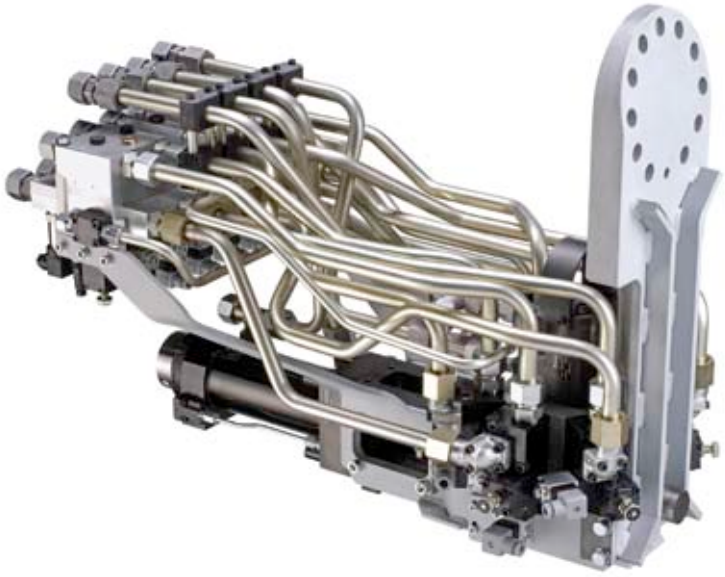
FAPU

EUROPEAN POLYURETHANE JOURNAL

November 2008

WORLD OF POLYUREA



German Issue

FAPU

FACHMAGAZIN FÜR DIE POLYURETHANINDUSTRIE

Newsletter

FAPU

ФАПУ – ПОЛИУРЕТАНОВЫЙ БЮЛЛЕТЕНЬ

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For unrequested articles no guarantee will be taken. Articles signed with the author's name or signature do not necessarily represent the editor's opinion.

Cover photos: BASF, Cognis, KrausMaffei

Editorial

„If you visit an event to learn about new products and technologies, you have done a bad job" (quotation from the PU industry)

8 fairs, 5 conferences and 3 forums in total (more or less) around polyurethane in 4 weeks, that really keeps you busy. There are good events and some, I don't even want to talk about. Most of them are titled with my favourite vogue word "international", so I ask myself the question: How many exhibitions, conferences and (very popular in the moment) coating shows are really needed. Everything is so international, that you meet the same exhibitors and the same visitors and (more or less) hear the same presentations. No wonder, as almost no company has as many different innovations per year as there are possible events available. So I finally come to my conclusion: Probably only the organizers are getting benefit out of this.

Here is a little appeal for our readers: We would highly appreciate it, if you inform us which fairs and conferences have been useful for you as a polyurethane marketer.

Of course there are some well established events going on in 2009. For example the exhibition quartet for the plastics industry: Arab-Plast (Dubai, 10th – 13th January, 09), INTERPLASTICA (Moscow, 27th – 30th January, 09), PLASTINDIA (New Delhi, 4th – 9th February, 09) and CHINAPLAS (Guangzhou; 18th – 21st May, 09). What a pity for me – from 31st March to 2nd April 2009 UTECH Europe 2009 at Maastricht, in the Netherlands and the European Coatings Show at Nuremberg, Germany are taking place at the same time. A lot of companies will be represented at both fairs, but smaller firms don't have the necessary capacity to do this. As FAPU will co-exhibit at UTECH (booth No 1170), I will not be able to attend ECS, which I regret very much.

"Imitation is the best form of flattery." That's not like it sounded, when we received new information from Crain Communications. There is another new show – even imitating the PU China logo – that has been announced for the polyurethane industry: 2009 PU China, in September 2009 at the Shanghai New International Expo Centre, with the reputed assistance of API and other well-known organizations. Crain Communications likes to dissociate from this and wants to point out, that the next "original" PU China will be held in 2010.

As we come to the year 2010, all signals are already set now to "Go!" for the 2010 American Coatings Show & Conference. Following its successful June 2008 premiere, the next event will take place April 12-15, 2010 at the Charlotte Convention Center in Charlotte, N.C.

And, at the end, a little tip: It is worth looking at our event calendar; as at least the answers to some of the questions I have been asked would be self-evident. Furthermore, all our subscribers to FAPU will receive our wall calendar with important events listed for 2009.

Birgit Harreither

CONTENT

PRESS INFORMATION

Bayer MaterialScience starts construction of a world-scale TDI plant in Shanghai

During the course of this year Bayer MaterialScience plans to start construction of a state-of-the-art world-scale facility for the polyurethane raw material toluene diisocyanate (TDI) at the integrated production site in Shanghai. The relevant Chinese authorities granted permission for the new plant, which is scheduled to be commissioned in 2010, to have an initial capacity of 250,000 metric tons per year. The company's global TDI capacity will thus increase to over 700,000 metric tons a year. There are plans to expand the production capacity of the new plant to 300,000 metric tons per year at a later date.

The innovative gas phase phosgenation technology developed by Bayer MaterialScience is being used on a world scale for the first time in the TDI plant. It reduces solvent consumption by around 80 percent in a production facility of this size, thereby cutting energy consumption by up to 60 percent. Thus the process technology enables a significant reduction in operating costs and also makes a key contribution to climate protection. Compared with conventional production facilities of similar size, carbon dioxide emissions can be cut by around 60,000 metric tons a year. The new process technology also cuts investment costs for this type of large-scale facility by some 20 percent.

The TDI project is part of a wide-ranging investment program at Bayer's integrated site in Shanghai. The total investment planned for this site up until 2012 amounts to EUR 2.1 billion, EUR 0.7 billion of which are scheduled for the period from 2009 until 2012. This will cover the expansion of the originally planned production capacities, including the necessary precursors, as well as any increased construction costs – due to the price of steel, for example.

The integrated site in Shanghai is currently being expanded by Bayer into the group's largest and most technically advanced production site in the Asia/Pacific region. The backward-integrated world-scale plant for diphenylmethane diisocyanate (MDI) is due to go into operation this year, with a capacity of 350,000 metric tons per year. This production facility will be the largest of its kind in the world.

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Quick and easy colour changes

Colour management is an important aspect of PUR processing. More often than not, colour is the key to making an attractive consumer product. To give consumers a wide choice, PUR products, for example, for automotive applications, sport and recreational products, are produced in a range of colours. There is generally a trade-off in the form of increased manufacturing costs, because every colour change takes time and reduces productivity. In addition, colour changes often lead to colour carryover, resulting in subsequent parts failing to meet quality criteria. The result is increased manufacturing costs due to the higher reject rate, higher material consumption and disposal costs.

KraussMaffei has developed a solution to these problems – the MicroDos colour metering system. It's especially cost-effective for products that involve frequent colour changes. To eliminate the risk of colour carryover, all elements in contact with the pigment are integrated in the colour-change module. For a colour change, the whole module is simply swapped for a new colour module. The MicroDos system makes colour changes quick and easy and totally eliminates the risk of colour carryover. The result is a more stable process and higher productivity.

Changing a colour module takes a matter of minutes so that the line is back in production very quickly. No traces of pigment are left in the metering system, so that no cleaning is required and no cleaning waste is generated. Fast, clean colour changes mean more flexibility and a stable production process. MicroDos is engineered for high-precision colour metering; the specified colour concentration is accurately maintained, so that pigment consumption can be reduced to a minimum and product quality remains constantly high.

KraussMaffei's MicroDos system can also be used for dispensing other PUR additives such as blowing agent, catalysts and stabilizers, which are usually added in low concentrations. Combining MicroDos with KraussMaffei's multicomponent mixing heads can extend production flexibility even more, right through to colour change from one shot to the next.

To eliminate the risk of colour carryover, all elements in contact with the pigment are integrated in the colour-change module. For a colour change, the whole module is simply swapped for a new colour module.

Elastogran is Polyurethanes

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Elastogran

BASF Group

On track for peak performance

Sports surfaces of BASF's Conica brand help athletes set new records

Higher, faster, further – in striving to create new records athletes push themselves to the limits of their capabilities. Stadium surfaces promote these outstanding achievements and help prevent injuries. Having the right surface can easily make a difference of tenths of a second when running, and a difference of centimeters when jumping. Innovative sports surfaces provide safe and productive conditions for training and competition.

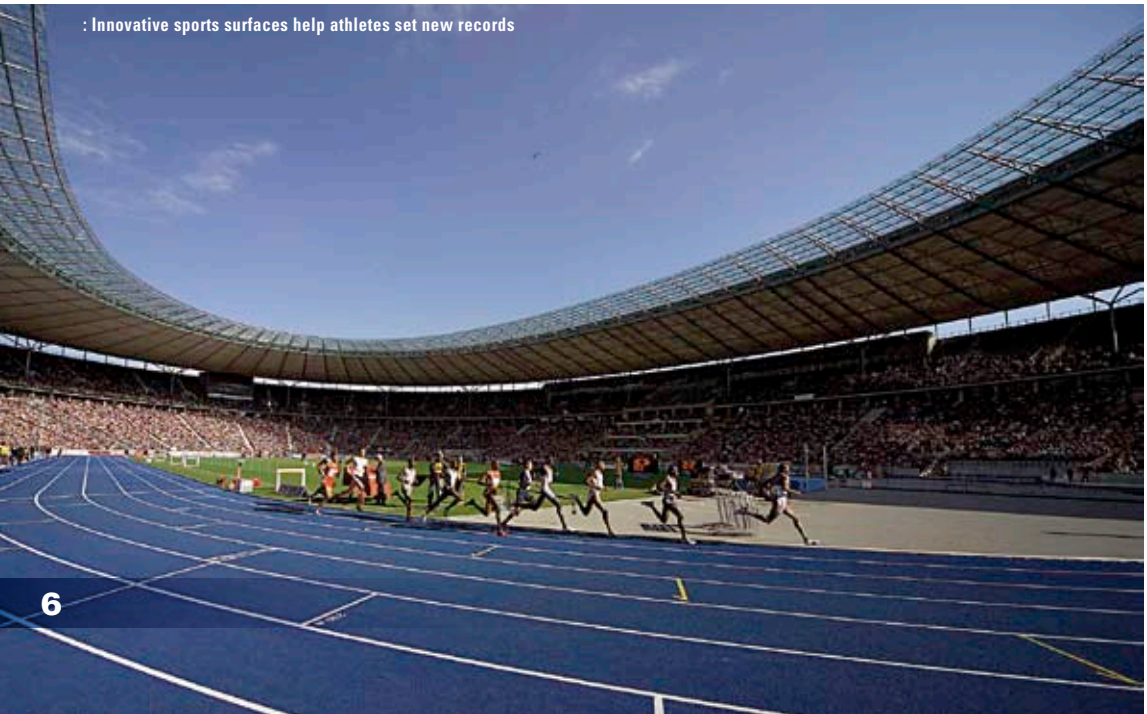
Since they were first used at the Olympic Games in Mexico in 1968, synthetic sports surfaces have become firmly established worldwide. Conica, a division of BASF Construction Chemicals Europe AG and headquartered in Schaffhausen, Switzerland, is the world market leader in this segment. For more than 30 years, products for the manufacture of sports surfaces have been developed, produced and marketed under the Conica brand. „Today, running tracks are genuine high-tech sports equipment. They must neither be too hard nor too soft. But they must be sufficiently elastic to generate a catapult effect that returns the largest possible amount of energy introduced into the track surface back to the athlete," explains Dr. Ralph Bergs, Strategic Marketing Manager Sports for the Conica brand. Especially prominent among the company's range of products are the running track systems of the Conipur® family certified by the International Association of Athletics Federations (IAAF). With this certificate, the IAAF confirms that the running track system has been tested and meets all the requirements for use in international athletic competitions.
For the world's most important athletic arenas, the Swiss researchers have developed the top of the range Conipur® M surface. This three-layer, solid plastic surfacing system is considered one of the fastest of its kind. Like all Conica stadium surfacing systems, Conipur® M is not prefabricated and laid in sections, but poured in situ. The plastic polyurethane used for this purpose consists of the chemical components isocyanate and polyol. The hardness and elasticity of polyurethanes can be precisely adjusted by modifying the individual component formulation. The advantage over prefabricated products is obvious: the sports surfacing systems are poured in one piece which makes them seamless. This means, for example, that rainwater cannot seep under the surface, which offers maximum resistance against changes in temperature and weather conditions.

Installing an athletic track with Conipur® M is a stepwise procedure, resulting in a three-layered finished system altogether about 14 millimeters thick. First, qualified application experts apply a specially designed polyurethane leveling coating onto the absolutely level asphalt substrate and sprinkle it while still fluid with an excess of synthetic rubber granules (EPDM).
The coating sets overnight and binds the rubber granules in direct contact with it. This process is repeated to create a second layer. These two lower layers of the system are designed to minimize the risks of injury for athletes. Tiny air chambers both in the polyurethane and granules provide the most stress-free possible conditions for athletes' joints and have shock absorbing properties.

The topmost layer must be harder than the two lower layers and ensure maximum return of energy to the athlete. This is achieved in a third step by applying a specially formulated, also liquid polyurethane levelling coating onto the two lower layers and sprinkling it with harder, but still elastic granules. Unlike the first two layers, the topmost layer is applied with as few air inclusions as possible. The track surface can be given a finishing touch by applying a final seal coating that maximizes resistance to abrasion, cleanability and aesthetic appeal.

Full pour application of the coating also confers another major benefit: even as it is being installed, a stadium athletic track can have its properties repeatedly checked and optimized. In this fine tuning process, the specialists rely not only on their own technical and chemical know-how, but also consult active professional athletes, such as Olympic pole vault competitor Tim Lobinger from Germany. „I have tested and trained on many track systems during my career. When running on a track I soon notice how much energy the surface gives back and how hard it is. An ideal track is elastic but still fast," explains the top athlete in a film interview about the Zurich Letzigrund Stadium. So both sides benefit from the cooperation: the athletes from a track specially tailored to their needs and BASF's sports surfaces business from the athletes' experience.

For the top class running tracks, a testing institute accredited by IAAF checks whether the technical parameters of the new track satisfy the IAAF requirements. In this case, the federation issues a Class 1 certificate. This allows international competitions to be held and is also essential for the recognition of world records. Altogether, 17 stadiums equipped with a Conica running track hold an IAAF Class 1 certificate.



: Innovative sports surfaces help athletes set new records

High potential: New Hennecke agent in South Africa

In cooperation with Greenacres Holdings (Pty), Hennecke GmbH from Sankt Augustin near Bonn is setting up a local presence in South Africa. This new partnership is consistent with the high-grade polyurethane processing technology manufacturer's strategy to expand its international network of subsidiaries and agents. Besides selling machinery and systems, the new representative will focus on high-level technical after-sales service.

The rising worldwide demand for polyurethane can to a large extent be traced back to the emerging markets. The Southern Africa Development Region (SADC) is an ideal example: Bringing together 15 southern African states, the organization has recently attracted a large number of European companies to invest in the African continent, where there is increasing political stability and considerable economic growth. Many products, which previously had to be imported, are now being produced locally. Six of the ten major players in the automotive industry have already set up their own production facilities in the SADC region.
But by no means should this be considered a short-term scenario. Far more, political and economic actors are working hand in hand to build solid foundations through sustainable planning for a variety of ventures. This is becoming increasingly apparent as the next football World Cup nears, which is bound to provide many positive spin-offs.

With its new representative, Hennecke GmbH will make good use of the local market's potential, demonstrating once more that the company's international approach is a major part of its business strategy. Moreover, the partnership with Greenacres is proving to be a very good choice. The South African company has shown itself to be a reliable partner with great expertise in the machinery construction sector. Customers too will benefit from the cooperation, thanks also to the long-standing experience, particularly in the area of polyurethane processing, of Greenacres' founder and CEO, Des Green. Many of them are already well acquainted with Green who was born in South Africa and worked with Hennecke in the 1980s.

With Albrecht Baeumer GmbH, Greenacres represents another medium-sized machinery manufacturer that has its headquarters in Germany's Rhineland and supplies solutions for the storage and transport of polyurethane slabstock products.

