with neighbors, local politicians and media, associations, investors, customers, suppliers, authorities, and all other interest groups that are directly or indirectly affected by our activities. This is achieved in direct exchange, with our annual reports and the annual sustainability reports, through participation in association meetings, and open house activities held every three years.

The essential stakeholders are determined on the basis of many years of experience and the recognizable need for communication. But they are also defined based on knowledge



regarding expectations and concerns vis-à-vis the chemical industry. In this report, we display the results of our continuous dialogue in a so-called materiality matrix (see graphic above). It lists the most important sustainability topics and their significance for ALTANA, on the one hand, and for our stakeholders on the other. The same topics are the focal points of this sustainability report. Although we deem all action areas important, we focus particularly on the topics in the right field of the matrix.

Memberships

ALTANA is a member of the United Nations' Global Compact program. We view this as a voluntary commitment to continual improvement in the areas of human rights, occupational standards, environmental protection, and anti-corruption. This sustainability report also serves as our Global Compact progress report. In addition, ALTANA supports the chemical industry's Responsible Care initiative, a voluntary commitment to continual improvement in the areas of product stewardship, plant safety, work safety and health protection, environmental protection, transport safety, and open communication. In this context, all of ALTANA's German companies report to the German Chemical Industry Association (VCI). The VCI prepares its annual Responsible Care report based on this data. Responsible Care covers part of the Global Compact commitments. Therefore, ALTANA also reports significant incidents according to the VCI definition, this year related to working hours for the first time (see also page 32). As a contribution to the reduction of land use and biodiversity conservation, ALTANA supports the AAV NRW (Association for Remediation Services for the state of North Rhine-Westphalia).

ALTANA's German companies are members of the VCI, of the umbrella organization of the 17 European professional associations for coatings, printing inks, and artists' colors (CEPE), as well as the Association of the German Coatings Industry (VdL). In addition, some of our affiliates are members of the German Verband der Mineralfarbenindustrie (association of producers of pigments, fillers, functional additives, food colorants and others, VdMi), the German Association of Plastic

Films (IVK), and TEGEWA (association representing manufacturers of textile, paper, leather, and fur auxiliaries and colorants, surfactants, complexing agents, antimicrobial agents, polymeric flocculants, cosmetic base materials, pharmaceutical excipients, and allied products).

Implementation of the Global Compact principles in the ALTANA supply chain:

Measures in 2012

1. Communication of ALTANA's commitment through the presentation of a Supplier Code of Conduct pertaining to visits to suppliers and supplier audits (ongoing).
2. Examination of adherence to principles during visits to suppliers and supplier audits (ongoing). In 2012, 34 visits to suppliers and supplier audits were made in India, China, Taiwan, Poland, Italy, and the U.S.
3. Communication of the ALTANA Supplier Code of Conduct within the framework of the ALTANA Corporate Procurement Intranet site (ongoing).
4. Communication and voluntary commitment of ALTANA on the websites of ALTANA's purchasing network. The web pages have been online since November 2011. In 2012, 118 suppliers contacted ALTANA via the respective pages and committed themselves to adhering to the Global Compact guidelines.
5. Training of all purchasing employees (Raw Materials, Technical Purchasing, IT, and Logistics) regarding compliance taking special account of the Global Compact principles.
6. Development of a risk management system for raw materials and preliminary raw material sources of ALTANA subsidiaries. In the evaluation, criteria for evaluating the institutional anchoring of the adherence to human rights and of sustainability and anti-corruption measures were explicitly recorded.

Outlook for 2013

1. Continuation of the communication of ALTANA's requirements regarding cooperation with suppliers within the framework of visits to suppliers and supplier audits.
2. Systematic increase in the number of suppliers who commit to adhering to the Global Compact guidelines through ongoing measurement of supplier registrations on the procurement website.
3. Systematic analysis of the results of country risk evaluations including derivation of concrete measures.

For further information, please visit:

www.altana.com/company/global-purchasing-network.html

Awards

ALTANA's treasury won the "Treasury of the Year 2012" award. The team was presented the prize at the 8th Structured FINANCE congress. The jury gave the award to the treasury for carrying out different capital market transactions in parallel and introducing a treasury management system, a platform for derivatives trading, a deal confirmation platform, and a multi-cash system in tandem.

During the China Composite Expo 2012 in Shanghai, BYK was given the CCE JEC Innovation Award in the Raw Materials category for the two additives BYK-P 9065 and BYK-P 9051. Thirty-two composite materials of 30 manufacturers were nominated for the prize.

As the only company from North Rhine-Westphalia, BYK was additionally awarded for its special commitment to students in their transition phase between school and job. Under the slogan "Mein Engagement macht Schule," the Bundesarbeitsgemeinschaft Schulewirtschaft (Germany's national working group on schools and business) honored companies for their exemplary cooperation with schools. BYK received the 3rd prize in the Medium-sized Businesses category. In addition, the BYK innovation team received the internal ALTANA Innovation Award 2012 for high-performance wetting and dispersing agents for surface coatings. Within the framework of the ALTANA Innovation Conference, we have given awards to our best product innovations, which boast outstanding technology and are successful on the market, since 2009.

42,000,000,000
crown corks
x 175 mg
sealant
= 10,000 t
less steel

A light closure saves a weighty resource

Not consuming something is the most sustainable way to save it. For example, efficient use of materials in production makes an important contribution to conserving natural resources and relieving the environment, as well as to enhancing the profitability of production processes. According to the German Federal Ministry of Economics and Technology, expenditure for material in Germany comprises by far the largest cost pool of the manufacturing and processing industries, at around 40 percent. The situation is similar in other countries.

Resource efficiency is one of the key issues in the worldwide sustainability debate. An example shows the impressive effect just a few tenths of a millimeter of thin steel sheeting can have. The three closure manufacturers Pelliconi, Packaging Products del Perú, and Coleus produce crown corks for SABMiller, the world's second-largest brewery group. The latter's characteristic bottle tops are up to 0.07 millimeters thinner and 0.3 grams lighter than standard crown corks. The enormous potential for conserving material and cutting costs is apparent alone from the number of serrated bottle caps SABMiller needs each year for its bottles: 42 billion. With the lighter crown corks, the British-South African company consumes about ten percent, or 10,000 tons, less steel. That is as much as the volume of material used to build the new Wembley Stadium. The equivalent value: almost € 10 million.

No light crown corks without special sealant

This potential prompted other beverage companies to take action. In the future, a few soft drink manufacturers intend to use the light bottle tops too, and more will surely follow. But the innovative step was not as easy as it sounds. Similar to metal vacuum twist-off tops for jars, the thickness of the metal of crown corks can only be reduced with the help of special sealants. "The sealant has to take over some of the properties of the metal," says Wilfried Lassek, Managing Director of ACTEGA DS in Bremen. "This can only be achieved with an extremely flexible and soft plastic." ACTEGA is an expert in meeting such special requirements. The sealant SVELON 830 LG for lighter crown corks, which weighs only 175 milligrams, is comparable with PROVALIN. It also consists of so-called thermoplastic elastomers, is free of PVCs and plasticizers, and is delivered to closure manufacturers in granulate form.

Today, ACTEGA DS sells sealant material in over 100 countries worldwide; more than every second crown cork used in the U.S. is equipped with high-tech plastic from Bremen. Every day, five to six truckloads of granulate are produced which has to be melted down by the closure manufacturers before processing. One truckload suffices for the bottles in 6,000 fully loaded beverage delivery vehicles. This success story required close cooperation between all of the companies involved. "It took almost two years to develop the new sealant. Without the excellent cooperation with the three closure manufacturers and with SABMiller, this would have been extremely difficult," says Wilfried Lassek. "But as we talk about new developments and possible cooperation with nearly all of our clients during sales negotiations, we are able to implement new ideas in concrete projects and products."

Chemical products that have only slight effects on the environment and can be used safely have competitive advantages and hence good sales opportunities on the market. At ALTANA and with our clients, such products make a key contribution to corporate sustainability. Central issues of our product responsibility are resource and energy efficiency, emissions of volatile substances (VOCs), as well as the safety and health of our clients and staff.

Resource protection

Careful use of resources is becoming more and more important. On the one hand, certain raw materials, such as crude oil, for example, are not infinitely available. On the other hand, there is growing wealth worldwide and with it a need for more resources. Most of the raw materials required by ALTANA are based on crude oil. As this finite raw material is becoming more and more expensive, it is imperative that we act now.

Contributions to resource efficiency

- Recycling and reuse
- High level of conversion of raw materials into products
- Material efficiency
- Use of renewable raw materials
- Long-lasting products

Unnecessary losses of water are prevented by a new development of ELANTAS Italia which can be used to seal porous water pipes. With Cured in Place Pipes (CIPPs), a hose impregnated with thermoplastic synthetic resin is fed under pressure into the pipes, becoming the new inner wall. The resin is molded and hardened using hot water or water vapor. An advancement of the product even shows the exact degree of hardening through changing colors.

The issue of recycling does not play a significant role at ALTANA because as a rule our products cannot be recycled or reprocessed, or only with difficulty. Therefore, we make an effort to use raw materials optimally already during product manufacturing, assisted by additives, for example, used to make powder coatings and so-called high solid coatings, whose primary aim, however, is to reduce VOC emissions.

Alternatives to fossil raw materials

The use of renewable, biogenic raw materials makes an important contribution to climate protection. When crude oil based products are burned at the end of their lifecycle, additional CO_2 is emitted. Regenerative raw materials, on the other hand, are almost climate neutral, as by far the largest share of the resulting CO_2 emissions are in a natural cycle.

Around five percent of the raw materials used by ALTANA are renewable. This is relatively little compared to the average in the chemical industry (13 percent). But since we are not a primary industry we only have access to regenerative resources offered by suppliers. Nevertheless, our research and development deals intensively with the potential of renewable raw materials. And the issue of "Green Chemistry" was discussed in workshops at the last two ALTANA Innovation Conferences. In addition, within the framework of a so-called "Innovation Challenge" on the Intranet (ALTANA Innovation Portal), we asked our worldwide research community about their current state of knowledge:

- Which renewable raw materials do we use today?
- How can we increase this share?
- What kinds of renewable resources have potential for us or should be analyzed in more depth?
- Where do we get these raw materials and who could be our partners?

This initiative broadened our knowledge and generated many ideas for the future that are being pursued further. In principle, one can observe that when it comes to renewable raw materials, the chemical industry faces the same problem as energy suppliers do with so-called first-generation biofuels: There is a need for more agricultural land; more fertilizer is

used, which, moreover, emits climate-damaging nitrous oxide; and the plants might be produced in competition with food. In chemistry, however, there is the advantage that chemical companies do not have to perform the energy-intensive synthesis, which has already been achieved by the plants, as is the case with fossil raw materials.

Second-generation biogenic raw materials based on biowaste can be given a much more positive evaluation. While there is also competition with recycling for energy purposes, in our opinion optimum material utilization should be given priority. Alternatively, the sun, wind, and water can be used to generate energy. With material utilization, the CO_2 remains bound that is environmentally friendly, and thus for reasons of climate protection a higher degree of recycling should generally be striven for rather than thermal utilization.

