

Beckers Magazine



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Painting a bright future

2018 has been yet another dynamic year with a range of economic and environmental opportunities and challenges around the globe. As a leading supplier of coil coatings and selected industrial coatings, Beckers must adapt to the demands of the global marketplace. Unlike some of our competitors, however, we are a private business with over 30 years ownership by the same family, unconstrained by the short-term interests or quarterly reports. We are willing and committed to invest long-term in creating value and promoting what we consider an essential transition to a more sustainable world.

This frees us to look further ahead, to provide functional solutions not only to current challenges, but to develop sustainable concepts that can transform applications across our key business segments, backed by our exceptional coatings expertise, superior product development programmes and uniquely integrated customer support.

This latest issue of Beckers Magazine addresses some of the innovative ways in which we will achieve our vision of a more sustainable future.

PROACTIVE CUSTOMER SUPPORT

Much more than a supplier of paint systems, Beckers is both partner and adviser to the coating industry. We respond to the current perceived requirements of our customers, but believe that true customer support

should be proactive, pointing to future applications and potential business opportunities. We call this "Adding value beyond the surface", designing coating solutions that stimulate our customers' business operations by anticipating future trends and technical requirements.

The articles in this current issue of Beckers Magazine feature numerous examples illustrating our broader commitment to exactly this kind of customer support. These include the introduction of the SafeIT global classification and labelling compliance system for chemical ingredients, lifestyle marketing insights and the launch of a European advanced logistics management and sourcing system.

ENVIRONMENTALLY RESPONSIBLE

Committed to the development of environmentally compatible paint systems, Beckers has long been a pioneer of waterborne systems, which in recent years have enjoyed resurging popularity in the light of the climate-change debate. This issue features several articles highlighting the multiple benefits of waterborne finishes, while also suggesting solutions to some practical challenges. These include an article on our innovative high-solids Beckqua® Color waterborne basecoats for the automotive plastics exterior market, which offer benefits in terms of a reduced environmental footprint and enhanced coating efficiency. We also highlight the growing demand for waterborne paints in China, fuelled by the country's introduction of ambitious chemical management legislation.

SCIENTIFICALLY RIGOROUS

Another important topic addressed in these pages is that of natural and accelerated weathering. Deter-

mining a coating system's theoretical service life, based on its chemistry alone, is not enough: we need concrete proof that it can do the job. This is a complex, time-consuming and costly process, involving a challenging number of variables. In a special technical feature, James Smith, of our Long Term Development lab, describes how the latest research in accelerated weathering is improving standardized testing methods for exterior exposure.

FLEXIBILITY FOR LONG-TERM CUSTOMER SUPPORT

Always alert to our customers' needs, we also focus on future trends while adopting the latest technological advances, to maintain the flexibility essential to ongoing innovation. To ensure long-term customer support, proximity is an essential component for success, which is demonstrated by our investment into a second site in Vietnam.

We hope this issue of Beckers Magazine offers some useful and stimulating insights for the coming year, as well as providing some inspiration for a bright and sustainable future!



Dr. Boris Gorella
CEO Beckers Group





Front page

Analytical Chemist Beckers Malaysia
Phui Kuan Lee



Renaissance for waterborne coil coatings?



European platform for Domestic Appliance coatings



SafelT – globally compliant labelling and classification



Waterborne industrial coatings surge



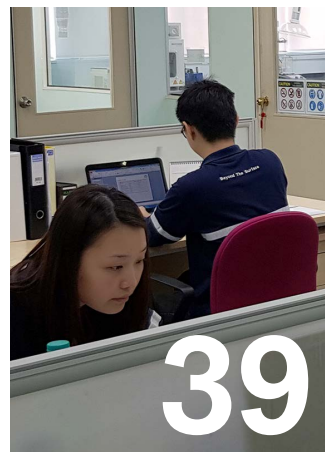
Beckqua® Color waterborne basecoats



Natural and accelerated weathering – a hot topic



Beckry® Shield – the antibacterial solution



Lab upgrade for Beckers Malaysia



Smart sourcing for sustainable freight solutions

Contents

- 4 CEO has the word**
- 8 Renaissance for waterborne coil coatings?**
KC Chew & Eric Xu
- 11 New brochure High Build Systems & Beckers Sustainability Report 2017**
- 12 European platform for Domestic Appliance coatings**
Dr. Paul Sylvester & Loek Smits
- 14 SafeIT – globally compliant labelling and classification**
Dr. Contzen Pereira
- 16 Waterborne industrial coatings surge in wake of Chinese regulation**
Catherine Vincent
- 18 Beckqua®Color waterborne basecoats for the automotive exterior plastics market**
Ignacio Perera
- 20 From functional transport to lifestyle statement**
Adrian Xie
- 22 Natural and accelerated weathering – a hot topic**
James Smith
- 31 Beckers raises the digital bar**
Christophe Perin
- 32 New Alubond coating line for Europe**
Mauro Lozza & Nicolas Sabatier
- 33 Passing the baton**
Christophe Sabas
- 34 First Strategic Partner Award from Chinese major**
Emily Wu
- 35 Expanding prospects in Romania**
Krzysztof Tabor
- 36 Beckry®Shield - the antibacterial solution**
Saravanan Natarajan
- 39 Lab upgrade for Beckers Malaysia**
Dr. Karsten Eller
- 40 Smart sourcing for sustainable freight solutions**
Matthias Fischer
- 42 Cameroon establishes its first coil coating line**
Hérve Fréry
- 44 Addresses**
- 46 COO Editorial**
Dr. Karsten Eller

Renaissance for waterborne coil coatings?

KC CHEW & Eric XU

Beckers has long been a consistent pioneer and promoter of sustainable technology. Some five decades ago, the company was one of the first in introducing waterborne paint to the European coil coating industry.

Already in the 1960s Beckers supplied a waterborne coating to one coil coating line in Sweden, and later on in the 1970s Beckers supplied waterborne acrylic coil coatings to several customers first in Scandinavia and later on to the European markets. Although offering numerous environmental benefits compared to their solventborne equivalents, these early waterborne products initially failed to gain broad industry approval, due to inferior coating performance, paint handling and processing issues and continuous improvements in solvent abatement technology that were steadily reducing the environmental impact of solventborne paints.