Alois Schmid new Managing Director of the Hennecke Group

Torch passed on at Hennecke: ADCURAM Group AG appoints Alois Schmid to manage the company. The recognized industry insider takes over the management from both ADCURAM board members Dr. Matthias Meise and Dr. Ulf Lange. Schmid is expected to continue the positive development of this leading producer of polyurethane-processing machines and systems. ADCURAM Group AG will continue to strongly support and accompany Hennecke on a long-term basis. Schmid has worked in plastics engineering for over three decades. His professional career is closely connected with the KraussMaffei Group. Before coming to Hennecke, the 49-year-old worked for the plastics machine manufacturing company as the head of the Extrusion Department. He also established sales and productions facilities in China and Slovakia for KraussMaffei. The Munich native began his career with an apprenticeship as a lathe operator. He then obtained his master and studied business administration.
Schmid assumes the leadership of a company that is very well positioned to compete on today's global markets: "Hennecke is a company with cutting-edge technology, a strong brand, a broad consumer base that grew over decades, and highly motivated and qualified employees. So I think we have a strong chance to participate in the international growth of the polyurethane market,"
Alois Schmid explains: "However, this much is also clear: our competition doesn't sleep. We are going to have to invest considerable time and effort in expanding and developing our technical expertise if we are to remain the arket leader and secure our advantage," explains Schmid. To achieve this, it is essential that we allow the company the freedom to restructure the Sales Department. Moreover, surplus productivity must be increased and foreign markets expanded. Finally, services for Hennecke clients must be significantly expanded.

How serious Hennecke is, has been demonstrated at the FAKUMA press conference, where the company has presented its new service concept. With this new ‚360° service', the Sankt Augustin-based polyurethane pioneer combines different services in a bundled package, thus helping users maintain maximum production efficiency and the highest possible highest-possible system availability.
Customers who opt for Hennecke systems can now also take advantage of the 360° service. This new service is specifically geared towards production needs and achieves maximum efficiency by combining different components – even, and in particular, at the least appropriate times.
In complex production systems especially, problems can have severe consequences. Even though polyurethane applications using high-pressure technology are tried-and-tested, there can always be disturbances in the production process because of technical problems or the maloperation of machinery. In such cases, it is essential to detect and classify the problem as soon as possible and, above all, to react in a timely manner so that the worst-case scenario of a production downtime does not occur. The 360° service offers processors protection from as many hazards as possible.

360° troubleshooting

Hennecke's technical hotline offers first-level support from qualified specialists 24 hours a day, seven days a week. A team of specially-trained call operators first narrow down the problem and detect the possible causes as fast and reliably as possible. They then give concrete advice and ideally help the caller solve the problem on the spot. If the support team cannot offer an adequate solution, it consults an appropriate specialist for the localised problem as soon as possible. If it turns out that the problem can only be solved on site, then the 360° service has access to a decentralised network of highly-experienced service engineers. With their expert knowledge and access to a wide range of spare parts, these engineers are fully prepared for a variety of problem situations and can be with the customer at short notice. This efficient on-site support prevents long-term system downtimes and can also save on travel costs - a welcome bonus.

360° spare parts service

An efficient method to avoid costly production losses in the first place is by using original spare parts, which come with a manufacturer's warranty. The spare parts service, which can be part of the 360° package, is attractive not only because of reliable and fast delivery, but also because of a surprisingly good price/performance ratio. The order hotline offers assistance with the selection of the right spare part, even outside regular business hours and until late at night, and it also provides various customer-specific solutions. So users have access to different-sized, personalised spare part packages. Moreover, thanks to the sophisticated logistics system in Hennecke's own spare parts warehouse, many spare parts can be on their way to a customer within 24 hours.

360° repair service

The operating life of machines and plants can often be significantly prolonged with a cost-efficient upgrade of some components only. In addition to an individual efficiency audit, the 360° service also offers a wide range of replacement components to keep the production running while a part is under repair. Thus the optimum operation of a system is always ensured. The name says it all and so it is not surprising that the 360° service also provides optimum solutions for dealing with system failures. For instance, it minimises the risk of a sudden equipment breakdown very effectively by incorporating preventive measures or training of operating staff from the outset.

360° preventive service

One preventive measure is the regular inspection of the production system according to an individual inspection schedule. The schedule includes the verification of all relevant parameters, regular maintenance work and any necessary readjustments; all of which our rapid on-site support team deals with. Another bonus of these preventive measures is that they make the operating staff's work easier and further optimise a machine's performance.

360° training

To keep overall repair costs down, the 360° service also offers customer-specific courses and comprehensive training. These are as flexible as the service itself and can be conducted either in Hennecke's own technical lab or on-site – the decision is the customer's to make.

Cover made of polyurethane integral skin foam

The ability to determine one's exact position at any spot in the world is now more or less taken for granted thanks to Global Navigation Satellite Systems (GNSS) like the Global Positioning System or GPS. GPS was originally developed for military purposes, but its enormous application potential quickly led to widespread use of the system in civil segments like road traffic, sea and air travel, surveying and agriculture. For applications that are dependent on centimeter-accurate positioning, such as the precise working of farmland, GPS's accuracy of around 10 meters is not sufficient. For precision guidance of a tractor by an automatic steering system, additional correction signals are needed from reference stations or networks.

To receive signals inside such networks, choke ring antennas are used, for example the AT504 (GG) model from Leica Geosystems AG, a leading supplier of surveying instruments headquartered at Heerbrugg, Switzerland. The cover that protects the sensitive instrument from the effects of the weather is made by Emaform AG, Gontenschwil, Switzerland, from Baydur® 60, a polyurethane integral skin foam from BaySystems®. BaySystems® is Bayer MaterialScience's umbrella brand for its global polyurethane systems business, and embraces many decades of know-how in the field of polyurethane in conjunction with close customer support.
Choke ring antennas consist of a number of conductive cylinders arranged concentrically around a central antenna. The design on which the Leica AT504 model was based was developed by the US space authority NASA and the Jet Propulsion Laboratory (JPL), and is regarded as a global standard for permanent GNSS reference networks. The antenna is noted among other things for its good signal-to-noise ratio and high resistance to radio frequency interference signals. The polyurethane material satisfies the strict specifications relating to undisturbed reception and is highly resistant to all kinds of weather. The material is also unaffected by bird droppings. It offers exceptional design freedom so that even complex molding geometries can be created. This allows designers to optimize the shape of the protective cover to ensure that it is exactly the same distance from the mechanical center of the antenna element at every point. This is necessary to keep the remaining influence on the signal reception constant over the entire horizon and for every elevation angle. The new Leica antenna AR25 is also equipped with this cover.

The protective cover is 45 cm high and has a diameter of 40 cm. The use of inexpensive aluminum molds ensures very economical production. At the end of the production process, the part is coated, printed by pad printing, furnished with installation materials, and delivered to the customer. „Leica Geosystems benefits from our flexibility and our proximity to customers, and also appreciates our consistent quality," says Christian Merz, head of Sales and Marketing at Emaform.
The high performance of the devices is opening up additional applications in very different fields. Only recently, the British Highways Agency decided to award Leica Geosystems a contract for GPS/GNSS instruments, motorized total stations, services and training programs, significantly extending its capabilities for accident investigation.

POLYURETHANEX

International Specialized Exhibition

February 25-27, 2009

Pavilion 1, Hall 1, Crocus Expo, Moscow, Russia

THE ORGANIZER:
Exhibition Company "Mir-Expo"

General Information Partner:
International specialized journal
«Polyurethane technologies»

THE MAIN PURPOSE OF THE EXHIBITION:

The main purpose is to hold on the event enable the exhibitors to establish new business contacts and friend relations, to develop the polyurethane technologies and materials and apply them to production in the different brunches of industry.

GENERAL EXHIBITION SUBJECTS:

- Raw Materials for Polyurethane Manufacturing
- Polyurethane Producing and Processing Technologies
- Foamex based Thermo Insulation
- Polyurethane Use in:
  - Machine- Building, - Motor-Car Construction,
  - Railway Transport (including Car Manufacture),
  - Aircraft Transport, - Pipe-Line Transport,
  - Electrical Engineering, - Consume Goods Manufacturing,
  - Light Industry, - Medicine, - Furniture Trade, - Chemical Industry,
  - Building Industry, - Mining Industry,
  - Metallurgy

BUSINESS PROGRAM:

The **"Modern State and Prospects of Development of Polyurethane Materials Production and Use in Russia"** practical-research conference is being run during the exhibition.

INFORMATION SUPPORT:

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Cognis' Sovermol 815 – "green" polyol for efficient pigment pastes

Consumers and industrial users are placing increasing demands on polyurethane (PUR) coatings with regard to the optical surface properties, viscosity, UV stability and chemical resistance – but also regarding ecological compatibility. This has led to a steadily increasing demand for high-quality raw materials for PUR coatings. Today, solvent-free PUR systems are preferred for industrial floor coatings as these systems are especially environmentally sound. Arichemie, specializing in pigment preparations, has for example developed its new color series Vocaplast-P based on Sovermol 815 from Cognis, the worldwide supplier of specialty chemicals. Sovermol 815 is a branched polyether/polyester which brings together both technical and ecological benefits.

The key to superb self-leveling floor compounds and coatings is choosing the right polyol. Also, the properties of a coating are influenced by the specific selection of color pastes, fillers, and additives. Bio-based polyols, especially the polyfunctional alcohols of the Cognis Sovermol series, are produced from renewable raw materials. They are free from solvents and volatile organic compounds and thus provide an excellent alternative to products containing solvents and VOCs. Sovermol 815 combines superb technological and ecological properties bringing about a balanced viscosity profile, high resistance to acids and alkaline solutions, good UV stability and pigment wetting as well as being markedly hydrophobic.

Arichemie uses Sovermol 815 in its new color series Vocaplast-P. Arichemie's basic color range comprises of organic and inorganic pigments covering a large proportion of the RAL colors as well as specific color shades. Arichemie can produce the paint preparations directly on site or the coating manufacturer can mix the colors themselves using monopigmented pastes. Vocaplast-P does not negatively impact the hardness or other mechanical properties when added in amounts of three to six percent (calculated over the total amount). The pigments in the new color series have optimal dispersion and are cost-effective due to the use of maximum color strength without the need to use any other wetting or dispersing additives.

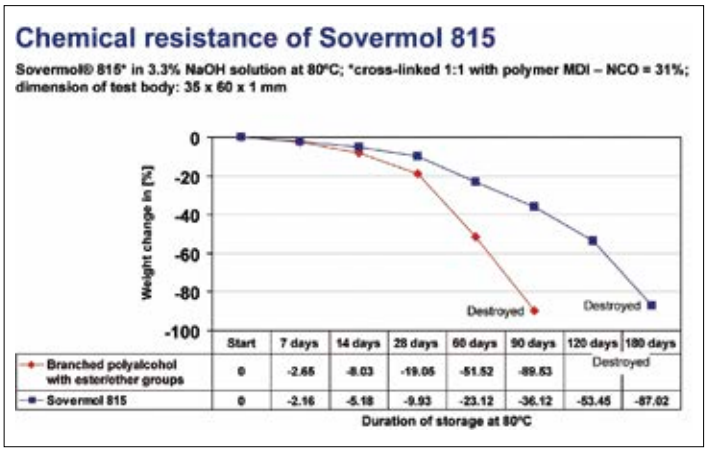
The low intrinsic viscosity permits manufacturers of PUR coatings to add greater amounts of fillers while maintaining the leveling properties (see Fig. 1). The use of Sovermol 815 as a binder also substantially improves chemical resistance (see Fig. 2).

Fig.1: Analytical values for Sovermol 815 compared to a standard ether/ester polyol

	Sovermol 815 branched polyether/polyester	Branched polyalcohol with ester/ether groups	
Viscosity 25°C	1600	3400	mPa.s / ISO 2555
Hydroxyl value	215	173	mgKOH/g / ISO 4326
Water content	< 0,2	< 0,2	% / ISO 4317
Acid value	< 3	< 3	mgKOH/g / ISO 660

The low intrinsic viscosity permits manufacturers of PUR coatings to add greater amounts of fillers while maintaining the leveling properties.

Fig. 2: Chemical resistance of Sovermol 815



The use of Sovermol 815 as a binder also substantially improves chemical resistance (test results with 3.3 % NaOH solution at 80° C).

Yellow pigment paste from Arichemie

The efficient color pastes from Arichemie are based on Cognis' Sovermol 815 which combines superb technical and ecological properties.

Parker Acquires Three Companies Contributing

Parker Hannifin Corporation announced that it has acquired three companies whose total sales for their most recently reported fiscal years approaches one half billion dollars. Parker is remaining focused on executing its plans for growth throughout the current economic turbulence.

The three businesses that Parker has acquired, Legris, SA; Origa Group; and Hargraves Technology Corporation, reflect the company's continuing goal of diversifying operations internationally, extending and complementing existing technologies, and taking advantage of opportunities in less cyclical end markets, such as life sciences.

Parker's acquisitions announced today include: Legris SA, headquartered in Rennes, France, is a leading manufacturer of fluid circuit components and systems for pneumatic, hydraulic, and chemical processing applications. These products are typically used in automotive process, transportation, agricultural machinery, food processing, construction and ship building industries.

In 2007, Legris recorded revenues of 233 million euros (approximately $340 million). The company has approximately 1,800 employees, 10 production facilities, and a global network of 25 international sales offices. The acquisition is expected to be accretive to earnings in the first full year of operations. Legris sales will be recorded within the Industrial International (90 %) and Industrial North America (10 %) segments of Parker's global fluid connectors group.

Origa Group is a manufacturer of rodless pneumatic actuators, electric actuators, FRLs (filter regulator lubricator), pneumatic cylinders, and valves used in the transportation, semiconductor, packaging and conveying markets. Its most recently reported annual sales were approximately 67 million euros (approximately $98 million). The Group employs approximately 350 people and has major operations in Filderstadt, Germany, Wiener Neustadt, Austria, Glendale Heights, Illinois in the United States, and smaller facilities in several other international locations.

Hargraves Technology Corporation of Mooresville, North Carolina, is a leader in the innovative design and manufacture of miniature liquid and pneumatic diaphragm pumps, control valves and system solutions. These products control movement and direction of precise amounts of fluid in medical devices and life science analytical instrumentation as well as diagnostic, gas detection, and printing systems. Hargraves' sales for the fiscal year ending December 31, 2007 were approximately $14 million. Parker will combine the acquisition with its technology platforms for diaphragm pumps, miniature solenoid and proportional valves, electronic pressure controls, liquid and aggressive media valves and system integration capability to establish a newly created Precision Fluidics Division. This division is focused on medical, analytical, life sciences and printing markets worldwide.

LACKFA and Purant agree upon Cooperation

LACKFA Isolierstoff GmbH & Co.KG, located in Rellingen, Germany – better known under the short name "LACKFA" – and Purant GmbH in Ortrand, Germany, decided in March 2008 to jointly extend their activities. In the future LACKFA will concentrate more strongly on their system business, whilst Purant will manufacture Polyurethane processing machinery for LACKFA.

Purant GmbH is a private company, which was founded five years ago. Today the company has 11 experienced employees, some of them from the former „Elastogran Maschinenbau". In cooperation with partner companies Purant is able to offer the complete spectrum of machine and plant building, service, trouble shooting and fault resolution, alterations, and spare parts delivery. In the stationery equipment field Purant is cooperating with IBW GmbH. High-pressure equipment for outdoor application is now built for LACKFA. The 2 component machinery is suitable for processing PUR-in-situ, spray foam and coatings. Mixing heads and pistols are also manufactured for each application.

Founded 1945 LACKFA has produced 2-component polyurethane systems for various industrial applications for more then 40 years. The development of this product line has been continuously improved and today LACKFA's high performance systems are successfully used worldwide. The range of applications varies from PUR-in-situ-foam (cast and spray systems) to sandwich panels, container and vessel insulation, molded goods and cavity foaming. They have also newly developed a range of coating systems, supplied under the trade name LAMOLTEC. In the field, LAMOLTEC offers fast spray application on surfaces.

Besides service for their own brand machines Purant also offers to their clients support on all other brands of machinery. Systems can be adjusted on-site to each condition. For Thomas Wolf, CEO LACKFA, this is one of the main advantages of this cooperation: "We don't need to build our machine equipment ourselves anymore, service and maintenance will be covered by Purant too. This now gives us more capacity for intensive work on new and further development of our PUR systems. This is clearly a benefit for our customers. "

"This is an additional Revenue Stream for our enterprise, which perfectly fits into our concept. Until now, we were mainly active in stationary production and now we are gaining experience of how different the requirements are onsite", explains Steffen Nensa, Managing director of Purant GmbH, showing his excitement for this cooperation. "We are also responsible for optimisation of LACKFA equipment and customer-specified requests can be discussed and elaborated." Mutually both enterprises achieve new customers and existing ones can be assisted even more efficiently.