Another raw material even surpasses the life cycle assessment of biogenic sustainable raw materials: water. Related to the finished product, ALTANA currently uses ten percent water as solvent, and the proportion continues to increase.

While searching for alternative raw materials, ECKART discovered a mineral substrate that is coated with metal oxides (ilmenites) for the development of a synthetic pigment with the visual properties of aluminum (metallic effect). These pigments are not nearly as reactive as aluminum, have high chemical resistance and are therefore ideal for water-based coatings. But they are also suitable for other applications in which aluminum is not desired, e.g. in cosmetics or when electromagnetic fields should not be shielded. At the beginning of 2012, ECKART brought the first synthetic pearlescent pigment (SYMIC) onto the market. More are to follow.

Much more efficient than coating paper or foils with metal is the use of printing inks, which ACTEGA manufactures for diverse applications. This requires less material and reduces the amount of waste.

Energy efficiency

Impregnated resins for modern electric motors, generators, and transformers give the components mechanical stability, protect against environmental influences, and improve the heat transfer between individual components. These synthetic resins from ELANTAS Beck in Hamburg are in liquid form and hardened by means of heating, with quickly curing resins preferred for shorter production times, saving energy and increasing production output. ELANTAS Beck achieved significantly improved curing through the use of optimized systems.

For printing inks cured by means of UV radiation, UV lamps are being used increasingly instead of mercury lamps. Usually, three to six mercury lamps are needed to cure the printing ink and another top coat, whereas only one UV lamp is needed. But this requires an adaptation of the protective coating and the printing ink. By changing its coating systems, ACTEGA Kelstar was able to offer suitable products for this and contribute to considerable energy savings by refraining from using mercury lamps.

Solvent reduction

A substantial proportion of emissions of volatile organic compounds (VOCs) comes from the coatings sector. Due to degradation processes, these solvents lead to ground-level ozone formation and thus contribute to so-called summer smog, which can cause health problems. In addition, the emissions are partially responsible for climate change.

VOC climate effect

Solvents consist of different hydrocarbons some of whose degradation products have significantly higher greenhouse gas potential to change the climate than CO_2. When 1 kg of VOCs is burned, approximately 2.7 kg of CO_2 are emitted.

For many years, the coatings industry has worked continuously and successfully on various technologies to reduce VOCs:

- Water-based coatings (water is used to replace organic solvents)
- High solid coatings (with a reduced share of solvent)
- Powder coatings (without solvent, greater energy needs)
- UV-cured coatings

ALTANA, too, has long contributed to the development of these technologies. At ACTEGA, for instance, the range of water-based and UV-cured coatings is continually increased. The TerraRich matt coating Magic Touch, for example, which gives packaging materials a soft feel, can be used for every printing machine with a coating unit. As a result, its areas of application are more variable than those of the usual UV-cured products. The TerraCross coating combines the positive properties of water-based and UV-cured coatings, namely extraordinary mechanical characteristics and flexibility. The limits of existing coating technologies for the graphics industry have been surpassed by the new hybrid technology from TerraCross. The coating is first dried by means of hot air and then cured by UV radiation. Consequently, there are very good chances of improving the production process and the printed articles. ECKART has further developed aluminum pigments for water-based coatings and in the process varied the composition and amount of grinding and stabilizing additives, improving the adhesion and stabilization of the coating.

BYK is producing new additives for water, powder, high solid, and UV coatings, and thus promoting the development of emission-reduced coating systems. The basis of a group of new wetting and dispersing additives, including BYKJET-9151, consists entirely of a so-called active substance containing no solvent. Another new additive is an emission-free wetting and dispersing agent that has very good storage stability, contains no solvent or other volatile components, and meets the stringent requirements of the health evaluation of VOC emissions from building products (AgBB) as well as French VOC standards.

Other newly developed additives for water-based coating systems improve the adhesion of metals and glass, and on the basis of a special wax mix technology ensure high scratch resistance as well as good sliding properties on surfaces, or are responsible for improved air release of powder coatings on porous substrates. Additionally, we offer emission- and silicone-free defoamers that can be used for coatings containing solvents as well as for solvent-free, high solid, and UV-cured systems.

Radiation curable systems are used increasingly with wood and industrial coatings. They are impressive mainly due to their flexibility, adhesion, and hardness as well as fast curing. These advantages coupled with the absence of solvents are creating strong demand, also for the right additives. BYK has developed a number of new additives that can be used in different coating systems with different cleanability and anti-slip properties.

Safety and health

A company has particularly great responsibility when its products come into contact with foods. ACTEGA manufactures a number of coatings, pigments, and sealants for container closures and for use in or on food packaging. The sealant PROVALIN, which ACTEGA developed over a period of five years, for glass jar lids is free of PVC and so-called plasticizers (phthalates). The sealant is based on thermoplastic elastomers, among other things, and is now also sold as PROVAMED for medical-technology and pharmaceutical applications as well as for the cosmetics industry. With PROVALIN, a big step has been taken towards food safety.

ECKART has brought the first sheet-fed offset metallic ink series with low migration and sensory neutral properties onto the market: the METALSTAR FPG 11 series. It is suitable for use on premium food packaging. The formulation of the metallic paint, produced under the conditions of Good Manufacturing Practice, a guideline for quality assurance of production processes and environments, is based on carefully selected raw materials monitored using cutting-edge analytical methods. In 2012, ACTEGA Rhenania presented pigmented coatings for direct contact with food, PVC-free sealing waxes for aluminum and plastic foils, laminating adhesives and coating systems free of synthetic resin, as well as coatings for twist-off bottle caps without bisphenol A, a substance currently being discussed as possibly having hormone-like effects.

Due to the huge responsibility it carries in the food packaging segment, ALTANA founded the EHS working group Food Contact, which discusses, for example, legal framework conditions. Current topics include the new European plastics regulation (EU) 10/2011 ("PIM"), the draft of a German printing ink ordinance, and the ban on bisphenol A which has already been implemented or planned in some countries.

The EU regulation on chemicals, REACH, sees products containing chromium (VI) as being a health concern (see also page 23). This affects the manufacture of sheet metal, electrolytic chromium coated steel (ECCS), and aluminum. ACTEGA Rhenania is therefore already adapting to requirements today that we could face in the future. We develop and test coating systems for different applications on the three alternatively pre-treated metals. In cooperation with a sheet-metal manufacturer, excellent results have been achieved with such systems.

We try to replace substances assessed as being critical in terms of their toxicity or ecotoxicity. The number of such substances, which include e.g. the solvent N-Methyl-2-Pyrrolidon (NMP), has increased due to more extensive investigation under REACH. NMP was classified as being toxic to reproduction and fertility and put on the list of substances that are to be subject to the REACH authorization regime. Since around 1984, ACTEGA had used NMP as a solvent for the interior finish of spray cans. Together with ELANTAS, a coating devoid of NMP has been developed that contains ELANTAS resin systems based on other binding agents. The first compatibility tests were positive.

At ELANTAS Beck in Hamburg, a safe alternative was developed for organic peroxides used in certain polymerizations. Usage of these readily decomposing substances is very risky and subject to strict regulations. Larger trial quantities of the alternative substance are currently being manufactured in a new testing facility.

Guidelines

ALTANA follows discussions about legal changes primarily by working in associations in the countries in which we are active. When legislative procedures affect us strongly, we evaluate the consequences and where appropriate take part in political discussions.

ALTANA's contributions to political discourse

- Bring our own position into that of associations
- Participation in Internet consultations, e.g. in the EU
- Direct talks with politicians

Regulations and legislative procedures relevant for ALTANA

- REACH review (EU)
- Global Product Strategy as a voluntary commitment (International Council of Chemical Associations)
- Globally Harmonized System (UN)
- Definition and regulation of nanomaterial in the EU
- Reform of the U.S. Chemicals Act TSCA

Safe handling of chemicals

In 2012, the legally prescribed evaluation of REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) began in the European Union. ALTANA took a stance on REACH via the German Chemical Industry Association. In our opinion, the legislation should remain as unchanged as possible in order to use and strengthen processes already established in the companies. We particularly welcome the current regulations on polymers, which are exempt from registration as soon as their individual components (monomers) are registered. When monomers are converted into polymers, their potential to cause harm is reduced.

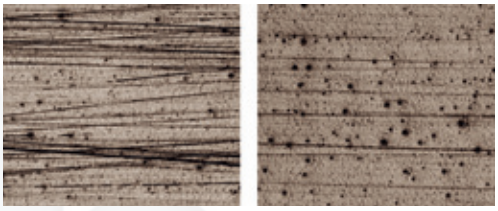
However, we believe that communication in the form of several hundred-page-long safety data sheets, particularly for mixtures, has become unnecessarily elaborate. The data sheets have to be reworked often and thus bind personnel resources. In addition, the benefits of the comprehensive material for subsequent users (so-called downstream users) are very questionable. Translation of the sheets into the many EU languages is also tedious. The Reach review probably began too early to recognize this problem.

In 2012, ALTANA prepared the registration of eleven substances to meet the deadline in 2013. We would like to publish information on safe handling of these substances on the Internet, based on the guidelines of the voluntary commitment Global Product Strategy (GPS) of the International Council of Chemical Associations (ICCA), which we support. However, this is not possible with additives for reasons of confidentiality, because ALTANA manufactures an "effect" and not a specific chemical substance. The chemical associations have not found a solution for this special case yet.

The Globally Harmonized System (GHS) is an effort on the part of the United Nations to develop uniform guidelines for classification and transport of chemical substances. GHS is being legally anchored in more and more countries. The companies in the EU have already implemented the guidelines or will do so before the deadline. In 2012, in the U.S., too, a law went into effect based on GHS guidelines. ALTANA's U.S. plants will together push forward the implementation in 2013.

NANOBYK: More UV protection and less abrasion

According to the "Precautionary Strategy for Nanomaterials," a study conducted by the German Advisory Council on the Environment, it is hard to find examples of the use of nanomaterials that solve environmental problems in reality. But NANOBYK products are a very real example of such solutions, as they contribute, for instance, to resource efficiency due to the long life of products – a specialty of chemistry. For example, coatings, with their corrosion protection, increase the durability of cars, bridges, and wind turbines. Additives increase the life of coatings and thus save an enormous amount of resources in the long run. NANOBYK additives make a substantial contribution to enhancing the durability of coatings. They improve their UV protection and scratch resistance.



Fewer scratches on coatings: Nano-based BYK additives improve scratch resistance.

Coatings weather due to outer influences such as UV radiation, cold, heat, moisture, and mechanical factors, which lead to scratches and abrasion. Today, BYK offers eight nano additives on the basis of cerium dioxide and zinc oxide, which act as UV absorbers without being depleted by the rays. They convert UV light into harmless oscillations and heat. For safe handling of the nanotechnology, coatings manufacturers receive so-called highly filled dispersions so that they do not have to work with nanoparticles in powder form. When used properly, there is no danger that the tiny particles will be inhaled. And not much of them is needed. Even with a very small percentage of nanoparticles (0.5 to 2 percent, related to the solid content of the coating), the additives provide outstanding UV protection. A higher concentration of the alternative microparticles is needed, though.

