CHEManager EUROPE

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THE NEWSPAPER FOR THE CHEMICAL AND LIFE SCIENCE MARKETS


**REACH**

*The European Commission's REACh Review received a mixed response from industry and NGOs*

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**Chemicals**

*Combining performance and sustainability is the big deal in the coatings sector*

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## Newsflow

**M&A-News**

**Kemira** sold its 39% stake in German $TiO_2$ producer **Sachtleben** for €97.5 million to its joint venture partner, US holding **Rockwood**.

**Monsanto** acquires Israeli crop bio-engineering company **Rosetta Green** for $35 million.

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**Companies**

**Evonik** is taking aim at a stock market launch for the fourth time since 2008. After the aborted attempt in June 2012 to publicly place 30% of shares, observers now give the German specialty chemicals company better odds of succeeding.

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**Investments**

**Shell** is upgrading its Singapore production facility for polyols by more than 100,000 t/y and adding new grades. The project is due for completion in 2014.

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**Pharma**

**Biogen** is paying its Irish partner **Elan** $3.25 billion plus future royalties to claim full ownership of the blockbuster multiple sclerosis drug Tysabri.

**Lonza** has been awarded a contract to generate induced pluripotent stem cells for research purposes by the U.S. National Institutes of Health Center for Regenerative Medicine.

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**Collaborations**

**Richter**, the Hungarian drug maker, has formed a 51:49 marketing joint venture in China with its marketing partner **Rxmidas Pharmaceuticals**.

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**Southeast Asia**

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**Plastics**

Polyvinyl Chloride (PVC) has come a long way since its inventor in 1913. PVC's journey to becoming the world's third largest-selling plastic has not always been easy.

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# Science Driven By the Market

## CEO Patrick Thomas Takes a New Approach to Innovation at BMS

**Materials** – When new company chieftains say they want to be a catalyst for change, many listeners brush it off as a tired cliché. Patrick Thomas is proof that it needn't be. Stepping into his new role as chairman and CEO of Bayer MaterialScience (BMS) in 2007, the then 49-year-old Englishman who previously had led the polyurethanes businesses of ICI and Huntsman in the UK and Belgium quickly went to work holding the old German company's cherished traditions and practices up to the light for scrutiny while contemplating new business models.


Patrick Thomas, CEO, Bayer MaterialScience

After six years in the job, many chief executives might be tempted to declare "Mission Accomplished" and fall back into a more comfortable operating mode. This thought would not occur naturally to Patrick Thomas. The Portsmouth native and Oxford graduate who calls himself "an engineer by birth and by training" is still far from finished reshaping the polymer producer's approach to innovation and marketing – two concepts that in his mind go hand in hand.

Having scarcely paused to catch his breath since arriving in Leverkusen, Thomas blogs relentlessly, sparking dialog throughout the Bayer worldwide social media community. Covering topics ranging from finance to sustainability and points in between, his community, simply called "Patrick" has 14,000 followers – the most in the company. "It's an effective way of communicating," while sitting in his office and chatting with CHEManager Europe's Dede Williams. Since mid-2011, Thomas has also dedicated a portion of his seemingly boundless energy to another "interesting job" as president of the European industry association Plastics Europe (until June 2014).

Sipping Diet Coke from a polycarbonate glass while scrolling through his laptop to find a video of a high tech application he wants to show, Thomas reflects on the gentle cultural metamorphosis at Bayer MaterialScience over the past half decade. "You cannot radically change the culture of a 150-year-old company," he remarks. "What we've basically done is to take Bayer's technical dreams and push them out into reality."

At BMS, polycarbonate, polyurethanes and their production chains, along with coatings raw materials, are the stuff technical dreams are made of. The €11.5 billion plastics portfolio, custom-designed when Bayer's plastics business was split between MaterialScience and spin-off Lanxess in 2005, was "put together very intelligently," the CEO says. BMS kept the two most versatile polymers, with bread and butter materials such as PA , PBS and ABS (the latter business subsequently was sold to Ineos) going to Lanxess.

"From the outset, BMS was designed as a growth business, and this is what what we have continued to do with it," says Thomas. To start with, "we have broadened the geographical basis enormously, investing heavily, for example, in China". In the past, all businesses were run from Germany. Under his aegis, headquarters of the global polycarbonate business was relocated to the People's Republic, the center of the market. One of the last to launch a major platform there, "we are now the largest foreign company, wholly owned, with a market capitalization of $3 billion. And we're also "the biggest and most cost-effective."

*"About 70% of what scientists do should be driven by the market."*

New processes are now often tested first in world-scale plants in China before world-scale facilities are built in Europe and the rest of the world. in this way, the company has successfully leveraged a number of innovative new technologies developed in-house, such as the gas-phase route to polyurethane feedstock TDI and the new energy-saving oxygen depolarized cathode (ODC) chlorine process.

Before making bold strategic moves, new managers often must tighten internal nuts and bolts. Several such tasks awaited Thomas at Bayer MaterialScience. Overhauling accounting procedures was an early challenge. "We had the most complicated SAP system in the world," he recalls. The world market leader for company software usually uses traffic light colors to rate internal corporate procedures. "For us they had to add a fourth color, black, for processes they couldn't interpret." Today, BMS operates with one set of processes globally. Regional differences are a thing of the past.

Another hurdle the first outsider and non-German to run the company had to surmount was reducing working capital. First, however, he had to convince the Bayer holding's chief financial officer that the targets were achievable. Over six years, Thomas and his financial team have reduced working capital by €500 million, and "we now have benchmark working capital across the entire company."

A pet project of the new chief executive was establishing strict cash discipline, which turned out not as easy a sell internally as it might have been. The reason, Thomas believes, was that "at a company like Bayer with a fabulous credit rating, it was not a natural thing to think about." But coming from a highly leveraged company like Huntsman, he found it essential. "If you manage cash well, you can manage other things well." Over the past decade, Bayer's polymers business has generated €3 billion in cash. Unlike some plastics companies, "we have been cash positive even in recession years."

A new concept Thomas's management team has introduced is the global "non-touch order," which if one day applied broadly could revolutionize buying and selling. From call-off to invoicing and cash collection, no human hand touches the process. For the bulk of the portfolio, total automation is not yet in sight. However, in the US, where the system was developed and first launched, around 60% of customers who regularly order the same products, without price negotiation – polyurethane systems, for example – are now using it.

"We had the process designed in the US, because Americans are usually more efficient," says Thomas. Europeans might have made it too complex." Around 20-30% of European and Asian customers have now adapted the system, 12% in Latin America. Besides simplifying and speeding orders, the system is cheaper for the company as well as the customers, he says. The bonanza in Asia was especially tangible. "When we went live, the auditors reduced our bill by several million dollars because we made their job easier. The money saved is being invested in R&D."

As might be expected, BMS' approach to R&D under its English chief executive diverges from that traditionally embraced by the German chemical and plastics industry. "Our mantra," he says, is "more innovation, less administration. Innovation is not just science and technology. It's also about how you do business." Applying one of his cherished concepts, industrial marketing, to innovation at BMS three years ago was a sea change and a learning process for most employees.

"At Bayer, we are very good at invention," Thomas asserts. While manufacturers' traditional approach to invention is "to develop a product and see if there's a market, a better method, he says, is to go to the marketplace to find creative impulses that match the portfolio and business strategy.

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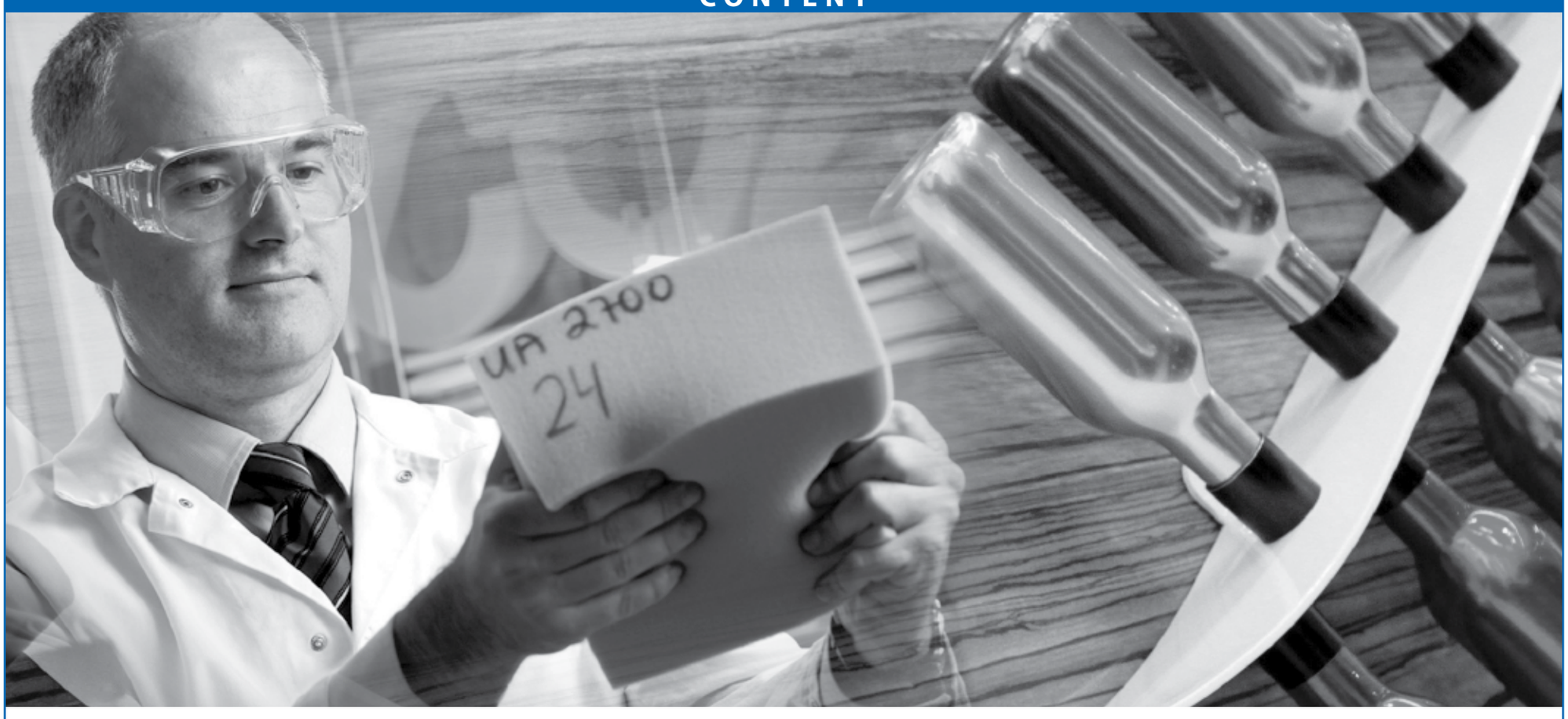




# Akzo Nobel Will Speed Up Performance Improvement Plant

Over the next two years, Dutch chemical producer Akzo Nobel will concentrate on speeding up the ongoing cost-cutting process and focus on cash generation, chief executive Ton Buechner said in a strategy update, while presenting annual results in late February. He said the company will aim for a return on sales of 9%, a return on investment of 14% and a ratio of net debt to EBITDA of less than 2.0 times by the end of 2015. The ongoing earnings improvement scheme will be completed by 2013, a year earlier than planned an is expected to deliver €500 million in EBITDA gains at a cost of €205 million.

The company's financial report for 2012 shows that sales rose 5% year-on-year to €15.4 billion, with EBITDA 4% higher at €1.9 billion.

**Ton Büchner**
**CEO, Akzo Nobel**

The net loss from continuing operations for the full year totaled €1.7 billion after a net profit of €536 million and is blamed on a Q3 impairment charge of €2.1 billion. The Decorative Paints business, sold in December 2012 to PPG, was impacted by weaker demand in the European markets, while Performance Coatings made a strong showing, driven by improved margins and operational efficiency measures, despite weaker volume sales. ■

# Carlyle Completes Acquisition of DuPont Performance Coatings

Private equity investor The Carlyle Group has completed its $4.9 billion acquisition of DuPont Performance Coatings and will rename the company Axalta Coating Systems, starting in the third quarter. The paints and coatings manufacturer with more than 11,000 employees is active in many segments of the coatings business and has been a major industry player for over 90 years. Its European presence dates from in 1999, when DuPont acquired Herberts, the coatings business of the former German chemical producer Hoechst.

The Carlyle Group is a global alternative asset manager, which has been active in the automotive M&A sector. At the end of 30 September 2012, it had $157 billion in assets. The deal with DuPont was announced in August 2012 and in October 2012, the European Commission said it would investigate the transaction. ■

# Dow Chemical Ordered to Pay $400 Million for Isocyanates Price Fixing

As one of the last defendants in a price fixing suit brought by buyers of urethane chemicals in 2004, Dow Chemical has been ordered by a U.S. federal court to pay $400 million in damages The plaintiffs had asked for damages totaling $1.25 billion. The U.S. chemical group has said it it will consider an appeal of the ruling. Along with Dow, Bayer, BASF, Huntsman and LyondellBasell also faced charges that they fixed prices for MDI and TDI.

The other accused producers had previously settled out of court, with Bayer paying the largest settlement, of $55 million. BASF paid $51 million, Huntsman $33 million. LyondellBasell, which was protected from fines while in Chapter 11 bankruptcy proceedings, avoided payment altogether. Some of the polyurethane foam producers pressing charges are themselves embroiled in a price fixing suit for finished foam products. ■

# Wacker Ends Short-time Working at Burghausen

Germany's Wacker Chemie has ended short-time working in polysilicon production at its Burghausen site in Bavaria, citing a revival of demand from its solar industry customers. In October 2012 the company cut output to two-thirds of nameplate capacity on sinking demand. Around 700 workers were affected by the move. ■

# BASF Completes Acquisition of Nutrition Specialist Pronova

At the end of January, BASF completed its acquisition of Norwegian nutritional products manufacturer Pronova BioPharma, after winning the last shareholder holdouts with a sweetened offer. With 98.19% of the company's share under its control, the world's largest chemical producer moved toward a squeeze-out.

BASF said it will "fully integrate" Pronova into its Nutrition & Health division, and the company will become a "key part" of its omega-3 business. Through the deal, the German group expects to achieve a leading position in the market for the nutritional supplement. ■

# Merck & Co to Pay $688 Million to Settle Vytorin Suits

U.S. drug maker Merck & Co has agreed to pay $688 million to settle out of court two U.S. class-action lawsuits brought by shareholders who said they lost money because the company concealed the poor results of a clinical trial of the anti-cholesterol drug Vytorin. The suits led by several international pension funds alleged that Merck and Schering-Plough, which merged in November 2009, knew more than a year in advance that the drug trial, Enhance, was a failure but withheld that information from investors.

Law firms representing some of the plaintiffs said the combined settlements are among the 10 largest in a securities class-action that did not involve a restatement of significant uptick in settlements of securities cases.

Merck said it recorded a $493 million after-tax charge for the settlements, reducing the company's previously reported profit per share. It said it believes both companies acted responsibly and that the settlements include no admission of liability or wrongdoing.

Merck also will pay $215 million to settle a lawsuit brought by investors in its securities and $473 million to settle a lawsuit by Schering investors. Both settlements require approval by a U.S. district judge. ■

# Buyers Eye Multibillion Dollar Deal for Brazilian Drug Maker

International pharmaceutical industry players looking to increase their footprint in Latin America are said to be weighing bids for privately owned Ache Laboratorios Farmaceuticos, one of Brazil's biggest drug makers. Reports say the Brazilian arm of investment bank Lazard has been mandated by key shareholders to investigate a sale and that several European and U.S. companies drug makers have shown interest.