Changing times in China

Fast forward to the present and it is clear that environmental concerns are once again a primary driver of change in paint technology. In China, solventborne paints are being subjected to intense scrutiny by the authorities, who are eagerly, if not always consistently, enforcing the country's latest legislation on VOC emissions, the most recent regulation being introduced in January 2018.¹

One consequence of this increased scrutiny has been the closure of a number of coil coating lines following inspection by the authorities. However, these lines

The historical perception that waterborne coil coatings are intrinsically inferior to their solventborne counterparts is no longer entirely valid

produced coil coated steel or aluminium, serving the lower cost sectors of the market. Although high-end solventborne coating operations remain relatively unaffected, such enforcement activities have led to increasing enquiries from coil coaters concerned that reduced emission limits may eventually cause them to cease operations.

As well as citing waterborne alternatives, these recent emission regulations typically favour any paint based on low Volatile Organic Compound (VOC) technology. The advances in VOC abatement technologies such as RTO (Regenerative Thermal Oxidizer) are also noted with approval. RTOs involve a sizable investment however, many coil lines in China lack the necessary financial resources, so waterborne paint presents an attractive alternative.

Many coaters express keen interest in waterborne paints, although such interest is seldom translated into action. Only a limited number of coaters have taken the next step and initiated trials. One such, a major coil coater in northern China, trialled a waterborne topcoat applied to a solventborne primer, noting a performance comparable to a standard full solventborne system. Even so, this did not lead to commercialization, due to the higher cost of the waterborne paint. An equally successful trial was conducted by another major coil coater in Shandong province but, as in the previous case, this also led to nothing.

Elsewhere in Asia and Australasia?

In contrast to the Chinese market, South East Asia and New Zealand seem more receptive to the benefits of waterborne paints, which are currently used on several coating lines. In South East Asia, the paints are used on lower-end products, where coating

properties and performance are not critical. In New Zealand,² however, waterborne paints are applied as topcoats on standard to high-end products. Durability and corrosion resistance is comparable to solventborne topcoats applied on the same substrates and primer.

If viable in South East Asia and New Zealand, why are waterborne coil coatings not more widely adopted by the industry elsewhere? The historical perception that waterborne coil coatings are intrinsically inferior to their solventborne counterparts is no longer entirely valid. Problems in handling and processing, while still present, are hardly insurmountable, as evidenced from the successful adoption by New Zealand coaters and supported by the fact that the line trials conducted in China reported no major processing or handling issues. ►

Watery challenges

One obstacle to the broader usage of waterborne coil coatings is the energy needed for curing. Curing a waterborne paint requires 10–20% more energy than solventborne paint to achieve the same film thickness.³ While the use of water as a solvent is environmentally preferable, the energy requirement seems to negate the benefit, unless the system can be cured at significantly lower peak metal temperatures (PMTs). Waterborne paints are also never completely solvent-free. They usually feature co-solvents that are added or contained in the raw materials, such as resins, crosslinkers and additives. Consequently, solvent abatement systems such as incinerators are still required.

Another challenge is the waste management of water-based effluent and unwanted paint. An on-site water treatment facility would be ideal, but involves a major investment. Suppliers may outsource paint disposal to waste management firms, but it is not always clear where these waste materials eventually end up. This is a serious concern, exemplified in China by a case where a coating supplier was closed down temporarily by the authorities following the inappropriate handling of water effluent by an external contractor. The case aroused general concern in the coating industry about the risks of water pollution relating to waterborne paints.

Apart from these environmental risks, the main challenges associated with waterborne paints are higher cost and lower solids.

A sustainable debate

Whatever the pros and cons of waterborne coil coatings, the increasingly stringent environmental regulations being introduced by a growing number of countries may eventually push the industry towards broader acceptance, regardless of costs and other issues. The industry and its 'ecosystem' will have to adapt.

At Beckers, to address industry requirements and customers' expectations, the redevelopment of waterborne coil coatings is already underway. The true impact of these coatings in terms of sustainability may never be fully known, but it is critical that we adapt to changing needs, actively embracing the challenges posed by increasingly ambitious environmental targets. ■

References

1. The People's Republic of China Environmental Protection Tax Law
2. "Ecofriendly Coil Coatings – Meeting Tomorrow's Needs Today"; L. Gommans, S. Morrison; Journal of Surface Coatings Australia, Oct 2017, pp14-22
3. Simulated using ECCA's Continuous Coil Coating Modelling Software

Characteristics	Compared to solventborne coil coatings
Coating performance	Comparable
Energy needed for curing	Higher
Energy from solvent incineration	Insignificant
VOC level	Much lower
Health and safety	No fire hazard, negligible odour and solvent evaporation
Paint handling and processing	Generally more difficult
Solids content	Generally lower
Paint costs	Higher for same quality
Special coating line requirement	None
Sustainability credentials	Perceived to be much superior

Characteristics of current waterborne coil coatings v. solventborne coatings.

Sustainability Report 2017 in new format

Check out our website because this year Beckers publishes its Sustainability Report in a digital format making it possible for us to include interview films and animations. You can learn how Beckers aligns to


the global United Nations Sustainable Development Goals, performance, stakeholder's feedback, social initiatives and much more.

3.0 Working on impact

To become truly sustainable – environmentally, socially and economically – we continue to work across all our functions, with partners along our value chain and with communities.

3.1 Tackling the challenge of environment, health & safety at Beckers

2017 was a challenging year for occupational health and safety at Beckers. Find out how we are tackling it.




3.2 Joining forces to make our operations more sustainable

2017 was a challenging year for Environmental Health and Safety (EHS) at Beckers. Safety is the top priority for our business. Here we share what happened and our plan going forward, because transparency is important to us!

3.3 Our results

See how we are measuring up on our commitments around water, energy, VOCs and climate emissions.



3.4 How solar is lighting the way ahead



3.5 Greater insight for faster progress

Find out how EcoVadis is helping us monitor our impact and improve our performance and that of our suppliers.

3.6 We are proud of our people

At Beckers, we believe social sustainability is as important to our future as environmental sustainability – it is impossible to have one without the other.

3.7 The Beckers sustainability awards


Meet the first winners of our new sustainability awards.

3.1 Tackling the challenge of environment, health & safety at Beckers

For us, employee wellbeing is one of the most important aspects of social sustainability and occupational health and safety is a major part of that. In the words of our CEO, "Having worked in the chemical industry for over twenty years and seen what could happen, I am well aware how important Safety is for all of our employees and therefore it is so important that we all strive to achieve our vision of zero accidents."