Furthermore, BYK markets ten additives that improve the scratch and abrasion resistance of coatings and thus their durability. Scratches such as those found on cars, wooden floors, or furniture not only impair the appearance, but also the surface protection provided by the coating. As harder coatings offer more protection, the surface of silicon dioxide nanoparticles has a so-called acrylic functionality. During hardening the cross-linking density of the molecules is increased, which means less abrasion and improved scratch resistance. The same can be achieved with nano additives, which offer e.g. optimum surface protection when a surface is scratched by returning immediately to their initial state (reflow) and closing the scratch. This outcome is attained with two seemingly contradictory properties: hardness and elasticity. The silicon nanoparticles are distributed evenly in the coating and thus act as a shock absorber.

NANOBYK products can be assessed as being safe, because during manufacture they remain in a closed unit, existing as dispersions for further processing. The material is later firmly embedded in a coating matrix, and so consumers and the environment cannot come into contact with free nanoparticles.

Nanotechnology

For quite a while, there have been debates worldwide about the legal regulation of nanomaterials. We share the view of the chemical associations that REACH sufficiently regulates nanomaterials, but believe it would make sense to make further clarifications in the course of evaluation. It is important that concerns about possible risks of this promising technology be adequately addressed in legal regulations. A continual point of criticism in public discussions is that nanotechnology has not lived up to expectations thus far. For this reason, we have brought the positive effects of our NANOBYK products, including their environmental merits, into the debate.

The European Union's definition of nanoparticles, explained below, is subject to criticism. The suggestion provides for a particle size distribution based on number rather than volume. Normally, volumes or mass distributions are measured.

The difference is considerable and can be understood based on the example provided on the right.

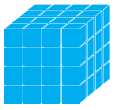
It may reasonably be doubted whether the EU definition makes sense. So far, no suggestion has been made for a suitable measuring method. And the definition may not even be able to be implemented for measurements. Should a measurement be possible, then it is to be feared that nearly all powdery substances can be seen as nanomaterial. A component of the EU's definition is the limit for the specific surface. This is easy to measure and appropriate and would be completely sufficient as a definition.

We are also closely observing the reform of the American Toxic Substance Control Act (TSCA), which has been part of the political debate for some time now. If necessary, we would bring our experiences with REACH into this discussion.

Volume distribution

The entire volume distribution of the pigment sample in the picture is $64d^3 + 64d^3 + 64d^3 = 192d^3$

64 cubes with side length d



Volume $64d^3$

8 cubes with side length 2d

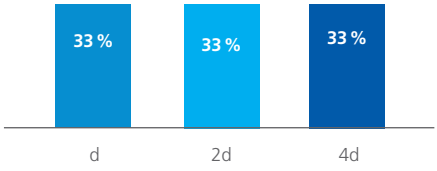
Volume $8 \times (2d)^3 = 64d^3$

1 cube with side length 4d

Volume $1 \times (4d)^3 = 64d^3$

This leads to the following percentages of volume distribution:
Small particles: **33 %**
Medium-sized particles: **33 %**
Large particles: **33 %**

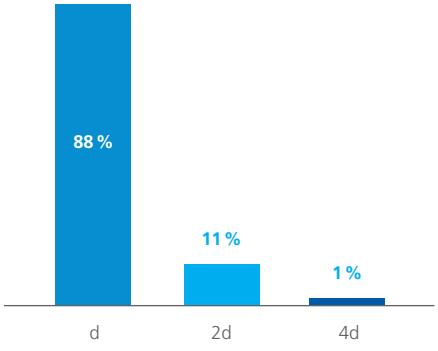
This can be depicted in the following histogram:



Number distribution

The total number of parts in the pigment sample is: $64 + 8 + 1 = 73$
This leads to the following percentages in the total number distribution of all particles:
Small particles: **88 %**
Medium-sized particles: **11 %**
Large particles: **1 %**

This results in the following histogram:



This example shows that the same initial conditions can lead to completely different results. Naturally, this would also apply e.g. to a realistic powder sample containing very small particles: A relatively small percentage of small particles ($^1/_3$) of the total volume and thus the total amount will lead to a very high percentage in the number distribution.

Safety pays off

The development of cities never ceases. Many commercial and industrial areas which were a good distance away from residential areas when they were established are sooner or later "caught up with" by growing settlement. Things were no different with today's ACTEGA Rhenacoat site in Sedan, France. But back then there were no special safety regulations for residents or the environment.

When ACTEGA acquired the paintings and coatings factory from the former owner in 2001, the modernization began. This included not only the implementation of ALTANA standards, but also new regulatory requirements. An accident in a fertilizer factory in Toulouse led starting in 2002 to more stringent regulations for resident and environmental protection in France. Fire protection was a special priority.

"We had to reduce the amount of combustible substances on our factory grounds immediately," says Thierry Tabeaud, Managing Director of ACTEGA Rhenacoat. The company has specialized in coatings systems for metal packaging since 2004. "Due to the regulations we were leasing an external warehouse," adds Tabeaud. "Every day, a truck shuttle drove the raw material 125 kilometers to our factory." By 2011, the annual costs for this safety measure had risen to €260,000. In addition, there were the exhaust fumes and about 30 tons of CO_2 a year from the many transport drives.

10 years

+2,200,000 €

=0 domino effects

Opening of ACTEGA Rhenacoat's plant extension for greater soil and fire protection.

The same safety standards with lower costs

In 2005, the management presented a construction plan to the authorities for a new warehouse, an extinguishing water catch basin, and a new tank farm for synthetic resin. Everything was supposed to be built on the factory grounds and the residents were to be protected with fire protection walls. Also, a hazard study was presented. But the construction work for the new warehouse, which began in July 2005, was stopped after a little over a year. "The costs for the first concept would have been too high," says Thierry Tabeaud. "We needed a new solution that guaranteed the same amount of safety for residents and that adhered to environmental protection requirements, but cost less." In mid-2010, the authorities granted approval of the new warehouse concept. In addition, the old tanks were replaced as they were not compatible with the new safety system. Moreover, two of the old tanks had leaks. So €300,000 were spent to clean all of the soil and €400,000 to replace the tanks.

The new solution now meets all requirements. The new buildings were distributed over a total area of 2,500 m^2 on several plots separated from one another, to prevent a domino effect from occurring in the case of fire, as the fire cannot spread to another area. There is 800 m^2 of space in the warehouse for 1,300 tons of raw materials and end products which is covered completely by a roof. The extinguishing water capacity was increased from 90 m^3 to 120 m^3 and the covered catch basin offers sufficient volume (760 m^3) to contain the extinguishing water. Furthermore, there is an emergency control center in a protected place. The entire project, which was completed in mid-2012, cost €2.2 million.

The new warehouse complex, which meets all of the demands of the French environmental authority DREAL and will be certified at the end of 2013 to ISO 14001, enables ACTEGA Rhenacoat not only to serve the market even more efficiently and to secure profitable growth, but also means much greater safety for residents. On top of that, daily transports are no longer needed, reducing the environmental burdens from CO_2 and noise.

Occupational safety

"Safety on the job" is a measure that was initiated to improve ALTANA's occupational safety. The project was launched in 2011 within the framework of the Management Development Program (MDP). The project team, with members from Germany, China, and the U.S., sought out best practice examples internally and externally, as well as the most successful methods and systems. To this end, a questionnaire, among other things, was developed and distributed to the managers responsible for Environment, Health & Safety (EH&S) in order to find best practice examples. The questionnaire included questions about management and leadership, about jobs, training programs, and safe handling of hazards and hazardous substances.

Self-evaluation method

The goal was to develop a globally implementable tool that, among other things, takes into account the cultural particularities of the different regions. To achieve this aim, interviews were conducted in Europe, China and the U.S. In the end, two methods were selected that were tested in pilot projects at several sites on three continents. As of 2013, all ALTANA companies are required to conduct annual self-assessments. The Group's EH&S department coordinates the survey, whose results are discussed at the annual EH&S meeting. The second method provides for an evaluation of a factory's operational safety culture by external experts. For this purpose, employees, superiors (foremen, and so on) and the management are surveyed (see information box). The advantages: More topics are covered, the survey is more objective, and it provides important results due to a direct comparison of the different hierarchy levels.

Content of the survey on safety culture

- Significance/value of safety
- Quality of daily management and leadership
- Quality of risk management
- Information and communication
- Development of safe conduct
- Development of safety competence

ECKART launched a comparable safety culture project involving external evaluations. In this project, too, safety-relevant organization and the regulations were examined; interviews were conducted with the management, department heads, and employees; and questions were asked about safety policy, management and leadership, and the use of classic tools such as training programs, inspections, causal analysis, and risk evaluations. The results show that ECKART is on the right track, but there is considerable room for improvement, e.g. regarding correct behavior, which is influenced significantly by the managers.

Less exposure to chemicals

ALTANA has introduced manifold technical measures to decrease employees' contact with chemicals, e.g. with closed metering systems for solvents. In 2012, the company invested

in new tanks at ELANTAS in Hamburg, in Ankleshwar, India, in Zhuhai, China, and at ACTEGA in Sedan, France. And to protect employees of ACTEGA Rhenania from dust from nanomaterial, a closed production facility was built.

In open facilities, the air quality at the workplace is measured, for example, to gauge the amount of nano dust at ECKART. Whether this material is actually a nanomaterial depends on the definition and measuring methods. As the European Union has not made a definitive decision on this matter yet, it cannot be assessed conclusively. Only one dimension of the ECKART pigments in question is in the nano range. As a result, it cannot be concluded that there will be a migration through biological membranes, e.g. the skin, and the toxicological risks can be assessed as low.

Measurement of nanoparticles

The following methods were used for the complex measurement of nanoparticles:

- Condensation particle counter (CPC)
- Scanning mobility particle sizer (SMPS)
- Welas optical particle counter (scattered light measurement)
- Scanning electron microscopy

Measurements using four different methods (see information box) were carried out at ECKART at nine different places in production and in the laboratory. In such measurements, the fact that nanoparticles naturally exist in air is taken into account. To achieve valid evaluations, the natural proportion of nanoparticles is measured first. The values lie between 10,000 and 20,000 nanoparticles (P) per cm^3 of air. A significant increase at the workplaces could not be observed. By comparison, the nanoparticle pollution in road traffic is approximately 40,000 P/cm^3 and in a smoking room as high as 100,000 P/cm^3.

Similar measurements were performed at BYK in the lab, where work with nanomaterial is done in so-called fume hoods, in an effort to limit exposure to nanoparticles in the laboratory's air. According to the measurements, the background concentration in the lab tested is comparably low. The main reason for this is probably the high air exchange rate with filtered air. But even with a significant increase in particles in the room air (highest measured value: 1,400 P/cm^3), the base level of particle concentration was achieved in just a few minutes due to the high air exchange rate and the suction power of the fume hoods.