Ache is regarded as a valuable prize in a fast-growing market. Its sale would build on a number of deals in the Brazilian sector in recent years, including Sanofi's 2009 purchase of generic drug maker Medley for €500 million, 3.3 times the company's historic sales. On that basis a deal for Ache could be worth at least $2.5 billion, observers say. In practice, the company's owners– three family groups – could expect more than that, reflecting the company's much lower reliance on generics

It is not clear which pharmaceutical companies have been looking at Ache but big emerging markets like Brazil are a major focus for many leading players. While ranking fourth in terms of overall Brazilian drugs sales, Ache is the market leader in prescription medicines and has a track record of producing its own branded products. ■


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# REACh Review Given a Mixed Response

## Industry Likes It but NGOs Accuse the European Commission of Being Too Cautious

**Regulation** – The European Commission's review of REACh has concluded that there is no need for any major changes in the legislation –at least for the moment. This has been welcomed by much of the chemical industry which had been telling the Commission that it wanted the legislation to remain intact so companies can adhere to it without fear of any big alterations.

"The REACh review brings legal certainty for the foreseeable future," says Gerd Romanowski, director of Science, Technical and Environmental Affairs at the German Chemical Industry Association (VCI). "Now chemical companies can continue to fully focus on REACh implementation." Hubert Mandery, director general of the European Chemical Industry Council (CEFIC), said that since REACh is functioning effectively "there is no need for a revision."

However, other groups are not so happy with the review. Although the Commission promised measures to ease the cost burden of REACh compliance for small and medium sized companies, SME representatives think that it did not go far enough. NGOs also attacked the Commission for being too cautious so that what they believe are significant weaknesses in REACh are not being tackled.

### Critics: Commission Avoids Confrontation

Critics of the review claim that the Commission opted for maintaining the status quo because it did not want to risk a possible confrontation with European Union governments and particularly the European Parliament when trying to push through amendments to the legislation. These would have had to be approved by the Council of Ministers, representing the EU's 27 member states, and the Parliament which would have been likely to take the opportunity to put down amendments of its own.

"Commission officials have been saying for some time that they wanted to avoid making any changes to the legal text, even though there were problems with it which needed to be sorted out," says Vito Buonsante, toxics lawyer at ClientEarth, Brussels, a campaigning group of environmental lawyers. "If changes to REACh had to be debated in the European Parliament, there would have been pressures from a variety of political groups for a wide range of changes, which would have caused a lot of political uncertainties."

The legislation on REACh (which stands for the registration, evaluation and authorisation of chemicals) stipulates that it must be reviewed by the Commission five years after it came into force in June 2007.

The Commission was obliged to look at a number of aspects of the legislation, the most important of which were "the experience acquired with its operation" and the effectiveness of the European Chemicals Agency (ECHA) – the Helsinki-based agency responsible for administering REACh.

The review comes at a time when only one of three phases of the registration with safety dossiers of at least 30,000 substances had been completed. This was for chemicals which are produced or imported by registrants in annual quantities of 1,000 tonnes or more and which had to be registered by late 2010. Substances produced or imported in amounts of 100 tonnes or more have to be registered by June 1 this year. The deadline for the remainder of 1 tonne or more is in 2018.

> *"The REACh review brings legal certainty for the foreseeable future."*
>
> **Dr. Gerd Romanowski, director of Science, Technical and Environmental Affairs, German Chemical Industry Association (VCI)**

> *"The big burden for SMEs is not the level of registration fees but the cost of gaining access to data."*
>
> **Peter Newport, director of the UK Chemical Business Association (CBA)**

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### Commission: REACh Delivers

The Commission acknowledged that it is too early to be certain of the benefits or disadvantages of REACh to the EU's competiveness, level of innovation and above all public health which had been assumed to start to become evident only 10 years after REACh came into operation.

Nonetheless it decided that "REACh functions well and delivers on all objectives that at present can be assessed". Although the need for "adjustments" had been found, it had concluded that after taking into account the requirement for "legislative stability and predictability" changes to the "enacting terms" of the legislation were not necessary.

### Striking the Right Balance

It rebutted accusations that ECHA had been favouring industry over other stakeholders. The agency had to focus a lot on companies because their compliance and commitment was essential to the success of REACh. The Commission was confident that ECHA would continue to strike the "right balance between independence and stakeholder engagement".

Among the Commission's other findings were that the quality of information available for making risk assessments on substances had improved compared with the pre-REACh era. More information being passed down the supply chain from REACh dossiers was also resulting in more appropriate risk management measures being taken at the point of use of chemicals.

The Commission considered that in its role as administrator of REACh, the European Chemicals Agency had been effective with most stakeholders noting that it had performed well. But it thought the agency could have done a better job in disseminating data and in communication and transparency of information in general.

The placing of substances of very high concern (SVHC) on the candidate list for their authorisation had increased development work on their substitution, according to the Commission. It claimed that these findings showed that progress was being made towards meeting the human health and environmental aims of REACh. However, it conceded that as reported by ECHA, many registration dossiers had not met the data requirements of REACh with some even failing to identify properly the substances that were being registered.

Some registrants were not assessing adequately the levels of persistency, bioaccumulation and toxicity of substances. There were also problems with the content and format of extended safety data sheets (eSDSs) for disseminating information in registration dossiers downstream. These enlarged SDSs were often too long and not easily understandable to workers handling the chemicals.

The Commission wants industry to take steps to improve the quality of registration dossiers and both ECHA and EU member states to do more to encourage compliance with data requirements. "Industry needs to take full ownership of its registration dossiers and proactively work on their quality, even after submission to ECHA," it says.

### Financial Impacts of REACh on SMEs

One matter which the Commission wants to tackle relatively quickly is the financial impacts of REACh on SMEs. A recent survey of SMEs showed that they considered REACh to be among the ten most burdensome pieces of EU legislation.

ECHA has already been looking at ways to lower registration fees for SMEs. But the major concern of SMEs is the cost of collecting safety, either jointly through Substance Information Exchange Forums (SIEFs) or by drawing up their own dossiers.

A major difficulty for small companies is the fees charged within SIEFs usually by bigger producers with R&D operations for sharing data through the provision of 'letters of access'. SMEs have also been complaining about their disproportionate share of SIEF administrative costs.

The Commission has asked ECHA and industry to "address concerns" on cost sharing while calling for stronger incentives to "ensure an economically efficient SIEF administration".

"The big burden for SMEs is not the level of registration fees but the cost of gaining access to data," says Peter Newport, director of the U.K. Chemical Business Association (CBA), representing SMEs in chemicals production and distribution. "The Commission has recognized the issue but is just making pious observations about the need for fair cost sharing. We have examples of members who may have to go out of business because of the high fees for letters of access."

The European Association of Craft, Small and Medium-sized Enterprises (UEAPME), the main pan-European organisation representing SMEs, wants fees for letters of access to be linked to the sales volumes of registrants. "At the moment a company with a sales tonnage 10 times less than another is being charged the same fee, which is clearly unfair," says Marcus Susnik, UEAPME's specialist.on REACh.

### Alterations or Additions may be Necessary

With other issues on which the Commission has ruled out action in the short term, it has acknowledged that alterations or additions to the REACh legislation may be necessary in the longer term.

On nanomaterials, which critics claim that REACh in its present form does not have powers to control, the Commission has said it will be looking at possible amendments to the legislation's annexes so that a draft implementing act can be put forward by December this year. It is also investigating the possible need to register certain types of polymers whereas at the moment only monomers have to be registered under REACh. If necessary, it will come forward with a proposal by January 2015.

The Commission is also stepping up its efforts to complete a list of substances of very high concern by creating a roadmap to assess and identify SVHC chemicals. It will set out clear milestones and a division of work between itself, ECHA and member states so that all relevant known SVHC are placed on the authorisation candidate list by 2020.

NGOs in particular have been sharply critical of what they perceive as slow progress in the listing of SVHCs. "It is deeply worrying that the Commission decided to measure ECHA's effectiveness by the number of papers shuffled, rather than by the number of dangerous carcinogenic substances taken off the EU market," says Tatiana Santos, senior policy officer for chemicals and nanotechnology at the European Environmental Bureau (EEB), Brussels.

Over the next five years of the implementation of REACh, the main measure of its success or failure to many people will be the number of hazardous chemicals, widely considered to be a threat to human health and the environment, which are substituted by safer alternatives.

*Author: Sean Milmo, freelance science and business journalist, Essex, United Kingdom*

chemanager-online.com/tags/reach

## Europe Needs Safe and Innovative Nanotechnologies

Innovation and safety should go hand in hand in European discussions on nanomaterials and nanotechnologies, CEFIC experts said at a workshop organized by the European Commission. The workshop brought together representatives from the European Parliament, member states and stakeholders to discuss the findings of the Commission's second regulatory review on nanomaterials. Speaking at the workshop, Gernot Klotz, CEFIC Executive Director Research & Innovation, said: "Nanotechnologies are key enabling technologies that are ideally suited to help solve pressing societal challenges like energy storage or clean water. Deploying nanotechnologies across different industrial sectors can also help Europe strengthen its manufacturing base and build new value chains with high added value."

But Klotz called for a new way of approaching the implications of these technologies in European policy discussions. He said: "There is a need to bring the innovation and the safety communities closer together. Both aspects have to be addressed in an integrated way, looking at the benefits and risks in specific uses."

Presenting as a panelist at another workshop session, Peter Smith, CEFIC Executive Director Product Stewardship, stressed that the current EU regulatory framework already provides a solid basis for ensuring that nanomaterials are developed and used safely.

Smith said: "Like other chemicals, nanomaterials are covered by REACh. Any specific requirements for nanomaterials can be clarified in REACh Annexes and guidance. In addition, producers, users and importers also need to comply with other pieces of EU legislation addressing specific applications."

On the occasion of the workshop, CEFIC released together with 13 other industry associations common messages on nanomaterials and nanotechnologies. The sectors reiterated that Europe needs nanotechnologies to achieve the goals of the EU 2020 strategy. They highlighted the development of key enabling technologies as the prerequisite for smart, sustainable and inclusive growth as well as for the generation of new jobs in Europe.

■

# Industry Remains Concerned about Volatility

## C3X Survey Reveals Increased Focus on Strategic Planning and Volatility Monitoring Initiatives

**Strategy** – The prolonged Great Recession has signaled a new period of sustained market volatility. A recent Chemical Customer Connectivity Index (C3X) survey of 150 chemical industry executives conducted in fall of last year highlights concerns over this period of high volatility and the manner in which volatility has historically been managed. 50% of survey respondents stressed and increased focus on improved strategic planning and volatility monitoring initiatives.

Volatility and volatility management have become buzz phrases increasingly heard around the executive suites of the chemical industry's largest players. The latest C3X survey, published by A.T. Kearney, CHEManager Europe and Westfälische Wilhelms-Universität Münster, Germany has revealed that concerns over market volatility and the failings of historical volatility management are very clearly on the minds of chemical industry executives. The results of this empirical survey of 150 executives in the chemical and its customer industries unearthed the following three key findings.

> *The chemical industry has woken up.*

47% of chemical manufacturers see a balance of opportunities and risks arising from increased volatility. For more than one third of the companies interviewed the risks outweigh the opportunities. For less than one fifth of the respondents the opportunities outweigh the risks.

Half of the respondents are already working on strategic levers to improve volatility management. These levers include improved strategic planning, scenario development, and the use of effective monitoring instruments.

Two thirds (66%) of respondents felt that both the most difficult and most necessary improvements to volatility management need to be made in the realm of strategy. Procurement in turn is considered to need the least attention.

Dr. Joachim von Hoyningen-Huene, Principal in the Chemicals and Oil Practice at A.T. Kearney stresses: "Chemical companies around the world have increasingly realized that volatility is here to stay and work on both capitalizing on upturns and managing risks of downturns."

### Success Factor Monitoring

Recent economic turbulence has shown that customer and competitive structures in the increasingly interconnected regional markets are in constant motion and demand an appropriate degree of monitoring vigilance and agility. "Market ripples" are now happening with greater frequency and often with greater effect, leading to increased volatility amplified to often seismic levels in previously insulated markets and industries. As global phenomena, these "market ripples" must be monitored in a systematic and centralized fashion to achieve continued competitiveness and agility.

Tobias Fehre, Principal in the Chemicals and Oil Practice at A.T. Kearney emphasizes that, "for the last five years the entire world has ridden a roller coaster of volatility that has sparred no industry, the least of which the chemical industry. Successful riders looked ahead on the track for signs of upcoming dips, twists, turns and rises. The C3X survey emphasizes that the chemical industry has woken up to the importance of being an alert and informed 'rider'".

> *Volatility is here to stay.*

One important factor to be more proficient in anticipating market swings is systematic monitoring. Leaders are deploying advanced analytics to identify indicators that had a proven impact on their business in the past and are projected to continue to be leading indicators in the future. Most agile and prepared chemical companies integrate monitoring these indicators with processes on board and operational levels and have their action plan ready to act ahead of downturns and upswings.

### Chemical Customer Connectivity Index

The objective of C3X is to analyze the chemical industry from the vantage points of chemical companies and their customers. The survey captures the views of senior executives from leading European chemical companies and of decision-makers in customer industries working at the interface to their suppliers. Participants in this sixth C3X survey included executives from more than 15 European countries representing chemicals firms and client companies – a total of more than 150 executives in all. The customer industries cover a variety of different sectors, ranging from the automotive and food industries to the cosmetics sector.


chemanager-online.com/en/C3X

# ASEAN Harmonization

## The Southeast Asian Pharmaceutical Markets Are Undergoing a Period of Intense Evolution

**Economic Growth** – The Association of Southeast Asian Nations (ASEAN) – comprised of Malaysia, Burma, the Philippines, Singapore, Thailand, Vietnam, Brunei, Cambodia, Indonesia, Laos - is carrying out harmonization due to be completed by 2015. The goal of this harmonization is to create an integrated, open market across the ASEAN with uniform pharmaceutical regulation and quality control across the region. Reformation of government policies to support pharmaceutical production and a large, increasingly affluent consumer base make the ASEAN markets a pertinent pharmaceutical growth area projected to be worth $80 billion by 2017.

Martin Wilson
UBM Live

In particular, the Indonesian and Thai pharma industries are growing - driven by large population expansion with strong demand for pharmaceutical products and robust, stable GDP growth. In tandem, the smaller pharmaceutical markets of Vietnam and Malaysia are rapidly growing due to increased foreign investment and governmental support. In the past the ASEAN region has been hampered by the circulation of counterfeit medicines and those with inadequate efficacy. However, manufacturing standards, increased commitment to standardvized regulation, and improved packaging technologies such as track and trace are combating these problems. There has also been the introduction of legislation protecting intellectual property – crucial to safeguarding innovation – and improving safety standards.

### Specialization and Diversification

Interestingly, some of the Southeast Asian pharmaceutical markets are beginning to specialize. The Malaysian government has specifically targeted the acceleration of the biotechnology sector with the aim of positioning the country as a leader by 2020. The region's established economic standard bearer, Singapore has attracted strong investment from multinational companies establishing biological facilities and the government is to invest robustly in biomedical research going forward – with western standards, the country will continue to attract investment however, other countries in the region will be bigger drivers of growth.