Our 2018 Sustainability Report featured an in-depth article on occupational health and safety at Beckers, including stories from our inaugural Global Safety Day. We also reported on an encouraging downward trend in the number of accidents and Loss Time Injury rate (LTI). LTI refers to the number of work related injuries that result in absence the next day or shift, per million work hours.

Unfortunately, in 2017, both indicators moved in the opposite direction. This is largely because of an increase in LTI at one specific site, all other Beckers' sites have maintained or improved their LTI numbers since 2015. Nonetheless, we have responded to this year's performance with a set of mitigating actions and a long term plan to continue towards our ultimate goal of zero injuries, no lost work days and no occupational diseases in Beckers Group.




Actions

We used EHS by:

- Running routes for Safety Observation and Near Miss Reporting
- Improving our communications with the launch of an EHS Monthly Bulletin, the Chemical Regulatory News Bulletin and the EHS 360 Newsletter
- Releasing Safety Alerts for all significant incidents, with learnings and preventive actions
- Conducting EHS observation audits at all levels
- Creating and conforming to Personal Protective Equipment rules
- Starting every meeting with a safety brief

New brochure!

Beckers' High Build Systems offers a range of products featuring a variety of alternative systems, textures and gloss levels.





Beckers Group is a leading worldwide supplier of coil coatings with an international organisation that ensures global coordination and consistent product standards. We are flexible and innovative and work in close cooperation with our customers.

We are focused on developing sustainable coatings – our vision is to become the most sustainable coatings company in the world.

Beckers' High Build Systems offer a range of products featuring a variety of bespoke resins, textures and gloss levels – all with the same potent properties:

- Exceptional surface hardness
- Superior scratch resistance
- High durability
- Flexibility
- UV resistance
- Excellent anti-corrosion performance







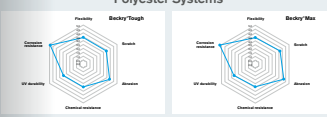
Performance

Beckers' High Build Systems offer a broad range of application options. Whatever your climate, corrosive environment or cost parameters, our systems offer the optimum balance between application properties and long-term performance.

Polyurethane Systems



Polyester Systems



Beckery Duro is a highly UV-resistant coating system offering excellent chemical stability for cladding, roofing and rainwater systems. Scratch and corrosion resistant, it is the preferred choice for markets where coatings are exposed to sunlight or abrasive conditions, such as those caused by sand. Also suitable for indoor applications, where industrial buildings may be exposed to pollution.

Beckery Tough ensures a tough surface that combines good flexibility with high corrosion and scratch resistance. Its low gloss level makes it ideal for coating container systems and in the manufacture of roofing sheets.

Beckery Max structured surface and bespoke resin chemistry also provides excellent performance for roofing and container systems. Beckery Tough and Beckery Max properties make them suitable for colder climates.

Beckery Tex PUR is a durable coating system especially suited for roofing. This weather resistant product features a range of versatile aspects.

The brochure is available in English, French, Russian and Spanish. You can download it from our website or contact coilcoatings@beckers-group.com

BECKERS MAGAZINE 2018 | 11

European platform for Domestic Appliance coatings

Dr. Paul SYLVESTER & Loek SMITS

Beckers Group has a long and distinguished history in specialty coatings for Domestic Appliances such as refrigerators and washing machines, as well as applications like interior lighting and climate control appliances.

Our robust product portfolio is the result of more than 30 years' technical and application experience. Now these considerable resources are being concentrated in a dedicated focus-group, to maximize innovation potential under a Europe-wide programme.

...the Domestic Appliance market continues to offer considerable growth potential – and we mean to play a key role in such growth



Core Beckers strengths are the ability to respond rapidly to volatile market trends and the capacity to fulfil the shifting requirements of customers and OEMs. Recent developments in the Domestic Appliance market have involved a change in Beckers' perspective, with a shift in focus from England to Central Europe. This has led to a strategic decision to concentrate resources in the form of a coordinated European platform, with a view to leveraging the company's accumulated expertise and thereby optimize commercial opportunities.

This concentration of resources is already bearing dividends. Deliveries to customers such as Voestalpine, Thyssenkrupp and ArcelorMittal make Beckers Germany one of the leading European suppliers of several approved specialty paint systems for global OEMs like BSH, Samsung and Whirlpool. Significant additional amounts are also being supplied to the global OEMs by Beckers production units in France, the UK and Turkey.

Coordination of sales and marketing activities for all stakeholders across Europe is handled from Beckers Germany. This coordination and concentration of the Group's comprehensive coating expertise in the Domestic Appliance sector, creating

a unique Centre of Excellence, is crucial to continued success in this challenging market. We are convinced that the Domestic Appliance market continues to offer considerable growth potential – and mean to play a key role in such growth. ■



From left to right: Chemist Christian Fischer, DA Technician Ivan Stampf, DA Commercial Project Leader Loek Smits, DA Technical Project Leader Dr. Paul Sylvester & DA Technician Kimberly Taylor Burmeister

SafelT – globally compliant labelling and classification

Dr. Contzen PEREIRA



SafelT is an in-house Environmental, Health and Safety project focused on the concept 'One Beckers – One IT platform'. The aim is to promote and maintain compliance in labelling and classification of the chemical contents of Beckers products, in line with all national and international regulations. By establishing a consistent global approach to classification, the SafelT system will also enhance the safety of our own employees, customers, other stakeholders and the environment at large.

SafelT programme eliminates uncertainty

Chemical products enhance and facilitate modern living in innumerable ways. Used incorrectly or carelessly, however, they can also have an adverse impact on humans and the environment. Over the years, to mitigate these potentially adverse effects, numerous

countries and organizations have developed regulatory legislation that requires suppliers of chemical products to provide users with detailed information on contents and usage, in the form of labelling and Safety Data Sheets (SDS).

Although similar in many respects, these regulations differ enough to require differ-

ent labels or SDS for the same product in different countries. Companies engaged in international trade must naturally comply with these laws and regulations, requiring the creation of many different labels and SDS. The SafelT programme is Beckers' solution, resolving the challenges posed in developing and maintaining a comprehensive system for the classification and labelling of its chemical

products. Able to collate, cross-reference and process a huge range of data, the SafelT software ensures full compliance with the most complex labelling requirements, for even the most highly-specialized niche sectors.