PU system achieves flammability rating S4

Whether in the bus or train - RAMPF is always there. Folding tables and cladding elements in public transport must be particularly hard-wearing. For special protection purposes, RAMPF Giessharze (Casting Resins) offers special edge-casting resins made of polyurethane (PUR). Recently, a material has been on the market, which has achieved the flammability rating S4 in the composite test.

The portfolio of edge protection materials from RAKU-PUR® (brand) is extensive. Among the most important areas of application are school, laboratory, hospital, office and public transport. Due to the good adhesion on wood and their high impact strength, polyurethane materials form an optimal protective edge. The demands placed on edge protection systems are particularly high in buses and trains. In order to provide optimal passenger protection, RAMPF Casting Resins developed the edge-casting system RAKU-PUR 70-2359. It is used for folding tables, cladding elements and window frames. The flame retarding polyurethane material achieves the flammability rating S4 in the composite test. Compared to conventional casting systems, fewer flue gases are released in case of fire. Apart from the self-extinguishing properties, RAKU-PUR 70-2359 is characterized by high impact resistance and a good acid resistance, for instance, towards cola beverages.

New Graco Reactor® IP

Graco is pleased to introduce the latest addition to the Reactor proportioner family, the Reactor IP. This entry-level system, designed for rigid and flexible in-plant polyurethane foam processing applications, is available immediately. Designed for precision dispensing, the Reactor IP accurately measures the volume of material poured and provides repeatability for consistent parts production.

Traditional Reactor proportioners are used in spray foam insulation applications, whereas the Reactor IP is used in a wide variety of in-plant foam applications such as architectural products, insulation for refrigeration units, or cores for snowboards or surfboards, to name a few.

The Reactor IP bare unit includes a shot controller and linear transducer. There is also a package version that includes a 25 ft hose, a whip hose and an AR gun. Graco offers two different models, the Reactor IPH-25 and Reactor IPH-40.

The shot controller works in combination with a linear transducer that is installed on the horizontal pump. The unit can be set to manual or automated mode. In automated mode, up to 25 pre-programmed shots and five sequences (a combination of up to 10 shots in a pre-defined order) can be entered into the unit. When the gun is triggered, the pump starts the motion, and the system monitors the exact distance needed to move to achieve the pre-set amount. For example, if you set the equipment for a 210 cc shot, then after the gun is triggered, the system will start pouring the material until the desired amount is dispensed.

Features & Benefits

The Reactor IP is a cost-effective solution to in-plant foam applications and offers the following features:

- Local control module – allows up to 25 programmable shot settings and five shot sequences
- Accurately controls the amount of material to dispense
- Easy clean-up – no gun purging, no solvent flush
- Easy start-up and shutdown

The Reactor IP is available in two models:

- Reactor IPH-25 with flow rates of 25 lb/min (11.3 kg/min)
- Reactor IPH-40 with flow rates of 50 lb/min (22.6 kg/min)

KraussMaffei expanding its product portfolio of lamination systems

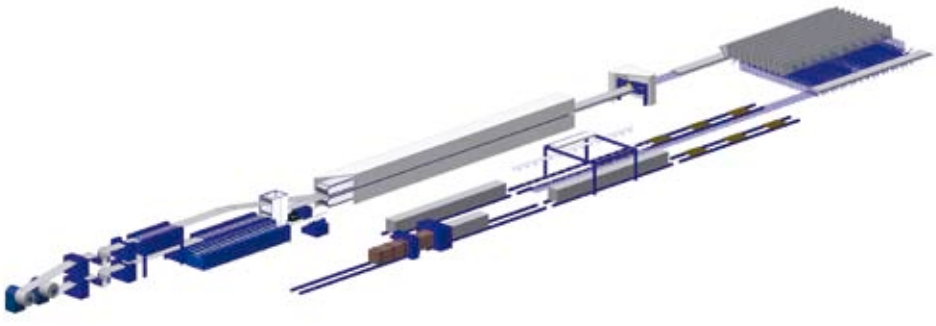
KraussMaffei Reaction Process Machinery has taken the strategically important step of further expanding its product portfolio for insulation technologies. The company recently started offering lamination systems for continuous mass-production of large sandwich panels with rigid and flexible facings. Such panels are used to provide thermal insulation and consist of two facings, between which an insulation layer of PUR/PIR foam or mineral wool is sandwiched.

KraussMaffei has long been active in the provision of insulation technologies for white goods and as a supplier of presses for discontinuous production of polyurethane sandwich panels. Says Frank Peters, head of the Reaction Process Machinery division at KraussMaffei: „This strategic expansion into lamination systems for PUR insulation positions us as an expert one-stop provider that can supply its customers with complete systems for producing large panels."

The high performance of lamination systems is needed whenever sandwich panels have to be produced in bulk. These panels are primarily used by the construction industry to thermally insulate cold stores, cold storage cells and industrial halls and also find application in garage doors and industrial doors. The facings in this application are made of steel while the panels themselves can be up to 300 mm thick.

For traditional building insulation, the sandwich panels may also be faced with flexible layers of aluminium foils, plastic foils or paper. Given the right foam systems, lamination systems can boost line speeds substantially. Sandwich panels made with mineral wool, too. Where higher fire safety requirements are imposed, the core material may consist of bonded mineral wool instead of PUR and PIR.

KraussMaffei offers not only pure mineral wool systems but also combination lines that process PUR and PIR foam, and mineral wool as core material. This gives plant operators the flexibility to vary their product ranges in line with market needs. Rising energy prices, climate protection requirements and scarcity of energy reserves are making it increasingly important to thermally insulate buildings as a way of cutting heating costs. KraussMaffei therefore expects thermally insulating sandwich panels to enjoy high growth rates on the world's markets in the future.



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Messe Düsseldorf

New Products for Testing Plastics

Zwick is concentrating its activities in the plastics field through its own competence center. The "Plastics Testing Initiative" has been underway for two years, and the range of products for testing plastics is being systematically expanded within the framework of this initiative.

Helmut Fahrenholz, who heads the competence center, is expecting the plastics market to continue its strong development. "The particular material characteristics, numerous design possibilities, and cost-effective processing continually allow new product innovations which are not possible using other materials. Material characterization plays an important role in development as well as quality assurance. Examples of promising markets are the construction industry, electronics, automotive, packaging, and medical technology."

As Zwick is already strongly established in the plastics industry with its static testing systems, the goal of the initiative is to further expand the product range. Zwick will now cover the measurement of mechanical characteristics as well as thermal and rheological characteristics in accordance with the basic values stored in CAMPUS®. Testers will carry out static, creep, pendulum impact, drop impact, and high speed tests, as well as extrusion and hardness testers and HDT/Vicat machines.

As the world market leader in robotic material and component testing, Zwick has more than 20 years of experience in developing solutions for customers around the world.

Determination of the Melt Index Value

The Mflow (Modular Flow) is a plastometer which in its basic version covers all tests in accordance with process A (MFR determination) of the ISO and ASTM standards. By adding a displacement sensor, the Mflow can be upgraded to measure the MFR in accordance with process B. An optional weight lift unit allows the machine to be operated entirely automatically. A significant advantage of the machine is the constant temperature in the extrusion barrel, which meets the requirements of the draft ISO/CD 1133-2 standard (moisture sensitive and time-dependent materials). The Adaptive Parameter Configuration (APC) system is a unique innovation which enables the tester to automatically select test parameters to optimize measurement precision. The automatic detection and elimination of the effects of air bubbles in the material guarantees reliable and meaningful results.

Determining MFR

The Cflow is based on the Mflow concept, but is designed solely for the simple determination of

the MFR. It is designed to be cost effective but cannot be upgraded to the same degree as the Mflow. The temperature control system meets the high requirements of the current draft for ISO/CD 1133-2. An automatic cutting unit for the extrudate improves the precision when measuring higher MFR values, and a laboratory scale is required to calculate the result.

The latest developments in Pendulum Impact Testers

Zwick introduced new HIT series of pendulum impact testers in 2005 and 2006 with impact energy ranges of 5.5 Joule, 25 Joule, and 50 Joule, and has already been very successful in the global market. A new compact 5 Joule ISO machine with an extremely compact construction has been developed for Charpy and impact tensile testing. This is achieved by using short ISO pendulum hammers and restricting the measurement range. The tester possesses the same advantages as the larger machines, and uses the low-vibration, double-rod carbon pendulum, which features very high rigidity in the impact direction and a high concentration of the mass at the point of impact. The automatic pendulum recognition (APR) system means that the test results are traceable even if different pendulums are used. Additional advantages are the slip-proof tool fixtures with dovetail guides and a convenient USB interface for connecting to the testXpert® II software.

The larger pendulum impact testers were also improved and Zwick has added a new motorized pendulum lifting unit together with a new CE-conforming protective shielding. This increases the operating convenience significantly especially for the large 25 or 50 Joule pendulum hammers. In addition, the motorization is an important precondition for the automation of the impact tests.

Drop Impact Tester

Zwick recently introduced its new HIT230F instrumented drop impact tester for multi-axis penetration tests and compression-after-impact tests. This machine is optimized especially for the requirements of penetration tests, e.g., in accordance with ISO6603-2 and ASTM D3763. The drop impact tester is equipped with a low-noise characteristic piezo force sensor. The sensor is located very close to the impact point to minimize the effects of the mechanical vibrations found in other instruments. An innovative pneumatic specimen gripping system allows the insertion and impacting of specimens in less than 5 seconds, and in many applications it is possible to avoid the installation of an expensive temperature chamber. The testing area is outside of the protective shielding and is easily accessible by the operator - but still optimally secured. An optional spring pre-load is available for additional acceleration to increase the impact speed.

The drop impact tester can also be used to initiate mechanical damage to long fiber-reinforced composites for the compression-after-impact (CAI) test. Additional tooling is available for this purpose. The compression test for determining the influence of the damage on the compressive strength is then performed on a static testing machine.

NEWS

BASF strengthens position in Chinese automotive industry

A new BASF plant for the manufacture of automotive spring aids made of Cellasto® for approximately five million vehicles per year is to be built in Shanghai by early 2010. The move allows BASF to create a base for close-to-the-customer supplies for the growing automotive market in China. After Nansha, also located in China, and Shinshiro in Japan, Shanghai will be the third production and development site for these polyurethane (PU) based car components in Asia. "This investment will considerably expand our position in Asia", says Jacques Delmoitiez, President BASF Polyurethanes. "With our three sites we will be able to supply all our customers in the entire Asia Pacific area." Shanghai is one of the core regions of the Chinese automotive industry. "We are establishing a modern, highly flexible Cellasto site where our team will co-operate very closely with our customers and accompany their dynamic growth" says Chew Eng Soo, Group Vice President, BASF Polyurethanes Asia Pacific. The new Cellasto branch establishment will be integrated in the already existing BASF site in Shanghai. Like the Nansha site, the Cellasto plant will be equipped to increase production at short notice to meet surging demand.

Paint and concrete: a successful mix

Industrial Coatings by BASF Coatings is now providing a colored protective finish for concrete mixers owned by the Italian company Le Officine Riunite - Udine Spa (Le ORU), part of the IMER Group. BASF Coatings is now supplying Le ORU a wide range of products, from primers for corrosion protection to waterborne topcoats in the colors gray and green, the characteristic colors of Le ORU's machines. These products are applied to all kinds of metal surfaces, including towers, tanks, silos, mixers, conveyers and other parts of their batching equipments. The cooperation between the two companies, which are leaders in their respective markets, will open up new paths and offers good prospects for the future. "The industrial equipment sector is one of BASF Postcoatings' major commitments. We are looking forward to our partnership with Le ORU and to exploring the opportunities for us to enter new markets," explains Luca Cerini, Marketing Manager for Postcoatings at BASF Coatings Spa.

Bayer significantly strengthens its presence in China

Bayer MaterialScience has successfully started production at its new 350,000 tons/year MDI complex at the Bayer Integrated Site Shanghai (BISS). The new world-scale plant is the largest MDI facility of its kind in the world. Furthermore, the company has now broken ground for a 250,000 tons/year TDI plant at BISS which is scheduled to come on stream in 2010. China is already the world's largest single market for polycarbonates, and it is expected to become the largest global consumer of polyurethanes by 2015.

New TDI production plant planned for integrated site in Dormagen

Bayer MaterialScience also plans to extend its isocyanate production significantly in the Europe, Middle East, Africa (EMEA) region in order to meet rising demand there. A new world-scale plant for TDI with an annual capacity of 300,000 tons is slated for construction at the Dormagen/Uerdingen integrated site in Germany. It will replace the existing TDI plants at the Dormagen and Brunsbüttel sites. MDI production at Brunsbüttel will be expanded to a total capacity of 400,000 tons/year by making use of the existing capacity of 160,000 tons/year and the existing infrastructure, and by converting the present TDI plant to an MDI facility. Given the right business conditions, i.e. political acceptance and the availability of a suitable infrastructure for raw materials and energy, the two projects are scheduled to be completed by 2013 at a total investment cost of about EUR 300 million.

Bayer MaterialScience expands global production network for polyurethane dispersions

Bayer MaterialScience has opened a state-of-the-art production plant at the integrated production site in Shanghai to manufacture polyurethane dispersions (PUD). The plant has an annual capacity of 20,000 metric tons. Bayer MaterialScience now therefore has facilities in North America, Europe and Asia for these key raw materials for manufacturing environmentally friendly, waterborne coating systems and adhesives.

Cargill's biobased polyurethanes business opens European Sales Office

Cargill's biobased polyurethanes business has opened a sales office in France to serve its fast-growing European customer base. The office will manage ordering, customs clearance and delivery logistics for the company's BiOH® line of soya-based polyols used in manufacturing flexible foam for the furniture, bedding and automotive industries. Etienne Bauman will serve as commercial lead for the office, assisted by specialists in supply, logistics, delivery and invoicing. The opening of the European sales office comes at a time when Cargill is scaling up its industrial polyol manufacturing capabilities by opening a $US 22 million plant in Chicago. Expected to be fully operational in November, the new production facility is the first world-scale biobased polyols plant.

New Adiprene® Duracast™ from Chemtura Urethanes: Larger, more durable parts with total Cost improvement

Chemtura Corporation (NYSE:CEM) literally recasts the rules of urethane manufacturing with new Adiprene® Duracast™ Two-Component Urethane System. This groundbreaking advancement enables customers to pour parts of all sizes, including some of the largest, most intricate parts ever—all with greater ease, toughness and durability than ever before possible. A major step forward in processing ease and productivity. The two components of Adiprene® Duracast™, with its proprietary curative, offer high performance through superior phase segregation. With no MOCA or BDO cures, Adiprene® Duracast™ delivers significantly longer pot life and quick demold times. As a result, manufacturers gain tighter control over ratio and waste— and higher productivity at lower cost. No TDI and no MOCA also means improved environmental health and safety, especially in handling. Manufacturers can start using Adiprene® Duracast™ without investing in major new mix technology. With no TDI and no MOCA, Adiprene® Duracast™ has the potential for better long-term price stability.

Desmovit: geba and Bayer MaterialScience are co-operating again

The geba Kunststoffcompounds GmbH, Ennigerloh, Germany, will in future be developing and producing reinforced thermoplastic polyurethanes (TPU-R) based on Desmopan® from Bayer MaterialScience – this is the centerpiece of a collaboration agreement that the two companies concluded. Reinforced thermoplastic polyurethanes combine high wear and impact resistance, even at low temperatures,

with excellent heat resistance and linear coefficients of expansion on the scale of aluminium. The new members of this family of materials are being marketed by geba under the name Desmovit®. The close collaboration now agreed is not the first between Bayer MaterialScience and geba. Since 2003 there's a collaboration agreement concerning the compounds sector for the production of automobile slush skins.

BBS INSTITUT tests the DUO foil strip from Hanno

The new foil strip from Hanno serves the sealing of windows. It can be used both inside and outside as a result of the variable SD-value of the fleece strip. The foil strip can be painted and plastered over and can be used as a 3-level-system component for the sealing of windows. Hanno provides a manufacturer's guarantee of 10 years as long as the Hanno 3-level products are correctly installed. The fact that Hanno is not making too many promises was recently confirmed by the BBS INSTITUT in Wolfenbüttel:
The Research and Material Testing Institute for Applied Building Physics in Wolfenbüttel has conducted a thermic-hygric structure simulation for the usage of the DUO foil strip on the inside and the outside of a window connecting joint. As a second version, the foil strip was tested on the inside with Hannoband BG1 on the outside. From the result of both of the version, it is clear that they meet the requirements of climate-related moisture protection. This means that there is no moisture accumulation in the structure. The highest value of the relative moisture is lower than a relative humidity of 70%. This means that the value is much lower than the reference moisture content which is 80% for ambient moisture content for the structure. The summary from the BBS INSTITUT: "superhygroscopic water contents up to the formation of condensation water inside the structure are not to be expected".