Healthcare systems and services in the area are hugely diverse with countries at different stages of healthcare development. The increasingly politically open states of Southeast Asia, such as Thailand, have a growing urbanized middle class population demanding good quality healthcare serviced by a booming private sector.

The detrimental effect the global recession had on these countries has put a renewed political emphasis on social security and essential healthcare.

All countries in the region are striving to fund basic healthcare for those on low incomes and poor access to healthcare, such as the health fund for the poor scheme in Vietnam. Though tax-funded centralized schemes do show stability, there is rising pressure from the public to increase quality and efficiency of healthcare.

### Country by Country Analysis

Although not currently a problem, the inevitable onset of an aging population in Southeast Asia will reinforce the need for long-term healthcare financing. Compulsory savings for medical care and social insurance are being introduced to address this. There has been politically motivated decentralization of healthcare systems in a number of Southeast Asian nations such as Vietnam and Indonesia, delivering power to local governments which will make standardization of care more difficult. Universal healthcare is the ultimate goal for Southeast Asia, but there are still many challenges to be overcome including finance and infrastructure.

### Indonesia

Of the ASEAN, Indonesia is particularly well placed as a center of pharmaceutical market growth. The country along with Thailand weathered the global economic downturn well and has an impressive projected GDP growth rate of 6% in the upcoming years, due to robust domestic consumption and primary exports. By 2016 the pharmaceutical market of Indonesia is projected to be the sixth largest of the Asian pacific region, and the economy has become conducive to long-term investment (Foreign Direct Investment $ 20 billion in 2011) with inflation kept in check at 4.5% and low interest rates. Coupled with this, the current government has demonstrated stability and a political will to reform the economy whilst implementing measures to fight corruption.

Indonesia possesses substantial pharmaceutical manufacturing capabilities, with 240 domestic pharmaceutical manufacturers and there is increased scope for research and development domestically. Legislation requiring all drugs that are sold on the Indonesian market to be manufactured domestically will provide a boost to national investment and lower the long term costs of production.

### Thailand

The pharma market in Thailand is in need of some structural reforms as although it is predicted to grow at double digit pace over the next few years, it has a significant trade imbalance and relies very heavily on imports. That said, Thailand remains a very open marketplace and its growth and investment potential still remains largely untapped by big pharma, with just two contract manufacturers operating in the region, which handle much of the repackaging requirements of international firms. With the Government's commitment to its 30 Baht healthcare scheme the domestic market will be dominated by generics, however, AEC membership for Thailand means increasingly it will become a good base to export pharmaceuticals to the wider ASEAN region. In addition, the removal of GPO (Government Pharmaceutical Organisation) privileges, the harmonization of the ASEAN region (with GMP standards) and the Thai universal healthcare system bodes well for the private sector – with Indonesia and Malaysia the main regional competitors.

### Vietnam

Historically local drug production has accounted for half of the country's overall needs, and the Government has set an ambitious target of raising this figure to closer to 70% by 2015. IMS data shows that the pharmaceutical economy is growing apace at an annual rate of between 18–19% over the next few years; however, demand is predominantly being led by the purchasing of generics. Due to recent price rises there is likely to be a sustained effort by the government to manufacture essential drugs locally and decrease its import dependence. With a growing healthcare insurance and self-pay market a growth in the portfolio of pharmaceuticals products and services offered in the country is likely.

### Malaysia

The Malaysian pharmaceutical market is relatively small compared to the other ASEAN nations, with a heavy dependency on medical imports. However, the sector is forecast to grow at a strong compounded annual growth rate. There are approximately 250 domestic licenced pharmaceutical manufacturers, with the majority servicing local markets. Tight regulation has limited the presence of multinational companies in Malaysia; however, relaxation of legislation will attract large multinationals determined to tap into this potentially lucrative market.

Martin Wilson, CPhI Southeast Asia Event Manager at UBM Live, provides the inside track on the region ahead of this month's CPhI Southeast Asia event. In light of the rapid pharma sector growth in Southeast Asia, the new co-located events – P-MEC and InnoPack, representing innovative pharmaceutical technology and packaging, respectively, will be launched.

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**CPhI Southeast Asia**

**March 20–22, 2013**
**Jakarta International Expo, Indonesia**

**Summit Highlights:**
- ASEAN Harmonization
- IPR protection
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## Clariant Indonesia Site Awarded GMP Certification for Cosmetics

Clariant has achieved ISO 22716 Cosmetics Good Manufacturing Practice (GMP) certification for its cosmetics ingredients site in Tangerang, Indonesia. The site is the eighth Clariant location to be endorsed with the cosmetics industry reference standard.

This latest accomplishment reinforces the company's on-going commitment to support the personal care sector with guaranteed globally-consistent products and processes. Awarded by SQS, the Swiss Association for Quality Management Systems, the global ISO 22716 Cosmetics GMP ensures deliverance of highest quality products and production standards by the cosmetics sector, and also fulfils EU guidelines for cosmetics production.

"The extension of ISO 22716 accreditation to Indonesia and across the rest of our sites is official testimony to our ability and dedication to provide not only exciting and sustainable innovations, but the

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transparency and consistency that our customers need to be efficient in their local operations and new product development," comments Mauro Bergamasco, Head of Global Marketing Business Unit Industrial & Consumer Specialties.

Eight cosmetic ingredients' production sites spanning Brazil, China, Germany, Indonesia, Spain and U.S.A have so far been approved within the global ISO 22716 Cosmetics GMP certification accredited to Clariant in December 2012. Authorization for Clariant's eight remaining locations serving the personal care sector should be finalized by the end of 2013. ■

## Huge Opportunities in Southeast Asia

With a young population of 600 million and a fast growing middle class with money to spend on consumer products, Southeast Asia offers huge investment opportunities. However, many European companies are underinvested in Southeast Asia's emerging markets, observes Ervin Schellenberg, Managing Partner at EquityGate. "Especially in Germany," he says, "this is due to the strong export position that made foreign direct investment to some extent unnecessary."

But this is now changing. According to Schellenberg EquityGate is receiving an increasing number of enquiries from European clients considering investing in Southeast Asia, in particular. "And rightly so," says Nigel Jones, Managing Director at Alpha Advisory in Singapore. He partners with EquityGate when it comes to helping European companies prepare for market entry in the region. "Even though growth

Ervin Schellenberg
EquityGate

rates have been somewhat dented in the financial crisis, they are still far higher than in Western Europe," he says.

Although the 10-member Association of Southeast Asian Nations ASEAN only had a GDP of $2.2 trillion (€1.7 trillion) in 2011 (compared with Germany's some €2.6 trillion), with a rapidly growing GDP per capita (the top three countries are already at European levels) the future looks rosy and offers huge opportunities for investing in ASEAN countries. ■

## Wacker Opens New Dispersions Plant in South Korea

Wacker Chemie officially launched its new production plant for vinyl acetate-ethylene copolymer (VAE) dispersions at its Ulsan site in South Korea. The additional 40,000 metric tons from the second reactor line increase the site's VAE-dispersion capacity to a total of 90,000 tons per year. The production capacity of the site has thus almost doubled, making the plant complex one of the biggest of its kind in South Korea. The expansion is Wacker's response to the rising demand for high-quality VAE dispersions, especially in Southeast Asia's emerging markets. The project goal is to ensure sufficient capacities of Vinnapas VAE dispersions now and in the years ahead.

Having invested around €10 million in the expansion project, Wacker is strengthening its position as one of the world's major suppliers of VAE dispersions. President and CEO Rudolf Staudigl emphasized the strategic importance of the new reactor line for Asian markets: "The demand for top-quality VAE dispersions is continuously rising in Southeast Asia, especially for those used in formulating low-emission, eco-friendly products." ■

## BASF to Reshuffle Corn Crop R&D as Syngenta Ups Feed Production

BASF Plant Science is adding corn as a target crop to its fungal resistance research platform while at the same time ending research activity into nutritionally enhanced corn in the U.S. market. It is also halting the European approval process for potato products Fortuna, Amadea and Modena. The German chemical giant said continuation of the European projects "cannot be justified due to uncertainty in the regulatory environment and threats of field destruction.

The discontinuation of the corn enhancement project will lead to closure of six of the group's U.S. field sites in Olivia, Minnesota, Henderson, Nebraska, Weldon and Sycamore, Illinois, Estherville, Iowa and one of its two sites in Ames, Iowa. Some 40 jobs will be eliminated.


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R&D activities for fungal resistant corn will be located at BASF Plant Science's new global headquarters in Research Triangle Park in North Carolina. Field testing sites will be based in North Carolina and the U.S. midwest region. The chemical group's plant science subsidiary will continue to focus on development of corn crops with high yields and improved resistance to stress conditions, partly in a key partnership with U.S. agricultural mammoth Monsanto. BASF shocked the European market in 2012 with its decision to move the headquarters of the plant science business to the U.S..

Syngenta meanwhile is investing $77 million to quadruple its corn feed production at Formosa, Brazil to 1.6 million bags by 2015. The Swiss agrochemicals giant is responding to the planned nearly doubling of Brazilian by 2020 spurred by growth in the animal feeds market. Over the same period, the value of the country's corn seed market is expected to reach $2.7 million with increased second season production and greater technology adaption. ■

## Sanofi CEO Upbeat Despite Pressure from Patent Expirations and Generics

In 2012, what CEO Christopher Viehbacher called "a milestone year" for the French drug maker, Sanofi was battered by patent expirations and generic competition. Net sales grew by only 0.5% at constant exchange rates to €34.9 billion, with net sales lost to generic competition totaling €1.3 billion. Net income at constant exchange was down 7% to €8.2 billion.

Viehbacher said the results, which were marked by a dismal performance in the fourth quarter, were "more or less what we expected at the beginning of the year." On a more positive note, he said the company's growth platforms, that now represent 70% of business, increased their sales by 10% last year. He pointed also to "extraordinary progress" on the R&D front, which resulted in nine new drug approvals over the course of 2012.


**Christopher A. Viehbacher**
**CEO, Sanofi**

The CEO said Sanofi's business will see "two dynamics in 2013. In the first half, the company's performance will look less favourable, compared with the more positive business development of the 2012 period. In the second half, a return to growth will be seen. For the full year, earnings per share can be expected to be 5% lower. Expiration of the patent for the anti-clotting drug Plavix, once the world's second best selling prescription drug, is expected to shave around €800 million off first-half earnings.

For the near future, Sanofi has a "robust" phase III pipeline that includes drugs for cancer, multiple sclerosis, cholesterol and a vaccine for Dengue fever, Viehbacher said. Over the next year the company plans to spend €1-2 billion on bolt-on acquisitions to its growth platform and remains open for "opportunistic" share buybacks. It is also on track to deliver its planned €2 billion in cost savings by 2015, the CEO added. Around 60% of the target was reached in 2012. Savings of around €500 million are budgeted for 2013. ■

## Shell Grows Singapore Petchems Footprint with New Polyols Investment

In a project due for completion in 2014, Shell is upgrading its Singapore production facility for polyols by more than 100,000 t/y and adding new grades. The additional products will help meet demand growth from key markets in Asia and China, the oil and petrochemicals group said.

The upgrade will achieved by optimizing existing facilities and deploying a catalyst that improves onsite conversion of propylene oxide and ethylene oxide. Shell said its proprietary technology consumes less energy and process materials as well as generating less waste.

The polyols expansion is part of a drive to strengthen the group's worldwide propylene oxide and derivatives business. In November 2012, Shell and joint venture partner SABIC announced plans to develop a range of polyols and styrene monomer propylene oxide plants at their SADAF facility in Saudi Arabia. ■

## Bayer Buys U.S. Land for Films Expansion

The U.S. arm of Bayer MaterialScience (BMS) has purchased nearly 11 acres (4.45 hectares) of land adjacent to its South Deerfield site near Pittsburgh, Pennsylvania, allowing for expansion of its NAFTA-based business with functional films. The company is "committed to its specialty films business in North America, and this land purchase support our future growth plans for this important region," said Shaun Gaus, general manager, Functional Films NAFTA. The Bayer sub-group's South Deerfield site manufactures and sells thermoplastic polyurethanes, polycarbonate polymer and polycarbonate blends as well as speilaty film and sheet for applications such as medical, automotive, sports/recreation and safety & security. ■

## Titanium Dioxide Market Heads for Consolidation as Kemira Exits

The global titanium dioxide market, hit by weak pricing due to overcapacity, appears to be headed for consolidation. In mid-February, Finish water treatment chemicals specialist Kemira sold its 39% stake in German $TiO_2$ producer Sachtleben for €97.5 million to its joint venture partner, U.S. holding Rockwood. The latter has now confirmed plans to exit the market by the end of 2013 and competitor Tronox has told analysts it may be interested in picking up the assets. Rockwood said another option under consideration is a spin-off of the loss-making business to its shareholders.

The turbulence besetting the $TiO_2$ market has negatively affected earnings of producers, which also include U.S. chemical giant DuPont and Saudi Arabia's Cristal Global. To ease the overcapacity situation, producers cut output in 2009. Demand from the automotive industry subsequently rebounded but prices came under renewed pressure as idled plants were restarted.

Rockwood, which merged its own $TiO_2$ assets with those of Kemira in 2008, blamed in major part weak demand for the paper bleaching pigment for its 65% year-on-year decline in net earnings in the fourth quarter of 2013.

Presenting quarterly and full year 2012 results in early February 2013, Kemira CEO Wolfgang Büchele said the $TiO_2$ situation had a "substantial" impact on the company's earnings, which were negative at €40.6 million last year. "The market environment for titanium dioxide changed completely in 2012, causing a deterioration of the performance of the JV Sachtleben. The sale to Rockwood will also pressure Q1 2013 earnings due to a voluntary €25 million writedown related to the transaction, he said.

Titanium dioxide consumer, Dutch paints and coatings manufacturer Akzo Nobel said in late February it expects a price squeeze for the $TiO_2$ producers as their prices will likely remain flat while oil and petrochemical prices rise. Producers of the pigment are targeting price hikes in March, following a year of declining notations; however, reports say they are unlikely to be successful due to long availability. ■

# Science Driven By the Market

Continued Page 1

Over the past three years, the company has invested considerable sums to develop an "outside in perspective, which its chief calls a "real industrial marketing approach."

This strategy is an integral part of BMS' cooperation with Japanese professor Yoshiyuki Sankai, a renowned expert in exoskeletal robotic systems. The company is contributing an extremely lightweight, super strong reinforced polycarbonate material to Sankai's much-touted Hybrid Assisted Limbs (HAL) therapeutic program, designed to help people with neurological injuries regain use of their limbs.

*"You cannot radically change the culture of a 150-year-old company."*


**As part of the cooperation with Japanese professor Yoshiyuki Sankai, a renowned expert in exoskeletal robotic systems, BMS is contributing an extremely lightweight, super strong reinforced polycarbonate material to Sankai's much-touted Hybrid Assisted Limbs (HAL) therapeutic program.**

Due to the bulky encased electronics, the polycarbonate skin is not much of a fashion statement, especially when worn under clothing. "Not everyone wants to look like Iron Man or the robot HAL in Stanley Kubrick's film 2001, A Space Odyssey," Thomas muses. To find a more attractive solution, BMS, together with Sankai and his venture capital firm Cyberdyne, launched a design competition. The invitation to tender went out as a iPad app, and design institutes paid to participate. A German contestant emerged the winner.