Using more harmless substances

Wherever possible, we refrain from using hazardous substances or replace them with less dangerous ones. Examples are the sealants PROVALIN and PROVAMED (see also page 22), which do not need plasticizers. Consequently, a hazardous substance has been eliminated at our production sites and our clients no longer have cause for concern when using our substances for their applications.

We also seek to replace organic solvents, most of which are highly flammable and detrimental to health, with alternative substances such as water. This aim is primarily driven by the desire to reduce ozone pollution or so-called summer smog. Among the causes are volatile organic compounds (VOCs), emitted, for example, from coatings containing solvents. In 2012, ACTEGA produced around 117,000 tons of coatings containing approximately 37,000 tons of water as a replacement for solvent. ALTANA plans to replace even more solvent with water in the future.

E-learning enables individualized learning

Training and education are important ways to improve safety, as only through such measures can employees learn and internalize appropriate safety-relevant modes of behavior. Theoretical procedural guidelines alone are not sufficient. E-learning has already proven successful in compliance training (see also page 11). A big advantage of learning on the computer is the flexibility, as each participant can study individually, based on the time available to them and their learning speed. In addition, several employees do not have to take off work at the same time, which can lead to problems, e.g. in production. Another benefit of e-learning is that the person studying keeps on taking the concluding test until he or she has understood all of the subject matter. ELANTAS Beck in Hamburg has used e-learning since 2012 for safety briefings. If the results are positive, this will surely become a best practice example for other ALTANA companies.

Also in 2012, ELANTAS Beck introduced the Behavior Based Safety (BBS) program to improve occupational safety. In BBS, qualified employees observe the behavior of their colleagues with an eye to safety and immediately give them positive or negative feedback. The results are statistically evaluated, thus showing where action needs to be taken. ACTEGA Rhenania has made great progress in occupational safety with BBS and other measures, including closer scrutiny of safe behavior by foremen. The excellent result: 22 accident-free months.

The target is zero

ELANTAS Beck India also has a positive safety record. This is due not least to the annual National Safety Day, in which many of the plant's employees take part. Under the motto "zero accidents," fire drills, a safety quiz, and written competitions are organized, and information stands inform the workforce about how to avoid accidents at their workplace.

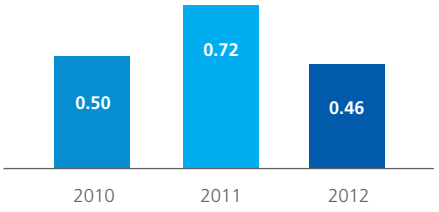
In 2012, ECKART organized safety days under the motto "no risk allowed." The employees in Güntersthal had the opportunity to visit a mobile exhibition mounted by the German Employers' Liability Insurance Association for Raw Materials and Chemical Industry (BG RCI) devoted to safe driving and minimizing transport risks. They received information about how to recognize and deal with dangers, what constitutes good safety training, vision and visibility, and corresponding best practice examples. In addition, employees were advised about what kind of safety boots and goggles to wear, as well as about respiratory and hearing protection. Explosion protection training will be offered next.

Technical occupational safety

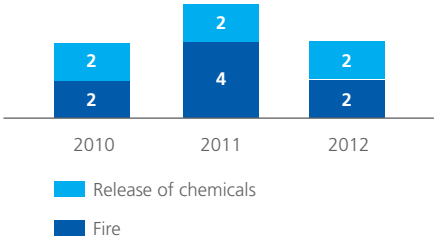
ALTANA also applies on technical measures to minimize incidents causing damage and their consequences. For example, ELANTAS Beck uses an infrared camera to detect possible weaknesses in the electricity grid that could lead to overheating. ELANTAS Beck India built a new firewater basin with a volume of 25,000 m³ that contains a unit for dispensing fire-extinguishing foam. At ELANTAS PDG, a CO_2 extinguisher in an existing production plant that poses risks to people was replaced by a water-based sprinkler system including a catch basin. Furthermore, fall protection when employees climb onto tankers was improved. ACTEGA DS installed a blasting cubicle for safe cleaning of extruder screws and began operating a new testing facility with explosion protection that is significantly safer than the previous system. At ACTEGA Rhenania, steel platforms were reinforced to improve earthquake protection and

footpaths were labeled to protect pedestrians from forklift traffic. ACTEGA Foshan erected a new pumping station for its tank farm at a suitable distance from the tanks.

Number of incidents according to process safety incident (PSI) for 2010/2011/2012 related to one million working hours



Number of incidents in absolute terms for 2010/2011/2012 differentiated according to fire and release of chemicals



Damage incidents

Incidents such as fires, explosions, and release of chemicals can affect the company and its neighbors. For this reason, ALTANA records all incidents worldwide it considers significant and reports on them. As to the definition, we follow the guidelines of the VCI:

Number of incidents categorized as a "process safety incident" (PSI):

Release of substances or energy if one or more criteria are fulfilled:

- Injuries leading to a hospital stay (≥ 24 hours) or lost works days of employees or third parties
- Damages > €25,000
- Exceeding 5, 100 or 2,000 kg depending on the GHS classification regarding release of substances

Number of PSIs related to working hours:

The number of incidents is related to one million working hours based on VCI guidelines.

After six incidents in 2011, ALTANA recorded four cases in 2012:

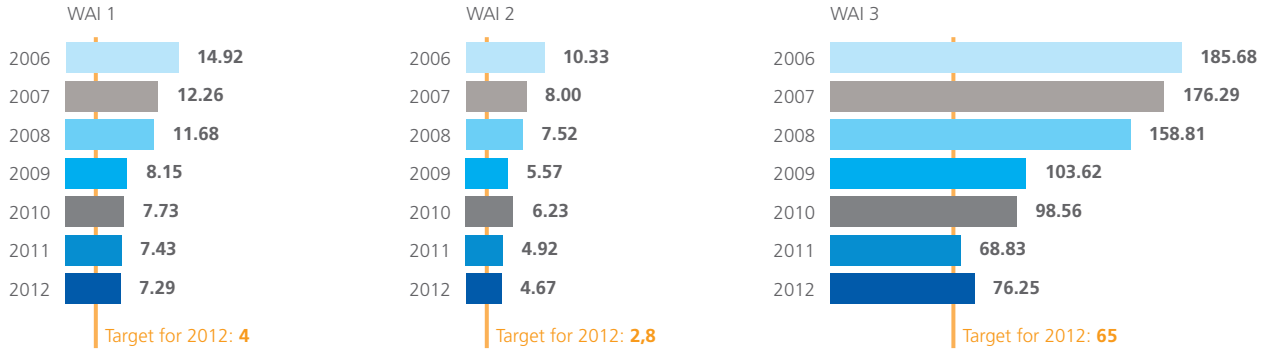
1. In the ACTEGA DS plant in Bremen, there was a fire with smoke formation in a control cabinet. Three affected employees were observed for one day in the hospital. There were no consequences for their health. All of the old control cabinets were replaced by new ones.

2. At BYK USA in Wallingford, 200 liters of liquid were released due to foaming, but the liquid was caught in containers provided for this purpose. No harm was done to people or the environment.

3. There was a deflagration at the ELANTAS PDG site in St. Louis. Regrettably, one employee suffered severe burns. As a consequence of this accident, technical changes were made to avoid such accidents in the future.

4. At ECKART in Güntersthal, 400 liters of liquid spilled out due to a leaky filter. But thanks to constructional installations, all of the material was caught. To avoid renewed leakage, technical changes were made to the filter.

Occupational safety success rate targets for 2012
We did not reach our targets for Work Accident Indicators WAI 1 and 2, but almost reached WAI 3.



Achieved in 2006-2012: **-51.14 %**

Achieved in 2006-2012: **-54.79 %**

Achieved in 2006-2012: **-54.79 %**

Fewer incidents due to "safety on the job"

We generally assume that the MDP "safety on the job" project will make a considerable contribution to reducing incidents (see also page 29). While our principle is "every incident can be avoided," we cannot rule them out completely. Thus, a professional approach to each incident is all the more important to keep consequential damage to a minimum. For example, BYK and external accident experts developed a crisis management system (CMS) that is being introduced in 2013. The new CMS supplements the existing preventive safety measures of the emergency response planning. In addition, it provides detailed information about what should be done in the case of an incident.

In addition to crisis management, fire drills are very important at ALTANA. At BYK in Kempen, a drill was carried out involving a leaking tanker carrying chemicals. The goal of the exercise was to help BYK employees prevent the danger from spreading. A total of 75 firemen and 14 vehicles were deployed. After the drill was completed, the course of the incident and the potential for improvement were analyzed with experts from the Düsseldorf district government and the regulatory agency of the district of Viersen. Another fire drill was performed at ACTEGA Rhenania in Grevenbroich to test alarm and communications plans under real conditions. A total of 120 firemen and rescue workers trained on the company grounds. Seventy-five percent of the workforce volunteered to take part in the drill.

Since 2006, we have measured the occupational safety success rate at ALTANA based on uniform and binding international indicators:

- WAI 1 (Work Accident Indicator): Number of occupational accidents with one or more days of lost work time per million working hours
- WAI 2: Number of occupational accidents with more than three days of lost work time per million working hours
- WAI 3: Number of lost work days due to occupational accidents per million working hours

As the graphic at the top shows, we improved all of the indicators significantly from 2006 to 2012.

Based on statistics compiled by the German Employers' Liability Insurance Association, the chemical industry in Germany is one of the safest sectors. The average WAI 2 for 2011 according to the association was 9.5 (at ALTANA, by comparison: 4.7). In 2012, as in the two previous years, there were no fatal occupational accidents at ALTANA.

Nor did we have any work-related illnesses acknowledged by the Employers' Liability Insurance Association as so-called occupational illnesses in 2012.

Health protection

In 2008, ALTANA signed the European Union's Luxembourg Declaration and since then has promoted health protection. On the one hand, this is a clear sign of our appreciation of our employees. On the other, the greater efficiency of healthy employees benefits our company.

Lost work time due to illness is much higher than lost work time due to occupational accidents. The ALTANA Group seeks to heighten the wellbeing and availability of its staff in so far as possible. To understand the effect of the activities carried out to achieve this aim, the company's executive management decided to record illness at all ALTANA companies as a key performance indicator. The result is reported to the Management Board.