Honeywell Sells Novel Low-Global-Warming Blowing Agent To European Customers

Honeywell announced beginning of October it has begun selling its low-global-warming blowing agent for one-component foam and aerosol applications in Europe. Honeywell launched the product and received clearance from the European Union to import limited commercial quantities last year. The new blowing agent, hydrofluoroolefin HFO-1234ze, has zero ozone-depletion potential and meets EU regulatory requirements for reducing the use of high global-warming-potential (GWP) substances. This fourth-generation technology from Honeywell is a direct replacement for hydrofluorocarbon R-134a in one-component foam and aerosol applications. The product enables one-component foam to expand in order to seal gaps and crevices around windows and doors which can help home and building owners save energy. According to industry estimates, there were more than 200 million cans of one-component foam sold throughout Europe in 2007. One-component foam is easily dispensed from a can and requires no mixing.

New Huntsman TPU line starts up

Huntsman Corporation (NYSE: HUN) announced the start-up of a new production line to manufacture specialist high performance TPU grades at its Osnabrück, Germany facility. This capacity expansion was previously announced in November 2007. Volume and financial details were not disclosed.

Global overview of TPU market

IAL Consultants is pleased to announce the forthcoming publication of its second edition of its global review of the thermoplastic polyurethane (TPU) industry. The report is available as a single volume, covering the three main global regions: EMEA (Europe, Middle East & Africa), THE AMERICAS, and ASIA-PACIFIC. Publication date will be November 2008.

Kemiropa became new LEL-Partner

The LEL Group, founded on 19th November 1999, has extended its' sphere of operation by welcoming Kemiropa (www.kemiropa.com.tr) into the European Alliance of Independent Technical Distribution Specialists. At a ceremony in Istanbul on 9th June 2008, Turkey was added as the final European country in which LEL members provide a local technical sales and pan-european logistics force to manufacturers of specialty chemicals. LEL (www.LEL-Group.com) is a joint venture of six independent, privately owned distributors with 260 years of combined LEL operational experience in Europe. Global manufacturers of specialty chemicals achieve €279 million of industry leading technical sales, locally, through the LEL Group. The alliance members are C. H. Erbslöh KG, Kemiropa, Lake Chemicals and Minerals Ltd., Lavollée Chimie S.A., URAI S.p.A. and Zeus Química S.A.

L to R: Yesim Yavuz, Steven Cartlidge, Hervé Ory-Lavollée, Haluk Giray, Roberto Giuliani, Andrea Giuliani, Ramon Viñas
Bottom L to R: Carl-Hugo Erbslöh, Nazif Çavusoglu, Gunter Klemm

KraussMaffei makes one billion in sales for the first time ever

With record sales of 1.05 billion Euros and growth of 11 percent over the previous year, KraussMaffei AG, Munich, has brought fiscal 2007/2008 (1 October 2007-30 September 2008) to a close. Incoming orders of the world's largest manufacturer of plastics and rubber processing machines grew about 3 percent to around 1.1 billion Euros, which is also a new record. As fiscal 2007/2008 ended on 30 September 2008, these are provisional figures only. Those figures can be split for the 3 business units as follows: 60 percent injection molding, 30 percent extrusion and 10 percent PUR processes.
"Incoming orders at all the machine makers in our sector who are grouped together under VDMA declined 7 percent in the period January-June 2008 compared to last year," noted Dr. Dietmar Straub, CEO of KraussMaffei AG, showing that the company's growth had bucked the trend.
In fiscal 2007/2008, KraussMaffei more than managed to offset the weak economy in the USA and parts of Western Europe (Spain, France and Italy) through strong growth in Eastern Europe and Russia.
The company has been particularly successful in launching machines onto the market that, thanks to "Technology Cubed", combine the various processing methods. "As a result, we can often reduce the number of machines that customers have, replace the cumbersome handling of semi-finished parts and dramatically lower production costs," affirmed Dietmar Straub.

Momentive - new SPUR® Prepolymers offer high tensile strength for structural adhesives

Momentive Performance Materials introduces two breakthrough prepolymers for industrial adhesives formulations. SPUR® 3100HM prepolymer and SPUR® 3200HM prepolymer will join the successful SPUR® family of silylated polyurethane resins.
High-performance, low viscosity SPUR+ 3100HM and SPUR+ 3200HM prepolymers are formulated without plasticizers and contain no free isocyanates. Shelf life of both products is approximately 12 months.
Test results: SPUR® 3100HM prepolymer - tensile strength: 450psi, hardness: 40 Shore A.
SPUR® 3200HM prepolymer – tensile strength 1,000psi, hardness: 60 Shore A.

Acquisition of PEGUFORM GROUP

POLYTEC HOLDING AG acquires PEGUFORM GROUP, one of the leading European Automotive Suppliers, from CERBERUS Capital Management L.P. With combined sales of 2.2 billion EUR, POLYTEC GROUP advances to the TOP 100 Suppliers of the Automotive Industry.

Rieter plans to discontinue automotive component production in Bebra

In the light of expiring supply contracts and in order to improve profitability at the Automotive Division, the Rieter Group has announced its intention – after examining various alternatives – of closing the Bebra plant in stages by the end of 2010. Rieter has informed the works council and the 75 employees affected and will immediately commence negotiations with employee representatives and consultations with the relevant authorities.

Welcome to Sonderhoff – New uniform "look"

Global markets and international growth require a successful company to be innovative, flexible and clearly structured. To further succeed in business and expand also in the international market, the enterprises of the Westhoff group have been structured

newly under the umbrella brand Sonderhoff. This new corporate design has been introduced for the first time at Bondexpo from 23rd to 25th of September 2009 in Stuttgart and is valid since 1st of October 2008.

sonderhoff

The new redefined group of companies are:

Sonderhoff Chemicals GmbH, former Sonderhoff GmbH with focus on: Development and production of chemical gasketing, glueing and potting systems.

Sonderhoff Engineering GmbH, former EDF Polymer Applikation Maschinenfabrik GmbH with focus on: Development and production of dispensing machines and automation systems.

Sonderhoff Services GmbH, former Ferma Polymerservice GmbH with focus on: Custom processing and other services.

PUR-NEWS-NAFTA

Amerityre Making Inroads with Light-Weight, Environmentally Friendly Tire Fill

Amerityre Corporation announced that it has completed shipment of five light-weight fill machines for its high-quality polyurethane foam for use in the commercial tire fill market. Each fill machine is expected to pump between 100,000 to 200,000 lbs. of fill material annually, although the capacity of each machine is in excess of 500,000 lbs. per year. The company has an additional six machines in the pipeline that it expects to place with other potential customers this fall. The fill machines are being sold to new customers in combination with Amerityre's tire fill material, which is marketed under the name Amerifill®, and is based on Amerityre's proven, premier "flat-free," closed-cell, environmentally friendly polyurethane foam technology.

Thermedics™ Polymer Products Expanding its Aliphatic TPU Line into the Asian Market

Lubrizol Specialty Chemicals (Shanghai) Co., Ltd., a subsidiary of The Lubrizol Corporation (NYSE: LZ), introduces the expansion of its aliphatic thermoplastic polyurethane (TPU) Thermedics™ Polymer Products line into the Asian market. The Wilmington, Massachusetts, USA manufacturing facility, which produces aliphatic TPUs for medical applications, has expanded the capacity in order to meet the growing demand.

Thermedics is one of the major producers of aliphatic TPUs in the United States. These TPUs offer a unique combination of softness with strength and superior physical properties. Thermedics aliphatic TPUs are known for producing exceptional medical devices and supplying the industry with an outstanding array of products: Tecoflex®, Tecothane®, Carbothane®, Tecoplast® and Tecophilic® TPUs. These TPUs have been specifically formulated to have flexural endurance, high strength and processing versatility over a wide range of applications.

PUR-NEWS RUSSIA

BASF Coatings site in Russia certified

The Pavlovskij Posad site in Russia is a new important hub of BASF Coatings' worldwide production network. Now, the site has received black-and-white confirmation of its standards for quality. It meets the automotive industry's high standards for quality for suppliers with regard to products and processes in every respect. This was the conclusion of neutral auditors after they intensively tested the site over a period of several days. The Pavlovskij Posad site thus passed the DQS audit to test conformity with automotive standard TS 1694949. As part of the process, certification according to ISO 9001:2000 was also successfully obtained. For the customers of BASF Coatings, this means they can absolutely rely on the company's quality. BASF Coatings is the only international paint manufacturer with its own production facility in Russia. The Pavlovskij Posad site can supply the car manufacturers operating in Russia with high-quality products promptly and locally, and this has now been confirmed by the auditors. "There's no question that this is yet another important step for the qualifications of the site," said Dr. Andreas Kunze, head of Quality Management at BASF Coatings and its Automotive OEM Coatings unit for Europe. After the startup of the new site and the supply of the first batches of basecoat to the car manufacturer AvtoVAZ, certification for BASF Coatings is another milestone in its systematic development of the growth market of Russia. At the new site in Pavlovskij Posad, BASF Coatings has an annual production capacity of around 6,000 tonnes of basecoat and clearcoat. As demand grows, the production line can be expanded considerably to more than 20,000 tons. In addition, the employees at the site offer customers local support for application techniques and laboratory services. At the Pavlovskij Posad site a staff of 50 will be employed in production, the quality test lab, the warehouse, the workshop and administration.

BASF Coatings paints and services for Belarus

BASF Coatings AG has signed a distribution agreement with Belarusian importer and dealer Sagbel. The Minsk-based company will sell BASF Coatings paints, such as cathodic e-coats and liquid coatings, in Belarus. The cooperation will focus on supplying the automotive industry and its suppliers. The agreement also provides for market probes, researching and examining bids, as well as post-delivery technical service at the customers' sites. The basecoats can be supplied from the new BASF Coatings' production site in Pavloski Posad, Russia. For Sagbel, represented at the official signing by Alexandr Nevmerjitski (General Director), Dmitri Nevmerjitski (Executive Director), and Sergey Bakhrushin (Deputy General Manager), the established partnership is both a commitment and an incentive. "We will help BASF Coatings to noticeably improve its position on the market in Belarus," they promised.

Dow Izolan Breaks Ground on New Polyurethane Systems Facility in Russia

Dow Izolan broke ground today on a new, state-of-the-art polyurethane systems manufacturing facility in Vladimir, Russia. The new plant will help Dow Izolan to enhance its offering to Russian customers serving the fast-growing automotive, consumer, footwear, furniture, appliance and construction markets. The facility is scheduled for start-up in mid-2009. From rigid foam systems used in construction panels and insulation to flexible foam systems used for arm rests, head rests and seating in automotive applications, the facility will produce a broad range of polyurethane systems.

Dow Izolan Announces New Leadership

Dow Izolan announced that Mikhail Tsarfin has been named Dow Izolan general manager, effective November 1, 2008. Since the JV formation in 2006, Tsarfin has been the company's sales and marketing director and first deputy general manager. Tsarfin succeeds Aldo de Santi, who will assume expanded business responsibilities while keeping his current role of commercial director for Northern Europe for the Dow Polyurethane Systems business. De Santi will continue to offer his experience to the joint venture after relocating to Italy in January 2009. . Sergey Anikin, currently sales and marketing manager for Dow Base and Performance Chemicals in Russia and the Former Soviet Union, has been named Dow Izolan sales and marketing director and will be located in Vladimir.

COMPANY PRESENTATION

„Sales expansion through the acquisition ..."

Interview with Dr. Klaus Schamel, RAMPF Giessharze

The positive development of the RAMPF Group has increased sharply. Even during difficult economic times the group was able to stand its ground. Today, the company has around 420 employees and achieved a turnover of more than 91 million Euro worldwide in the last financial year and is today one of the leading companies for reactive resin systems and machine equipment.

Since 1st June 2008, Dr. Klaus Schamel is the head of RAMPF Giessharze supported by a dedicated team.

The first 100 days in the company

Dr. Schamel, it is said: "The first day, the first month, the third month and the first year are the most important." How would you judge this statement?
That is absolutely correct - the first days are crucial. This is normally the time when it shows whether you will be accepted or not. There are experts who advise: only listen to start with – I see that differently. I think it is necessary to point the way right from the start and also to set course with the first decisions. One of my first jobs was to motivate our raw material suppliers to offer more support and service to the RAMPF group.

Please tell us something about the most important stages in your professional career.
It was important and right for me that I consistently followed my instincts. From a chemist in the laboratory - the acquisition of commercial qualifications - the management of development and production - up to the assistant of the executive management, I learned the PU industry from scratch.

Before joining Rampf you worked in an international organisation. How is it now to work for a medium-sized company? Where do you see differences? Advantages - disadvantages.
A big difference is the reporting system. Perhaps in a large concern this can take a third of the working time. At RAMPF, agreements function on demand without an agenda. One meets, describes the problem briefly and if it is well justified, a decision is already made in the corridor. However, the pressure is higher, because the decisions are implemented faster than I am acquainted with, for example, from my previous employer. There are still some decisions waiting to be made there …

Due to the flat hierarchies I am responsible for a lot of things and also gladly work from the bottom up. The sentence "I am not responsible for that" does not exist in a medium sized company! It is exactly this variety and diversification in my working area that makes it fun. That is where it shows that "managing director" is not just on the visiting card, but is actually lived. The financial responsibility for the employees is, however, the same whether for 100 or, as previously, for 10,000.

What expectations did you have when you started as managing director at Rampf? Have some of your expectations already been fulfilled?
I expected to come to an enterprise which has a strong foundation and which is well positioned for the future - a company in which the senior manager still knows his employees personally. Here a good working climate is written in capital letters and I feel that the staff not only work because of money, but because they are gladly here. These expectations have been fulfilled and therefore I have also no problem to work 12-14 hours, because it is fun! Naturally, there is room for improvement also in this company, as everywhere.

What are your long-term goals and resolutions in the new job?
For the moment I am still learning about the multitude of products. With 840 products, of which 800 are custom-made/ customer-specific solutions, I will surely still need a little time yet for this. We currently supply worldwide in a density range from 0.05 g/cm³ to 1.6 g/cm³. However, I have my goals clearly in front of me: the extension of the product portfolio, particularly within the area of moulded foam in which I am specialized. As the number of employees in sales and product management has almost doubled, it is also an important goal to increase sales accordingly. Besides that, I have undertaken to further improve the customer service and to promote customer loyalyt. I am well-known for being a good sport and seal a business deal with a handshake. This means: we are altogether more flexible and offer better service than a big business. We want to use this chance, because by the time a large-scale enterprise has provided an offer, RAMPF has already supplied. Besides that, we work worldwide in different languages, e.g. English, French, Spanish, Turkish, Russian, Chinese or Japanese. Altogether, these are the best prerequisites for the RAMPF Group to become the number one in sealing foam and electrical casting resins, and naturally the number one in customer service.

Where do you see Rampf Giessharze in 10-15 years?
By then we want to have our own production on each continent. What this means is: Sales expansion through the acquisition of smaller international companies specialized in PU-systems. I do not want to make any prognosis about sales level – you need a crystal ball for that.

Fotos by Stefan Ziemba (www.photography-sz.com)

It is a common thing today to ask some private questions in an interview, so I would like to do that too. The two most popular questions are: a) "Where do you see your strengths and weaknesses?" and b) "What did you want to become as a child?

a) I am a completely OK guy! I am an affable person and a team player, who always listens to both sides of a problem. The order of the day for me is: "Better to do 80 per cent than to leave 20 per cent".
My weakness is sweets. So I seldom pass an ice-cream parlour, for example, without taking some delicious thing with me. A further weakness is my impatience. I would prefer to do everything yesterday instead of tomorrow. I also have a memory like an elephant - you probably call that "unforgiving".

b) As a child I wanted to be a train driver and I still have a model railway even today. If you interpret this correctly, then I even fulfilled my childhood dream: Technology and leadership. In addition, I also collect letter-cards. I am particularly interested in Bavarian postcards from 1870-1918 with postage stamps.