The SafelT team

The SafelT programme is managed by Beckers' Global Environmental Health & Safety (EHS) Director, supported by Beckers' Global Chemical Regulatory teams based in India, Sweden, France and Germany. The Global Chemical Regulatory Group in Goa, India, provides support on all regulatory and compliance-driven initiatives worldwide, employing fully integrated software from a leading EHS software provider.

The team in Germany assists with the entry and update of raw materials for Beckers' European sites as well as other country-specific regulatory aspects. This team collaborates closely with our Swedish-based Global Raw Material team on the verification and analysis of the chemical data provided by our suppliers, prior to entry into the system.

Our SafelT programme team necessarily comprises a highly diverse group of experts in chemical toxicology, regulatory toxicology, organic and inorganic chemistry, the biological sciences, biochemistry, paint technology, sustainability, information technology, systems processing and systems programming, dedicated to ensuring that Beckers' labels and SDS are 100-percent compliant wherever the Group operates.

The SafelT software

The enterprise-level EHS software provides a highly flexible solution that enables Beckers' team of experts to create, manage and distribute the latest regulatory content and workplace safety documents (SDS, labels, workplace safety cards, transport

emergency cards), required when marketing and shipping Beckers products. The system contains regulatory data for thousands of chemical substances, a phrase library featuring countless phrases translated into more than 45 languages – and a range of regulations governing the automated creation of SDS and labels, involving hundreds of pre-formatted compliance-approved templates.

Fully integrated with Beckers' main Enterprise Resource Planning (ERP) systems, the EHS software helps analyse materials and products, performs material requests and approvals and enables the publishing and distribution of safety documents, driving quality and compliance processes across the entire product lifecycle.

Vigilant and alert

An ambitiously comprehensive system, SafelT has been successfully rolled out at Beckers sites in the US, Poland, Sweden, the UK, Malaysia, Vietnam, Indonesia and China; and the successive roll out at all sites will be completed within the next coming years.

Continuous support and the management of on-going requests, updates and regulatory

changes from these countries are currently handled by the Global Chemical Regulatory Group in India, which maintains 24/7 vigilance to detect any business-critical failures in compliance.

The team is also responsible for ensuring the rapid processing of requests from respective countries/sites, as well as implementing regular upgrades to reflect changing regulatory requirements in various countries, without impinging on the day-to-day operation of the SafelT platform. Wherever you operate and whatever regulations may apply, you can relax. As a Beckers customer, you can be certain that our products always comply with the latest legislation – thanks to SafelT! ■



The teams in Sweden and India. From left: Agneta Pettersson, Gunnel Gustaver, Sandhya Edara, Gabriella Åström, Contzen Pereira, Neha Naik, Shradha Shirodkar & Shameen Dabolkar

Waterborne industrial coatings surge in wake of Chinese regulation

Catherine VINCENT

China's blistering pace of commercial and industrial development has promoted equally rapid development in the field of environmental regulation. As part of the ongoing effective control and supervision of the potential impact of its industrial operations, China is reorganizing its current chemical management system, establishing a new department focused on hazardous chemicals, as well as forming new ministries with responsibility for environmental regulation.

Atmospheric change

Many changes have already been implemented and are having an impact on the Chinese chemical industry, causing knock-on effects throughout the entire production chain, both upstream and downstream.

These changes include a four percent tax on Volatile Organic Compounds (VOCs) and the imposition of an Environmental Protection Tax (EPT). The latter applies to all emissions, ranging from VOCs to solid wastes and waste water. Furthermore, these costs are non-tax-deductible for business purposes.

The Chinese decision to vigorously promote a reduction in VOC levels has generated new momentum in the development of waterborne coatings, heralding dramatic change across the entire Asia-Pacific region.

Current statistics determine that China releases more than two million tons of VOCs into its atmosphere every year. Industrial solvents are a major source of these problematic emissions, accounting for some 30 percent of the VOCs released into the environment. Traditional coatings, formulated with organic solvents and diluents, rep-

resent a significant share of such solvents. Depending on formulation and end use, the levels of solvent in solvent-based coatings may range from 40 to 60 percent. These solvents evaporate during the curing process and, if no mitigating procedures (such as filters or an afterburner) are in place, are released directly into the atmosphere.

Featuring significantly lower levels of VOCs than solvent-based systems, waterborne paints offer an increasingly attractive option for industrial coatings. Enabling the total or partial replacement of organic solvents



with water, they can eliminate or dramatically reduce VOC emissions. This said, in spite of the obvious environmental benefits of waterborne paints, a transfer from solvent-based to waterborne systems also poses a number of practical challenges, in terms of plant and production. Some of the most obvious challenges are:

- 1.** Generally speaking, the application window (temperature and humidity) is narrower than for solvent-based systems, due to the specific evaporation curve of water.
- 2.** The water present in the process constitutes a corrosion risk, requiring the potential replacement of current process equipment (stainless steel instead of mild steel, coated piping instead of bare metallic piping).
- 3.** Increased energy consumption in connection with the curing process. Curing waterborne systems is more energy intensive



than for solventborne equivalents, involving greater cost.

- 4.** Co-solvents or coalescent may be required to promote film forming, involving an additional extraction process from the water vapor generated during drying.
- 5.** The paint chemistry must be adapted to ensure the appropriate reaction in the presence of water (e.g. polyurethane coatings).
- 6.** Last but not least: these waterborne coatings must provide the same high performance as their solvent-based counterparts – in every respect!

As growing pollution promotes increased awareness of the urgent need for environmental protection and regulation in the Asia-Pacific region, it seems likely that other countries will follow China's lead in terms of tougher legislation. One consequence is likely to be a significant increase in the usage of waterborne paints and coatings.

As a leader in the development of innovative waterborne products for a broad range of industrial coatings, Beckers is ideally placed to meet this growing demand for more sustainable products. ■



Beckqua® Color waterborne basecoats for the automotive exterior plastics market

Ignacio PERERA

As an innovation-driven company, the Beckers Group is deeply committed to long-term industrial sustainability. Consequently, the need to mitigate environmental impact forms a key element of the Group's R&D programmes. Beckers is introducing the state-of-the-art Beckqua®Color waterborne basecoats for bumpers, mirror caps and door handles. The project initiated two years ago by the Group's Automotive Plastics Exterior segment, provides an excellent example of progress in this area.

Until recently, due to differences in local regulations and manufacturing philosophies, Beckers' extensive experience in bumper coatings in Scandinavia had largely been limited to solventborne solutions. Upgrading existing waterborne technology to the latest industrial specifications was not a practical option. The decision was made to launch an entirely new development project, featuring brand new technology, new formulations, some new resins and a complete range of new tinting pastes.