From the chief executive's viewpoint, the outside-in strategy is the biggest cultural change to take place within BMS under his leadership. It is also being applied to promotion of the Bayer EcoCommercial Building, a sustainable structure that draws energy for heating, ventilation and lighting from renewable sources, employs an insulation concept based on BMS' polyurethane raw materials and is used as a showcase for the company's technological competence.

Some of our competitors simply sell building products, but we take a more holistic view, Thomas says. "If we're asked if we have a certain product, we always say yes." The company has built up a network of more than 90 external partners that are paying to participate in the EcoCommercial building. One of them will be able to provide a solution. "In the end, we all benefit," says the CEO. "It's the Science for a Better Life" principle. Some of the partners are academic, such as the technical university at Aachen, Germany, which helped developed the catalyst for BMS' Dream Reaction route to producing polyols from waste $CO_2$.

The outside-in strategy is one that Thomas intends to anchor even more strongly at Bayer MaterialScience in future. "If you watch us over the next few years," he says, "you will see us recruiting more and more people you would recognize as professional marketeers rather than just scientists. About 70% of what scientists do should be driven by the market."

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# Getting The Pulse

## Singapore Aims to Be a Model of Sustainable Development As it Sets Out for the Next Phase of Growth

**The Lion City** – The Merlion – a mythical creature with the head of a lion and the body of a fish – is regarded as the Singapore icon ("Singapura" means "lion city" in Sanskrit). As one of the world's leading energy and chemical hubs, Singapore's contribution to the chemical industry is vast, both in terms of output and research. The city state in the center of Asian emerging markets continues to receive glowing reviews year after year for its infrastructure, manpower capabilities, as well as ease of doing business. And the Republic is constantly working to stay at the forefront of the industry's advancement and benefit from the Asian growth story. Michael Reubold spoke with Kian Teik Beh, International Director Europe of the Singapore Economic Development Board (EDB) about Singapore's strategy to create a perfect business environment for chemical and pharmaceutical companies.



Kian Teik Beh, International Director Europe, EDB Singapore

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***CHEManager Europe: Let us start by looking back three years. During the global crisis of 2008/2009 that hit the entire world, Singapore's economic growth rate dropped to negative 2%. How did your government react to that unprecedented situation and how did Singapore's economy rebound in the aftermath of the crisis?***

**K. T. Beh**: During that period of uncertainty, the government responded in a very level-headed and clear-sighted way by setting aside extra budget to help companies co-share their hiring costs and train their employees. It was a period when demand plunged dramatically and nobody knew how long the uncertainty would last. We took the opportunity to improve Singapore's industrial base. As soon as the economy rebounded – at a pace that was unexpected – we grew at 14.9% in 2010. Germany adopted a similar model of providing support for the industry, and I believe that is why Germany also grew above average.

***But not every Asian economy rebounded at such a high rate. Why is that?***

**K. T. Beh**: The reason why Singapore grew at that speed was because people were going for re-training during the economic downturn. When the economy rebounded, employers didn't have to hire new staff because they were still meaningfully employed, well-trained and prepared. As we had prevented minimal layoffs, our economy was able to react to the surging demand immediately.

Another reason for Singapore's high growth rate is a changing mindset of investors. Take for instance sectors such as specialty chemicals, food or pharmaceuticals. These sectors are responding to the growing demand of the Asian emerging markets for nutrition, health & consumer care, construction materials or transportation. The growth that we are experiencing is also testimony to the Asian growth story.

Before the economic crisis, most companies were focusing their attention on China, but now they are thinking beyond China. They see the emerging markets of Southeast Asia like Indonesia, Vietnam, Thailand and Myanmar. Companies want to respond to these growth opportunities in a manner that will allow them to grow with the market but also make sure that the growth is sustainable. Therefore, they choose a location within this region that will allow them to be flexible depending on where the growth is. And this is the story of Singapore. Everyone is looking for growth, but at the same time they want to be in a place where they feel comfortable.

***And Singapore is a perfect home base and hub for all the Southeast Asian countries?***

**K. T. Beh**: Yes, and also for other markets around the region/ For instance, Korea, Taiwan, India, Pakistan, Australia and New Zealand. Some companies even cover Africa from Singapore.

***What makes investors from the chemical and pharmaceutical industry feel comfortable in Singapore?***

**K. T. Beh**: Besides being strategically located in the center of the Asian growth markets, there are several factors that speak for Singapore. In particular, the ease of setting up and doing business as well as the availability of talent. Talent is a key enabler for this complex and dynamic industry and good people are limited, especially in a region that is growing at a fast pace. So you need to pick a location that maximizes your chance of finding or attracting skilled staff. Singapore's distinguished academic establishments produce a well-trained pool of engineering and management talent as well as skilled technicians. In addition, the multi-cultural, open-minded character of our modern city makes international staff and their families feel comfortable.

Singapore's position as a global chemicals hub started with the amalgamation of seven small islands into Jurong Island, an integrated complex housing many of the world's leading chemical companies.


The establishment of the Biopolis, a state-of-the-art infrastructure for the life sciences, has enabled Singapore to develop swiftly into a global biomedical sciences hub.

The Merlion – a mythical creature with the head of a lion and the body of a fish – is regarded as the Singapore icon.

***You mentioned the ease of setting up and doing business in Singapore. What governmental initiatives aimed at attracting investors to Singapore are going on right now?***

**K. T. Beh**: Quite a few actually. Let me explain them from the standpoint of the companies looking for a new location in this region. The first thing these companies need is a place for them to set up their business quickly. We are able to help companies set up office and lab facilities in a way that best suits their needs. It takes 30 minutes to register an enterprise and companies can either rent or build a new facility if they want to. So within a very short period of time, their physical lab is up and they can start hiring well-educated, technically trained, multi-disciplinary local staff. Education is one aspect of the macroeconomic investment that we have done. Being a multi-ethnic society, Singapore is a microcosm of Asia and , you can hire people who are able to speak English, Mandarin, Malay and Tamil , so they can speak the language of their customers.

The next thing that you need is product development, because you have to be innovative. The pace is very fast, so you have to put new products on the market not just every three years, but every two years or almost every year.

Again, speed is of the utmost importance and you require the fast setup and additional staff to meet your needs. For product development, companies need to hire scientists, engineers, and product developers. Singapore is able to fulfill those hiring needs. The strong local talent base, complemented by diverse international talent contribute to a world-class workforce, which companies can hire from to quickly ramp up their operations and drive growth in Asia.

Given the nation's strong track record for intellectual property rights protection, Singapore is ideal for companies seeking to develop and commercialize proprietary products and technologies.

On the front end, which is the market, we have set up the Institute on Asian Consumer Insight, an institute conducting market research.

Companies are able to find in Singapore the whole infrastructure they need to establish a business, staff it, obtain market information and start working with customers.

***We have spoken about companies in general. Can you mention some of them who have set up subsidiaries or even headquarters in Singapore?***

**K. T. Beh**: Yes. The top chemical and pharmaceutical corporations have operations in Singapore, from administration to production to research & development. Examples include GlaxoSmithKline, Johnson & Johnson, Procter & Gamble, Abbott, Evonik, Wacker, Mitsui, Clariant, Celanese, Lanxess or Unilever. If the market is there, you have no choice: you have to be there in order to get the pulse and the feel of the market.

***When we are talking about manufacturing and production we are probably talking about Jurong Island.***

**K. T. Beh**: Yes. Jurong Island is an integrated complex housing many of the world's leading energy and chemical companies. As you know, there are big plants like the steam crackers. But now the story for us is downstream development. Once you have got that scale, there is critical mass to produce downstream molecules.

***So you want to go into specialties?***

**K. T. Beh**: Exactly, that is what we are interested in. Our aim is not just to be a hub and a production center for basic chemicals, but to take those chemicals from the big steam crackers and the basic chemical plants and use them on Jurong Island for downstream industries. Singapore is well-positioned to further expand the chemical industry by focusing on high value-added specialty chemicals.

***Sustainability is a big issue in the chemical industry now. If you think about a place with a lot of petrochemical industry, it doesn't necessarily go hand in hand with sustainability.***

**K. T. Beh**: No, it does. I think that all of us recognize that these are products and materials that are necessary, but our accountability is to be responsible for how we produce them. We look at it from two themes; competitiveness and sustainability. We have been emphasizing this for some time and we call it our Jurong Island version 2.0 initiative. We talk about being more efficient, we think about energy and feedstock options because as Singapore positions itself for the next phase of growth, it aims to be a model of sustainable development. We are taking the lead in terms of raising the bar in energy efficiency, emissions management as well as accelerating the development of new, sustainable feedstock and technologies.

A number of high impact projects will be implemented over the next few years. These include key infrastructure such as a gasification plant and a LNG terminal for one and a half billion dollars. We feel this is the right investment for energy security, but also for clean energy.

We also actively support companies to encourage adoption of energy efficiency improvement projects. We have programs to support manufacturers to do efficiency benchmarking and help to them to upgrade their efficiency. So, we pay attention to the big things but also to the minor details, because every single thing will help make the industry a little bit more efficient.

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# Urbanization as a Growth Driver

## Lanxess Expands its Global Production Network for Pigments with a New Plant in China

**Global Networking** – Specialty chemicals company Lanxess is expanding its global production network for inorganic pigments and building a new plant in China for the Inorganic Pigments business unit. The new facility for high-quality iron oxide red pigments is being erected at a cost of €55 million at the chemical park in Ningbo, on the eastern coast of China. The pigments will be marketed worldwide under the product name Bayferrox and are intended for use in the paints and coatings sector and in the construction and plastics industries. The rising demand for these high-quality and sustainably produced pigments is being driven by growing urbanization – a megatrend and a key focal point in Lanxess' growth strategy. Michael Reubold asked Jörg Hellwig, head of the Inorganic Pigments business unit at Lanxess, about his strategy for the unit.


Jörg Hellwig, head of the Inorganic Pigments business unit, Lanxess

***CHEManager Europe: Mr. Hellwig, the investment in the new plant in Ningbo underlines the importance of urbanization as a megatrend for Lanxess and the Inorganic Pigments business unit. What kind of growth do you expect worldwide for inorganic iron oxide pigments?***

**J. Hellwig**: We look at a range of studies and our customers' growth plans and analyze the markets. All our findings show that the global market for iron oxide pigments is continuously growing. When viewed in detail, the rate of growth differs from region to region and according to the area of application. The new facility in Ningbo will give us additional capacity that we can use to serve the growing markets across the world. For example, the construction industry is set to grow by 3.5% worldwide this year and by 5% next year. What's more, we have optimized our processes so that we can respond faster to increased volatility.

***What exactly is driving growth?***

**J. Hellwig**: One of the main growth drivers for our sector is the megatrend of urbanization. The construction, plastics and paint and coatings industries all benefit from this trend. People are flocking to cities and ever larger urban conurbations are springing up. Furthermore, although urban planning originally had an entirely utilitarian focus and was geared solely towards creating space, modern approaches are increasingly taking esthetic dimensions into account, too. Architects are thinking about how they can make concrete more attractive, and sooner or later they come across our pigments. Whether paving materials, roofing tiles, wall coatings, laminates or artificial grass, colorful objects that don't require extensive maintenance work and are produced on a sustainable basis are in greater demand than ever before.

***Are there other applications driving growth?***

**J. Hellwig**: Lanxess has identified three further megatrends besides urbanization that serve as focal points for our business strategy and we offer iron oxide pigments for all of them. Bayoxide E 33 is relevant to the megatrend of water because it is highly effective in binding arsenic, enabling the purification of drinking water in all regions of the world. Bayoxide E 16 is highly promising for the megatrend of agriculture, as it can be used in desulfurizing biogas plants. We are also developing technical iron oxides such as Bayoxide E B 90, which is used in the batteries of electric vehicles and therefore responds to the megatrend of mobility.

***What are the growth markets from a geographical perspective?***

**J. Hellwig**: We have a global customer base. While our traditional markets are in Europe and North America, recent years have seen burgeoning growth on the Indian subcontinent and in Southeast Asia. Indeed, China is already the world's biggest market for iron oxide pigments. Thanks to our global distribution network, we can sell our products in virtually every country on Earth. That makes us less vulnerable to regional economic fluctuations.

***Lanxess is already running one of the biggest plants for iron oxide pigments in the Asian market, at its Jinshan site near Shanghai. Why did the company decide to build the new plant at a different site?***

The stately structures with impressive architectural features of the Plaza de la Libertad complex in Medellín owe their distinctive coloration to Bayferrox pigments.

**J. Hellwig**: Ningbo offers us the best conditions for building a new plant that meets cutting-edge standards. The infrastructure in the chemical park there is excellent and perfect for our needs. Due to the introduction of extremely stringent environmental standards, manufacturers in China are being forced to invest massively in the treatment of wastewater and waste air. We did that in Jinshan, after buying the plant there, and naturally we will do the same when building the new facility in Ningbo.

We have also established that the demand for environmentally friendly and sustainably manufactured products is on the rise. Lanxess is one of the leading suppliers in this field and applies the same high environmental standards wherever and whenever it is active. In many cases, these standards go beyond local guidelines.

***Will these market conditions lead to an ongoing consolidation?***

**J. Hellwig**: This trend – the demand for environmentally friendly and sustainably manufactured products – is set to continue and will also lead to a further increase in the demand for Bayferrox iron oxide pigments. That is why Lanxess is continuing to invest in the pigments business. However, it remains to be seen how many of the current manufacturers are financially able to make this kind of investment and how many will have to pull out of the market. We anticipate that, in the medium term, some of our competitors will simply have to shut down production – not just in China, but worldwide. The process of market consolidation will continue.

***The group-wide production of inorganic iron oxide and chrome oxide pigments is still centered in Germany, but additional capacities are primarily required in the growth regions. Where do you plan to make further investment?***

**J. Hellwig**: We are the only manufacturer of synthetic iron oxide pigments with a global production network. Our current three synthesis sites are located in Krefeld-Uerdingen in Germany, Jinshan/Shanghai in China and Porto Feliz near São Paulo in Brazil. We also have additional mixing and milling plants for processing iron oxide pigments in Australia, China, the United Kingdom, Spain and the United States. All these sites are networked and not restricted to their local region. That means wherever our customers are in the world, we're close to hand.

***What role will Germany and the rest of Europe play in your production network in the future?***

**J. Hellwig**: Krefeld-Uerdingen is our largest site and perfectly equipped to be globally competitive. Over the past few years, we've really done our homework in Germany – a business location that many consider to be "expensive" – and further boosted competitiveness through investment, particularly in automation and efficiency enhancements. Accordingly, we are making full use of the outstanding benefits that the site offers, such as the exceptional level of training among the workforce and integration into a cutting-edge chemical park. In the coming years, we will continue to optimize our processes and delivery service – an approach that will see further investment in Germany as a production location.

***Synthetic iron oxide pigments were developed back in the 1920s. Just how "innovative" is your business? What are you researching and what new areas of application could be important for your products in the future?***

**J. Hellwig**: Iron oxide pigments have been part and parcel of day-to-day life for almost a century. All the same, the performance profile demanded by the various applications has changed significantly over that period. Take for example the requirements that the paints and coatings industry places on us – the dispersibility of pigments is a particular challenge in this application. The micronization process we have introduced responds to this need and is still a cutting-edge technology today. The world has also changed when it comes to the need for consistent quality. The paint and coatings industry applies stringent demands to the specification of shade and color strength. Our response was to introduce the Bayferrox High Performance product line. Our products have now reached a quality standard that we could never have dreamed of 50 years ago.