Successful in finding:

www.fapu.de

PUBLIC AFFAIRS

LEWA launches own subsidiary in Norway

The company LEWA ranks among the leading solution providers worldwide for liquid metering in the process industry, especially where critical conditions are concerned. There are hardly any alternatives on the market to LEWA's hermetically diaphragm pumps and metering systems for applications involving critical processes and requiring a high degree of safety.
LEWA is a renowned specialist in metering systems and solutions provider even in Norway thanks to the use of its pumps in several local projects. A list of clients that includes 'Snøhvit' (CO2 re-injection) and FPSO Skarv Idun (methanol injection) together with the YME Re-Development Project (Chemical Injection) have strengthened LEWA's presence. To meet the demands of its continued growth (currently € 145 million in revenue, 650 staff worldwide, 16 subsidiaries, representatives in over 60 countries), LEWA is expanding its international presence and keeping in line with this trend, has launched the Norwegian subsidiary LEWA AS.
Arne Hauge will take on the role of Managing Director at LEWA AS based in Sandnes. He brings along many years of experience engineering and managing projects for operators in Norway's Oil & Gas Industry. In 2001, he formed the company Chemical Injection Equipment AS (CIE) which specializes in products, systems and solutions for the Oil & Gas Market. In 2005, CIE became a Norwegian representative for LEWA. After six successful years, Arne Hauge sold his company. LEWA AS provides its customers in the Oil & Gas and Process Industry with services and advice particularly in the areas of engineering, after sales, service and training, in addition to its range of metering pumps and metering systems. This also includes taking on the planning for plant modernization and renting of test equipment and injection systems for temporary use. Arne Hauge explains, "As far as my own experience goes, larger suppliers that have evolved from consolidations are faced with the difficult challenge of truly offering customer-oriented solutions. We may not be a very large team, but we make up for that fact with our high level of flexibility. Our customers can count on quick, competent and reliable service."
LEWA AS is accepting applications for project engineers, service technicians and sales associates through to the end of 2008.

Booming automotive market creates demand for spray painters and body shop staff

BASF Coatings has opened a new training center in Shanghai to meet the burgeoning demand for automotive spray painting professionals and body shop staff. The training center will further strengthen BASF Coatings' competencies in providing enhanced refinish coatings solutions – high quality products bundled with the best application techniques and training.
"These days, repairing damage to a car's finish is a highly complex process. It takes constant training at all levels to achieve perfect results in just the wink of an eye, with spray gun in hand. The opening of this international standard training center will allow us to further support the professional development of spray painters and body shop staff in China, and has demonstrated our commitment to supporting after-sales

networks in China," said Hans-Juergen Becker, the head of BASF Coatings International Trade (Shanghai) Co. Ltd.
The new Refinish Competence Center in Shanghai provides training for spray painters from authorized service centers and body shops working with leading distributors. Successful participants learn the best techniques for painting and repairing car brands such as Mercedes Benz, Audi, Volkswagen, and Peugeot Citroen, as well as other leading brands. Courses last for four days each and range from beginning spray gun use to advanced color matching. Faculty of the center include a permanent trainer as well as a BASF Coatings national trainer. Attendees of the inaugural courses at the Center, which is equipped with the latest spray guns and ovens, have provided positive feedback, including this comment from a SVW 4S shop painter: „I am very satisfied with this training; it greatly improved my knowledge of color matching." The Center can train up to 600 specialists per year. Following the opening of training centers in Beijing, Shenyang and Guangzhou, it is BASF Coatings' fourth Refinish Competence Center in China. BASF Coatings now has over 47 Refinish Competence Centers worldwide, reflecting the rapidly growing automotive industry, both in China and the rest of the world. Statistics from the Shanghai Bureau of Transportation shows that the number of auto repair chain stores in the city established through MLS, partnership, authorized partnership, joint ventures and other forms had reached 350 by mid-2007, and is growing rapidly. There are also hundreds of independent body shops, serving a booming population of cars in the city. In Shanghai alone, the number of individual passenger cars had already reached 410,000 by the end of 2006 and the number of civil passenger cars reached 620,000. The newly established Center will serve this automotive sector and the surrounding region as well.

Glasurit: From paint business to global player

BASF Coatings' "Glasurit" brand is celebrating its birthday. Exactly 110 years ago, in 1898, the „Glasurit" brand name was registered. The name stands for "glaze-like hard coating", communicating a crucial quality characteristic of the paints originally produced by Max Winkelmann. The story of the Glasurit brand actually already started 120 years ago in Hamburg, where merchant Max Winkelmann opened his "business with paints and lacquers" back in 1888. He quickly began his own production of the then revolutionary new paint color crystal white and the rust preservative Eisenglasurit (Iron Glasurit). The gigantic steamer ships and the imperial yacht were refinished with Eisenglasurit, kicking off Glasurit's success story. In a matter of 10 years, the products from Winkelmann's business were so successful and so numerous, that he decided to market them under a single brand name. And that marked the birth of Glasurit. In 1898, the Glasurit brand was officially registered, and Glasurit's first symbol and logo was born: the Chinaman.

The rapidly growing fledgling company quickly reached its capacity, but the factory in Hamburg could not be expanded. In 1903, a piece of real estate near a canal, railway and road in the town of Münster-Hiltrup became the paint factory's new site – and has served as the company's home ever since.

A meeting in the 1950s in the laboratories..

That same year, construction work for a coatings factory on the new premises was started. In 1904, the site's landmark, the water tower, was erected. It is still standing today. In 1908 the official name of the plant became "Max Winkelmann Aktien-Gesellschaft" (public limited company, "AG" for short in German). In 1920, the ethyl alcohol coatings factory went into operation. The year 1924 saw the beloved parrot, which today is recognized throughout the world; replace the Chinaman as the company logo.

The year 1925 ushered in the nitrocellulose coatings era. The "Glasso" paint factory was built, and the name became a symbol for progress and innovation. Glasso made Germany's first spray application for cars possible.

From 1930 onward, „Glasurit" was the continent's largest coatings factory, with a workforce of 1,000. In 1932, the next milestone was achieved: the production of synthetic resin paints and enamel coatings. The products were marketed under the "Glassomax" name, which later adorned a number of factories. In 1938, Glassomax I, with an area of over 4,000 square meters, was the first factory to open.

The Second World War brought a great deal of suffering and damage to the residents of Hiltrup and "their Glasurit." The laboratory, warehouse and production facilities were destroyed. But not long after the end of the war, the company started over again and growth continued. In 1949, the new resin laboratory was built. The launch of metallic coating in 1962 was a genuine milestone. In 1965, e-coating was developed. That same year, the Max Winkelmann GmbH became a subsidiary of BASF Aktiengesellschaft, Ludwigshafen.

In 1972, the company was renamed BASF Farben + Fasern AG and Glassomax IV was built. Other important steps were the construction of the new resin factory in 1979 and the building of Glassomax V in 1985. In 1986 the company was called BASF Lacke und Farben. In 1992, waterborne refinishing products were introduced. The company was given the name BASF Coatings AG in 1997. The year 2003 marked the 100th anniversary of the founding of the site. The state-of-the-art distribution center was built in 2004. In summer 2003, the new Color Design Studio Europe, the first of its kind for the coatings industry in Europe, was opened in the former „Villa Kaven" located directly at the production plant. There's no question: BASF Coatings and its Glasurit brand have been true global players for many decades and are among the leaders throughout the world.

Opening Ceremony at P+S

On September 12th 2008 the company and its invited guests from government and industry were celebrating relocation into the new factory at business park Kielweg in Diepholz, Germany. After tough negotiations, when originally movement had seemed already decided on to a different region, the new mayor Dr. Thomas Schulze succeeded with a more unconventional style in keeping the 9 million Euro building project in Diepholz. On a 30.000 m² field (15.000 m² build area) a 6200 m² large, new production facility and office complex have been built.

The speedy build (from starting in September 07 to finishing in May 08) was carried out with the most modern economical and ecological considerations. Walls have been isolated with PU insulation foam and a heat recovery plant takes care that only production requires energy, and with recovered energy, for instance all the offices can be heated. As you gain lots of heat during polyurethane processing, it seems certain that the 93 employees won't have to freeze in the winter time.

As it was unfortunately necessary to fell a tree during construction, two bird boxes have been put on the rear of the factory. So now, both the employees and the birds are lucky that they didn't have to move.

"Our plans have been designed with a promising future and the three hectare property gives us enough capacity for a further 8000 m² production area", said Manfred Heckert, President of P+S Polyurethan Elastomere GmbH & Co. KG, at the ceremony. "In the near future, we have already planned a new 1800 m² facility to be able to integrate part of the production, which is still left at the old location." Overall, the company is on its road to success and expects a turnover of 12 million EUR for 2008. "Even internationally, we are getting more and more recognized", Heckert is pleased about this positive development.

P+S was founded by Dieter Kolthoff in 1972. In 1977/78 the company started to produce bumpers and springs with microcellular Vulkollan®. Obviously Bayer MaterialScience thought this is one more reason to celebrate, and their Dr. Noelia Mansilla, Marketing-Manager BaySystems Diversified Industries, surprised both P+S presidents Ingo Becker and Manfred Heckert with the presentation of a glass sculpture, dedicated to 30 years of Vulkollan processing.

1984 the company took over PU production of parts from tyre-manufacturer Veith-Pirelli AG, and after a management buyout (with 13 employees involved) Dieter Kolthoff and his family moved to Switzerland. But they also got a big surprise during the opening ceremony. Produced as a special limited edition, both presidents handed 2 golden PU bumpers to Kolthoff and his wife. Another P+S jubilee: 10 million bumpers produced!

NEWS

Wolfgang Niedermark to head BASF's Berlin Liaison Office

BASF has appointed a new head of its Berlin Liaison Office. Effective September 1st, 2008, Wolfgang Niedermark (43) has succeeded Dr. Annette Zimmermann in coordinating the dialogue between politics and the company in Berlin. Niedermark will report to Elisabeth Schick, head of Corporate & Governmental Relations at BASF.
Niedermark regards the primary goal of his new job as promoting BASF's Berlin Liaison Office in its function as an information hub in the dialogue between business and politics. Niedermark is married and has two children.

PolyTHF: 25 anniversary of "Verbund" product, still going strong

Twenty-five years ago, in September 1983, BASF brought its first plant for the production of polytetrahydrofuran on line at its "Verbund" (integrated production) site in Ludwigshafen, Germany. The product is now marketed under the name PolyTHF® throughout the world. With a nameplate capacity of altogether 4,000 tons per year the first plant was the launch pad for a remarkable success story. Now with an aggregate capacity of 185,000 tons and a world-spanning network of production plants, BASF is globally the most important supplier of this multifaceted intermediate.
Driven by growing demand for PolyTHF, a second plant was built in Ludwigshafen and started operations in 1995. It had to be expanded in 2002. At the same time BASF was building added capacities close to Asian and NAFTA customers. Beginning in 1987 the company began supplying customers from a plant in Geismar in the U.S. state of Louisiana, while Asian customers started receiving PolyTHF from the Ulsan site in South Korea as of 1998. The newest chapter in the annals of success is the PolyTHF plant at the Caojing production base near Shanghai. Since becoming operational in early 2005 the plant has mainly supplied customers in Asia, now not only the largest PolyTHF market, but also the fastest growing.

Dow Automotive names new Global R&D Director

Dow Automotive, a global provider of advanced solutions for vehicle manufacturers and aftermarket repair, has named David Bem, Ph.D., the new Global Research & Development (R&D) Director. Effective immediately, Dr. Bem will be responsible for identifying, developing and commercializing new technologies that create sustainable value. He replaces John Hacskaylo who is now Chief Technology Officer at K-Dow Petrochemicals.
Most recently, Dr. Bem served as the Senior Research Director for Dow Hydrocarbons & Energy, Alternative Feedstocks and Basic Chemicals. Prior to joining Dow, Dr. Bem was Global R&D Director at Celanese LTD for the Ticona Engineering Resins business. He also led the Global Acetyls R&D for the Celanese Engineering Resins business and worked at UOP LLC, a Honeywell Company, where he held various positions.
Dr. Bem is a certified Six Sigma black belt and holds nine US patents. He has authored more than 20 publications. He earned a Ph.D. in solid state inorganic chemistry from the Massachusetts Institute of Technology and his undergraduate degree in chemistry from West Virginia University. His office will be based in Auburn Hills.

Huntsman and Nestaan take ‚Walk the Talk' initiative to Benelux sprayers

MDI-producer Huntsman and systems house Nestaan Holland joined forces twice this year to train more than 40 polyurethanes insulation sprayers from Belgium and the Netherlands on the safe handling and usage of MDI.
The training sessions were based closely on the European Di-Isocyanate and Polyol Producers' Association's (ISOPA) 'Walk the Talk' product stewardship programme for MDI users, which was first launched in 2006. The meetings covered not only essential information on MDI's chemical and physical properties and EHS data, but also safe and unsafe handling behaviours, recommended personal protective equipment/workplace measures and emergency procedures in case of spillage.
Kay Hennekens, Managing Director of Nestaan Holland said: "The polyurethanes sprayers we supply handle and use our isocyanates and polyols every day at construction sites across the Benelux region and it is essential that they be fully aware that with proper precautions they can operate in complete safety."
Gwendolien Fonck, Business Manager Systems Houses for Huntsman's polyurethanes division added: "We are pleased to assist Nestaan to take downstream to their customers a training module developed by our upstream polyurethane raw materials trade association - with this 'multiplier' effect we can ensure that accurate information on the safe handling and use of MDI travels effectively down to end markets."

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Guangzhou International Convention & Exhibition Center

Profile

China, the second largest country of coating production and consumption, has maintained its production growth rate at above 20%. According to the National Bureau of Statistics, the coating production of the first ten months in 2007 has reached a record of 4.92 million tons.

COATEXPO, is an industry event which has been organized by Guangdong Coatings Industry Association and Shunde Coating Chamber of Commerce, and is also one of the best business platforms for international suppliers to consolidate and expand their market in China.

Based on 413 exhibitors in 2007, the exposition area will exceed 20,000 square meters and more than 500 companies will be involved. There will be two halls: Raw Materials & Equipments Zone and Coatings Zone.

We sincerely invite you to join in.

Hot News

The 20th Anniversary Celebration of Guangdong Coatings Industry Association will be held concurrently and over a hundred of members such as The China Paint MFG. Co.,Ltd, Huarun Paint Chemical Co.,Ltd and Carpoly Chemical Co.,Ltd etc.will participate in COATEXPO2009.

Hosted By

- Guangdong Coatings Industry Association
- Shunde Coating Chamber of Commerce
- Wise International (H.K) Co., Ltd
- Wise Exhibition (Guangdong) Co., Ltd

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E-mail: coatexpo@yahoo.cn

www.coatexpo.cn

智展展览

EVENT CALENDAR

Polymer Foam 2008
11th – 13th November 2008
InterContinental Pudong Hotel, Shanghai, China
Organizer: Applied Market Information Ltd., 45-47 Stokes Croft, Bristol, BS1 3QP, UK
Phone: +44-(0)117-924-9442
Fax: +44-(0)117-311-1534
e-mail: sh@amiplastics.com
www.amiplastics.com

FSK Conference Foam Plastics
18th -19th November 2008
Maritim Hotel Würzburg, Germany; Organizer: FSK Fachverband Schaumkunststoffe & Polyurethane e.V., Am Hauptbahnhof 10, 60329 Frankfurt, Germany
Phone: +49-(0)69-299207-0
Fax: +49-(0)69-299207-11
e-mail: fsk@fsk-vsv.de
www.fsk-vsv.de

PDA Europe 2008
18th – 20th November 2008
Austria Trend Parkhotel Schönbrunn, Vienna, Austria
Organizer: Polyurea Development Association Europe, AISBL
Avenue Marcel Thiry 204, 1200 Brussels, Belgium
Phone: +32-2-774-9611
Fax: +32-2-774-9690
e-mail: pda-europe@kelleneurope.com

Central European Coatings Congress 2008
25th – 27th November 2008
Warsaw International Expocentre, Warsaw, Poland
Organizer: Dmg Coatings Group, UK; Phone: +44-(0)1737-855162
Fax: +44-(0)1737-855034
e-mail: leszselyi@dmgworldmedia.com

The Ural Week of Chemical Technologies – 7th Int. Exhibition VARNISHES – PAINTS
26th – 28th November 2008
World Trade Centre, Yekaterinburg, Russia
Organizer: Ural Exhibitions – 2000 Off. 505, 11A Sverdlov Str., Yekaterinburg, 620¬027, RUS
Phone/Fax: +7 (343) 370-33-74, 370-33-75, 355-51-95
e-mail: vystavka@r66.ru
www.uv2000.ru

EuroMold 2008
3rd – 6th December 2008
Expo Center Frankfurt/Main, Germany
Organizer: DEMAT GmbH
PO Box 110 611, 60041 Frankfurt, Germany
Phone: +49-(0)69-274003-0
Fax: +49-(0)69-274003-40
e-mail: info@ demat.com
www.euromold.com