Two years of intensive development led to the creation of a series of highly effective prototype waterborne coatings in white, black metallic, silver and solid red – the four basic colours required for technical approval by prestigious automotive manufacturers such as Volkswagen and Daimler.

Following successful in-house testing, the prototype coatings were forwarded for external testing at the Sames Technologies

facility in Grenoble, France (application tests) and the Q-Lab facility in Saarbrücken, Germany (technology validation tests).

Unique benefits

This new Beckqua®Color range of waterborne coatings offers unique benefits that include a solid content 20-30% higher than competing products, as well as enhanced appearance – the result of a smoother film surface that eliminates any visible "orange peel" effect.

In the case of a white coating, this dramatic improvement in solid content means that a coating line with a normal annual paint consumption of 60 tons can reduce this to 45 tons. This translates into 750 fewer pails of paint that need to be transported, kept in a climate-controlled warehouse and eventually disposed of, once used. The environmental gains are obvious. Additionally, higher solids

offer customers greater efficiencies and lower defect rates for coated components.

The practical, economic and environmental benefits are compelling arguments for adopting these new Beckqua®Color waterborne coatings. We believe the multiple benefits of these innovative coatings speak for themselves and we expect to start deliveries soon. ■



From functional transport to lifestyle statement

In an increasingly competitive global market, the key to sales success in the consumer sector depends on creating a product that stands out from the crowd, a product that offers unique – and uniquely appealing – qualities. Whatever the product, colour, texture and finish are critical elements in determining how it is perceived by the consumer – and in its ultimate market success. Visual impact is crucial in grasping the attention of a potential customer. As a globally recognized pioneer in innovative finishes, creating visual impact is a Beckers speciality.

Adrian XIE



E-scooters from Yadea

With a huge population and vast range of choice in terms of consumer products, China poses a massive marketing challenge when it comes to communicating the unique qualities of a specific product. This is particularly true of mass produced items that have a universal appeal and are available in every conceivable variant – such as scooters. One of the most popular forms of transport, especially in the highly congested environments of the world's largest cities, the ubiquitous scooter has had to evolve to meet the twin challenges of air and noise pollution. Thanks to the development of ever lighter and more powerful batteries, the noisy, smelly, fossil-fuelled scooters of recent decades will soon be history.

Electrifying development

The future lies with electrification – enter the E-scooter. Something between a bike and a motorbike, the E-scooter is pollution-free, almost silent, affordable, flexible and, in China, requires no formal driving

licence. This has made it especially popular in the world's most populous country, where E-scooter sales account for more than 80% of the entire global market.

Innovation the key

Such vast potential naturally generates fierce competition, and thousands of companies are determined to exploit the opportunities offered. However, relatively few have the necessary innovative skills, technical know-how and sufficiently sophisticated production facilities to fully realize the market potential – which is where Beckers China comes in. Offering uniquely innovative coating solutions, it is helping transform an already attractive product into a lifestyle necessity.

Living the dream

In earlier times, market success could be assured if a product was functional, reliable and competitively priced. In today's fashion-

conscious world driven by social media, product appeal is all about lifestyle choices. The E-scooter is no exception. In China, exhaustive consumer research has demonstrated that people apparently care more about design than function. Even the top ten manufacturers are reassessing their technical strategies and tactical design approach.

The future is here

Responding to the industry's new awareness of a need to change its marketing emphasis, Beckers China decided to launch a road show to promote its inspirational approach to coating innovation, radical colour trends and style-defining finishes. Beckers cannot claim to predict the future – but can certainly point in the right direction.

Yadea is one of the first of China's leading E-scooter brands to fully appreciate the true breadth and value of the support Beckers can offer at every stage of the supply chain, from trend analysis to mass production.

Lifestyling

As in consumer electronics such as mobile phones, colour, design and surface finish can be used to tailor an E-scooter's image to reflect its owner's personality and lifestyle preferences, paralleling the marketing techniques of designer brands in other consumer sectors.

Responding to this emerging trend, Yadea – in association with a number of leading international design companies – has launched an innovative design strategy which focuses on creating a pre-eminent version of two-wheeled transportation for the global market. This new design strategy is being combined with a new marketing strategy, avoiding conventional participation in trade fairs and exhibitions. Instead, Yadea is launching its new 'lifestyle' E-scooter by staging special-invitation press conferences, at which the designer of the new series will personally present the story of its birth and gestation.

Creative partnership

Thanks to its innovative and trend-driven profile as a coating supplier, Beckers China has forged a strong and increasingly close relationship with Yadea since 2017. The company is convinced that the outstanding performance and unique finishes offered by the Beckers range of coatings will have a major impact in differentiating Yadea's product from other domestic brands.

"Beckers offers much more than mere sampling and colour matching services. The company provides both trend analyses and consistent innovation, both in terms of technology and aesthetics. This is perfectly in sync with our design priorities!" notes Yadea.

By maintaining our commitment to innovation in colour, texture and performance, we at Beckers firmly believe we can convince the market of the literal truth of our corporate slogan: "Adding value beyond the surface!" ■



The owner of this house was surprised when the steel siding changed colour in the sun. As the blue pigment degraded, the colour changed from blue to brown

Natural and accelerated weathering – a hot topic

James SMITH

Why coat things?

Traditionally, coatings have primarily been used to add colour. However, with the passing of time, coatings have become so much more. We now produce coatings that are not only aesthetically pleasing but that add further value to the coated article. This added value may be in the form of protection (as from abrasion, corrosion, UV radiation or chemicals), in the unique nature and feel of a finished surface or in its functionality (thermal or pollution control). Modern coatings can also extend the service life of coated articles, in some cases more than 30 years.

Why test?

Determining a coating system's theoretical service life, based on its chemistry alone, is not enough: we need concrete proof that it can do the job. Obviously, we could just place a coated sample in its planned location and leave it exposed for the test period – and then check the end result. Not practical – for two reasons. First, this approach would involve spreading small metal panels at every conceivable location during the test period. Second, a 30-year wait prior to being able to market a coating would be totally unfeasible. A quicker method is needed, one that is more consistent and that enables more accurate comparison between coatings. This has led to the development of a large number of international testing standards for coatings, designed to standardise testing across all coatings suppliers for a given industry. These standardised test methods typically involve exterior exposure and accelerated weathering techniques.