Sports offers at ELANTAS Beck

- Rowing course
- Soccer group
- Tennis group
- Participation in the Hamburg rackleton tournament consisting of table tennis, badminton, squash, and tennis competitions
- Participation of three ELANTAS teams in the Hamburg MOPO Relay Race
- Fitness room with cross trainers, bicycle ergometers, wall bars, punching bags, dumbbells, expanders, and gymnastic mats
- Massage offers
- Vital Compact back training course

600,000 steps from Hamburg to Wesel

ALTANA's health-related activities continue to focus on ergonomics, sports, and nutrition, as well as mental health. In the different companies, there are many offers and great support for sports activities. To motivate people to exercise who otherwise do not do sports, there are different ideas for sports competitions in our company. One of them was the virtual walking competition "From Hamburg to Wesel" organized by ELANTAS Beck in Hamburg. The competition was virtual because the destination was not really Wesel, but rather employees were supposed to take 10,000 steps a day – at home, at their workplace, and during their free time – for 60 days. All participants were given a pedometer and could follow their virtual routes on an online map. For the target of 600,000 steps, the employees could even convert other sports activities into steps. The fastest group covered twice the distance in the time allotted – from Hamburg to Wesel and back, you could say.

At ACTEGA DS, 23 employees including managers took part in the "PROVALIN Triathlon." The disciplines of the triathlon, which is actually called the Silberseetriathlon, were a 500-meter swimming competition, followed by a 20-kilometer bicycle race, and finally a 5-kilometer run. Those who took part received support from the management, which strongly advocated participation, and from colleagues from ELANTAS. On the whole, the employees of the ALTANA companies did very well, finishing in 1st, 3rd, 5th, 6th, and 7th place in the company relay race. Needless to say, ALTANA plans to participate again in 2013. In 2012, BYK employees also had the opportunity to take part in various internal and external sports events and courses, such as the Lichterlauf race, the Additives Cup, a running group, and a dragon boat race on Auesee Lake in Wesel.

Fighting mental overload

Mental health is another issue addressed at ALTANA. Psychological disorders are now the second most common employee illness. Mental overload and addictions of all kinds need to be dealt with sensitively and require a special trusting relationship between the management, the works council, and staff. At ALTANA and BYK in Wesel, every employee has since 2011 been entitled to five anonymous psychological consultations a year free of charge. If patients need longer-term therapy, they are referred to cooperating counseling services. In addition, various relaxation programs have proven to be very effective.

Psychological counseling in demand

In 2012, 40 colleagues made use of the psychological counseling offer in 148 consultations. The total cost was approximately €40,000. Seven staff members are currently in therapy.

BYK also has a work group called Addiction & Psychological Burdens. Volunteer helpers from different departments who can be reached by phone or e-mail at any time view themselves primarily as listeners and mediators for clarifying sensitive issues. Respectful treatment of the colleagues in question and their respective problem is a matter of course. BYK-Gardner also offers psycho-social consultations, which have been very well received by employees thus far. The talks take place in an external psychologist's office, guaranteeing anonymity. At ELANTAS Italia, a special questionnaire for determining whether employees are suffering from psychological stress was used for the first time.

In November 2012, a workshop was held on best practice examples at all German sites, enabling participants to exchange ideas about different health measures. Mental health was a focal point here too. A first step towards an analysis has already been taken, with a survey on employee satisfaction. In it, questions are asked about mental overload and underload, and about cooperation with superiors and colleagues. In addition, employees always have the opportunity to talk about special burdens at the mandatory annual Compass Dialogue. ALTANA will examine whether BYK's counseling model can also be offered at its other locations.

Numerous courses devoted to health

BYK in Wesel now offers many courses designed to help employees remain healthy, ranging from sports and consulting to courses that help people quit smoking. Normally, however, the number of registrations is higher than the number of employees who actually attend the courses, and so the conditions for participation were changed. Moreover, in the future the health examination for employees at BYK will be considerably more extensive than the required checkups. The costs are expected to be partially covered by the health insurance companies. The health examination could serve as a best practice example for other ALTANA companies.

Nearly all of the sites now organize their own health days focusing on health club visits, cycling, health circles, and yoga. Between 50 and 70 percent of the company's staff take part. At one site, the share of employees participating increased from 30 to 70 percent thanks to the commitment of the works council. In addition to participating in health days, employees in Pune, India, devoted themselves to a special campaign against chewing tobacco. The use of carcinogenic chewing tobacco is widespread in India. ECKART contributed 50 percent of the financing for the Weight Watchers At Work diet program, with which 76 employees lost 484 kilograms body weight in 13 weeks. The success speaks for itself. Participants are now continuing with the course at their own expense.

Working in an award-winning building

Anyone who designs a new building today should think about tomorrow. Saving at the wrong end can quickly lead to a need for renovation due to higher energy costs or a poor building structure. But a lack of energy efficiency is not only detrimental in economic terms; it also has an adverse effect on the eco-balance. Sustainable, resource-efficient construction is gaining in importance worldwide, as "green" building saves energy and protects the environment.

The BYK division in Wesel faced this challenge with its new laboratory building. And passed the test with flying colors. The building, which was occupied in 2012, was planned and built in such an environmentally friendly way that it became the first building in Germany to receive the LEED Platinum label from the U.S. Green Building Council. LEED (Leadership in Energy and Environmental Design) certification is the standard for high-quality ecological buildings. The award was given not only for the building's energy efficiency, but also for factors pertaining to ecological construction, e.g. the building material, the room climate, and the comfort of users.

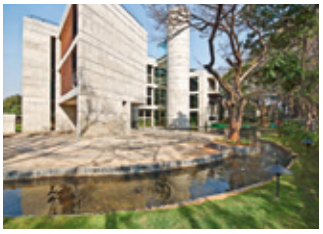
30 percent energy savings

During a construction period of two years, BYK created 9,000 square meters of laboratory space for around 130 workplaces distributed on five levels. "This state-of-the-art laboratory building is a further component of our comprehensive Green-ability concept," says Albert von Hebel, BYK's Managing Director Finance. "We not only develop additives enabling our clients to bring environment-friendlier products onto the market, but we are looking for ways of acting in a more environmentally aware way right here at our home base. This Platinum status gives us excellent confirmation and spurs us on to continue down this path." Even in the planning stage, the architects

9,000 m^2
building space

+130
workplaces

=30%
energy savings



Award-winning buildings: The new BYK laboratory was certified by the Green Building Council. ELANTAS' new administrative building in India relies on natural cooling.

attached special importance to efficient use of energy. Thanks to geothermal energy, heat pumps, and heat recovery, the primary energy consumption is 30 percent lower than that of standard buildings. In addition, sufficient daylight in the building was ensured by the targeted use of transparent partition walls. As a result, less artificial light and thus cooling capacity is needed. The construction materials used consist partly of renewable raw materials or can be recycled easily. The thermal insulation and the entire ventilation system also meet the stringent energy requirements of the Green Building Council.

ELANTAS Beck India's new administrative building is another new building that ALTANA erected according to environmentally friendly principles. The employees, who had previously worked in downtown Pune, moved to the grounds of the production site in the suburb of Pimpri. This change alone has brought lasting advantages. First, the time-consuming drives between production and administration are no longer necessary. And second, internal work processes and communication were accelerated. Work at the Pimpri site has since become much more efficient.

Natural ventilation supports the air-conditioning

The energy consumption of the new property was also improved. The overall concept is so sophisticated and comprehensive that the architects, who specialize in environmentally conscious building, received the AESA (Architects Engineers Surveyors Association) Award 2013. The V-shaped building is made of recycled concrete. And the air-conditioning, including the speed-controlled ventilators, which keep the room temperature at about 24 degrees Celsius via a presence sensor, is supported by natural cooling, the so-called Venturi effect, through an open roof over a glazed atrium and roof overhangs providing shade.

The ponds that enclose three sides of the building make a key contribution to the cool microclimate. The water for these bodies of water comes from the plant's own sewage system. Rotatable blinds also prevent the interior from heating up too much. They let in sufficient daylight, reducing the need for artificial light. Dr. Matthias L. Wolfgruber, the CEO of ALTANA, was enthusiastic about the advanced building at the opening ceremony. He congratulated the staff on their new workspace and encouraged them to derive inspiration from the refreshing green environment.

Energy efficiency

One of the key tasks of our age is to replace fossil resources with sustainable alternatives and to find solutions to global climate change. More economical usage of energy is part of this. Higher energy efficiency is possible particularly by means of advanced technology and low-emission management. At BYK in Wesel, following an energy-efficiency analysis the heating and ventilation systems were adapted to the operating hours, the emergency lighting was improved, and in one building a ventilation system with heat recovery was installed. By merging the two-part cooling system from production, which cost almost €2 million, its load and efficiency could be increased and the number of pumps reduced. The remaining pumps have variable frequency drives. That means lower energy consumption as well as fewer maintenance and repair measures and lower costs and reduced use of chemicals for fighting algae. In parallel, the base temperature of the heat transfer oil was reduced by 50 degrees Celsius. When more heat is needed, electric heaters are used according to demand.

1,300 tons of CO_2 saved

The measure, which will be amortized already in four years due to the lower energy consumption, decreased CO_2 emissions by around 1,300 tons, equivalent to 12 percent of BYK's entire emissions in Wesel. We are currently investigating whether an additional combined heat and power system is economically viable. A decision will be made in the course of 2013. A prerequisite is an alternative technology for exhaust air purification. The usual thermal afterburning process (TNV) is still being used with heat recovery. In conjunction with the modernized cooling water system, it would then be possible to reduce CO_2 by 18 percent.

Other feasibility studies on energy efficiency are currently being conducted by ELANTAS Beck in Hamburg. They concern various measures, including optimization of the TNV, exhaust purification, and a possible combined heat and power system.

Small measures with long-term effects

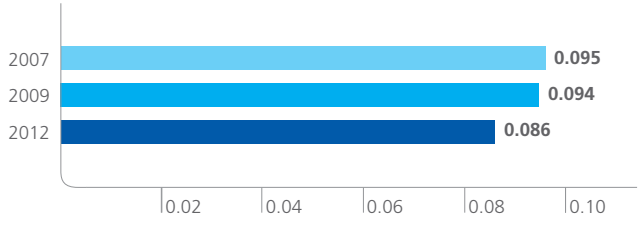
ACTEGA DS has already replaced an energy-intensive pumping device (extruder) with a device that saves significantly more electricity, and another replacement is planned. In addition, a hall for forklifts was equipped with two energy-saving fast-action doors. ELANTAS PDG replaced a steam boiler from 1981 with a more efficient device, and at ELANTAS Zhuhai raw materials are preheated in a new thermal chamber that makes use of waste heat from production. ECKART Zhuhai replaced nine old sieves for "screening" pigments with modern ones which not only consume 50 percent less electricity but also are considerably quieter. The replacement of more sieves is planned.

The optimization of the TNV at ACTEGA Rhenania provides more noise protection as well as greater energy efficiency. In addition, employee rooms were modernized with regard to energy efficiency. Among other things, a new ventilation system with heat recovery was installed. The heating in the administration was also optimized and the boiler replaced. ELANTAS Beck in Hamburg is now utilizing the waste heat from a further air compressor.