INTERPLASTICA 2009
27th – 30th January 2009
Expo Center Krasnaja Presnja, Moscow, Russia
Organizer: Messe Düsseldorf GmbH, PO Box 10 10 06, 40001 Düsseldorf, Germany
Phone: +49-(0)211-4560-01
Fax: +49-(0)211-4560-668
e-mail: KurtA@messe-duesseldorf.de, www.interplastica.de

POLYURETHANEX 2009
25th – 27th February 2009
Pavilion 1, Hall 1, Crocus Expo, Moscow, Russia
Organizer: "Mir-Expo", Superviser: Alexandr A. Golovin
Yury Andropov`s Avenue, 22, 115533 Moscow, Russia
Phone: +7-499-61805-65, +7-499-61836-83
Fax: +7-499-61836-83, +7-499-61836-88
e-mail: compo@mirexpo.ru; info@mirexpo.ru, www.mirexpo.ru

Interlakokraska + TIRES & RUBBER '2009
10th – 13th March 2009
ZAO Expocentr, Krasnaja Presnja, Moscow, Russia
Organizer: Maxima International Exhibitions, Natalia Skuratova
Profsoyuznaya Str. 3 of. 410, 117036 Moscow, Russia
Phone/Fax: +7-495-124-7760
e-mail: skuratova@maxima-expo.ru, www.maxima-expo.ru

Plastics in Automotive 2009
25th – 26th March 2009
Congress Center Rosengarten, Mannheim, Germany
Organizer: VDI Wissensforum GmbH, Peter-Müller-Str. 1, 40468 Düsseldorf, Germany
e-mail: wissensforum@vdi.de
www.vdi-wissensforum.de

UTECH Europe 2009
31st March – 2nd April 2009
MECC, Maastricht, The Netherlands
Organizer: Crain Communications Ltd.
Contact: B.V. Industrial Promotions International (I.P.I.)
P.O. Box 225, 7470 AE Goor, The Netherlands
Phone: +31-(0)547-271566
Fax: +31-(0)547-261238
e-mail: info@ipi-bv.nl
www.utecheurope.nl

EUROPEAN COATINGS SHOW
31st March – 2nd April 2009
Expo Center Nürenberg, Germany
Organizer: Vincentz Network + NürnbergMesse GmbH
VisitorService, Expo Center, 90471 Nürnberg, Germany
Phone: +49-(0)911-8606-0
Fax: +49-(0)911-8606-8228
e-mail: ecs@nuernbergmesse.de
www.european-coatings-show.com

MOSBUILD-2009 – The 15th Moscow International Building Exhibition
31st March – 3rd April 2009
Organizer: ITE Group Plc, 105 Salusbury Road, London NW6 6RG, UK
Phone: +44-(0)207-596-5000
Fax: +44-(0)207-596-5111
e-mail: mosbuild@ite-exhibitions.com, www.mosbuild-expo.com

ExpoCoating 2009
6th – 8th April 2009
Olympiysky Complex, Olympiysky pr., 16, Moscow, Russia
Organizer: Primexpo
24/A Yakubovicha str., 190000 St. Petersburg, Russia
Phone: +7-812-38060-16
Fax: +7-812-38060-01
e-mail: coating@primexpo.ru
www.expocoating.ru

PRIMUS: INTERPLASTICA 2009 - 5. Int. Plastics Exhibition
14th – 17th April 2009
KiewExpoPlaza, Kiew, Ukraine
Organizer: PRIMUS UKRAINE
Kiew, Ukraine P.O. Box 133, 04210, Kiew, Ukraine
Phone: +380-44-537-6999
Fax: +380-44-537-6996
e-mail: info@theprimus.com
www.theprimus.com

PIPELINE TRANSPORT-2009 International Pipeline-Exhibition
21st – 24th April 2009
ZAO Expocentr, Krasnaja Presnja, Moscow, Russia
Organizer: Euroexpo Exhibitions & Congress Development GmbH, Am Hof 11, 1010 Vienna, Austria
Phone: +43-1-2308535-32
Fax: +43-1-2308535- 50/51
e-mail: pipeline@euroexpo-vienna.com, www.expopipeline.com

8th International (Guangzhou) Coating Printing Ink & Adhesive Exhibition
18th - 20th May 2009
Guangzhou, China
Organizer: Wise Exhibition (Guangdong) Co., Ltd.
Room 1802, Huayou Building, No.5 Si You Xin Road, Guangzhou, 510600, China
Phone: +86-20-37599008 / 37599157 / 37599129
Fax: +86-20-37599151
e-mail: coatexpo@yahoo.cn
www.coatexpo.cn

Polyurethanes 2009
17th – 18th June 2009
Maritim Hotel, Nürnberg, Germany
Organizer: VDI Wissensforum GmbH, Peter-Müller-Str. 1, 40468 Düsseldorf, Germany
e-mail: wissensforum@vdi.de
www.vdi-wissensforum.de

Trade Meeting - PU Elastomers
16th – 17th September 2009
Leipzig, Germany
Organizer: KuZ, Kunststoff-Zentrum Leipzig gGmbH
PO Box 31 07 32, 04211 Leipzig, Germany
Phone: +49-(0)341-4941500
Fax: +49-(0)341-4941555
e-mail: weiterbildung@kuz-leipzig.de, www.kuz-leipzig.de

BONDEXPO
21st – 24th September 2009
Neue Messe Stuttgart, Germany
Organizer: P. E. Schall GmbH & Co. KG, Gustav-Werner-Straße 6, 72636 Frickenhausen, Germany
Phone: +49-(0)7025-9206-0
Fax: +49-(0)7025-9206-620
www.bondexpo-messe.de

ABRAFATI 2009
23rd – 25th September 2009
Transamerica Expo Center, São Paulo, Brasil
Organizer: Mr. Alberto Uribe, Assessoria de Comunicação - ABRAFATI
Phone: +55 11-3766-9015
Fax: +55 11-3766-9015
e-mail: comunicacaoabrafati@editoracla.com.br
www.abrafati2009.com.br

Polyurethanes 2009
5th – 7th October 2009
Gaylord National Resort & Convention Center On The Potomac, Fort Washington, MD (Wash., DC area)
Organizer: Center for the Polyurethanes Industry (CPI), 1300 Wilson Blvd., Arlington, VA 22209, USA
Mrs. Neeva-Gayle Candelori
Phone: +1-703-741-5654
e-mail: Neeva_Candelori@americanchemistry.com
www.americanchemistry.com/polyurethane

20. FAKUMA
13th – 17th October 2009
Expo Center Friedrichshafen, Germany
Organizer: P. E. Schall GmbH & Co. KG,
Gustav-Werner-Straße 6, 72636 Frickenhausen, Germany
Phone: +49-(0)7025-9206-0
Fax: +49-(0)7025-9206-620
www.fakuma-messe.de

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VINCENTZ

BONDexpo 2008 Close Successfully

The 2nd BONDexpo could already establish in the second attempt as the trade fair for suppliers and producers of adhesives and sealants, equipment and machinery as well as peripheral equipment and services.

Complementary to BONDexpo MOTEK was running for the 27th time. Both fairs have finished off with positive results: More than 1200 exhibitors, over 860,000 square feet of overall floor space, 36,119 expert visitors and a large percentage of international exhibitors and visitors.

With 36,119 expert visitors from 25 industrial and newly industrialised nations, the recent 27th MOTEK, together with the 2nd BONDexpo, fell just short of its record breaking levels from the year 2007 at which 38,000 visitors were registered. "These numbers can be classified as outstanding results, especially considering the fact that MOTEK took place for the first time at the new Stuttgart Exhibition Centre in 2007 and was thus able to arouse the curiosity of additional visitor groups", says promoter Paul E. Schall. Furthermore, the world's leading event for handling and assembly technology and the trade fair for industrial bonding technologies had to assert themselves against several competitors in the even numbered year. Roughly 16 % of the expert visitors came to Stuttgart from foreign countries near and far, and gathered comprehensive information regarding all conceivable topics from the fields of production and assembly automation, as well as industrial handling. MOTEK has established itself in a lasting fashion as the world's most important automation trade fair, and as a trend barometer. And BONDexpo is well on its way to achieving the same goal, as was unanimously confirmed by exhibitors and visitors alike.

Following highlights can be pointed out: ECO-Polyurethane-Materials from renewable „green" resources (Danquinsa GmbH), special application techniques based on robotics (Reis GmbH), application cells with co-ordinate reading process system (introduced in connection with a Carrera track – a special attraction for all visitors) and the possibility to apply max. 4 components (Rampf-Group), or also fast curing/reacting super glues, which can resist vibration and abrasion in a temperature range of -50 to +100° Celsius (Uhu GmbH).

The 3rd BONDexpo will once again be held at the Stuttgart Exhibition Centre together with MOTEK from the 21st through the 24th of September, 2009.

Everything for quick and economic modeling

RAMPF Tooling, Germany, introduces a new Close Contour Paste for the quick and economic production of models at Euromold 2008 in Frankfurt, Germany.

„From idea to prototype to series production“, that is the concept for the forthcoming Euromold exhibition. Along this process chain RAMPF Tooling has developed a comprehensive product range from which a number of highlights will be presented at the world fair for moldmaking and tooling. The focus of this year's exhibition will be Close Contour Paste, Close Contour Casting and liquid materials.

The RAMPF Tooling specialists will be presenting five Close Contour Pastes with the spotlight falling on a new polyurethane product (PU). Amongst the main application industries for Close Contour Pastes are automotive, marine, wind energy and aerospace. Advantages and key properties of the pastes are the quick and easy application as well as the very fine and homogenous surface without bonding lines. Furthermore, virtually any type of supporting structure can be used, e.g. very light weight, inexpensive materials like expanded polystyrene (EPS), medium density fibreboards (MDF), and board materials with a low density.

A closer look at the technical data of the PU paste confirms the economic efficiency of the new product. The applied paste can already be machined to its final shape after a twelve hour room temperature cure. It can even be applied to vertical surfaces in a layer thickness of 20 mm without slump.

The user can also save time and costs with RAMPF Tooling's Close Contour Casting process (3C). The technology stands for quicker machining, less tool wear, and less wastage. Close Contour Casting is an innovative concept whereby close contour models are produced through vacuum casting. The mold in which the liquid material is cast is produced according to the CAD data received from the customer.
RAMPF Tooling is currently offering seven products for Close Contour Casting. The application areas range from modeling over metal forming, lay up tools and seamless galvano bath models to the foundry industry. “The 3D concept is especially interesting since the whole casting process is done through RAMPF Tooling. The customer just has to provide us with the dimensions and we supply the final close contour casting ready for milling“, explains sales director Peter Kimmerle. Close Contour Casting is a very precise casting process and the lead time for a casting lies between five to ten days depending on the customer's specific requirements.

RAMPF Tooling's performance at the exhibition will be rounded off through the introduction of some new liquid materials. The focus will be on infusion systems with a high temperature resistance and good flow and wetting properties.

WORLD OF POLYUREA

Bernd Dietz – new president of PDA Europe

At the 2nd annual PDA Europe conference, taking place from Tuesday 18 to Thursday 20 November 2008 at the Austria Trend Parkhotel Schönbrunn in Vienna, Austria, the current President Marc Broekart from Huntsman will hand over his office to Dipl. Ing. Bernd Dietz, REMA TIP TOP GmbH.
Bernd Dietz is working as „Product- & Sales-Manager“ for REMA TIP TOP GmbH and signs responsible for commercialisation of polyurea- and polyurethane coating systems.

80 years of success story REMA TIP TOP has gained international reputation with high performance products and qualified custom services. Today the name REMA TIP TOP stands for reliability, competence, service and innovation.
REMA TIP TOP GmbH is a wholly-owned subsidiary of the STAHLGRUBER-group and divided into two divisions: Automotive and Industry.
In the section “Industry” REMA TIP TOP products are market leaders in various sectors regarding quality and reliability.
REMA TIP TOP polyurea spray systems are used as multifunctional material in wear and corrosion protection.

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Air-Purge
Impingement Gun

Fusion CS
Clear Shot Gun

Fusion MP
Mechanical-Purge
Impingement Gun

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Air-Driven
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PROVEN QUALITY. LEADING TECHNOLOGY.

PANADUR® Intelligent Surface (IS) – From design to functionality

Dr.-Ing. Wolfgang Beck, Dipl.-Ing. (FH) Anja Krichler – PANADUR GmbH

1. Plastics - the material of the 21st Century

A year ago we reported about an innovative and cost-effective technology for the surface design. Meanwhile, the possibilities of colouring are already state of the technology and so they should not be further considered extensively. Nevertheless, plastics are the material of the 21st Century.
"We are barely aware: We live in an age of plastics. With its many uses, they are no longer inconceivable from the modern life. From the coffee maker to telecommunications satellites, from the obvious car steering wheel to the ultralight airplane seat, from yogurt cups to high insulated energy-saving houses, from swimsuits to the hard shell suitcase: Plastics are always there, in securing basic needs as well as in modern lifestyle equipment. They offer crucial contributions to the quality of life and comfort to technology and progress, to aesthetics and comfort. Plastics are playing an increasingly important role in the conservation of natural resources, because - what is not known for many – plastics are saving more fossil raw materials, as for their production are needed. "[BASF]

2. Colouring of plastic moulded parts

Often a coating currently results from decorative and rarely from functional needs. New technical expertises let these processes appear in a different light.

2.1. Surfaces are linked systems

The influence of various factors, which interact with the coating of moulded part surfaces, are summarized in the following description (Figure 1).

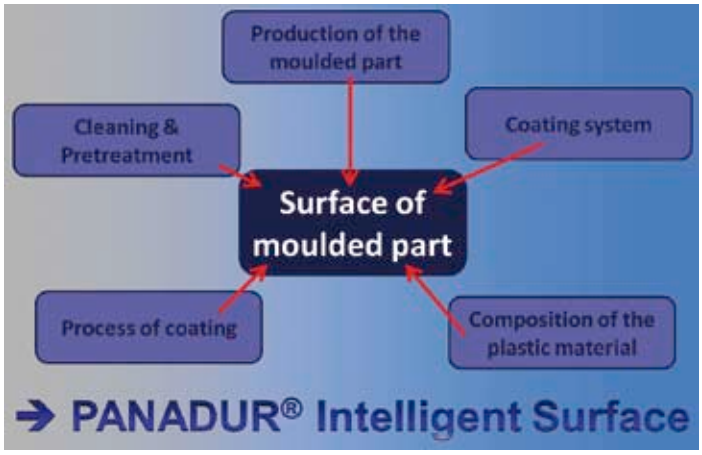

Figure 1: Influences on a surface of a moulded part

Besides the design the adhesive strength is a crucial criterion for the quality of the surface. Again a variety of defects and deficits influence the process, e.g.:
- Interaction of coating and plastic material
- Looming of fibres
- Separation of layers caused by insufficient moistening
- Testing only by destructive material check
- Multi-building: primer - basecoat - clear coat
- Different expansion coefficients
- Possible solvent emissions (including water)
- Low dry film thickness
- Fancy pre-treatment
- …

CONCLUSION:

Coated plastic parts are interacting systems.
Changes in the composition of the plastics, in the manufacturing process, in the pre-treatment, in the coating and in the coating system must be covered by sufficient coverage investigations.

➡ PANADUR® IS

solves a multitude of these issues through the use of the IS – procedure.

PANADUR® Intelligent Surface (IS):
- Unlimited creative latitude
- High reactivity (dust-dry after 60 seconds)
- Customer-specific functionalities
- High weather and chemical resistance
- Homogeneity of layer thickness
- Renunciation of any solvents
- Risk-free use of nanoparticles
- Flexible hardness according to customers' desire
- Template in the form
- Change of colours within the moulded parts requires a second machine
- High investment costs

Figure 2: Properties of PANADUR® IS

3. What is IMC? – Procedure

The PANADUR® In-Mould-Coating is a procedure by which the coating of plastic-moulded parts already starts in the tool. PANADUR® 2C IMC is so high reactive that it can only be applied by using a high precise coating machine of the company ISOTHERM AG (Switzerland). Thereafter, the substrate material will be brought into the opened or closed mould. After the end of the reaction the part can be removed from the mould. The result is a moulded part with a finished surface, which can be high glossy or even matt or structured, depending on the surface of the mould. "In-mould coatings can be easily manufactured with many methods of mould production, and can be combined with spraying, casting, pressing or foaming procedures.