The standard applied for exterior coil coatings is EN 10169-2 (section 6.2.2.3.2). In this standard, the UV durability classification of a coating is determined after 2000 hours testing in a UVA cabinet (according

to EN 13523-10) and two years exposure at a weathering site featuring a minimum of 4 500 MJ/m² cumulative solar energy. The performance requirement for UV durability levels is shown in *figure 1*. As can be seen, the standard does not require exactly the same performance level from both natural and accelerated tests. However, it does imply that 2000 hours in a UVA cabinet may be equated to two years exposure (if the differences in performance requirement are taken into account). ▶

Test requirements UV resistance category	R _{UV2}	R _{UV3}	R _{UV4}
Natural exposure			
Maximum colour change ΔE^*_{max} ^a during test. (CIELAB units)	5	3	3
Minimum retained gloss after the tests (RG) ^b , %	30	50	80
Accelerated exposure			
Maximum colour change ΔE^*_{max} ^a during test. (CIELAB units)	5	3	2
Minimum retained gloss after tests (RG) ^b , %	30	60	80

Figure 1: Performance categories for EN 10169-2

- a, The ΔE^* value is not applicable for saturated and other special colours such as metallics and shine.
- b, The retained gloss is expressed as a % of the original, it is not applicable to textured finished coatings.

Resin	T _g (°C)	Hardness (N/mm ²)
Std SDPE	28	91
SDPE mod 1	33	144
SDPE mod 2	58	262
Hi T _g Ar 3	63	280
Hi T _g Ar 4	55	226
Euro std PE	33	145

Figure 2: Physical characteristics of coatings tested (average of three colours). See also page 27.



When developing super-durable systems that have guaranteed usage lives of more than 25 years, the standard exposure time of two years is simply not sufficient. Significant natural weathering exposure at external test sites is required to validate the performance of these products (5-10 years at least). This raises two major issues: first, the time taken to get results and – second – the costs involved in paying third party companies to conduct the exposures. Therefore, in spite of the apparent dissonance, we use accelerated weathering to screen systems before we

place them for exterior exposure. Customers are also demanding that we UVA-test our systems for up to 6000 hours. Once again, this means a considerable wait when screening new materials. Consequently, our specialists at the Long Term Development (LTD) unit have been studying ways to accelerate the durability testing of experimental products, to achieve more focused development.

What we did

The EN 13523-10 standard defines the method for accelerated UV testing as follows:

“Cycle the test specimens through periods of four hours of dry UV exposure at a black panel temperature of $(60 \pm 3)^\circ\text{C}$, followed by a period of four hours of water condensation exposure, without radiation, at a black panel temperature of $(40 \pm 3)^\circ\text{C}$ (one cycle consists of eight hours exposure).” ▶



45° South facing Open backed Exposure

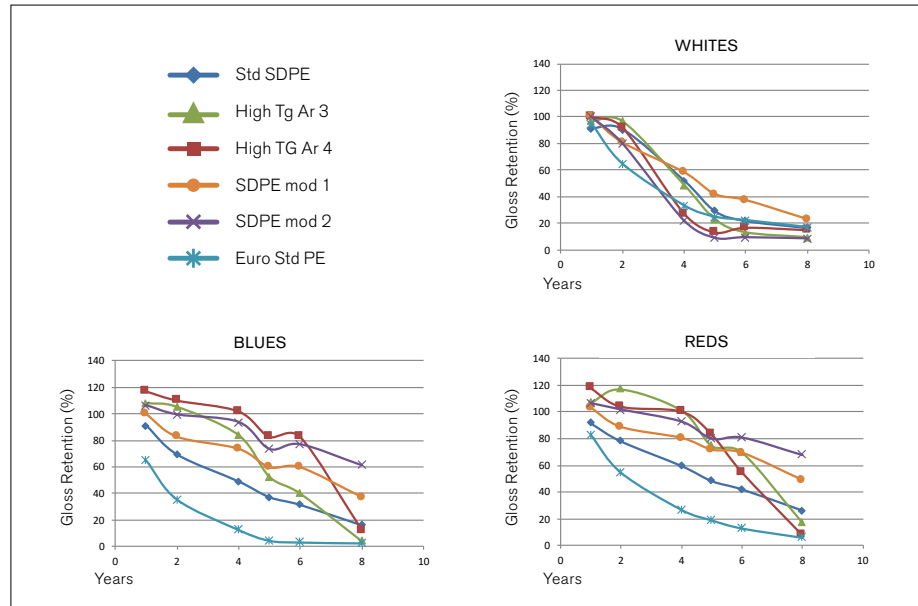


Figure 3: Gloss retention results from Florida

45° North facing Open backed Exposure

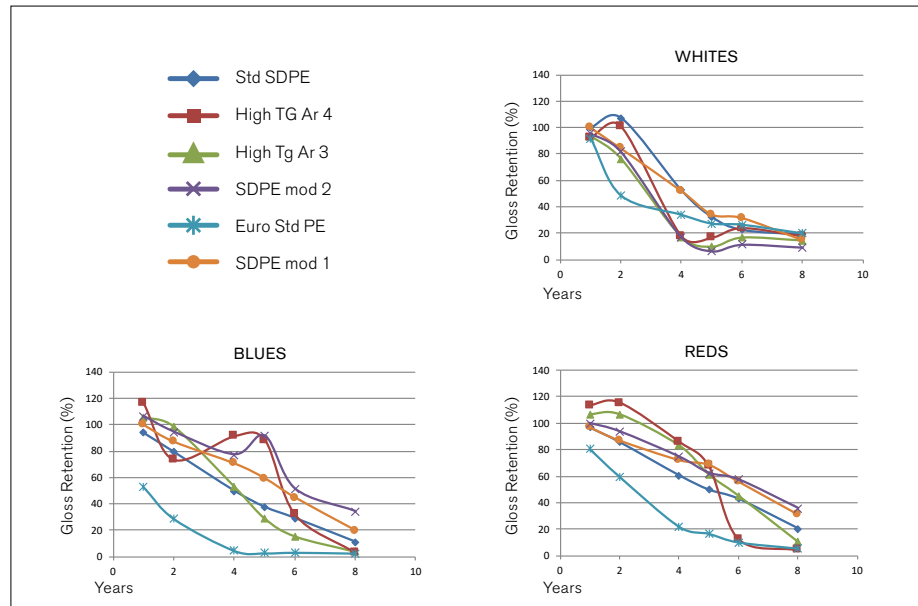


Figure 4: Gloss retention results from Allunga

Glossary figure 2-6:

PE = Polyester
 SDPE = Super-durable polyester
 Tg = Glass Transition Temperature

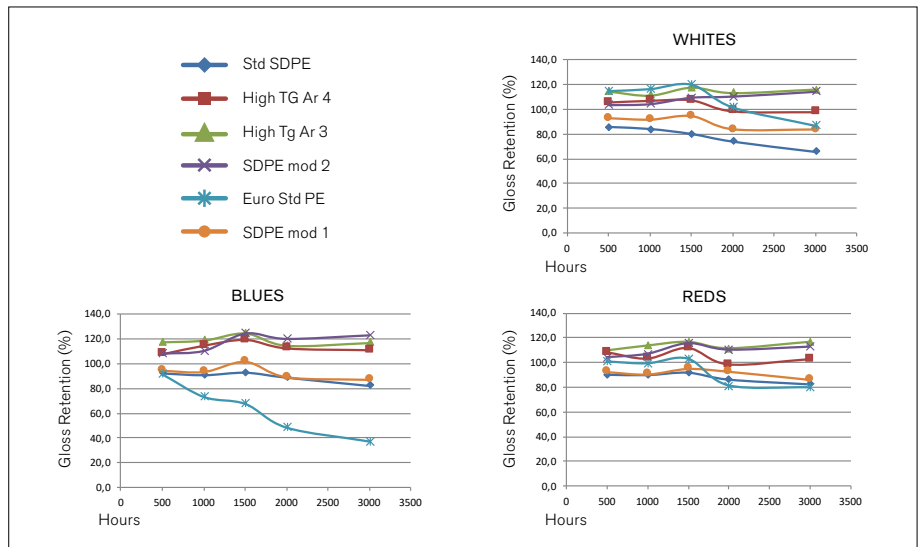


Figure 5: Gloss retention results, standard UVA testing

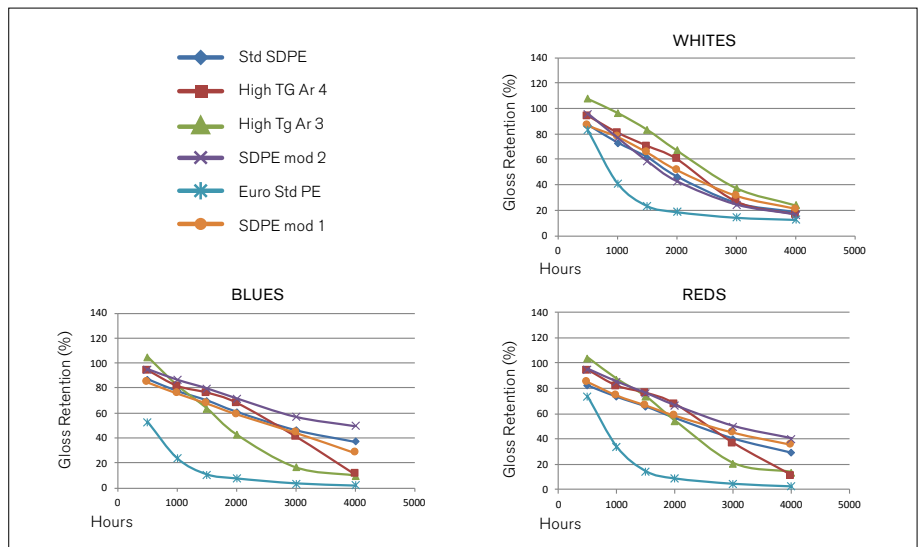


Figure 6: Gloss retention results, "hot UVA"

For UVA testing, lamps with emissions starting at a wavelength of approximately 300 nm with a peak emission at 340 nm are used. As already noted, we need a way to get results more quickly. In the hope of achieving this, LTD has started using the following method (again using 340A bulbs):

"Cycle the test specimens through periods of eight hours of dry UV exposure at a black panel temperature of (80 ± 3) °C, followed by a period of four hours of water conden-

sation exposure, without radiation, at a black panel temperature of (50 ± 3) °C (one cycle consists of 12 hours exposure)."

It may seem counter intuitive to say that changing to a test method that features a four-hour-longer cycle time will yield a quicker indication of exterior performance. However, what contributes to shorter total test times is the increase in temperatures for both periods.

Case study: Effect of resin backbone chemistry/ structure on durability

In 2006, a study was undertaken to try and improve the performance of Beckry®Tech for more aggressive environments. The study was designed to evaluate the impact of increasing the Tg (Glass Transition Temperature) of the coating to improve durability. Both aliphatic and aromatic systems were chosen and compared to the standard