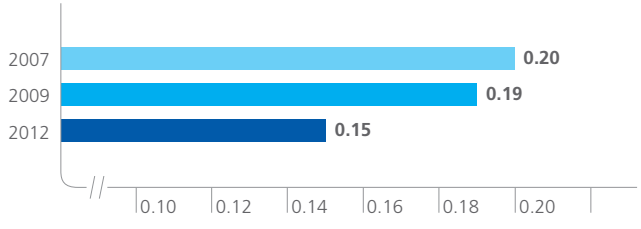
The development at our two sites in India does not seem quite as successful at first glance. The last targets set were not reached. A closer look, however, reveals that this is not due to a lack of commitment, but to the fact that energy efficiency measures were implemented there at a very early stage. Between 1998 and 2012, we reduced the energy consumption by 50 percent. But with that kind of success rate, it will be harder and harder to improve the efficiency even more.

Since 2007, the energy consumption of ALTANA's producing sites (including administration, labs, warehouses, etc.) has been recorded as a binding environmental key performance indicator. This includes direct energy consumption (Scope 1 – natural gas/crude oil) and indirect energy consumption (Scope 2 – electricity). During the reporting period, the energy savings amounted to 9.58 percent (Scope 1), and 26.39 percent (Scope 2), related to the gross value added.

ALTANA CO_2 from oil and gas consumption (Scope 1)
Related to gross value added (in g/Euros)



ALTANA CO_2 from electricity consumption (Scope 2)
Related to gross value added (in g/Euros)



Emissions

The predominant part of ALTANA's climate-relevant emissions come from direct (Scope 1) and indirect (Scope 2) energy consumption (see left column). They are calculated based on the guidelines of the Greenhouse Gas Protocol, an instrument for quantifying and managing greenhouse gas emissions, and the factors of the International Energy Agency. For electricity, we have considered the values of the national network in each case and not the values of a special electricity provider.

Other relevant greenhouse gases from production processes etc. are not emitted in significant amounts, nitrogen oxides (NOx) and sulphur dioxide (SO_2) arise solely from energy consumption, and are calculated accordingly. Ozone-depleting substances are not contained in any raw materials used by ALTANA, are not used in manufacturing processes, and do not exist in products. Several ALTANA companies emit volatile organic compounds (VOCs – see also page 20). The companies do not continuously measure VOCs, but estimate them from random samples instead. Based on these estimates, the amount is around 200 tons worldwide. The permitted emission volumes are defined by law in the countries in which we produce. We keep within these limits at all of our sites, usually with the help of waste air purification by means of thermal afterburning.

Initiatives to reduce greenhouse gases

We significantly surpassed our target of reducing our CO_2 emissions between 2007 and 2012 (related to gross added value) by 10 percent, cutting them by 21 percent. By 2020, we seek a decrease by about 30 percent. In this context, we would like to make mention of our new cogeneration or combined heat and power plant (CHP) in the ELANTAS factory in Ascoli, Italy (see also Sustainability Report 2011). The CHP improves our CO_2 balance not solely due to the more efficient energy conversion, but also through the use of biogenic fuels.

As expected, the plant provided around 900 megawatt hours (MWh) of electricity and some 300 MWh of heat. But the

information is not complete, as the CHP has only been operated continuously since June 2012. Since the costs for vegetable oil exceeded the original cost estimate by 30 percent, the amortization period was extended from two-and-a-half to eight years. As a result, less expensive alternative fuels are currently being looked into. The photovoltaic unit in Ascoli, however, lagged around 10 percent behind expectations, with an energy yield of around 900 MWh of CO_2-neutral electricity.

We will reduce other CO_2 emissions by switching from oil to natural gas at ECKART in Güntersthal. The plant is expected to go into operation in the fall of 2013 and to cut the amount of CO_2 by about 1,500 tons. A conversion to gas is also being prepared at ELANTAS Zhuhai. But there is still no municipal gas pipeline because so far not enough other customers have been found.

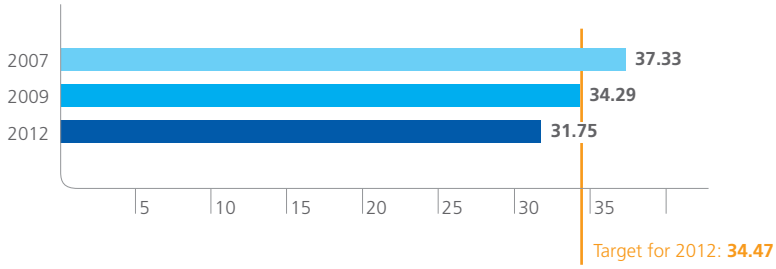
Projects to reduce VOC emissions

Emissions of solvents (VOCs) can be reduced through the use of exhaust air purification units. Another measure is the use of material and product tanks. The filling of the tanks through vapor recovery pipelines, which are used to feed solvent vapor back into the tanker, and the dosing of the raw material into the production container, occur via closed pipelines. Hence no VOC emissions can leak out in either process, as opposed to usage of barrels where this cannot be avoided.

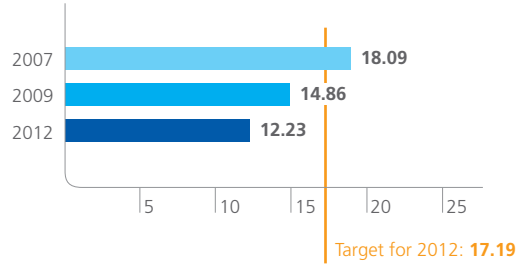
We invested in tanks at several sites. At ELANTAS Tongling, it is primarily intermediate products containing cresol that are stored in tanks. As a result, the smell of cresol is no longer as strong in the surrounding air. In addition, ACTEGA Rhenacoat set up a new tank farm as part of the refurbishment of the entire site (see also page 26). ELANTAS Beck India installed eight and ELANTAS Zhuhai six new tanks. ELANTAS Beck in Hamburg also expanded its tank farm in 2012.

Efforts are being made to further reduce VOC emissions at ELANTAS PDG as well. While the factory has had raw material tanks for years, there has been no pipeline dosing. So far, the raw materials have been dosed from the tanks into barrels and from there into the vessels – in other words, openly. Furthermore, in 2010, following an accident in the exhaust air purification unit, a new facility with better safety equipment went into operation and the production process that caused the accident was altered. The old unit is now being kept only for emergencies. ACTEGA Foshan significantly reduced the limit of its total VOC emissions, particularly hydrocarbons and xylene, thanks to a new exhaust air purification system with active carbon filters.

ALTANA: Hazardous waste
Related to gross value added (in g/Euro)



ALTANA: Non-hazardous waste
Related to gross value added (in g/Euro)



At ELANTAS PDG, purification of water from a distillation process via phase separation and active carbon filters was pushed further forward (see also Sustainability Report 2011). The process optimization, which is to be implemented in 2013, proved to be effective in laboratory conditions. In addition, new tanks ensure lower waste generation as they do not have to be cleaned as often and their filters do not have to be changed as frequently.

Contaminated waste and soil

In 2012, there was no soil contamination due to released chemicals at ALTANA. While at BYK USA 200 kg and at ECKART approximately 400 kg of chemicals were released (with both cases reported as a significant incident), no harm was done to the environment as the material was caught. New chemical plants in the countries in which we produce are generally equipped with appropriate receptacles for production units (tanks), for tank farms (catch basins), or for tanker loading areas (sumps). The measures are supplemented by sealed courtyard areas, closable wastewater systems, and firewater retention basins.

Our relatively new plants in China are particularly well equipped. For example, all sites there have suitable firewater retention basins. At ACTEGA Foshan, the new warehouses are equipped with a tank construct to catch leaking liquid. Furthermore, the separation of production and storage has improved the fire protection. In addition, a firewater retention basin was installed.

ELANTAS Zhuhai also installed a firewater retention basin with a volume of 500 m^3 during the construction of a new production hall with tank construct. These measures were rounded out by a modern fire-extinguishing system making use of water and foam additives. Fire protection and environmental safety were also greatly improved at ACTEGA Rhenacoat due to relevant construction measures (see also page 26).

Naturally, in the construction of all new tank farm buildings soil protection is taken into account. On the one hand, the tanks stand in basins or are double walled and have leakage alert. In addition, there are sumps at the unloading points for the tankers which can collect almost the entire content of the tanks if need be.

ALTANA supports the AAV

A big social problem is remediation of contaminated sites and recycling of fallow land with no responsible previous owner. Such cases bring into play the association for remediation and recycling of contaminated sites in North-Rhine Westphalia, AAV, which ALTANA supports. This is an example of cooperation between the public and private sectors. The AAV makes an important contribution towards fighting new soil sealing and preserving biodiversity. ALTANA encourages all companies to lend their support to this sensible initiative.

Creating values playfully

Motivated and qualified employees play a key role in the success of a company. But that is only half the truth. Staff who additionally think entrepreneurially and understand the financial mechanisms of a company are the basis for long-term success. ALTANA relies on value management and the so-called value creation indicator AVA (ALTANA Value Added).

For ALTANA, successful business means sustainable growth, having leading positions in its target markets, as well as high profitability and capital efficiency. These goals can be reached through the company's value management, an integrated corporate concept introduced in 2002. But not every employee is familiar with business management practices. For this reason, until the end of 2012 around 340 managerial staff from all ALTANA divisions were trained in matters pertaining to AVA in two-day seminars. In the end, 600 employees will receive AVA training, 250 of them at non-German sites. In addition, a brochure entitled "Value Management" was published.

"Value management is a very complex issue. We wanted to avoid dry chalk-and-talk teaching at all costs," says Dr. Paul Reuter, AVA project manager at ALTANA. "Therefore, we opted for a business simulation game. This type of approach worked well when dealing with such requirements in the past." In a business game, the participants are motivated to use their newly acquired skills and develop concrete measures to enhance their own business success. But before the game began under the guidance of business consultants, terms such as operating earnings, return on capital, and net current assets had to be explained first.

Three fictive years of management

The game simulates a company and the levers it uses to improve its profitability. For a fictive period of three years, each team took over the management of a company and thus was called upon to make corporate decisions, to analyze the economic repercussions, and to optimize the business processes. As in a real company, a management board with different departments such as finance, production, and development was established. Each staff member had their own area of responsibility. This kind of impartation of knowledge enhances employees' practical orientation and learning success and, not least, is fun. "We became acquainted with the interplay between the different components that determine AVA in a game," says Thomas Kröller, Business Line Manager at BYK. "In everyday work, we normally only have an influence on a few individual factors."

Thus, new access was created to business administration in a very playful way. The business game, in which different groups played against each other, was interrupted by presentations of different best-practice examples. At the end, each group presented their results in a fictive press conference. The different outcomes had one thing in common: All of the groups achieved the initial goal of increasing AVA. Due to the great success, the AVA seminar is expected to be a regular offer in the training catalogue. ALTANA honored the increase in value created by the different groups by donating €20,000 for social causes.

Two days for more value

The two-day training to increase ALTANA Added Value (AVA) was successful, because the employees had a very positive assessment of it. The following two opinions are representative:

"Great training program. I learned a lot about AVA, about improvements and implementations such as the use of appropriate resources at the right time."

"I very much liked the fact that what is actually a dry topic was presented in such an exciting and vivid way."