Selected properties of PANADUR® 2C IMC:
- Pot life between 0.5 minutes and 2 hours
- Hardness of the product from soft to hard
- Solvent-free, 100 % material or solid content
- Shrinkage smaller than 0.3 %
- UV-stable
- High chemical resistance, e.g. compared to diesel
- Liability on all isocyanative networking substrates as well as on a number of thermoplastics such as ABS and PA, on epoxy and selected polyesters
- All colours possible: RAL, NCS, metallic and pearl gloss as well as individual customer requirements
- No use of chromate or leaded pigments

4. Structure of the IMC-system

The PANADUR® IMC system is a modular system for surface coating of plastic moulded parts. To be able to respond to the great variability of technological parameters (temperature, pressure, shape, material, equipment makers ...) in the manufacture of plastic moulded parts, the PANADUR GmbH developed the outlined modular conception in the following display (Figure 3).

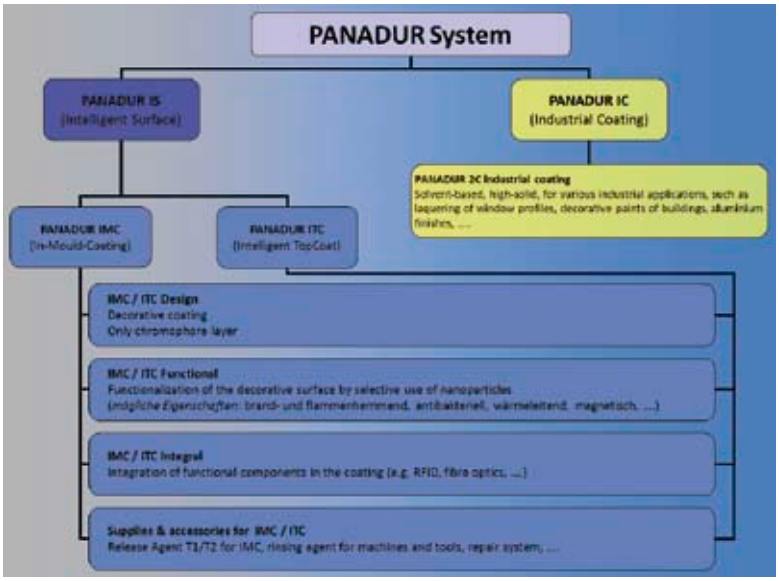

Figure 3: PANADUR®- system

more in FAPU 1/2009

TECHNICAL ARTICLES

Improving polyurethane dispersions using biobased technology

Erwin Honcoop, Hans Ridderikhoff, Karin van der Helm, Croda, Netherlands

Introduction

Polyurethanes have been used for many years to produce high performance materials such as solvent-borne coatings. However, though possible to formulate water-borne polyurethane systems, the widely used adipate polyester backbones often cause problems, such as reduction in storage stability and hydrolytic resistance. Additionally the water evaporation rate of polyurethane dispersions is seen as a drawback in certain applications.
Croda has countered these deficits through its range of hydrolytically stable polyester polyols using biobased technology. The reduced number of ester bonds and the hydrophobic environment make these polyols practically immune for water, while keeping the resistance against UV characteristic for polyesters.

In this paper, it is first demonstrated that the polyester polyols improve the hydrolytic stability of polyurethane dispersions. Subsequently, we present results showing that properties of the 1k polyurethane dispersions are also valid for two component polyurethane dispersions.
Finally we will demonstrate that the water evaporation of these systems is significantly improved, and that the adhesion of coatings on different plastic substrates has increased considerably.

Dimer fatty acids

Natural oils and fats have for years provided the polyurethane chemist with a variety of building blocks, such as glycerin and castor oil. Less well known is the use in polyurethane chemistry of a fatty acid derivative, the so-called dimerised fatty acids. These are obtained by the conversion of unsaturated fatty acids (from sources like soybean oil or tall oil) by a combination of pressure, temperature and catalysis. This process generates a mixture of products, the most important being dimerised fatty acid. Others are trimerised fatty acid, and isostearic acid.
Figure 1 gives an overview of the dimerisation process.

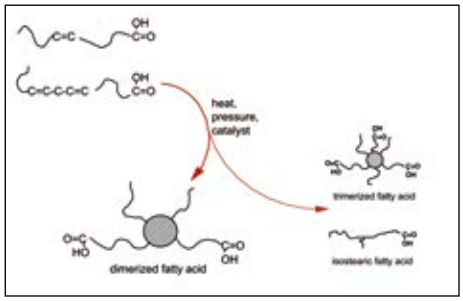

Figure 1: Reactions in oligomerisation of fatty acids

Starting from the C_{18} acids that nature typically provides, the dimer acid is a molecule with 36 carbon atoms, which makes it by far the longest dioic acid available. This hydrocarbon nature makes dimer acid and polymers in which it is included extremely hydrophobic. Besides, the combination of hydrocarbon character and non-crystallinity provides lubricity and flexibility, even at very low temperatures.

Dimerised fatty acids have found their application in areas such as polyamide epoxy curatives and polyester coatings, both solvent and waterborne systems. In all these applications, the value of the dimerised fatty acid is related to the features mentioned: flexibility and impact strength, wetting and flowability, and hydrophobicity and hydrolytic resistance.

Polyurethane dispersion based on dimer technology

The dimer fatty acids provide polyester and epoxy coatings with a range of favourable features, such as flexibility and hydrolytic resistance. Clearly, other coating systems could benefit from the introduction of dimer acids as well. Conversion of dimerised fatty acid to the corresponding diol, or by building dimerised fatty acid into hydroxyl-terminated polyesters, makes it suitable for incorporation in polyurethane (see figure 2 below). The dimer fatty acid based polyester polyols can be semi-crystalline or amorphous type, depending on the choice of polyol monomer.

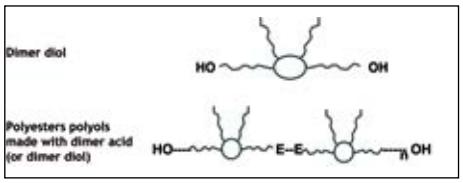

Figure 2: Dimer technology for polyurethanes

When comparing dimerate polyols to adipate polyesters, polycaprolactone polyols, and polyether polyols, it becomes clear that they form a category of their own. Compared to the adipates much lower moisture absorption, a lower hydrolysis rate, and a greater flexibility can be expected.
In comparison with polyethers such as polyethylene glycol (PEG), polypropylene glycol (PPG), or polytetramethylene glycol (PTMEG), the absence of ether linkages make dimer-based polyurethanes much more resistant to degradation by radical-type attack, such as heat, oxidation or ultraviolet radiation.

Especially this combination of stability against both hydrolysis and radical-type attack is unique, and is highly relevant for applications like heavy-duty coatings and adhesives, and automotive elastomers. Additionally, it has been found that dimer technology brings low-temperature flexibility, flowability, and affinity for low-energy surfaces; no monomer comes closer to a polyolefin than dimer acid.

A range of dimer based polyester polyols is commercially available, and recently they have been tested in polyurethane dispersions. The fact that dimer fatty acids are hydrophobic makes it challenging to get them into water, but this can be resolved by using the correct addition method during processing. This method was developed during an earlier study at Croda.

The polyurethane dispersions based on the dimer acid technology exhibit mechanical strength, adhesion, grain enhancement, gloss, and chemical resistance. Especially noticeable is the improved resistance to water when compared to adipate based polyester polyols. The dimer fatty acid based polyol shows no damage to the surface, where the adipate shows severe damage after hydrolytic exposure to the surface.
Additionaly, the water uptake of the polyurethane films has been evaluated. In figure 3, one can clearly see that the hydrophobic character of the dimer fatty acid has a positive impact on water uptake.
The adipate based polyurethane films absorbs up to 8 % water at 23° C and the PTMEG based films even up to 10 % versus only 1-2 % for dimer fatty acid based polyols.

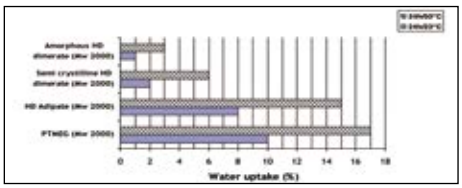

Figure 3: Water uptake of dimer fatty acid based polyurethanes

In comparison with polyether-type polyols, dimer fatty acid based polyesters have the advantage of lower sensitivity to heat, oxygen and UV-radiation, all of which attack ether bonds. The performance of dimer fatty acid based polyurethane was compared with an adipate polyester type and PTMEG diol in a weather-o-meter experiment. The results are shown in figure 4. The polyether formulation breaks down quickly because of UV attack. The adipate polyurethane also fails quickly, which can be attributed to the effect of periodic 'rain fall' in the weather-o-meter causing hydrolysis of the ester bonds. The dimer fatty acid based polyurethane resists hydrolytic attack as well as degradation by radiation and oxygen.

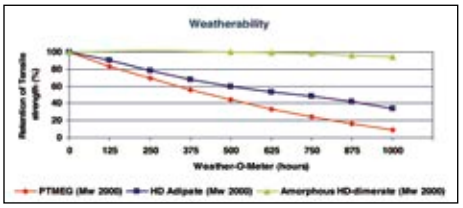

Figure 4: Weatherability of dimer fatty acid based and other polyurethanes

Hydrolysis and water flash-off

One of the challenges of water based systems is the hydrolytic stability on storage. This is especially the case when polyester polyols are incorporated within the backbone of the polyurethane.
Several polyurethane dispersions were exposed to storage at 50 °C after which the retention of the film strength was re-evaluated. Figure 5 shows that inclusion of dimer fatty acid based polyester polyols in the

backbone significantly improves the storage stability over an adipate based polyester polyol. This can be explained through the hydrophobic nature of the dimer based polyester polyols, protecting the ester-bonds from hydrolysis.

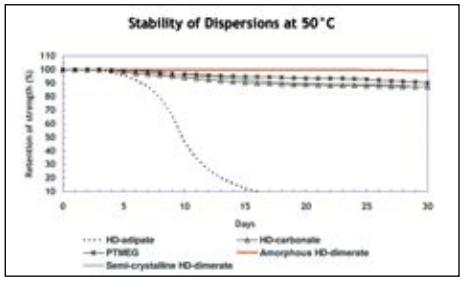

Figure 5: Storage stability of the dispersions

Also against other chemicals resistance of coatings based on the dimer fatty acid based polyester polyol technology is good overall and at least comparable to other polyols.

A disadvantage of water based systems like two component polyurethane dispersion systems is that an additional step in the drying cycle is required to remove the water from the system. Keeping the hydrophobic nature in mind of the dimer fatty acid based polyester polyols and the need to evaporate the water when using two components before curing them at elevated temperature, the influence of the hydrophobic dimer based polyols was screened.

For this we looked at a drying cycle used in the industry, when 2 component water based systems are applied.

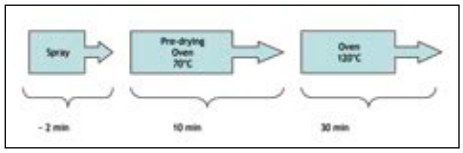

Figure 6: Drying cycle of an industrial coating system

As can be seen in figure 6 the drying step in the oven for the water evaporation is an additional step over conventional solvent systems. This pre-drying is needed to remove the larger part of the water from the system.

If one could increase the evaporation rate of the water, the drying cycle could be shortened.
For this study a 2 component systems consisting of a hydroxyl terminated PUD and melamine (CYMEL 327) were evaluated on the loss of water during the drying. For this thermographic equipment was used, using the same weight and solid content of the dispersions as sample material.

The thermographic temperature profile was set as given in figure 7.

Figure 7: Thermographic temperature profile run under air flow

The thermographic analyses were run on a Mettler TGA with the conditions as mentioned in figure 7 and set as followed:

Conditions:	**Air flow**
	30 mg sample in 150 ml cup
	25→ 70° C, at 10 °C / minute
	70 °C, keep for 10 minutes
	70→ 120° C at 10 °C / minute
	120 °C, keep for 30 minutes

As a comparison a hydroxyl terminated polyurethane dispersion based on a polyester polyol with dimer technology has been evaluated against adipate based polyester polyol.

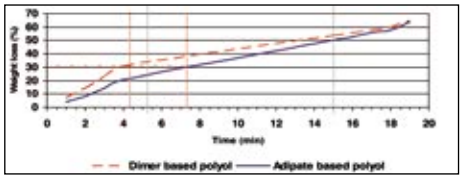

Figure 8: Water evaporation; weight loss in time.

We can see that the dimer based polyester polyols have a positive influence on the evaporation of water from the 2 component PUD. The high hydrophobicity of the dimer based polyester polyols enhances the water evaporation, leading to a 40-60 % shorter drying time of the cycle.

Adhesion Properties

The adhesion properties of the polyurethane dispersions were evaluated, not using normal coating adhesion test methods but a method used in the adhesive industry. This has been done to distinguish in an alternative way the adhesive strength of the PU dispersions.

The method used is a lap shear adhesion test, where the polyurethane dispersions were tested on several plastic substrates.
The adhesion of uncrosslinked PU dispersion is highly improved upon addition of dimer into the polyol. For crosslinked PU dispersions, the adhesion is comparable for all PU dispersions. The PU-dispersion based on the adipate polyol gives a low adhesion to tested substrates and fail almost immediately.
Dimer improves the adhesion significantly, probably due to the increased flexibility of the coating, resulting in increased stress absorption.

The results of these tests are mentioned in figure 9.

CONCLUSION

Polyurethane dispersions, being one or two component systems are recognised as an interesting technology. In this paper it has been demonstrated that the polyester polyols based on dimerised fatty acids offer several unique properties to one and two component polyurethane dispersions.

First of all, the hydrophobic nature of these products significantly improves the hydrolytic stability of the polyurethane dispersions and therefore improves the storage stability of these products.
The same hydrophobic properties also enhance the evaporation rate of the water from the two component polyurethane dispersion systems prior to the oven-cure, allowing shorter drying times during production.

Furthermore the morphology of the dimer fatty acid structure within the polyester polyol leads to a significant improvement on the adhesion on plastic substrates as PET, ABS and PE in comparison with adipate based polyols.

Polyester polyols based on dimer fatty acids form a class of versatile raw materials for one and two component polyurethane dispersions that allow the resin producer to overcome some of the major challenges of this technology.

Biography:

Erwin Honcoop is Application Specialist Coatings and Inks for the Polymer & Coatings group within Croda. He is a science graduate with specialization on polymer chemistry. In addition he followed a post doctoral course in Coating Technology from the foundation of Polymer Technology in the Netherlands a degree on Coating Technology, and worked as R&D development chemist dimerised fatty acids at Uniqema and technical service specialist in Europe, Asia and US.

Hans Ridderikhoff is technical marketing manager for Polymers and Coatings within Croda. He has graduated in 1988 in Organic Chemistry at the University of Leiden, and has worked in technical service and business development roles at several chemical companies as Quaker Chemical, Witco/Crompton and Uniqema in the application fields of Lubricants and Polymers.

Karin van der Helm is technical service chemist for Polymers and Coatings within Croda. She is a science graduate, organic sec-

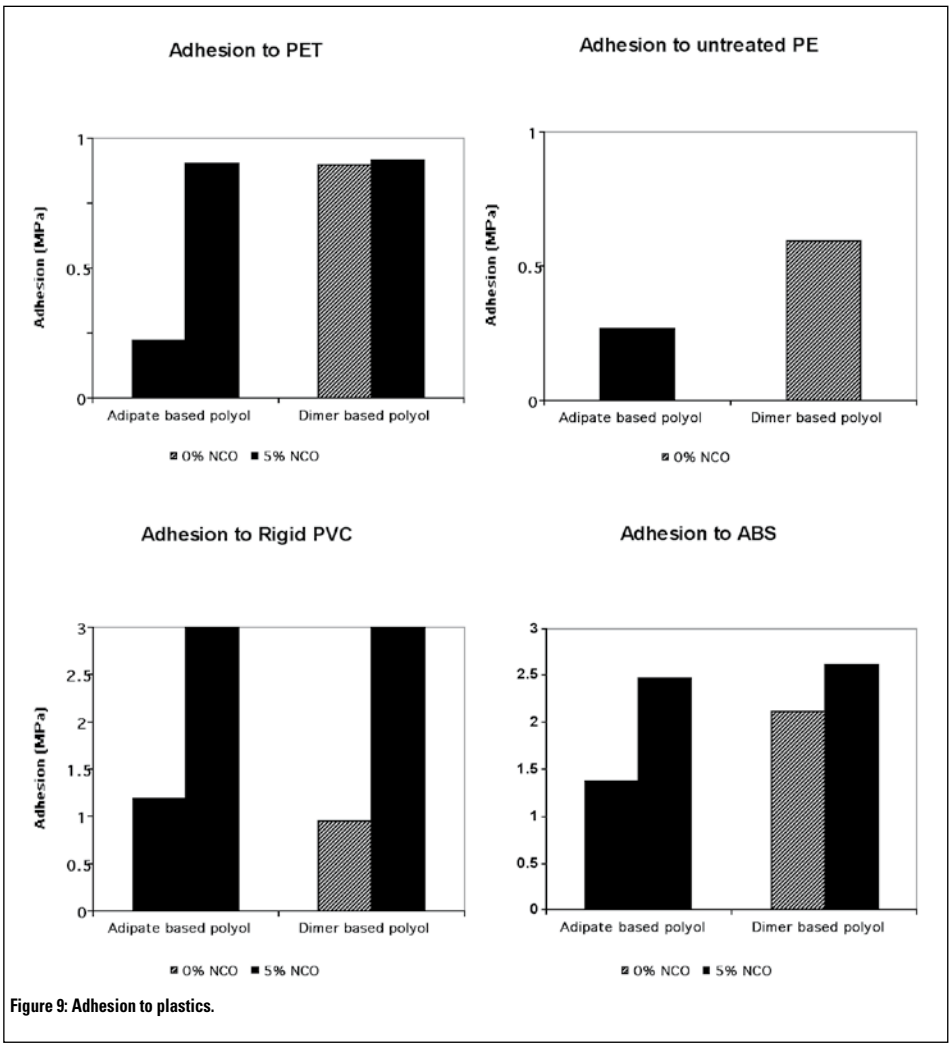

Figure 9: Adhesion to plastics.

tion. She has worked for DSM Resins (printing inks), Unilever Research Laboratory and Uniqema/Croda . With Uniqema she started in the Lubricants group and then joined the Polymers group, 14 years ago.