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## Reverdia Starts World's First Large-Scale Bio-Based Succinic Acid Plant

Reverdia has begun operations in Cassano Spinola, Italy, at a commercial-scale plant producing bio-based succinic acid (Biosuccinium). The plant, which has a capacity of about 10,000 t/y, is the world's first dedicated large-scale plant for the production of sustainable succinic acid from renewable resources. The facility benefits from experience gained using low-pH yeast technology on a demonstration plant scale. Reverdia, a joint venture between DSM and Roquette, regards this as essential to be able to promise further improvements in product quality. Applications for Biosuccinium include polybutylene succinate (PBS), polyester polyols for polyurethanes, coating and composite resins, phthalate-free plasticizers, and 1,4 butanediol. "This new phase will enable direct and indirect customers to start production of commercial scale volumes of materials and end products based on bio-based succinic acid", said Will van den Tweel, Reverdia's General Manager. ■

# Combining Performance and Sustainability

## Features at the European Coatings Congress 2013 Include Nanotechnology, Waterborne Systems and Biobased Coatings


**Formulating The Future** – Decreasing availability of classic raw materials such as oil affects the coatings industry like any other. The European Coatings Congress in Nuremberg therefore will focus on biobased and sustainable coatings. Presenting the latest results and industrial developments, the congress will cover the full range of processes and raw materials for the formulation of coatings, inks, adhesives, sealants and construction chemicals. From March 17 to 19 more than 144 selected papers will provide the industry's latest trends and innovations.

### Tutorials

In 11 pre-congress tutorials, numerous experts will offer training opportunities from the fields of functional and architectural coatings to renewable chemicals and more. Dr. Jamil Baghdachi from Eastern Michigan University will discuss efforts to reach the goal of sustainable technologies without compromises. Dr. Adrian Beard and Daniela Eisenhauer from Clariant will cover flame-retardant fundamentals as they speak about the burning behavior of different materials as well as flame-retardant and fire-resistant coatings. The pre-congress tutorials will be on March 17, right before the congress officially starts. Seats for these tutorials are limited, and since the main congress and the tutorials are individual events, pre-registration is recommended.

### Congress Highlights

Keynote speakers for the main event on March 18–19 are Dr. Adithy Ranade from Lux Research and Klemens Bartmann from DuPont Performance Coating. The combination of performance and sustainability will play a crucial role in both speeches. Ranade will cover assessing sustainability in architectural coatings. He will reveal a tool to assess the true sustainability value of coating technologies relative to their performance value to the end user. Klemens Bartmann, on the other hand, focuses on new sustainability challenges for global players in the coatings industry. He will discuss how to approach environmental regulations and how to turn challenges into opportunities.

The 24 main sessions will start with trends in automotive coatings. How novel polyester diols and urethane polyols are capable of imparting and enhancing a variety of properties in high-performance coatings is one of the most discussed issues. John Florio and Dr. Ravi Ravichandran from King Industries will dedicate two sessions to the advantages of these diols and polyols in high-performance amino-formaldehyde cross-linked coating applications.

The pressure on reduction of critical solvents in coatings and resins is another challenge within the automotive industry. Robert Harrer from Cytec will present a new solvent-free waterborne two-pack binder for plastic coatings, which can be used for applications with highest demands, such as automotive interiors. Dennis Heymans from Momentive Specialty Chemicals will take his listeners on "a possible route to solvent-free transportation and automotive topcoats." He will demonstrate how to optimize the process of solvent distillation from high-quality acrylic resins.

The session "Science Today – Coatings Tomorrow" will cover a wide field of highly innovative topics. Professor Bernhard Rieger, Wacker-Chair of Macromolecular Chemistry, TU Munich, will discuss "Materials for the 21st Century" and the question "Can carbon come from $CO_2$?"

How to use responsive nanoparticles to form coatings that change their surface properties is the issue of Professor Andres Fery from the University of Bayreuth. He will point out the perspectives of this approach for the example of bioactive coatings. So-called nanogels or microgels are the topic of Professor Walter Richtering. He will present the advantages of functional microgels as smart ingredients for waterborne coatings.

### Waterborne Coatings

Challenges of waterborne coatings keep the industry busy, and innovations to face those challenges will be presented at the European Coatings Congress. Benoît Magny from Arkema will lead the "waterborne coatings" session. New defoamer lines and foam control agents have been developed to ensure predictable performance of waterborne coatings. Dr. Sowmitri Tarimala from Ashland and Christine Louis from Air Products will talk about these new developments and their value for the industry. Dow Chemical will send Dr. Jay Romick to Nuremberg to present new waterborne polyolefin dispersions. These dispersions can facilitate coatings with excellent chemical resistance, adhesion to metal and flexibility.

### Antimicrobial Properties

How to use the power of silver for antimicrobial purposes will be discussed on March 19. Alexandra Pica from the Research Institute for advanced coatings will talk about the influence of silver nanoparticles on the morphology of film-forming materials and their antimicrobial efficiency.

Achieving antimicrobial characteristics of coatings without using silver is the aim of Dr. Alan Taylor. He will introduce CuViTo, a European-Mexican joint venture aimed at developing new products for the Mexican mining industry. To avoid high raw material costs, CuViTo is doing research with copper instead of silver. The challenge for copper coatings is to restrain the copper nanoparticles in a structure that provides antibacterial functionality. The financial opportunities might be worth this effort.

### Nanotechnology

Nanotechnology can be used not only to achieve antibacterial characteristics but also for a wide range of applications. Because of availability of new materials there are still only a limited number of products containing nanoparticles on the market. Ninja Hanitzsch from Byk-Chemie will be "Breaking New Ground" as she presents additives based on nanoparticles, which are easy to handle and ready to use. Research and investment in nanotechnology already has led to interesting results: Additives based on carbon nanotubes can be used as a versatile material to achieve new functionalities in coatings. Tobias Tinthoff, also from Byk-Chemie, will explain how to take advantage of this new and fascinating material.

### Sustainability and Biobased Coatings

Nevertheless, sustainability and the role of biobased coatings are the most important issues of this year's congress. In a session led by Dr. David Löf from PPG Europe, the latest innovations in biobased coatings will be presented. In order to improve the carbon footprint, renewable materials like sugar play a more crucial role. How sugar-derived biobased building blocks can be used to build polyester resins will be explained by Bas van Leeuwen from Purac.

To find sustainable solutions in high-performance coatings and adhesives, polyurethane dispersions are the key in many cases. Hans-Georg Grablowitz from Bayer MaterialScience will present first results of the development of polyurethane dispersions based on biobased raw materials.

*Author: Philipp Praet, freelance journalist*

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## Solvay Expands Output of HD Silica and Derivatized Guar

Solvay is increasing its worldwide capacity for highly dispersible silica (HDS) by 30% with investments in Poland and China. The company has budgeted €175 million for a new 85,000 t/y plant to be built at Wloclawek, Poland. Among other HDS products, the new unit will produce Zeosil Premium, a highly dispersible silica used in energy-saving tires.

At Qingdao, China capacity of the facility started up in 2010 is being expanded to 112,000 t/y by the end of this year. In 2012, HDS output was increased in France, in 2011 in the US. When all the expansions are completed, Solvay's worldwide production of HDS will double against pre-2010 levels to nearly 500,000 t/y. Solvay has also increased its global derivatized guar production by 40%. The Belgian chemical producer recently expanded output at its Vernon, Texas, site in the US to supply customers in the oil and gas market. At its site at Zhangjiagang site in China's Jiangsu province, it widened output for the home and personal care sector to meet growing demand for high-end hair care products. Including its facility at Melle, France, Solvay is the only guar supplier with production capability on three continents.

Produced from a bean grown mainly in India, the polymer guar is used as a bio-based solution for applications in the oil and gas industry as a gelling agent, in hair care products as a conditioner and in the agricultural sector as an anti-drift formulation. For 50 years, Solvay has secured raw materials supply through its partnership with guar gum and guar extracts producer in India. ■

## Thai Acrylic Fibre and Sanitized Form Alliance for Co-branding

Thai Acrylic Fibre Co. Ltd (TAF) and Sanitized have signed a co-branding agreement and licensing program for TAF's Amicor fibers. The new alliance covers the co-branding of future product developments using Amicor fibers and yarns and the Sanitized hygiene function. Under the new agreement, the world leading Sanitized antimicrobial hygiene function is built in to all Amicor fibers.

Recently, Amicor has unveiled new Biocidals Product Directive (BPD)-compliant fibers and yarns. The Amicor anti-bacterial and anti-fungal intelligent fiber–integrated technology was developed by Courtaulds/Acordis (UK) in 1998. The technology is specifically designed to incorporate the functional anti-microbial additive into the core of the fiber.

The additive is added to the fiber polymer before it is spun, containing it within the unique fiber structure rather than acting as a surface coating. When Amicor fiber is used at the recommended blend level it ensures durable and effective protection of the entire fabric.

"Innovation has always been the trademark of the Amicor brand, as has our strong emphasis on human and environmental safety", comments Ambrish Maheshwari, CEO of the Acrylic Fibres Business of TAF's parent company Aditya Birla Group. "This shared philosophy with Sanitized, a brand at the forefront of antimicrobial protection, made the creation of an alliance a logical progression for both companies." ■

## Formulation-Enhancing Solutions

Dow Chemical will showcase its portfolio of technologies and solutions for the coatings and construction industries at the 2013 European Coatings Show. Dow Coating Materials collaborates closely with customers to develop end-use products that are faster and easier to use, resist stains, enhance air quality, offer longer-lasting protection, and use fewer natural resources. Innovations to be presented at the show include the extended Evoque Pre-Composite Polymer Technology range, which is designed to help paint formulators maintain hiding performance while using up to 20 percent less $TiO_2$.

Dow Construction Chemicals will highlight solutions that permit building material manufacturers to enhance the value they bring to applicators by formulating future-oriented products that meet evolving performance requirements. The business offers products based on cellulose ethers, re-dispersible latex powders and acrylic emulsions.

Dow Consumer & Industrial Solutions develops multifunctional neutralizer technologies, which provide performance benefits such as product stability, efficient pigment dispersion and enhanced scrub resistance, the business also offers AEPD VOX 1000 Multifunctional Neutralizer, which was specifically developed for use in zero-VOC paints and offers improved freeze-thaw resistance and with virtually no odor.

Dow Epoxy will feature its expanded line of curing agents, resins and diluents, including the new D.E.H. Curing Agent family, which brings formulators and end users numerous benefits to enhance performance in construction chemical applications. ■

## Construction of Oxea's Specialty Derivatives Plant in China On Track

Oxea's first oxo derivatives plant in Nanjing Industrial Chemical Park, China, has passed the planning stage and construction is under way. Oxea expects its the plant to be complete at the end of 2013. The new state-of-the-art production site will serve the fast-growing demand for oxo derivatives in China and Asia. Oxo derivatives are key ingredients and are used in many sectors of China's economy, including automotive, construction, cosmetics, pharmaceutical and personal care products.

"China is the main growth engine for the Asia-Pacific region," said Miguel Mantas, Executive Board member for Marketing and Sales. "Thanks to the favorable strategic location of our new plant we will be able to better serve our customers in the region. Initially the Oxea Nanjing plant will produce specialty esters, phthalate-free plasticizers and other oxo derivatives for the local market," he continued. ■

## Raw Materials for High-quality Paints

BASF will be presenting many different products and services at the ECS in Nuremberg.

They offer a broad coating raw material portfolio for the Architectural Coatings & Construction, Industrial Coatings, Automotive Coatings and Furniture & Flooring Coatings industries.

One example is the Bismuth Vanadate pigment Sicopal Yellow EH 1567 (L 1130). With features such as high color strength, increased opacity and exterior durability, this new pigment is designed to meet the needs of the decorative, industrial and automotive coatings markets. It offers an ideal solution for customers wanting a lead-free formulation of especially bright and durable yellow shades.

Coating manufacturers are looking for dispersing agent solutions with top performance in the growing market segment of water-based coatings. The new Dispex Ultra PX 4575 boasts benchmark performance in inorganic pigments, providing improved color development and lower viscosities in order to help reduce pigment usage or increase pigment loading. This product innovation meets the requirements of the European eco-label for indoor and outdoor paints and varnishes (2009/544/EC and 2009/543/EC). ■

## Algicide Formulation Claimed to Reduce Ingredient Leaching in Paints

Lanxess, which claims to be one of the world's leading manufacturers of biocides, has developed a new formulation method for algicides in paints. The company said the new method offers additional benefits for paint producers.

Several tests have shown it to reduce active ingredient leaching caused by rain by 50% compared to conventional algicides, thus extending the life of the coating. At the heart of the formulation method, the company said, is a slow-release technology developed by researchers in its Material Protection Products business unit that exhibits "a far better ingredient retention in the color matrix than standard dry-film preservation products.

"Far lower" quantities of the active ingredient are said to be able to deliver results comparable with those achieved with a product based on conventional formulation methods. ■

## Dispersant for Waterborne, Binder-containing Pigment Dispersions

TEGO Dispers 761 W is designed specifically for waterborne printing inks and coatings for food packaging. The wetting and dispersing additive consists completely of raw materials compliant with the A list of Swiss Ordinance SR 817.023.21, Annex 6. By using TEGO Dispers 761 W in waterborne, binder-containing pigment dispersions, properties like gloss and color strength are enhanced significantly. It drastically reduces the mill base viscosities of dispersions based on organic pigments and carbon blacks. This characteristic enables the production of highly pigmented mill bases which can result in significant cost savings. ■

## Polymer Binders for Concrete & Construction Applications

At the (ECS) in Nuremberg Wacker is showcasing its latest polymer binders for concrete modification and environmentally sound construction applications. The new Etonis 260 makes drainage concrete for road surfacing in railway tunnels durable yet water-permeable. This enables rescue vehicles and fire engines to get to the scene of an accident inside a tunnel quickly and without any problems.

Furthermore, it facilitates the transport of moisture from the tunnel, significantly reduces the formation of puddles or backed-up water and makes the surface more durable overall. ■

# Sustainability Remains a Top Driver in Surfactants

**Coatings** – Solvay Novecare is a leading supplier of performance additives to a variety of paint and coating applications. With its expertise in formulations, rheology, surface modifications and polymer associations, the former Rhodia business is able to deliver custom-made solutions adapted to niches' needs and customers' particular requirements. Solvay Novecare develops and manufactures products that are used as additives in formulations and provide enhanced surface wetting, improved coating adhesion to substrate, superior dispersion stability and gloss, enhanced color development and stability, or better foam control. In addition, the products are effective in minimizing production mixing time and improve manufacturing efficiency. CHEManager Europe asked Simon Mawson, Global Director, Coatings Market at Solvay Novecare, about current trends in the coatings market.

Simon Mawson
Solvay

***CHEManager Europe: Mr. Mawson, what do you see as the main trends on the market for coatings?***

**S. Mawson**: Performance additives, such as surfactants, dispersants, defoamers, amines and other functional additives, including freeze-thaw and open-time extenders, remain the key components in the transition from solvent-borne to waterborne formulations. The same holds true for the transition from conventional waterborne to low- to zero-VOC waterborne formulations. Customers, especially in North America and Europe, are using APE-free and VOC-free additives only for new development and are replacing APE- and solvent-containing surfactants with APE-free and VOC-free versions for selective existing products in both emulsion polymerization and coating formulations.

***Thus, sustainability is a major trend?***

**S. Mawson**: Yes. The industry is also identifying ways to reduce formaldehyde and heavy metal content, and conducting life cycle and carbon footprint analyses. Bio-sourced surfactants also are gaining interest in the market in an effort to reduce the carbon footprint for paints and coatings.