Personnel recruitment

With around 100,000 staff members, the chemical industry is one of the most labor-intensive sectors in the German state of North Rhine-Westphalia. The employees' level of education is among the best in the world, as the companies attach a great deal of importance to continuous education and further training. Qualified and motivated staff are the most important basis for ALTANA's success. Therefore, we promote and support our workforce with a number of offers and services which aim to advance their careers and enhance their wellbeing. With the goal of becoming one of the most attractive employers, we seek to obtain personnel best suited to our company and give them the greatest possible job security.

Due to demographic changes and the shortage of skilled labor, fierce competition has broken out for the best talents and most qualified workers in Germany. While for a long time it was the companies that selected the most suitable candidates, it is now increasingly the applicants who choose their employer. This is a new challenge facing ALTANA. Aside from our extensive job portal on the Internet, an appreciative and open attitude to applicants is important to us, in keeping with our Guiding Principles. Apart from swift and direct communication, ALTANA always makes an effort to deal fairly with applicants throughout the application process. After all, the process of selecting new employees is like a business card that has a decisive influence on a company's reputation.

E-recruiting facilitates application

After an intensive test phase, our new uniform e-recruiting system went online in our job portal. This cross-divisional, global applicant management system aims at simplifying and accelerating the entire hiring process. The advantage: fewer paper and e-mail job applications and less maintenance. This not only saves time and money, but also ensures better communication with the applicants and is user-friendlier.

Moreover, e-recruiting enables an exchange of job applications between ALTANA companies, thus increasing the applicants' chances of finding an appropriate position. Via the job portal,

interested people who do not find a suitable job offer there can submit unsolicited applications to the ALTANA Group in a more targeted way than before. A user account makes it easier to apply more than once and to update documents and personal information. In addition, a job letter providing regular information about new job offers can be subscribed to, based on individual preferences.

ALTANA awarded Career's Best Recruiter

With its job portal, ALTANA is now one of Germany's best companies in terms of recruitment. This was confirmed by the study Career's Best Recruiters 2012/2013. ALTANA finished in first place in the rating of chemical companies and in fifth place in the overall rating of Germany's top 500 employers. Career's Best Recruiters cooperates with Fachhochschule Koblenz University of Applied Sciences for Human Resources and Education and, by its own account, is the largest recruitment study in Germany-speaking countries. The analysis came to the conclusion that we successfully implement our measures and processes in the areas of recruiting, university marketing, and employer branding, which applicants greatly appreciate. Apart from providing feedback on our application processes, the

study also discusses improvement potential. The steady advancement of our internal processes and instruments will continue to characterize our recruitment activities in the years to come.

Attractive employer

The chances of attracting the best employees depend in large part on the attractiveness of the location. The appeal of Wesel was improved by the fact that FOM, a private university for employees, located there. In the future, some ALTANA employees will study at FOM alongside their work. BYK USA's new program Seek Opportunities Achieve Results (SOAR), which specializes in innovation, sales growth, and the positioning of the company, is providing our staff with new creative resources. So far, more than 15 SOAR teams have been formed and several projects successfully carried out. A so-called i-Team supports SOAR projects and promotes a culture of innovation and creativity. For example, the "StarBYK's Innovation Station" was set up, a creative space for everyone with a relaxed atmosphere conducive to communication, Internet access, audiovisual equipment, and a giant wall area for brainstorming.

Employee survey

In 2011, ALTANA conducted a worldwide employee survey. The study found that our employees show above-average commitment but that there is room for improvement in different companies and functional units (see also Sustainability Report 2011). As a result, the company needs to continue to deal intensively with the fields of action analyzed and to implement appropriate improvement measures.

To understand employees' expectations better, we held staff meetings and workshops in the different departments and functional units of ALTANA companies. The most important fields of action are recognition and appreciation. As a consequence of this criticism, suggestions were made that were initially directed to managers and project leaders. The goal was to honor success appropriately. In the future, we aim to make completed projects and achieved objectives even more visible. Possible types of recognition, e.g. openly addressing employees or expressing thanks, celebrating together, and awards, were discussed with the managers and agreements were reached. Some companies also offer more social activities to improve teamwork. In cases where development measures were not assessed sufficiently, in the future the annual progress dialogue between employees and superiors will focus more on individual training needs. In the next employee survey in 2014, we will explore whether and to what extent these and other measures have led to positive changes in an effort to improve our company further.

Employee profit participation

In 2010, we issued ALTANA Profit Participation Rights (APPR) in Germany for the first time, thus enabling employees to participate in the company's future success. With the APPR, which have been offered annually since 2010, employees can participate in the company by investing between €300 and €5,000 a year. ALTANA provides tax-free subsidies for the investment of up to €360 per year and employee. Apart from the basic interest, ALTANA grants an additional bonus interest based on the company's success. For 2012, the interest rate was 7.2 percent. In recent years, roughly every third employee accepted the offer, and the total sum amounted to €6.38 million. In the meantime, programs comparable to the German one have been initiated in China, India, Japan, Korea, Switzerland, and Singapore. An implementation is being examined in other countries as well.

Suggestion system

In 2011, a worldwide employee suggestion system was introduced at ALTANA. Since then, the employees at all of our sites have been encouraged to submit suggestions for improvement. The current suggestion system contact person not only receives the suggestions, but also commissions experts to evaluate them (usually internally). If an idea is implemented, the person who made the suggestion receives a cash award. The focus is not always on cutting costs, but also on occupational and plant safety or health and environmental protection. Further goals include optimum exploitation or saving of manufacturing resources, as well as quality, customer orientation, and product improvement. To honor employees' commitment, in some cases a prize is paid even when the idea is not implemented.

Award-winning idea

By means of a small pre-heater in an atomizer, the temperature in a melting furnace in production can be reduced by approximately 30 degrees Celsius. With this improvement suggestion, around 75,600 kWh of energy can be saved every year, which of course also means lower CO_2 emissions.

An idea from Alfred Gierl, Wolfgang Müller, and Markus Schreiber (ECKART employees in Wackersdorf).

Big Ideas Wanted

In 2012, we launched the "Big Ideas Wanted" campaign so that we can exploit the great idea potential of all of our staff and receive even more suggestions. Usually, employees have the best ideas in connection with optimization of internal processes or procedures. The potential for improvement lies in details, and that is exactly what "Big Ideas Wanted" stands for: a small idea with which everyone can make a contribution. Posters with different motifs on plant safety and optimized work processes were hung up company-wide. Each idea submitted paves the way for improved workflows and a stronger focus on aspects relevant to safety.

Diversity

A key characteristic of ALTANA is its diversity. But a "quota for women" is not an option for us, because the key criteria for professional development are exclusively expertise and social competence, regardless of origins, age, gender, or beliefs. At present, about 30 percent of our workforce in Germany is female. However, the share of women in management positions in our German companies has so far been only around 19 percent, and in top management positions just eight percent. To remedy the situation, in 2012 twelve women employees established the initiative "LEADINGWOMEN@ALTANA" in Wesel with the approval of the executive management. Initially, they exchanged their own experiences and developed a concept to anchor the topic of "women in leading positions" in the company's philosophy of diversity in the long run. The result: In 2013, the initiative began with concrete measures at the Wesel site.

Graveling, painting, planting: 90 Mexican children are delighted about their renovated school. The helpers received gifts the children made themselves.

Absence of professional support

"Almost three quarters of the classroom furniture fell victim to the hurricane," says Lindsay Oddo, the marketing coordinator of BYK USA. "And the sanitary facilities, the library, the music room with the instruments, the kitchen, the technical equipment, and the computer of the school's administration were destroyed." The schoolyard and many windows and doors were also affected by the hurricane. But the school, which was founded in 1987, was not given any professional support during the clearing and renovation work. Only teachers and parents of schoolchildren lent a hand, doing everything they could to enable classes to be held again as soon as possible. "But without outside assistance a small school, where 90 children from preschool age to second grade are taught, cannot repair damage on this scale," says Oddo.

So it was a godsend that 50 BYK staff members from Germany, Canada, Mexico, and particularly the U.S. attending a BYK NAFTA sales meeting in Cancún in 2012 volunteered to help renovate the school and made donations for new furniture. "In three hours, we painted fences and facades, planted green areas, and regravelled the schoolyard," recounts Lindsay Oddo. "So much solidarity elicits a great feeling." In gratitude for all the help, the students sang for the assiduous helpers and gave them presents they made themselves.

Campaigns, donations, and sponsoring

As a good corporate citizen ALTANA considers itself responsible for the support of social projects. We particularly promote initiatives focusing on education, science, and research and are making an effort to arouse interest in the so-called MINT subjects (mathematics, information technology, natural sciences, and technology). With our efforts, we aim to make a comprehensive impact on education from preschool to university and to strengthen the local environment. All demographic analyses show that the future will see a lack of experts in the chemical industry. To help remedy the situation, we actively seek out so-called school ambassadors, i.e. employees who advertise ALTANA at institutions of higher learning.

For many years ALTANA has been a member of the sponsor association for the Rhine-Waal University of Applied Sciences (HRW) in Kleve, Germany. As part of a series of events titled "Insiders – Companies Introduce Themselves," Dr. Matthias L. Wolfgruber, the CEO of ALTANA and the president of the sponsor association, gave a lecture to around 60 students and teachers. The idea behind the series is for entrepreneurs and managers from the region to report on the processes and challenges of their everyday work and to give students insight into possible career paths and tips about the best way to find a job. Apart from regular visits to companies and speed dating for interns, the series of events is also intended to intensify exchange between companies from the region and students.

ALTANA has successfully cooperated with the chemistry department of the Hochschule Niederrhein University of Applied Sciences in Krefeld, Germany, for many years. Today, ALTANA not only participates regularly in the "Campus meets Company" university event but also promotes especially talented young chemistry students by providing ten students with scholarships within the framework of the Hochschule Niederrhein's Federal State of North Rhine-Westphalia Scholarship Program.

In addition, BYK had a booth at the annual Chemistry Action Day staged by Unternehmerschaft Niederrhein, a social-policy association, located in the Lower Rhine region. At the event, students from eighth grade on could gather information about various jobs in the field of chemistry. The young people could ask questions and were given advice regarding job applications and job interviews. BYK USA enabled three American interns to gain valuable experience for their future professional life. And there was a special surprise: All three had the opportunity to have dinner with the company's President Dirk Plas and learn more about BYK USA.

Students experiment in a KIS project.

The KIS project, promoting cooperation between the chemical industry and schools, is also very popular. With experiments, group work, and laboratory visits, KIS aims to get students excited about chemistry. On the side, young people can gain insight into the work, say, of coatings laboratory technicians. For example, students at two secondary schools in Wesel had the chance to manufacture additives with the support of BYK staff. As in real production, they produced defoamers themselves in a BYK lab, started up agitators and used substrates for later application. The KIS program also included application training.