Note of Editor: This paper was presented in February 2008 at the ECC Polyurethanes for High-Performance Coatings V in Berlin. (Organizer: Vincentz Network)

Advances in mixing heads

By Josef Renkl, Willi Dausch, Ralf Moser

Mixing heads are where all modern polyurethanes first see the light of day, whether these are used in the soft or hard foam sector, in in-mould coating, for manufacturing advanced composites or for innovative spray methods. They have therefore an extremely important role to play in PUR processing. This paper describes the state of the art using examples from some recent products developed at KraussMaffei.

Hardly any other modern polymers depend on the processing system for the quality and economics of their parts as much as polyurethanes do. After all, polyurethanes are generated in the user's factory – in the mixing head. The further development of existing designs of mixing head is therefore just as important to the industry as the development of entirely new processes.

Rigid foam and White Goods

One of the most important application areas of PUR insulation systems is the production of refrigerators („White Goods"). Recent developments seek primarily to improve the foam quality and to extend the service lives. The KraussMaffei **MKE-3B** mixing head, which lends itself chiefly to „open pouring" was recently fitted with wear protection and, when used with pentane-blown rigid foam, yields shot numbers in the six-digit range. This model uses innovative T-mixing impingement technology, in which one component stream is split over two nozzles and the mixture is carried laminarly into the mould over pins to produce an exceptionally smooth and void-free foam structure.

The **MK 12/18-ULP-2KVVG** mixing head, too, is a more rugged design specifically for rigid-foam production (Fig. 1).

Transfer mixing heads like this, in which the downstream transfer calms and post-mixes the reaction mixture combine high mixing quality – for sparingly miscible systems, too – with high reproducibility. These two KraussMaffei transfer mixing heads for the rigid foam area – plus the **MK16/25ULP-2KVVG** – can be operated without purging and are supplied with a prolonged nose (up to 120 mm). This ensures greater immersion depth and optimum positioning in the mould. Another plus point is the provision of a bell to separate the PUR and hydraulics.

The greatest technical modifications to these models, however, reflect the increasing proliferation of pentane systems, which impart a high degree of tack to the reaction mixture and cause greater wear. KraussMaffei tackled this challenge by thoroughly revamping the metal surfaces; wear on the mixing head is now minimised inter alia by a friction-

optimised bushing with specially hardened surface. The design has also been changed to incorporate a patented spiral groove at the cleaning plunger. By virtue of these new material pairings, and design details which are now found in many KraussMaffei rigid-foam mixing heads, the service lives of these products have been multiplied many times over – with 200,000 shots and more now being realized in practice.

The use of blowing agents such as pentane that can give rise to explosive gas mixtures makes it necessary to purge the mould with nitrogen. Depending on the system design, this is achieved either via an external lance or directly through the mixing head. The latter option is safer as it allows purging to be coordinated much more closely with the shot sequence. The KraussMaffei **MK 12/18-ULP-2KVV G-80** and **MK16/25ULP-2KVV-G** transfer mixing heads for the rigid foam sector therefore can be adapted to accommodate an N2 module which meters the nitrogen into the outlet pipe via a separate valve. At gas flows of 28 l/s, typical volumes are completely flooded within five to seven seconds.

Soft foam

In soft foam production, mixing heads with faster component selection are growing in importance. KraussMaffei has redesigned its 4- and 6-component **MK 14/20 ULP 4CN-G** and **MK 18/22 ULP-6-CN-G** mixing heads from scratch (Fig. 2). These multi-component heads feature a star-shape arrangement of needle nozzles around the mixing chamber, and an ingenious bypass system for component control. Unneeded components circulate through a bypass block where they remain under pressure as far as the mixing head. Pressure holes that could form when a switch is made from bypass circulation to high-pressure circulation are avoided by ensuring that the component stream switches at precisely the same time. Since the bypass nozzles are located in the immediate vicinity of the mixing chamber, the timing of component selection or deselection can be switched very precisely via these components. This type of control is much more precise than remote, more sluggish hydraulic systems.

New to the programme is the **MK 10/15 ULP-4kV 80G** four-component mixing head with a dispensing rate ranking between those of the **MK 8/12-4K** and the **MK12/18-4K**. With the new KraussMaffei transfer head, dispensing rates which are necessitated by the reduction in foam thicknesses in seat cushions and mixed production with small parts, can be realised without compromises: the **MK 10/15** has been specifically designed with this in mind. The nozzle position in this model was optimised by means of flow simulation. This enabled the mixing quality to be boosted even further again. Moreover, the mixing head is notable for its particularly compact connection geometry.

The high precision with which the cleaning plunger can be variably positioned is a further contribution to the optimisation of the mixing quality of the aforementioned KraussMaffei multicomponent mixing heads. With the aid of an accurate position-sensing system and proportional technology, the cross-section of the mixing chamber outlet can be infinitely adjusted. This allows optimum mixing and dispensing of polyol/isocyanate mixtures of different viscosities at different dispensing rates from shot to shot. This technology, which KraussMaffei previously only provided for CN mixing heads, is now also available for many other mixing heads.

The service life of KraussMaffei soft-foam mixing heads was further boosted recently with the introduction of a new surface treatment for the control pistons. At KraussMaffei, currently, the CN transfer heads have so far handled four million shots for producing multi-hardness seat cushions, without maintenance. The new models also boast further reductions in susceptibility to contamination: they now feature patented foam-blockers, which effectively prevent contamination of the hydraulics by the penetrating polyurethane. The FoamBlocker system makes do without seals, which are error-prone.

New nozzle design for optimum control over component pressure

A breakthrough has been made in the field of nozzles for controlling component pressure in soft-foam heads. Up to now, spring-loaded nozzles were widely used. However, the shape of the spring characteristics curve at different flow rates necessitates different component pressures, which is why compromises always had to be accepted when the mixing parameters were reset. Added to which, there were problems with hysteresis and uncontrolled vibrations by the spring system that were detrimental to the mixing quality.

A new, patented nozzle design from KraussMaffei uses electric needle-position control to solve this problem. This product uses an electric actuator, which only has to work against only very small forces because of the ingenious design of the nozzle needle (Fig. 3). As a result and thanks to the minimal

Figure 2: The 6-component MK 18/22 ULP-6-CN-G transfer mixing head from KraussMaffei has been redesigned from scratch. (Photo: KraussMaffei)

Figure 1: The MK 12/18-ULP-2KVVG transfer head recently completed the range of KraussMaffei mixing heads for the „white goods" sector; the extended nose ensures high immersion depth and thus optimum positioning in the mould. (Photo: KraussMaffei)

Figure 3: Thanks to a new nozzle concept patented by KraussMaffei, an electric motor only has to work against very low pressure moments. Thus, the needle can be moved effectively and quickly. Consequently, component pressure under varying dispensing rates can be regulated quickly and kept stable. (Graphic: KraussMaffei)

Figure 4: Clear coat moulding (CCM) can replace elaborate coatings. This technology is particularly popular in the automotive sector. (Photo: KraussMaffei)

size, very small forces are sufficient to position the needle effectively and quickly or to close the nozzle. An advance of one millimeter can be effected in around 0.4 seconds. For effective component control, fractions of a millimeter are usually sufficient.

An intelligent control system always sets the optimal pressures independently of other system parameters and component viscosities, even where dispensing rates vary substantially. The accuracy is ± 1 bar. The median time for setting the necessary component pressures is 0.2 seconds. If high shot frequencies are required, the optimum needle positions can be set directly. For smaller dispensing volumes, pressures can additionally be set which cannot be realised by spring systems.

In a major field trial currently being conducted on the electric nozzle control at a renowned PUR foam producer, a service life of one million cycles has been reached so far. After its market launch, the system will be capable of being retrofitted to most existing KraussMaffei mixing heads. Additionally, KraussMaffei will also offer a stand-alone version that works independently of the metering machine.

CCM and small volume mixing heads

Clear coat moulding (CCM) is increasingly superseding elaborate and expensive coatings (Fig. 4). The **MK 3.5/5UL-2KVV CCM** mixing head launched by KraussMaffei is characterised by especially good mixing quality. Due to its small mixing chamber, the mixing head can cover the dispensing range 5 to 50 g/s (3:1:6 to 35 g/s) at a mixing ratio of 1:1. Although dispensing rates of 18 to 35 g/s are more usual in CCM technology, small mixing chambers are still highly beneficial for these medium dispensing ranges: they ensure better mixing quality and reduce the risk of air pockets, which would adversely affect the product. Moreover, the waviness of the surface is reduced while the optical quality of the parts is improved.

Figure. 5: The MK 3.5. 5/5UL-2KVV compact mixing head is a new, extremely compact small-volume mixing head, which is ideal for C.A.S.E applications. (Photo: KraussMaffei)

This mixing head has recently been made available in a universal variant, which is tailored to a large number of C.A.S.E. applications (Figs. 5, 6): the **MK 3.5/5UL-2KVV** compact mixing head also features a small mixing chamber, but is designed specifically for minimal dispensing volumes. It differs primarily from the CCM variant in boasting less extensive measuring technology and the absence of component heating. The outlet chamber of the new compact mixing head is just five millimeters in diameter. It thus lends itself, for example, to foaming particularly small grooves with PUR. A current application (mixing ratio of 100:60) has even managed a dispensing rate of 3 g/s, with very good results. The control piston of the mixing head is just 3.5 mm in diameter (RK: 5mm).

The roughly 30 g/s offered by the KraussMaffei **MK 5/8 ULKP 2 KVV-F** transfer mixing head for the processing of filled polyurethane systems likely represents the lower end of what is technically feasible in another field. Here, the challenge is to develop filler-resistant control pistons. This goal was ultimately achieved by means of targeted geometry optimisations and in-depth metallurgical expertise. The 8/12 variant of this model, the **MK 5/8 ULKP 2-KVV-F-80** with long dispensing pipe has already managed a service life of one million shots (80 g/s, shot sequence: 5 s).

Spray technology

Spray methods are very much in vogue in polyurethane technology (Fig. 7). Although current PUR spray heads were all designed three to four years ago, they have benefited extensively from some improvements to details. Thus, the particle size of the PUR

Figure 6: Ideal team for C.A.S.E. appliations: The TwinComet with the new small KraussMaffei MK 3.5. 5-5UL-2KVV compact mixing head. (Photo: KraussMaffei)

droplets produced has been greatly reduced by the introduction of air-assisted spraying (such as in the **MK 2.0-2K-S-L** mixing head for the manufacture of spray skins, Fig. 8). They have paved the way to products, which, despite an extremely thin layer of much less than one millimeter, offer highly compelling high surface quality. The more uniform material distribution ensures consistent wall thicknesses.

Brand new are KraussMaffei mixing heads for fibre composite spraying (FCS), which is still in its infancy. This is a process for the production of polyurethane composites which are characterised by a highly complex layer structure of different – sometimes fibre reinforced – PUR layers. FCS can produce, for example, large-area parts that combine a high-quality surface with a layer of an extremely rigid, fibre-reinforced polyurethane system. The mixing heads offered by KraussMaffei for this versatile process reflect the manufacturer's longstanding experience in fibre-reinforced polyurethane parts; for example, the LFI process which KraussMaffei pioneered. In FCS, the fibres are chopped to size by cutters and blended with the PUR stream after the outlet pipe. KraussMaffei mixing heads, such as the **MK 3.0-4K-S**, offer a compelling blend of highly focused dispensing and little overspray.

Structural parts, sound insulation and coatings

Users nowadays can avail of several types of nozzles for spray-mixing heads for making structural parts. Blowing air into the reaction mixture creates very fine droplets that yield highly homogeneous and thin polyurethane films. Even high-speed systems readily lend themselves to spray mixing heads. PUR spray processing has established itself for the manufacture of soundproofing mats. Here, ultra-highly filled spray systems are used, whose polymer may contain up to 75 % barium sulphate. The spray heads must therefore be particularly resistant to these abrasive materials. Products such as the

Figure 7: Spray technology can also be used for the manufacture of extremely light yet resilient panel parts. (Photo: KraussMaffei)

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KraussMaffei **MK 10P-2K-F-PSM** mixing head, which have been adapted specifically to this application area, are notable inter alia for their very rugged hard-metal pistons (Fig. 9). Component metering has been overhauled, too: barium sulphate is harder than chalk, so the customer needs special nozzle materials in order that adequate life times may be achieved. This mixing head has been adapted from the systems used in linear technology and employs new high-pressure mixing. It is suitable for spray cycles with any number of partial shots and offers impressive spray definition with minimal overspray. The real innovation lies however in the mixing chamber and nozzle design. Clever design adjustments mean that the polyurethane reaction mixture can now be processed very gently: optimum results can now be achieved at pressures below 160 bar and temperatures around 50 °C, which place less burden on the isocyanate component, especially.

While air-assisted spray heads are still very much a rarity in the manufacture of structural parts and spray skins, they are commonplace in the field of coatings. Self-cleaning mixing heads such as the **MK 2.0-2K-AS**, which works on the spraygun principle, are now state of the art: they offer excellent mixing quality combined with low dispensing rates, work with and without fan air and have now been used for two years by major OEMs (Fig. 10). Again, atomization by means of air creates a very fine dispersion of the polyurethane and an extremely high-quality surface. These mixing heads, with dispensing rates of 10 to 30 g/s, are used for example in spray bonding and in in-mould coating.

Conclusion

The mixing head programme from Krauss-Maffei Technologies is in constant flux. An overview like this is therefore only a snapshot in time; space constraints preclude a discussion of many proven mixing heads that render sterling service, such as in LFI. Further developments have already been initiated: KraussMaffei recently expanded its product portfolio, for example, with mixing heads for double-belt systems on which easy-assembly insulating elements with two metallic cover layers can be produced very economically. The development of this technology has been entrusted to a dedicated team.
PUR machine makers have had to cope with difficult challenges in recent years. Relentless customer demands for better quality parts, low reject rates, and especially more systematic exploitation of efficiency reserves ensure that designers are kept on their toes as regards creativity and technical expertise. But they have also led to significant developments, such as FCS technology, which is still in its infancy and is an inexpensive spray process for the efficient production of panel-like fibre-reinforced polyurethane parts. This trend will undoubtedly continue. We can look forward to the innovations that PUR technology holds in store for the years ahead.

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Figure 8: Thanks to its long injection lance, the KraussMaffei MK 2.0-2K-S-L spray mixing head is also good at making undercuts in complex parts. (Photo: KraussMaffei)

Figure. 9: Perfect for the production of soundproofing mats made from highly filled polyurethanes: the KraussMaffei MK 10P-2K-F PSM mixing head. The product is characterised inter alia by a new mixing technology. (Photo: KraussMaffei)

Figure 10: Self-cleaning, handy spray-mixing heads, such as the MK 2.0-2K-AS, offer excellent mixing quality in small dispensing rates, spray with and without fan air and are already in series production. (Photo: KraussMaffei)

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