***What is Solvay doing to support these trends?***

**S. Mawson**: Solvay has been working alongside its customers since the 1990s to design surfactants and specialty additives that reduce the impact on health and the environment. Our primary focus is to service our customers' "greener" technology needs – whether that means VOC-free, APE-free, reduced heavy metal content, life cycle and carbon footprint analysis, etc. – and introduce technologies and products that enable progress toward low environmental impact, high performance and cost effective coatings.

***Which trends do influence our business the most?***

**S. Mawson**: We believe that sustainability, performance, raw material availability and cost are the primary issues facing the market today. Sustainability remains a top driver in surfactants for coatings. Significant efforts are engaged to accelerate the conversion to APE-free and VOC-free products due to regional regulatory guidelines set by the U.S. Environmental Protection Agency, the South Coast Air Quality Management District the California Air Resources Board, the Ozone Transport Commission Specifications, etc., and the EU Directive 2004/42/CE to limit emissions for paints varnishes and refinishing products. We have also seen a big market push by big box franchises for Eco Label and Green Seal for more eco-friendly products. ■

# Color And Functionality

## Clariant Masterbatches Pursues Strategy for Profitable Growth Based on Four Key Elements

**A Colorful World** – Masterbatches are adding color and functionality to plastics and, thus, help enhance the market appeal or the end-use performance of plastic products, packaging or fibers. The business unit Masterbatches of Swiss specialty chemical manufacturer Clariant is a recognized global leader in color and additive concentrates and performance solutions for plastics. CHEManager Europe asked Hans Bohnen, head of Clariant's Masterbatches business unit about the BU's business situation and growth strategy.

Hans Bohnen,
head of Masterbatches Business Unit, Clariant

*CHEManager Europe: Mr. Bohnen, 2013 is now well underway. How did Clariant's Masterbatches business perform in the last year, what is your outlook for 2013?*

**H. Bohnen**: We can definitely see the negative impact of the continuing economic slowdown in Europe, especially in the southern economies. While Germany was somehow sheltered in the first half of 2012, we did see the first indications of a slowdown in the second half. It is difficult to make a projection for the full year. Following a weaker December we saw a rebound in January and we expect sales on a level comparable to last year. In 2010, we developed a clear strategy for profitable growth. 2012 was another year in which we successfully continued our execution. In 2013 we do not expect a significant recovery in our industry. Especially Europe will at best stabilize on a low level. We are investing in growth in emerging markets and we believe that we can already capture some of this in 2013. We are convinced that we can further deliver on our profitable growth aspiration for the business unit.

*Where and how is Masterbatches looking to support its customers most in the coming year?*

**H. Bohnen**: Our customers will benefit through an even stronger footprint and improved services. This new approach towards innovation leads into a solid innovation pipeline, further enhanced capabilities and resources. Clariant is continuing to strengthen on-the-ground technical and product support for customers across the globe. Back in 2011, we introduced a new Masterbatches BU strategy for profitable growth based on four key elements, with the goal to create products and service value by meeting customers' needs. The changes have been implemented within our operations. Therefore we are beginning to see a more efficient and focused organization. This will enable us to improve the levels of service and innovation we can offer to our customers and allow us to concentrate on those innovation-driven markets where demand for support is strong.

*You mentioned a "strategy based on four key elements". Can you explain this?*

**H. Bohnen**: The four elements embrace growth via regional initiatives, a focus on the most attractive market segments, implementation of an industry-leading operational model, and building the next level of innovation. Our goal is to create products and services value by meeting customers' needs, and a focus on these four elements will help us attain this.

The strategy principally involves investment initiatives, be it investment in strategic sites, in operations, or innovation-related investments in all global regions, and realigning our way of thinking to ensure we truly appreciate and respond to the unmet needs of our customers and markets. This means extending our infrastructure through upgrades, capacity expansions or investment in new sites, implementing efforts to improve the efficiency of internal operations, and focusing our innovation, processes and services on fields and markets where we can deliver maximum value.

Every change we initiate internally must lead to an improvement for the customer. We do not change for the sake of change but to meet and exceed our customers' expectations.

> *"Clariant is well positioned to face medical and pharmaceutical customer demands."*

*How does this strategy tie-in with Clariant's corporate Performance. People.Planet values unveiled last year?*

**H. Bohnen**: Appreciating the needs of our customers is fundamental to realizing Clariant's corporate commitment to deliver added value for our stakeholders and partners, and become the global leader in specialty chemicals. The Performance.People.Planet values are an integral part of this approach, at the heart of our actions and defining our corporate culture. They describe the way we do business and the values that are our top priority in our interaction with others.

These values are therefore at the center of our BU strategy. We are only successful if our customers enjoy success; therefore we strive to offer them innovative, customized solutions focused on improving performance

*What will the Masterbatches strategy mean in reality to your customers? What direct benefits will they experience?*

**H. Bohnen**: Through our strategy we want to create added value, addressing significant unmet customer and market needs as a key part. In order to achieve this, Clariant has invested more than CHF 60 million to improve access to local supply and on-the-ground support for customers in the emerging markets of Asia, Latin America, India and the Middle East as well as in Europe and North America during the last 2 years. One recent example is the construction of our new site in Indonesia which will go on stream by the end of this year. Furthermore, we have invested CHF 14 million in a new plant in Poland to improve capacity, capability and flexibility in order to meet local customer demand in Central and Eastern Europe. In addition, we have expanded our sites in Russia, Saudi Arabia, Mexico and Pakistan in 2012 and will continue to do so. Further investments into regional expansion will be communicated shortly. This is just a snapshot of our ongoing program to improve support for customers at a local-level.

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The changes to our operating model will be felt by customers as we enhance products and services we offer customers. For example, developments have been made in creating a robust supply chain system for North America and in Europe that will lead to improved on-time and in-full delivery of Clariant Masterbatches. Clariant is also continually driving improvements in areas such as complaint handling, lead-time and quality levels at all sites.

> *"Appreciating the needs of our customers is fundamental."*

Our global footprint and global standards are 2 clear assets we are able to offer our customers. Our global key account and product management organization ensures implementation of best practices, highest standards and latest developments on a global base. Think global and act local is our strength.

Through our ongoing commitment to innovation we will bring to market products that support our customers in the challenges they face – the need for differentiation, to be more efficient yet still cutting-edge, to fulfill tightening market regulations, and be environmentally-considerate.

*You mentioned "Building the next level of innovation" as one of the four strategic key elements. What is meant by this?*

**H. Bohnen**: We recognize that Clariant will need to reach beyond its current portfolio in order to create maximum value and address the significant unmet customer and market needs that exist. Under the focus topic "Build the Next Level of Innovation" Clariant is committed to go beyond its current portfolio to ensure the sustainability of the Masterbatches innovation pipeline. The BU is engaged in long-term projects and breakthrough developments and in doing so, is partnering with customers, suppliers, leading institutes and universities to make sure promising ideas reach market maturity and are converted into real value for customers.

During 2013, we will strengthen our innovation activities through the addition of further dedicated personnel and equipment to help solve identified challenges, focusing on sectors such as packaging, medical, energy and construction. Resources will be focused in strategic locations globally, ensuring continuous innovation processes and strong interfaces with key partners.

*Medical is one segment where Clariant has taken a sector-dedicated approach. Will this approach be extended to other market segments during this year?*

**H. Bohnen**: Within Clariant's focus on supporting specific market segments, the organization is well prepared and positioned to face medical and pharmaceutical customer demands. Our medical segment has a high demand on GMP and product stewardship. This is why we work with a sector-dedicated approach. The fast growth we enjoy for this segment shows that this was the right decision.

But within the Masterbatches BU we have installed dedicated teams for each segment, not just medical, to enable us to meet all possible requirements on the customer side efficiently and effectively.

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## SABIC Expands Research Pact with Zurich's ETH

Saudi Arabian petrochemical giant SABIC has expanded its multi-year agreement with the Swiss Federal Institute of Technology (ETS) Zurich to cover multiple future projects in a wide range of areas of technology and innovation.

This follows a research collaboration agreed in 2012 covering functional films and nanotechnology. Collaborative projects with well-established scientific organizations and research centers are an essential part of Sabic's R&D concept, said Ernesto Occhiello, executive vice president technolgy and innovation at the Saudi group. ■

## Clariant Opens New Plant for AMPS Polymers in Spain

Clariant has started up its new €16 million plant for specialty polysulfonates at Tarragona, Spain. The facility, which will supply the cosmetics as well as the mining industry, incorporates the most modern process technology available. Two separate lines will manufacture polymers for the group's Industrial & Consumer Specialties and Oil & Mining Services business units, ranging from emulsifiers and rheology modifiers for use in face creams to fluid loss control additives for well cements used in oil and gas drilling operations. Output will meet growing demand from the market. ■

## Novomer Claims First Large-Scale PP Polyol Manufacturing Run

US company Novomer has completed the world's first large-scale run of polypropylene carbonate (PPC) polyols produced from waste $CO_2$ with more than 7 t of finished product. The firm, which received a $25 million grant from the US Department of Energy for the project, scaled up the process in cooperation with fine chemicals producer Albemarle at the latter's Orangeburg, South Carolina, site.

The material produced is a 1,000 molecular weight PP diol. Novomer is working with companies of the polyurethanes industry that will test the new material in their production processes. ■

# Bayer's New Chemicals Value Chain

## $CO_2$ and Hydrogen from Renewables Become New Raw Material and Energy Sources

**Modern Chemical Engineering** – Bayer Group is set to take a crucial step in 2013 in the realization of its plans to create a new chemicals value chain based on the conversion of $CO_2$ into a range of intermediates using stored energy from renewable sources like wind.

At the INVITE R&D center in Leverkusen, jointly run by Bayer Techology Services (BTS), the company's engineering arm, and Dortmund Technical University, the company is in spring due to start operating a demonstration $CO_2$-reforming reactor. The $CO_2$ will react with hydrogen from a renewables-powered electrolysis unit to produce intermediates such as carbon monoxide and formic acid.

"We are finding ways of creating a new value chain by making use of waste $CO_2$ from power generation and hydrogen coming from cheap energy," Professor Hans-Wilhelm Engels, research director at Bayer MaterialScience, said at a recent press conference at RWTH Aachen University, Germany.

The demonstration unit will provide a platform not only for making $CO_2$-derived polymers and other products but also for the development of technologies for the storage of excess energy from renewables like wind and solar power.

Christoph Guertler, head of the Bayer MaterialScience catalysis program.

### Research and Development

Initially the company's research efforts are being focused on the optimization of a process under which surplus wind energy is used for electrolysis of water into hydrogen, which can be a means of storage. But the hydrogen can also be utilized for the hydrogenation of $CO_2$ to formic acid which provides a much more stable form of energy storage.

Bayer is involved in a longer-term scheme for storing electrical energy from renewable sources with the aid of large zinc-air batteries, which if they can be designed to operate efficiently would be environmentally safe and relatively inexpensive with large quantities of cheap and readily available raw materials. However a major uncertainty overshadowing the use of excess renewable sources is the cost and availability of the surplus energy.

In Europe, power generators currently are obliged to buy at minimum prices guaranteed amounts of energy from wind farms and other renewable sources under the European Union mandatory targets for use of renewable electricity.

### Missing Storage Technology

Today, due to the absence of economically viable storage technologies, the surplus energy produced by wind and solar power operators on windy and sunny days is lost. However once these technologies are developed it is unclear how much of the surplus energy could be made available and at what cost to companies like chemical producers with innovative storage processes.

"Hydrogen from the electrolysis program could be very cheap if there is lots of renewable energy available at a very low price," Christoph Guertler, head of the BMS catalysis program explained. "We believe that given the right scenario with the hydrogen electrolysis process the cost of the electricity will be much lower than it is today so that the technology would be economically viable."

### The CO2RRECT Project

In Germany Bayer is not alone in pursuing a new chemicals value chain based on $CO_2$ and renewables. The development of the electrolysis process powered by wind energy is the main aim of the €18 million CO2RRECT project, mostly funded by the German Ministry of Education and Research (BMBF).

CO2RRECT ($CO_2$-Reaction using Regenerative Energies and Catalytic Technologies) has 13 partners, headed by BTS, including BMS. The others comprise RWE Power AG, the suppliers of the $CO_2$, Siemens, the originator of the electrolysis technology, and a number of scientific institutes.

The development of the catalytic technologies is being conducted by the CAT Catalytic Center, Aachen, an international catalysis research hub, founded in 2008 by Bayer and RWTH Aachen University with support from the German state of North-Rhine Westphalia. In September 2012, the unit secured another five years of funding from Bayer and RWTH. As a result it will continue to play a key role in the interdisciplinary research projects managed by Bayer on the use of power plant $CO_2$ as a chemical raw material. "Without the CAT Catalytic Center, we most certainly would not have progressed so quickly in developing these projects," Guertler says.

### The $CO_2$ Feedstock

The $CO_2$ comes from RWE's site at Niederaussem, Germany, where the carbon dioxide is first separated from flue gas and liquefied before being put into cylinders for transportation to Leverkusen.

For the production of formic acid from $CO_2$ and hydrogen, RWTH Aachen University has been researching a concept using a two-phase reaction system in a continuous process which applies supercritical $CO_2$ to help provide pure formic acid.

"We have been working on new ways to make formic acid for 20 years and naturally our research fits into our joint project with Bayer," Professor Walter Leitner said, chair of technical chemistry and petro chemistry at RWTH and scientific director at the CAT Catalytic Center.

Among the technologies being developed by the CAT Catalytic Center in collaboration with CO2RRECT the closest to commercialization is the catalytic conversion of $CO_2$ into polyols for reacting with isocyanates into polyurethanes.

$CO_2$ reacts with a zinc-based catalyst to make polyether polycarbonate polyols for the production of both rigid and soft polyurethane foam products, polyurethane coatings and thermoplastics polyurethanes (TPU).

"The zinc catalyst was known about for around 30 years," Thomas Mueller explained, head of research at the CAT Catalytic Center. "We worked on it in the lab to scale it up for pilot plant production within five years. The real success of this unit is taking things from the lab up to commercial scale feasibility."

Bayer is aiming to start large-scale production of the $CO_2$-based polyols with the mattress market being the first to be targeted because of the flexibility of its polyurethane foams and their greater flame retardancy compared to those of conventionally produced polyurethanes.

"We want the properties of the polyurethanes with the $CO_2$ polyols to be reasonably similar to those already on the market," Guertler said. "We want them to be 'drop-in' products so that the buyers of the polyurethanes do not have to invest in new processing equipment."


Pilot plant for production of the $CO_2$-based polyols.

### Building Blocks for Polymers?

In the longer term the objective is to use $CO_2$ as a building block for a range of polymers. The CAT Catalytic Center is already doing research work on the creation of aliphatic as well as polyether polycarbonates and on the catalytic copolymerization of $CO_2$ and epoxides and $CO_2$ and styrene oxide. "With the right catalysts $CO_2$ is easier to activate than expected," Guertler said. "There is more to come."

Bayer's R&D activities on the development of zinc-air batteries, which are powered by oxidizing zinc with oxygen from the air, are separate from those in catalysis innovations. Instead the research is focused on optimizing the batteries by exploiting Bayer's new oxygen depolarized cathode (ODC) technology for a more energy-efficient electrolysis membrane process for making chlorine. The ODC technology, which changes membrane electrolysis to a fuel cell concept through the feeding in of gaseous oxygen, reduces energy consumption in chlorine production by at least 30%.

