



# AdCoTec

NEWSLETTER FOR THE COATINGS AND ADHESIVES INDUSTRY

ISSUE 1\_2010



**Volker Mirgel**  
Senior Vice President  
Business Unit  
Coatings Adhesives & Specialties  
Marketing EMEA/LATAM

Editorial

*I am very pleased to welcome in the New Year and a new decade with the first-ever issue of a newsletter produced especially for you, our customers and business partners. This newsletter is published by the Business Unit Coatings, Adhesives and Specialties (CAS) of Bayer MaterialScience (BMS) and will focus on product and application news for the coatings and adhesives industry. In line with this, the top story in this first issue looks at the economic and environmental benefits of the innovative polyaspartic binders used in protecting the world's largest media façade from corrosion. Besides putting you in the picture with news of our latest product highlights, another important feature of this newsletter will be our service for you – useful information and advice on issues of topical interest. However, our main intention in publishing this newsletter is to enter into a regular dialogue with you, our customers. We sincerely hope that you take up our invitation and talk to us about what's on your mind. Because that is how we can make our products even more useful and relevant to your business.*

*AdCoTec will be published three or four times a year. The first few issues will be published in both print and electronic form before we concentrate on the electronic version at some later date.*

*I hope you enjoy your read!*



## ■ POLYASPARTIC BINDERS

### Seeing the light in corrosion protection

**Large steel structures have traditionally been protected from the ravages of wind and weather by a three-coat paint system. If the topcoat is based on innovative polyaspartic binders from Bayer MaterialScience, only two coats are needed because a significantly thicker layer of the topcoat can be applied in a single application.**

Before the former Bayer HQ in Leverkusen could be converted into the world's largest media façade, the 30,000 m<sup>2</sup> steel structure had to be protected from corrosion. This was achieved by applying a zinc dust primer based on Desmodur® E followed by a topcoat based on polyaspartic binders marketed under the Desmophen® NH trade name. There were clear econom-

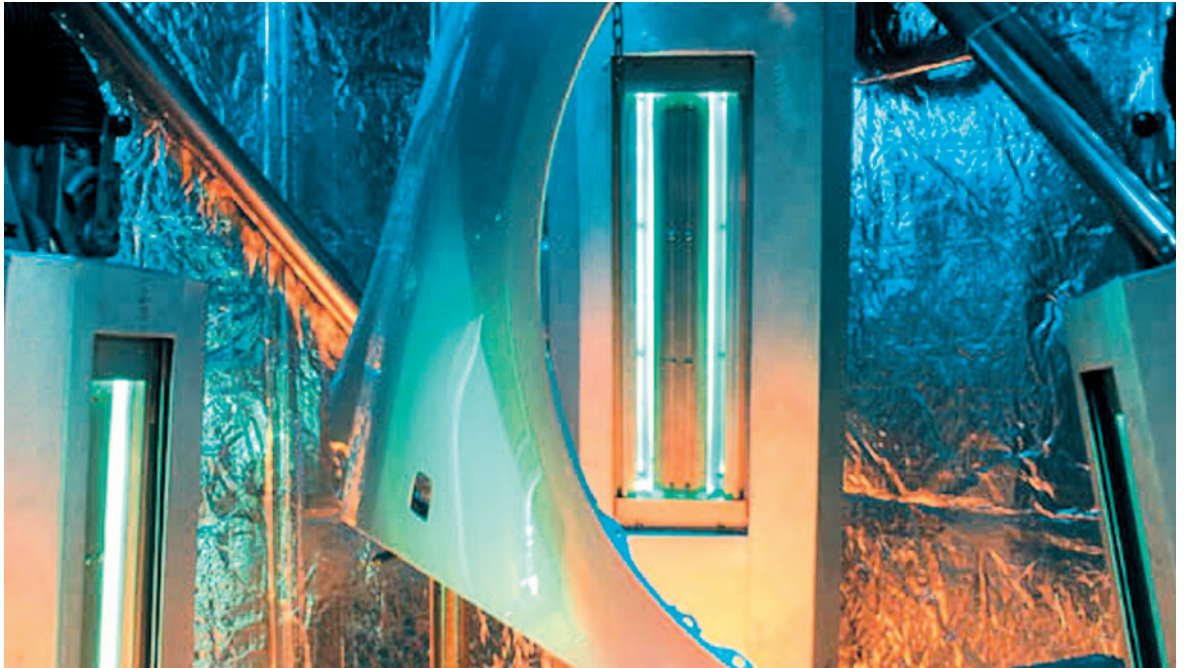
ic and environmental benefits. Only two coats were required instead of three and the primer and topcoat dried in a mere 6-8 hours (at 25° C.) instead of 24 hours for conventional three-coat applications. This brought significant savings of time and labour costs. What's more, the VOC content of this two-layer system was around 40% lower than in conventional three-coat applications. Now suitably protected against corrosion, the 122-metre-high building is the ideal medium for spectacular lightshows and eye-catching corporate messages.