ALTANA continues to support the Passo Fundo scholarship program in Brazil. The organization, founded by Professor Werner Wittkowski in 1988, enables gifted Brazilians from poor segments of the population to study at a university. ALTANA contributed €7,500 used for four scholarships. And the Howard Park Center in Ellisville (U.S.) can also still rely on our help. ALTANA donated more than €11,000 for a so-called Early Intensive Behavior Intervention Classroom. Howard Park Center, which was established in 1971, caters to the needs of developmentally delayed children and their families and is funded exclusively from charity campaigns and donations.

Fostering the abilities of elementary school students

ALTANA continues to sponsor the Junior Academy of the North Rhine-Westphalian Moyland Castle Museum, a program developed to promote the cultural education of elementary school children. The art education that ALTANA sponsors is geared to the curriculum of individual age groups and takes place in the castle under the leadership of a museum educator. For example, the second grade of an elementary school in Bedburg-Hau had a two-hour art class there once a week for a period of six months. Another academy ALTANA supports is the "junior engineer academy" of the Deutsche Telekom Foundation, whose goal is to get young people interested in the profession of engineers at an early age. To this end, 13- and 14-year-old students work intensively with local companies such as BYK-Chemie and universities, among others, for two years.

Junior engineer academy

The Deutsche Telekom Foundation's junior engineer academy is a model project for students in secondary education designed to kindle enthusiasm in young people for the natural sciences and technology. The aim is to provide young people with information about the profession of engineers and scientists early on, to make the transition from school to university easier for them, and to consistently foster their individual competencies at an early stage.

After appealing to first and second graders' desire to experiment at two elementary schools within the framework of the House of Junior Researchers concept the year before, BYK staff again visited the Adventure Land daycare center in 2012. During the first visit, there was not enough time to explore all facets of the topic of "air," so this subject was dealt with further in 2012. The BYK experts like to support this week devoted to science to give preschool staff a different perspective on research. For these activities, BYK has been awarded a partner prize by the House of Junior Researchers Foundation.

Another campaign also demonstrates where children's enthusiasm can lead. Industrial mechanic apprentices in the second year of their apprenticeship at BYK picked up on an idea of preschool children to invent an apple peeling machine and developed it further into an apple sauce and apple juice machine. Needy children in the U.S. had the pleasure of engaging in a completely different activity at Christmastime. During team-building activities at ECKART America's management meeting, employees built eight playhouses together. Each team had only four hours to construct a colorful house out of a stack of wood, plastic sheets, paint, brushes, and stencils. Despite the challenge, all of the teams finished on time and gave "their" child a nice Christmas present.

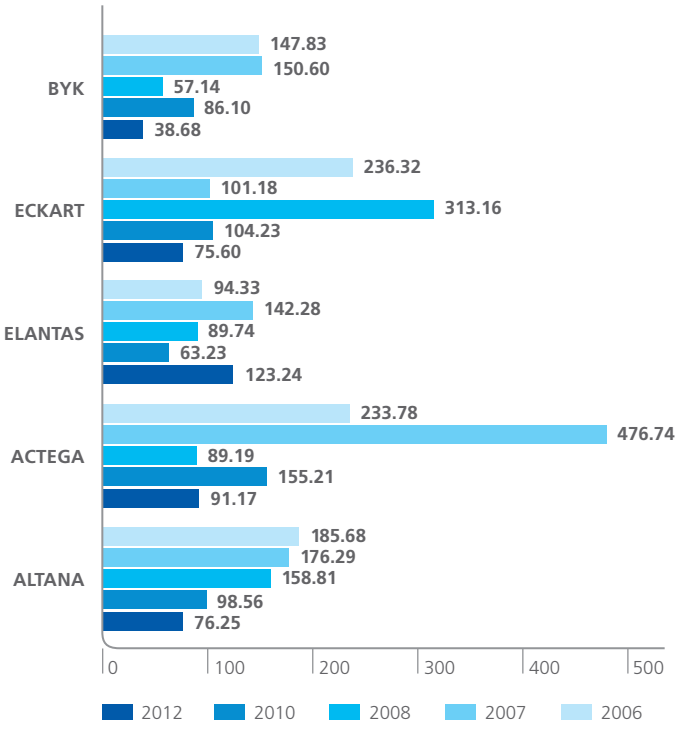
Partner of the region

Our involvement in the illumination of the Rhine Bridge in Wesel reflects our strong commitment to the Lower Rhine region. The bridge, which is known for its characteristic pylon, has lit up at night in the ALTANA colors of blue and cyan since March 2012. ALTANA covered the costs of around €210,000 for the nearly 100 high-power spotlights and floodlights. Today, the architectural gem, which was illuminated for the first time in the presence of Dr. Matthias L. Wolfgruber and other invited guests, is a symbol and landmark in the region. BYK also helped finance a bronze bust unveiled in 2012 honoring the chemist Ida Noddack, who was born in Wesel in 1896. The famous daughter of Wesel, who discovered the chemical element Rhenium, was nominated several times for the Nobel Prize in Chemistry.

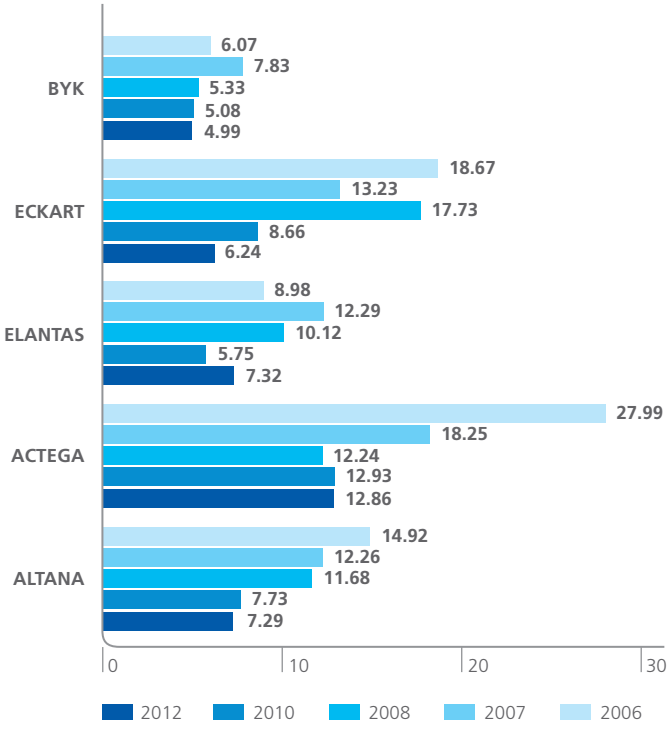
In 2012, ALTANA staff in the human resources departments of ALTANA and BYK were again involved in the International Peace Village in Oberhausen. On a day in the summer, eight colleagues tidied up the children's playground and the garden. And aid was also provided in a sporting framework. Employees of BYK, ELANTAS, and ACTEGA participated in a golf tournament at Weselerwald Golf Club for a good cause. The entire sum of the entry fees amounting to €3,500 was donated to the "Historisches Rathaus Wesel" citizens' initiative to restore the historic Wesel town hall.

On the safety performance indicators

WAI 3
(Number of lost work days due to occupational accidents per million working hours)

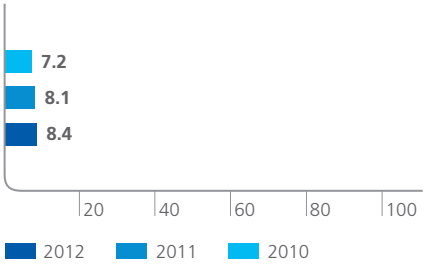


WAI 1
(Number of occupational accidents with lost work time of more than one day per million working hours)

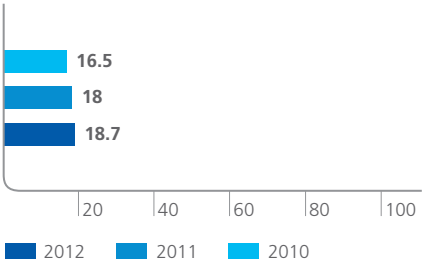


On the human resource performance indicators

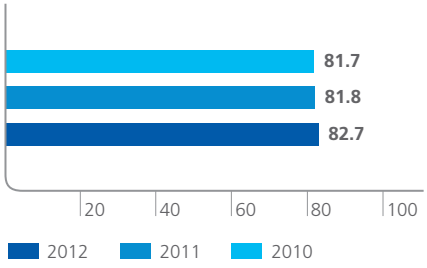
Share of part-time employees (in %)



Share of women in management positions (in %)



Share of employees with access to company retirement plans or company-funded pension plans (in %)



Highlights

- In 2012, BYK reported less than 1.7 occupational accidents with lost work time of three days or more per million working hours (WAI 2) and thus remained below its target (2.8 accidents). With 39 lost work days per million working hours, the company also was well below its target for WAI 3 (65 days).
- Following six major incidents in 2011, ALTANA recorded only four incidents in 2012, with only one injured person.
- The presidents of BYK, ECKART, ELANTAS, and ACTEGA took over the leadership of a different division as of November 1, 2012. The aim of the move was to open up new growth perspectives and exploit synergy potentials better.
- The anonymous counseling center in Wesel for employees with psychological problems went down well in its first year.
- In 2012, ALTANA reached all of the environmental key performance indicator targets it had set, and in most cases far exceeded them.
- The environmental management systems of ELANTAS Italia and ACTEGA Colorchemie were certified in accordance with ISO 14001 for the first time.
- ECKART became the first ALTANA company to receive a certificate in compliance with ISO 50001 for its energy management system.
- The audit of the new BYK chemical laboratory based on the guidelines of the Green Building Council was successfully completed. The lab received a LEED Platinum certificate for ecological construction in 2013.
- ELANTAS Beck India's new energy-efficient administrative building in Pimpri went into operation. The architects, who specialize in environmentally compatible construction, received the AESA (Architects Engineers Surveyor Association) Award for 2013.
- Renovation of ELANTAS PDG's administrative building and laboratory began with several measures to improve energy efficiency.
- ALTANA's information and communications technology was made more energy and resource efficient.

- ECKART decided to convert production operations in Güntersthal from oil to natural gas.
- New construction measures at ACTEGA Rhenacoat led to improved soil and fire protection.
- ALTANA developed numerous products that help its clients work in a safer and more environmentally friendly way.
- With an especially flexible sealant material for weight-reduced crown caps ACTEGA DS makes an important contribution to resource efficiency.
- ACTEGA increased the proportion of water in its raw materials to 34 percent.

Lowlights

- In 2012, ALTANA reported four significant incidents, with one employee suffering burns in one of the accidents.
- With 7.3 occupational accidents, we did not achieve our target for 2012 of a maximum of four occupational accidents with lost work time of one day or more per million working hours (WAI 1).
- There are still not enough women in leading positions at ALTANA.
- Due to violations of environmental and chemicals law, ALTANA had to pay fines amounting to €38,660.
- CO_2 emissions from logistics could not be recorded yet (see page 45).
- The product "IReflex" did not achieve the expected market success yet.
- Nor did benzpinacol, a safe alternative to peroxides for polymerization, attain the desired success on the market.