Zinc-air batteries have the advantage of a high specific energy density of 1,100 watt-hours/kg, giving them a higher capacity/volume than other types of batteries. But they have had short life cycles because of the build-up of materials on the zinc electrode and clogging of pores for the intake of air.

In a collaboration with partners in industry and academia and with funds from the German Ministry of Economics and Technology, Bayer is aiming to use ODC to sort out these problems. The company is already claiming that "a breakthrough may now have been reached" with the introduction of a "flowing electrolyte and special electrodes in conjunction with the ODC technology."

The ODC process for chlorine production which is currently being tested at a demonstration plant at Uerdingen Chempark, Germany, is already due to be marketed jointly this year with ThyssenKrupp, the engineering group which helped in its development. The zinc-air battery will take much longer to commercialize. "It will be run like a chemical plant," Professor Engels said. "Solving the few problems it has before it can be commercialized will take several years."

For Bayer in its drive to create new raw material and energy infrastructures for chemicals production, the current priority is the development of technologies and facilities for making $CO_2$ a building block project with energy coming via the hydrogen electrolysis route.

*Sean Milmo, freelance science and business journalist*

chemanager-online.com/en/tags/raw-materials

## Air Liquide Invests €65 Million to Supply Huntsman at Botlek

Air Liquide is spending €65 million on a new carbon monoxide plant in Rotterdam port as part of a long-time supply agreement with Huntsman. The CO unit will be built next to two TDI plants the U.S. chemical producer operates in the Botlek area of the port. When it comes on stream in the first half of 2015, the facility will double Air Liquide's capacity for the product in the basin. The French gases said it has invested €400 million in this key industrial area over the past five years. ■

## Corrected

### BASF Widens German Capacity …

In CHEManager Europe 1-2/2013 we reported on BASF's capacity expansion for Ultramid B (polyamide 6) film at Ludwigshafen and its plans for a global expansion of capacity for the chemical intermediate 1.6 hexanediol (HDO). The story erroneously stated that the expansion concerned polyamide 12 and also contained an incorrect figure for the HDO expansion. In fact, the German chemical group will spend over €30 million to increase capacity for 1.6 hexanediol to more than 50,000 t/y (rather than 50 million t) by 2014.

## Fluor Wins EPCM Services Contract for BASF's Ludwigshafen TDI Plant

BASF has chosen Fluor to provide engineering, procurement and construction management (EPCM) services for the new 300,000 t/y TDI plant it is building at its Ludwigshafen headquarters. No contract value has been disclosed. The U.S. contractor's operations center at Haarlem, The Netherlands, with support from Gliwice / Poland, has been actively involved in the single-train project since 2011, performing support services for both the pre-front-end design (pre-FEED) and FEED.

The world's largest chemical group is spending €1 billion to upgrade TDI production at Ludwigshafen by the fourth quarter of 2014, including investment in facilities upstream of the facility. BASF is currently number two worldwide in TDI, behind Bayer MaterialScience. It also produces the polyurethanes precursor at Geismar, Louisiana in the U.S., Yeosu, South Korea and in a joint venture with Sinopec at Caojing, China. ■

# 100 Years of PVC

## The European Polyvinyl Chloride Industry's Journey from Patent to Sustainability

**Modern Materials** – Polyvinyl Chloride (PVC) has come a long way since the German inventor Friedrich Klatte received the first patent for PVC in 1913. PVC's journey to becoming the world's third largest-selling plastic has not always been easy. In the past century a lot has changed in the way PVC is manufactured and used, especially in Europe where the industry is fully devoted to rendering PVC a truly sustainable material that can drive the transition towards a greener economy.

**Dr. Brigitte Dero**
Deputy General Manager, VinylPlus

© Christian Nesset

Light gray colored PVC fabric is used for the stadium cover of the new Juventus Arena in Turin, Italy.

Like many great things in life, Polyvinyl Chloride – PVC – was first created thanks to multiple and accidental discoveries in different places at different times during the 19th century. However, it was not until 1913 that Friedrich Heinrich August Klatte from Germany became the first inventor to receive a patent for PVC with a polymerization method for vinyl chloride using sunlight.

### From the Lab to Mass Production

Despite being one of the oldest synthetic materials in industrial production, PVC's early history was not characterized by successful commercial applications. The material was difficult to work with and a long way from the versatile polymer it has become today. In fact, no real useful purpose for PVC was found until the 1920s when Waldo Semon, an American industrial scientist, made PVC a more functional material while trying to create a synthetic replacement for natural rubber, which was becoming increasingly costly.

Sales took off eventually when PVC started being used as a water resistant coating for fabrics. Demand accelerated even more during the Second World War when it became the standard insulation for wiring on military ships, thanks to its superior safety and non-flammable electrical properties.

### On the Road to Stardom

Over the next decades, many more companies started to produce PVC and volumes increased dramatically around the world. Developers quickly found further, innovative uses and refined manufacturing methods to improve durability, opening the door to applications in the construction sector.

This plastic's resistance to light, chemicals and corrosion made it the best option for building applications such as window profiles, roofing membranes or wall coverings. Enhancing the material's resistance to extreme temperatures enabled PVC to be used in piping water to thousands of homes and industries.

Its low cost, excellent durability and light weight continue to make it the material of choice for dozens of industries including health care, IT, transport, textiles and construction. Few other materials are as versatile or able to meet such demanding specifications. A great example is the 2012 London Olympic Games; more than 140,000 $m^2$ of PVC were used in a number of sports facilities and buildings including the Olympic Stadium.

### What Makes PVC Special?

Modern PVC is a thermoplastic made of 57 per cent chlorine (derived from industrial grade salt) and 43 per cent carbon (derived predominantly from oil/gas via ethylene). It is less dependent on crude oil or natural gas than other polymers and therefore can be regarded as a natural resource-saving plastic.

In addition, most PVC products are long-lasting – in some cases more than 70 years – providing a reliable service through their entire life-span and cutting down massively maintenance and repair needs, as demonstrated in a 2011 study commissioned by the European Council of Vinyl Manufacturers (ECVM). This analysis, which looked at window frames, flooring and pipes, showed that PVC provides decisive cost advantages, not only in its low initial purchase and installation price but also throughout the lifetime of the product.

PVC resin powder: First patented in 1913, PVC is the world's third largest-selling plastic today © ECVM

Affordability is without a doubt one of the key success factors for this polymer. Research carried out in the UK by the Stockton-on-Tees Council has shown that twice as many PVC windows can be installed as timber windows for the same price. Another UK study done by the Brighton and Hove Council found that using PVC products instead of alternatives helped a municipality to save £36m (€44 million) over a period of five years.

### Market Evolution in Times of Crisis

According to market research published by companiesandmarkets.com, global demand for PVC has risen from 22.2 million tonnes (mt) in 2000 to 32.3mt in 2011 and is expected to top 49mt by 2020. Construction, packaging and electrical applications account for 17,9mt, 3,6mt and 2,7mt respectively, around 75% of global PVC demand.

Asia is currently the region with the highest commercial potential. Although demand in developed countries such Japan has stabilized, the growing economies and populations of booming countries such as India and China will require increasing volumes of PVC in the near future. Latin America and the Middle East – as a major hydrocarbon-producing region – also present substantial opportunities for expansion.

In the current economic climate, market growth forecasts for Europe seem to be stabilising but there is certainly hope for such a dynamic and committed industry which is working hard to improve the way PVC is manufactured. Its on-going sustainability efforts are a perfect fit for important EU policies such as the "2020 Resource Efficiency Flagship Initiative" or the "Energy Roadmap 2050". They aim at increasing resource efficiency as a way to create jobs and new opportunities for Europe, improve productivity, drive down costs and boost competitiveness while minimising energy consumption and greenhouse gas emissions, all of these objectives very much aligned with the work of the European PVC sector.

### The Road to Sustainability

PVC's century of history has not been without controversy. Twenty years ago PVC came under the spotlight due to concerns about the way it was produced and disposed of. Scientific investigations and the implementation of new industry initiatives have helped to reassure users and consumers. In addition, Life Cycle Assessment and eco-efficiency studies have showed that for many applications, PVC's environmental performance is comparable to or even better than alternative materials.

In Europe in particular, programmes such as VinylPlus and its predecessor Vinyl 2010, have boosted the industry by improving the way PVC is manufactured and increasing collection and recycling. Since Vinyl 2010 was launched in 2000, more than one million tonnes of PVC has been recycled in Europe (257,084 tons in 2011. Problematic additives such as cadmium stabilizers have been phased out. Lead stabilizers will have been completely substituted by 2015.

### The Future Ahead

The entire European PVC industry value chain, from resin to additive producers and converters, will continue working together under the VinylPlus program launched in 2011. Following a pioneering open process of stakeholder dialogue based on The Natural Step System Conditions for a Sustainable Society, the industry has identified a series of key challenges in the following areas - emissions, energy and raw material consumption, recycling and sustainable use of additives.

VinylPlus' vision is well-captured in the topic chosen for its 2013 annual event – "Smart, sustainable and inclusive growth for Europe and beyond" – which also reflects the desire to consolidate what has been accomplished while it continues to expand to other countries. Only by uniting efforts and working together with a common set of objectives can the PVC industry guarantee many more centuries of economic prosperity delivering essential products for everyday and industrial applications. Friedrich Klatte would be certainly proud to see how far his invention has come.

*Author: Dr. Brigitte Dero, Deputy General Manager, VinylPlus*

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## Fluoropolymer Material for Architectural Applications

More and more architects all over the world are turning to light foil constructions to develop their own designs and environmentally efficient building practices. However, constructions high up in mountains face extreme requirements that could only be fulfilled by solid structures until now. Climatic conditions with strong winds, snow loads, temperature variations of up to 60°C and intense UV radiation call for robust construction materials. Now, environmentally-friendly lightweight constructions are conquering this climatic zone. The elegantly sculpted foil constructions of the Gaislachkogl cable car in the Austrian winter resort Soelden blend harmoniously into the mountains in the Ötztal Alps. The mountain station is 3,040m above sea-level, making it the highest foil construction in the world. The foils are extruded from 3M Dyneon ETFE high-performance plastic and are extremely tear-proof, UV-resistant and highly transparent.

Texlon, a Swiss specialist, implemented the design and used extremely high tear-resistance Nowoflon foils extruded by Nowofol in Germany. As raw material the company uses ETFE fluoropolymer. This material is non-flammable, resistant to UV exposure and provides near-universal chemical resistance. Texlon made the foils at the Gaislachkogl cable car with just a single layer as the stations will not be heated. In contrast, multi-layer foil cushions are normally used for closed buildings as they have very good heat insulation properties.

3M/Dyneon, Neuss, Germany
europe@mmm.com
www.dyneon.eu

## Surface Aesthetics Solutions for the Automotive Market

Borealis and Borouge have developed material solutions for some of the important challenges that the global automotive industry is facing. Latest product innovations in surface aesthetics are focusing on the areas of primerless paintability and the elimination of flow marks, also known as tiger stripes. In the future, these material solutions will not only enable car manufacturers to achieve defect-free surfaces, but also help them capitalize on the benefits of reduced costs, environmental impact and optimized production cycle times.

Due to their cost reduction potential and sustainable appeal, primerless paint systems for exterior plastic applications are becoming increasingly popular in the industry. Yet at the same time, paint adhesion performance criteria are becoming ever more stringent. As most exterior parts are painted, demands on innovative solutions for improved paint adhesion are increasing.

Driven by the needs of leading original equipment manufacturers

(OEMs), Borealis has undertaken a major R&D initiative. Core aspects of this initiative include the development of 2-layer paintable materials for bumpers and body panels which have been able to withstand tough steam jet conditions in the laboratory environment and Borealis' investment in its own automated paint robot. "The trend is clearly towards the use of primerless paint systems on exterior plastic components to reduce total part costs," emphasizes Jost Eric Laumeyer, Borealis Global Marketing Manager Engineering Applications.

Another Borealis material innovation which is scheduled to become commercialized towards the end of 2013 is a new polypropylene matrix to be used in compounds to address the phenomenon of tiger stripes, a flow mark issue caused by converting processes, and a general problem affecting all thermoplastic materials, including polyolefins. Supported by way of trials carried out with several customers, this Borealis innovation will help avoid tiger stripes within a very broad processing window.

Borealis
Vienna, Austria
www.borealisgroup.com


**Dr. Gilles Della Corte** has been appointed as Director of Clinical Development and **Dr. Eva Castagnetti** as Director of Product Development at Anergis. Della Corte and Castagnetti will expand the management team and will strengthen the late-stage drug development expertise of the developer of allergy vaccines for allergen-specific immunotherapy. Della Corte, MD, brings to Anergis extensive expertise in global clinical development. In the past 22 years, he worked both for pharmaceutical companies and for CROs. Castagnetti, PhD, has several years of experience in both technical and business management functions in the biopharmaceutical industry with Lonza, Senn Chemicals and Rapid Pharmaceuticals.

**Joachim Blatter**, chief financial officer of Basilea, has left the Swiss biotech group just two months after the departure of the firm's founder and CEO **Anthony Man** in December. Blatter, a German citizen who had been in the role for little more than a year, will pursue other opportunities, the firm said as it posted a smaller than-expected loss for 2012. The departure is the latest in a string of shake-ups at the Basel-based firm. **Ronald Scott**, who was previously chief operating officer and before was CFO for many years, took over the helm at the start of this year.

**Jarrett Palmer** has been appointed as Operations Director of the formulated products business unit at Aesica. Based at Aesica's headquarters in Newcastle (UK), Palmer will report to Chris Gowland, managing director of formulated products. Before joining Aesica, an international contract manufacturing organization (CMO), Palmer has accumulated over 15 years' experience in senior leadership positions and has managed facilities for global CMOs including Catalent Pharma Solutions and Piramal Healthcare.

**Dr. Deepak Tiwari** has been appointed to the position of Director, Formulation and Process Development at Particle Sciences. Dr. Tiwari, who holds a PhD in Pharmaceutical Sciences from St. John's University, joins Particle Sciences following more than 18 years' experience in pharmaceutical development roles. Most recently, he served as Director, Pharmaceutical Development at Agennix. Prior to that, Tiwari held senior positions at Baxter and Bayer. His areas of expertise include formulation development, clinical trial materials manufacturing, and commercial scale manufacturing of drug products.

**Dr. Thomas Monath** and **Dr. Farshad Guirakhoo** have joined the management team of Hookipa Biotech, a vaccine biotech start-up, as Chief Medical Officer and Chief Scientific Officer, respectively. Monath has spearheaded the development of several market approved vaccines through his past work at CDC, Acambis and other companies. Guirakhoo is an accomplished virologist and has spent more than two decades in both biotech and large pharma companies. Prior to joining Hookipa, Dr. Guirakhoo held the position of Senior Director of External Research and Development at Sanofi Pasteur.

**Benoît Arnould-Jarriault** has been awarded the Arkema/INP prize for his final project study on the development of a new production process more environmental friendly, of natural fibers for non-paper applications such as bio-plastics. The award was presented at the 2012 graduation ceremony for engineers at the International School of Paper, Print Media and Biomaterials (INP-Pagora) in Grenoble, France.

**Prof. Chris Hardacre**, head of chemistry and chemical engineering at Queen's University Belfast, UK has been awarded the inaugural IChemE Andrew Medal in recognition of his contribution to the field of heterogeneous catalysis. Hardacre will be presented with the prize, introduced in memory of the late Prof. Syd Andrew, a distinguished professor in the field, at the Institution's first Chemical Engineering and Catalysis conference in London in June. Hardacre's research is recognized as world-leading and brings together chemical engineers and chemists.