→ Continued on page 6



**Protecting steel structures against corrosion: only two layers are required with a polyaspartics-based coating**

The preconditions for weatherproof coatings: a precise dose of UV radiation and a resistant binder



#### ■ LOW-VISCOSITY ACRYLATED ALLOPHANATES

## UV-curing & weatherproof in corrosive environments

**There is great growth potential for UV-curing binders in high-performance outdoor coatings. Isocyanurate-based materials, currently the first choice for many UV-curing outdoor applications, are hard, weatherproof and scratch-resistant but since they have a very high viscosity, they need diluting with solvents or monomers (reactive thinners).**

Testing the corrosion and scratch resistance of UV-cured coatings

Allophanate-modified urethane acrylates, a novel class of UV-curing resins, are low viscous alternatives to established outdoor-resistant urethane acrylates based on isocyanurates. Since they have a more flexible backbone, they exhibit a much lower viscosity but perform just as well in terms of outdoor stability, scratch resistance, hardness and chemical resistance. There are

options to modify the basic allophanate resin: multi-functional acrylates in the synthesis improve crosslink density and chemical resistance; and the incorporation of an elastifying double bond carrier is a suitable solution if more elasticity is needed.

Allophanate urethane acrylates are ideal for UV-curing coatings on plastic and metal substrates. The low viscosity of these allophanate urethane acrylates even permits formulations without any reactive thinner or solvent. All allophanate urethane acrylates have already proved their excellent stability in different accelerated weathering tests. Thanks to their ability to counterbalance the hydrophilic effect of common adhesion promoters for metal, allophanate urethane acrylate-based coatings can withstand even a corrosive environment.

Such allophanate urethane acrylates can thus be optimally formulated to meet the specific coating needs of different substrates. As Dr. Wolfgang Fischer from Bayer MaterialScience explains, "allophanate-based UV resins give our customers the greatest possible flexibility in the formulation of their coatings thanks to their wide versatility and the absence of reactive thinners."



■ CARBONIC ACID ACTIVATION OF POLYCHLOROPRENE DISPERSIONS

## Imagine if water sticks

Water-borne contact adhesives are nothing new, but they have not been known to combine high initial adhesiveness, easy repositioning and application flexibility.

A water-borne polychloroprene adhesive spray bonds foam and wood

Innovations over the past 30 years have led to a significant increase in the use of aqueous polychloroprene dispersions in the furniture and foam industries and, to a limited extent, in the construction and automotive sectors. A key contributory factor has

been the reduction of volatile components in these dispersions to levels below 50 ppm.

One disadvantage, however, is that typical formulations on the market have to be either activated before application by means of a rather complex procedure or formulated as 1K systems – with limited storage, temperature, shear and transport stability. But now Bayer MaterialScience has discovered that carbonic acid is a user-friendly activation method for water-borne polychloroprene dispersions. This enables high wet adhesion properties to be combined with the simple and reliable handling of 1K adhesives

while still benefiting from the pre-activation storage and transport stability that typifies 2K adhesives.

### Exploiting the huge potential

The outstanding wet-in-wet adhesive potential of water-borne polychloroprene adhesives is known from the 2K spray-mix process. However, this process is more complex and error-prone than 1K formulations and results in additional water and ion input into the adhesive joint. Studies showed that carbonic acid applied in the form of CO<sub>2</sub> gas was the ideal solution. Formulations activated by carbonic acid can be applied in the same way as 1K adhesives. The wet adhesion properties are as good or even better than common 2K formulations and carbonic acid has a positive influence on the open time of the adhesive formulation.

Activation takes place throughout the whole dispersion without locally elevated concentrations – an improvement on 2K formulations – so more uniform wetting on different substrates is achieved and wet adhesion is fundamentally higher. Carbonic acid activation can also be set at a higher level than in conventional 1K formulations without impairing the usability of the adhesive system, e.g. through premature coagulation.

The benefits of carbonic acid-activated adhesives based on new products from the Dispercoll® C range will combine with the products' labelling-free status to open up new fields of application. And there will be no doubts about water sticking well and fast.