## 125 Years of Angewandte Chemie

"Angewandte Chemie", one of the most renowned chemistry journals in the world, celebrates its 125th anniversary this year. On this occasion, the journal owners – the German Chemical Society (Gesellschaft Deutscher Chemiker, GDCh) – together with its publishers – Wiley-VCH – are holding an anniversary symposium on Tuesday, March 12, 2013. The live, physical symposium will be held in the Henry Ford Building of the Freie Universität Berlin, Germany. It will also be broadcast over the internet through a virtual event platform. Presentations will be given by renowned speakers like François Diederich, Helmut Schwarz, George M. Whitesides, Alois Fürstner, Robert Schlögl, E. W. "Bert" Meijer, Susumu Kitagawa, Andreas Kreimeyer, and Carolyn R. Bertozzi, including the three Nobel Prize laureates Roald Hoffmann, Jean-Marie Lehn, and Ahmed Zewail. During the event, the Carl Duisberg medal will be awarded to Dr. Eva E. Wille, Vice President, Executive Director, Chemistry, Wiley-VCH.

▶ http://angewandte.org/symposium

## Bio-Glasses

The first book is dedicated to glasses and their variants that can be used as biomaterials to repair diseased and damaged tissues. It covers all types of glasses: traditional glasses, bioactive glasses, sol-gel glasses, phosphate glasses, glass-ceramics, composites and hybrids. With discussion on how they are made, their properties, and the reasons for their use, the authors also cover their applications in dentistry, bone regeneration and tissue engineering, and cancer treatment. Its solid guidance describes the steps needed to take a new material from concept to FDA approval.

▶ Bio-Glasses
Julian Jones, Alexis Clare
John Wiley & Sons
Price: € 97,90
ISBN13: 978-0-470-71161-3

## Ullmann's Encyclopedia of Industrial Chemistry


The encyclopedia contains almost 1,100 major articles – Industrial Chemistry from A to Z. Subject areas include agrochemicals, analytical techniques, biochemistry and biotechnology, chemical reactions, dyes and pigments, energy, environmental protection, food chemistry, inorganic and organic chemicals, materials, metals and alloys, pharmaceuticals, polymers and plastics, process engineering, unit operations, and renewable resources.

For this revised electronic edition of the encyclopedia all revisions and improvements of the 7th printed edition (released in August 2011), plus a number of new and updated articles not found in the print edition, have been included. Users will find new information on, among others: Antipsychotics, Antiulcer Drugs, Bioseparation, Catalytic Fixed-Bed Reactors, Chiral Compounds, Chloroacetic Acid, Coal Liquefaction, Glass Fibers, Luminescent Materials, Metallic Foams, Micro Process Technology, Mutagenic Agents, Photochemistry, Plant and Process Safety, Poly(Vinylidene Chloride), Polyoxymethylenes, Process Systems Engineering, Radiation Chemistry, Surgical Materials, Thin Layer Chromatography, and Zeolites.

▶ Ullmann's Encyclopedia of Industrial Chemistry
Wiley-VCH
Price: € 2.250,--
ISBN 13: 978-3-527-33311-0

## The Future of the Chemical Industry by 2050

Discussing the technological supremacy of the chemical industry and how it will adopt a leading position to solve some of the largest global challenges humans have even seen, this book details how the industry will address climate change, aging populations, resource scarcity, globality, networks speed, pandemics, and massive growth and demand.

Following a detailed introduction to some of the megatrends shaping our world over the forthcoming decades, the book goes on to provide several scenarios of how the world could look by 2050, including "business as usual" and a "sustainable" one. Chapter 3 gives a comprehensive overview of the current status, while providing a short historical review of the chemical industry, its origins, achievements and fundamentals. The following chapter reviews the potential impact of each of the selected megatrends on the industry, while Chapter 5 proposes how it could look by 2050. Several features of the chemical industry are presented and discussed, including the industrial relevance from an economical, technological and profitability point of view. This chapter also reviews the impact of climate change on the chemical industry and, more specifically, the potential costs in reducing C02 emissions. A final, concluding chapter summarizes the forthcoming megatrends and potential challenges, opportunities and the outlook for the industry as a whole.

▶ The Future of the Chemical Industry by 2050
Rafael Cayuela Valencia
Wiley-VCH
Price: € 59,--
ISBN 13: 978-3-527-33257-1


### Plastics in Automotive Engineering 2013, 13 – 14 March 2013, Mannheim, Germany

The international congress Plastics in Automotive Engineering organized by German Engineers Association VDI in cooperation with VDI Society for Plastics Technologies is widely recognized as "the" meeting-place for the automotive industry. It features a technical conference and a trade exhibition by raw material producers, manufacturers of plastic processing machines, plastics processors, and system suppliers. The conference provides a comprehensive overview of current developments in plastics at the German manufacturers of passenger cars and commercial vehicles. Car manufacturers discuss which plastics and plastics-specific processing technologies have found their way into current component applications.

▶ www.vdi-wissensforum.de/en

### LogiChem Europe 2013, 16 – 18 April 2013, Antwerp, Belgium

LogiChem Europe is an annual strategic-level chemical supply chain event. The overriding theme of the12th LogiChem conference 2013 will be "Developing a commercially-driven supply chain to deliver a top line contribution to the business". The program will deliver top-line strategies from leading manufacturers including BASF, Dow, LyondellBasell, Syngenta, DuPont, and Braskem. Key topics for discussion include deploying accurate segmentation of customers and services, moving the supply chain from being a cost center to a profit enabler, achieving process excellence, managing complexity, analyzing emerging markets as well as overcoming market volatility and capitalizing on growth within seeds.

▶ www.logichemeurope.com

### 21st European Biomass Conference & Exhibition 2013, 3–6 June 2013, Copenhagen, Denmark

Held in different cities annually, the European Biomass Conference and Exhibition (European BC&E) has been running for over 30 years. It successfully combines a renowned international Scientific Conference with an Industry Exhibition and attracts participants from a wide ranging background including researchers, engineers, technologists, standards organizations, and financing institutions. This global exchange platform of current knowledge in turn attracts industrial exhibitors, making the conference a significant tool for technology transfer and innovation. The Conference is designed to provide a platform for knowledge exchange on the latest scientific and industrial results, developments in policies and deployment of this global energy technology.

▶ www.eubce.com

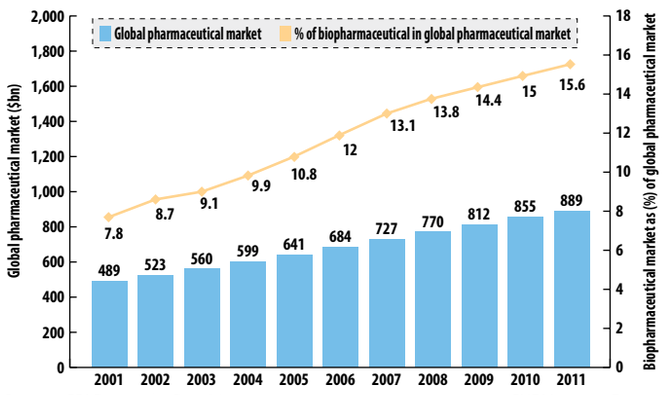
### ChemOutsourcing 2013, September 16–18, 2013, Long Branch, NJ, USA

ChemOutsourcing is the largest annual USA-based API show attracting 100+ exhibitors and more than 700 chemists from the pharmaceutical, biotech, and chemical industries. The conference focuses on API development spanning early drug discovery through chemical development and commercial supply. Attendees are executive scientists from pharmaceutical companies responsible for sourcing starting materials, intermediates, and active ingredients, and experienced in working with Contract Research and Contract Manufacturing Organizations. In 2013, new, business-critical topics for panels and talks will be added to the conference agenda that will again feature high profile keynote speakers.

▶ www.chemoutsourcing.com

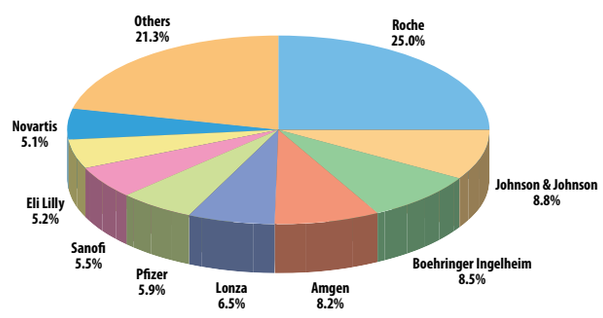
## Biopharmaceutical Manufacturing

**Biopharmaceutical Manufacturing, Percentage of Biopharmaceuticals in the Global Pharmaceutical Market**
2001–2011 — Fig. 1



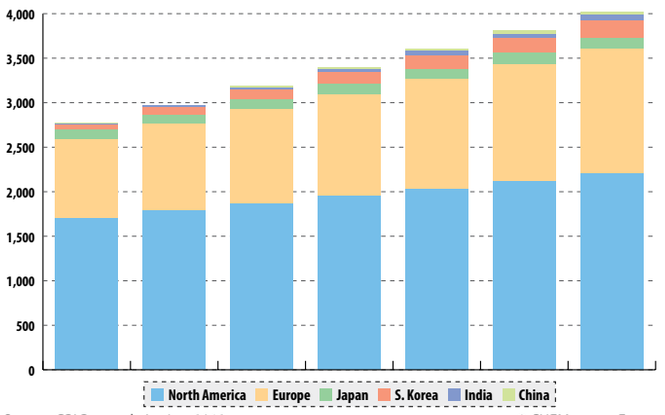

Source: GBI Research; Gao, 2011 © CHEManager Europe

**Biopharmaceutical Manufacturing, Global, Production Capacity by Company**
(%), 2011 — Fig. 2



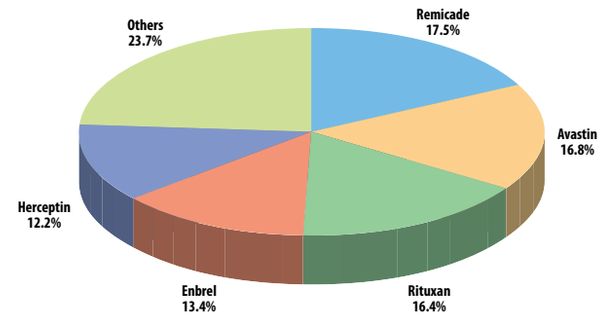

Source: GBI Research; Levine, 2011 © CHEManager Europe

**Biopharmaceutical Manufactuing in India, China and South Korea, Geographical Distribution of Cell Culture Capacity**
(000' liters), 2011–2017 — Fig. 3




Source: GBI Research; Levine, 2012 © CHEManager Europe

**Biopharmaceutical Manufacturing, Product Demand Distribution in Monoclonal Antibodies**
(%), Global, 2011 — Fig. 4




Source: GBI Research; Levine, 2012 © CHEManager Europe

### Environment Conducive to Growth

A new report on Biopharmaceutical Manufacturing has been released by GBI Research. It focuses on India, China and South Korea while also providing data for the global market. According to the report, regulatory framework, infrastructure support and discovery funding create an environment conducive to growth.

The report provides an analysis of biopharmaceuticals approved in 2010 and 2011, operating dynamics in the biopharmaceutical industry, the current scenario in biopharmaceutical manufacturing, key stakeholders, the current market size (2011) of biopharmaceuticals, and forecasts to 2016 for India, China, South Korea and the global market. The report also presents trends witnessed in biopharmaceutical manufacturing, preferred partnership pricing models, and contract manufacturing partnerships.

### Contract Manufacturing

Leading Contract Manufacturing Organizations (CMOs) offer manufacturing functions both upstream and downstream equally. In addition to manufacturing in biopharmaceutical production, they also offer clinical trials, logistics, packaging, and even marketing.

According to industry experts, almost 60% of the CMO market is dominated by manufacturing functions, out of which more than 50% is dominated by the downstream process. Many pharmaceutical companies are expected to outsource most parts of their research & development and biopharmaceutical manufacturing to emerging economies such as India and China.

### Factors Facilitating Outsourcing

Cost rationalization and skilled labor are the main factors facilitating the outsourcing of processes to these countries. Contract manufacturing is experiencing an upsurge in these countries; outsourcing activities for biopharmaceutical manufacturing include secondary manufacturing such as fill and finish operations, mammalian cell culture, Active Pharmaceutical Ingredient (API) biologics, microbial fermentation and plant cells.

### Biomanufacturing Capacities Expanding

Outsourcing analyses by pharmaceutical companies reveal that product characterization testing such as bio-manufacturing, toxicity, bioassays and analytical testing form the bulk of outsourcing to CMOs. With the increase in outsourcing, biomanufacturing capacities in emerging economies have been expanding.

### Competitive Landscape

The report also provides a comparative analysis of biopharmaceutical manufacturing in India, China and South Korea, and the competitive landscape for the countries covered. Although the U.S. continues to be a leader in biopharmaceutical production, with approximately 45% of the total production share, China's and India's shares have been continuously increasing, with 8% and 7%, respectively. Sponsors are building strategic relationships with the contract players and progressively working towards homogenizing and simplifying manufacturing processes in order to ensure normalized products.

# Quality Information Required for REACh Compliance


Pursuant to Article 54 of the REACh Regulation, the European Chemicals Agency (ECHA), based in Helsinki, Finland publishes a report on evaluation by the end of February each year. The Evaluation Report 2012 shows that a large part of the examined registration dossiers still raise quality and subsequently compliance concerns. ECHA strongly encourages registrants, in particular if they are preparing registration dossiers for the second REACh registration deadline, to read the recommendations of the report and act accordingly. The report lists the most common shortcomings found in the dossiers and gives specific recommendations for registrants.

Last year was a crucial year for evaluating REACh registration dossiers. During 2012, ECHA examined all the testing proposals received for the first REACh registration deadline in 2010. The Agency adopted 171 decisions on testing proposals, and sent 364 draft decisions to registrants.

In 2012, ECHA also launched a new strategy for selecting dossiers for compliance check that may contain typical shortcomings. The new, additional approach increases the chances of finding and addressing information gaps in all registration dossiers. The Agency concluded 354 compliance checks during 2012. However, ECHA did not have to request registrants to provide further information and were able to close the case in only 33% of these cases.

"I need to remind registrants that registration under REACh is not just a paper exercise and that high quality data is not an end in itself. The purpose of describing a substance clearly and assessing potential hazards and exposure with scientific rigour is to ensure that the risks are properly identified and controlled in order to protect workers and the public at large," says ECHA's Executive Director Geert Dancet.

Read a comprehensive status article about REACh including comments on the recently published REACh Review by the European Comission on page 4 of this issue. ■

**Compass Stadium** – For the new 22,000-seat Compass Stadium in Houston, Texas, the architectural firm Populus designed an exterior surface composed of geometrically expanded metal mesh and orange polycarbonate sheet cladding. The state-of-the-art, open-air arena and new home of the Houston Dynamo sports a brilliant display of the Major League Soccer team's distinctive orange brand featured on enclosed entrance façades with a vibrant shade of LEXAN Thermoclick sheet. The material's nine-wall configuration delivers a high level of thermal insulation for energy savings. In addition, the lightweight and versatile PC sheets from SABIC's Innovative Plastics business help architects and designers achieve ever-higher levels of safety, durability and design excellence.

## Index




## Imprint

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