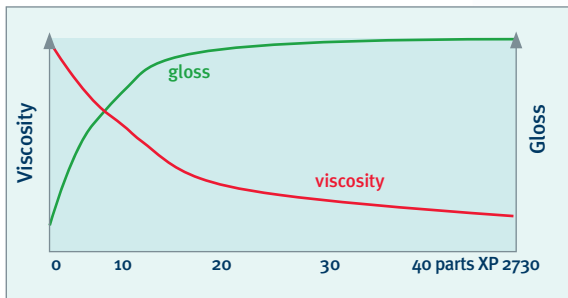


## ■ DESMODUR® XP 2730

## Why not pick ultra-low viscosity?

Is a polyisocyanate (PIC) with a viscosity of less than 100 mPas realistic? Desmodur® XP 2730 breaks this barrier to offer significant benefits, especially in smart combinations with other products from the Bayer MaterialScience PIC range or in appropriate systems as a unique hardener.

The PIC with the world's lowest viscosity helps to solve the challenge of combining less solvent and easy processing with application versatility in 2K PUR systems. Up to now, low viscosity in binders, for example, was achieved by synthesizing smaller molecules – at the expense of performance. Bayer MaterialScience has succeeded in optimizing the PIC side of the 2K PUR equation by decreasing solvent content and improving processing.



An ultra-low viscosity PIC brings benefits in refinishing work

If 20% Desmodur® XP 2730 is used as a reactive thinner, the viscosity of the hardener and complete system can be reduced by up to 80%. In solvent-borne 2K PUR systems, e.g. for refinishing, Desmodur® XP 2730 brings a clear VOC advantage with no deterioration in performance. The clear benefit in water-borne 2K PUR systems is easy mixability with the aqueous polyol, which results in an exponential improvement in gloss and appearance thanks to reduced particle size. Furthermore, less entrapped air, less foam and fewer additives or solvents are convincing arguments for Desmodur® XP 2730 in water-borne 2K PUR formulations. This gives the paint industry greater freedom in formulation options. Though hydrophobic, Desmodur® XP 2730 mixes well with water-borne polyol and hydrophilic Bayhydrol®, thus optimizing the PIC side of 2K PUR paint systems.

## ■ BAYHYDROL® UH XP 2719

## Water is green – and cost-effective on wood

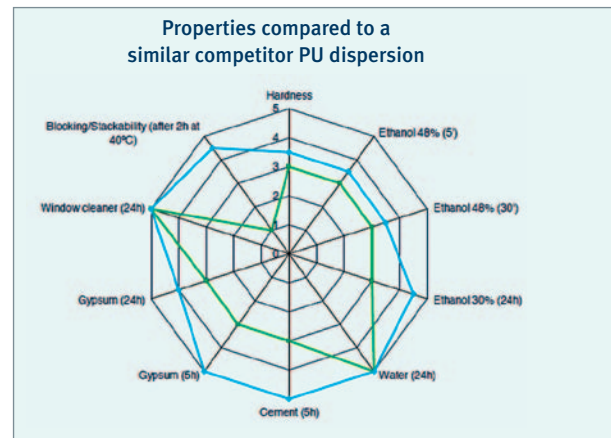
The ecological advantages of aqueous coating systems are clear. But what about their performance?

A new solvent-free aliphatic polyurethane dispersion (PUD) from Bayer MaterialScience, Bayhydrol® UH XP 2719, combines the green qualities of water with cost-effectiveness and performance. This PUD is particularly suited to applications where coatings with high blocking and mechanical properties are required, e.g. industrial wood coatings, interior joinery and parquet coatings. Besides being solvent-free, it is extremely elastic,



The ideal coating for a parquet floor

hard and resistant to alkalis and cleaning agents, offers excellent blocking resistance and dries quickly. Its good compatibility with other dispersions is especially valuable in elastifying polyacrylates and helping to reduce the VOC of a 2K coating system. When cost-effectiveness and performance count, Bayhydrol® UH XP 2719 is the ideal solvent-free solution, proving that water can be green and good.




● Bayhydrol UH XP 2719  
● NMP-free competitor product


 ■ CUSTOMER SERVICE

## D-Day for NMP

1 December 2010 is deadline day for the reclassification and labelling of products containing NMP. A recent amendment to the European Commission's Classification, Labelling and Packaging (CLP) Regulation has tightened up the harmonized classification and labelling of N-Methyl-2-pyrrolidone (NMP). From 1 December this year, preparations with an NMP concentration of  $\geq 5\%$  will have to be labelled as toxic "T" and R61, i.e. "may cause harm to an unborn child". A concentration of  $\geq 10\%$  will require additional labelling with R36/37/38, i.e. "irritating to eyes, respiratory system and skin".

Right at the start of the debate on the suspected fetotoxicity of NMP, Bayer MaterialScience proactively initiated the search for alternatives to NMP in coating raw materials. Bayer has had a lot of experience with production processes for solvent-free waterborne dispersions and alternative NMP-free dispersions are now available for nearly all the products concerned. Moreover, these NMP-free products display coating and application properties that are in no way inferior to conventional systems. NMP-free binders for use in a wide range of coating applications are now available under the Bayhydrol® trade name. If you are still using products containing NMP, we recommend you test the relevant NMP-free Bayhydrol® products as soon as possible – because time is running out for NMP.



Years of experience in NMP-free coatings

## ■ CUSTOMER SERVICE

## What's going on with MDI?

**Chemicals legislation in the EU is a complex business, and the reclassification of MDI is no exception. It will have wide-reaching consequences, but fewer than many in the industry feared.**

### Reclassification timeline

The implementation date for the revised classification of MDI – "limited evidence of carcinogenic effect" – is 1 December 2010. All mixtures containing  $> 1\%$  MDI sold from that date onwards will have to be labelled with R40 under DSD or H351 ("suspected of causing cancer") under the EU Directive Classification, Labelling and Packaging of Substances and Mixtures (CLP).

### Workplace health and safety

The reclassification of MDI will have no impact on workplace health and safety measures. Good practice has to be maintained, e.g. ISOPA's Walk the Talk programme. Like all isocyanates, MDI is already subject to stringent Occupational Exposure Limits (OELs) and here there will be no further restrictions

on MDI handling or use in professional and industrial applications. On the other hand, industrial users may have company-specific policies restricting the use of substances labelled as carcinogen and consumer use may be affected by national restrictions. In Germany, for example, self-service sales of mixtures labelled with R40 will not be permitted to the general public unless an exemption is granted. An initiative to achieve such an exemption has been started by the German Adhesives Manufacturers Association (IVK).

### Risk reduction measures

An EU Directive decrees that mixtures or preparations containing MDI in concentrations  $\geq 0.1\%$  may only be marketed to the general public after 27 December 2010 if the packaging contains protective gloves and is marked with specific handling instructions.

CONTINUED FROM PAGE 1

### Wide range of applications

Polyaspartics also played a key role in rebuilding BayArena, a Bundesliga soccer stadium. "It would never have been possible to keep to the tight schedule without the rapid drying qualities of this new topcoat," says Karl-Heinz Birk, head of the coating shop at Max Bögl Bauservice, one of two general contractors for the rebuilding project. Topcoats based on polyaspartic binders from Bayer MaterialScience are also used to protect the steel towers and blades of wind turbines from corrosion. An additional bonus of these topcoats is their excellent adhesion to metal.

Since Desmophen® NH polyaspartic binders from Bayer MaterialScience combine increased productivity and environmental compatibility with the typical performance qualities of PUR coatings, e.g. durability and flexibility, corrosion protection experts in many fields have now seen the light.



Quality testing ensures both layers are applied properly

CUSTOMER SERVICE

## Where to find out more

Interested in more information about any of the topics covered in this Newsletter – and lots more besides? Simply visit our website.

We hope we have succeeded in informing you about some of the most interesting new developments in coatings and adhesives at Bayer MaterialScience. But a newsletter like this is naturally limited in its scope and format. So if we have whetted your appetite for more, the place to visit is our website: [www.bayercoatings.com](http://www.bayercoatings.com)

There you can not only download a PDF version of this Newsletter (in case you want to mail it on to anybody else), but also find out more about the Bayer MaterialScience portfolio of raw materials for coatings and adhesives. You also may like to log in as a registered user to enjoy privileged access to breaking news and other information of relevance to your business. If you have any specific questions, please do not hesitate to contact us on [cas@bayermaterialscience.com](mailto:cas@bayermaterialscience.com)



### IMPRINT

#### Publisher:

Bayer MaterialScience AG  
Business Unit  
Coatings, Adhesives & Specialties  
51368 Leverkusen

[cas@bayermaterialscience.com](mailto:cas@bayermaterialscience.com)

[www.bayercoatings.com](http://www.bayercoatings.com)

#### Disclaimer:

This information and our technical advice – whether verbal, in writing or by way of trials – are given in good faith but without warranty, and this also applies where proprietary rights of third parties are involved. Our advice does not release you from the obligation to verify the information currently provided – especially that contained in our safety data and technical information sheets – and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of our technical advice are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our General Conditions of Sale and Delivery.