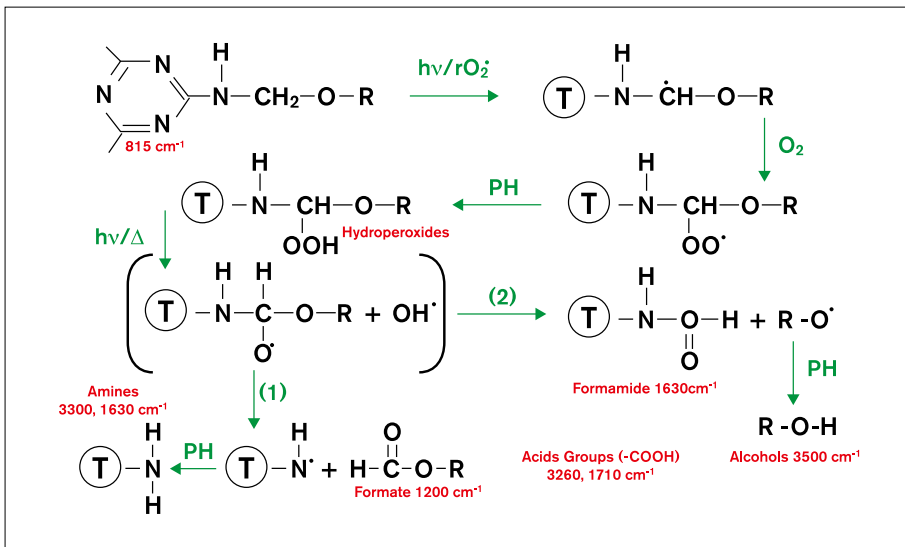


Figure 7: Mechanism for the photo-oxidation of polyester melamine coatings

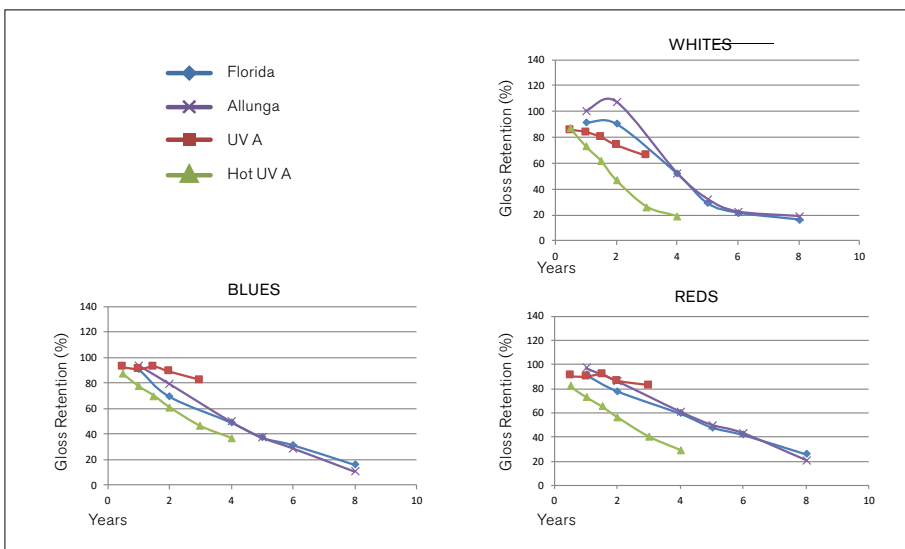


Figure 8: Summary of all testing of super-durable polyesters (with 500 hours=6 months standard UVA & "hot UVA")

Beckry®Tech system (Beckry®Pol was included to highlight the difference in performance between the standard polyester and the super-durable polyester). The coating characteristics for the materials tested are shown in figure 2. The resins were evaluated in three colours: white, red and blue, to make sure that any conclusions drawn could be related to the resin chemistry, not the pigment chemistry. For the same reason, this study only focuses on gloss retention, not colour change. Panels were exposed in

Florida and Allunga (Australia) for natural weathering, whereas for accelerated weathering both the standard UVA and new "hot UVA" methods were used. In the case of standard UVA testing, the panels were tested for 3000 hours and, with the "hot UVA" method, for 4000 hours. The results are demonstrated in figures 3-6.

What we discovered

One of the first things to come out of the

study was the difference in performance between the white and the red and blue paints. With all of the resins tested, the white coatings have poorer gloss retention than their red and blue counterparts. This is due to the photo-active nature of TiO₂ which, when exposed to UV radiation, produces O₂ radicals that degrade the polymer network (see figure 7). The blue and red coatings contain much smaller amounts of TiO₂, resulting in much less free radical degradation. ►

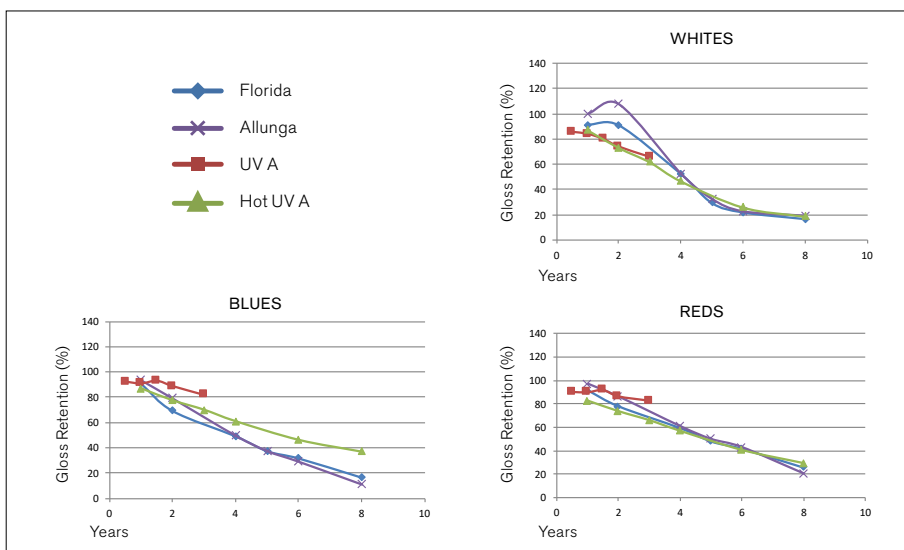


Figure 9: Summary of standard super-durable polyester testing (with 500 hours = 6 months standard UVA & 12 months "hot UVA")

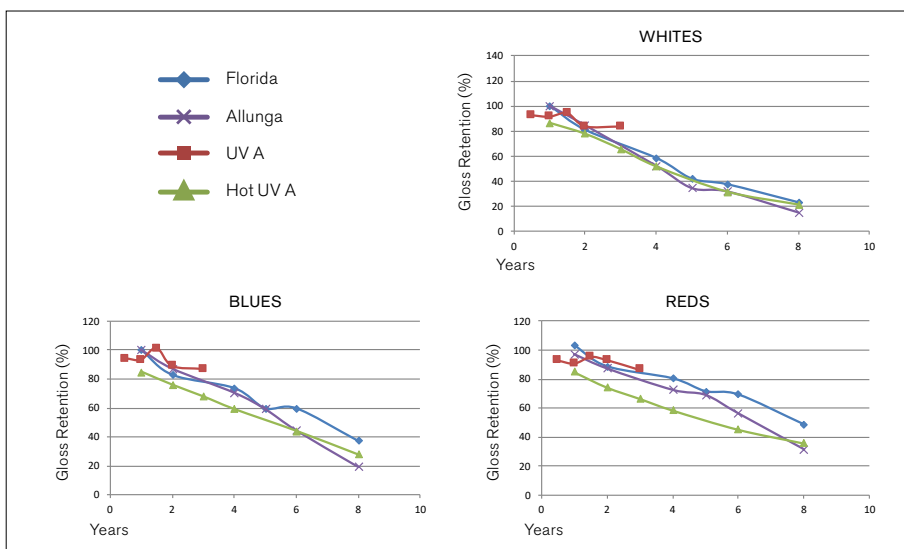


Figure 10: Summary of super-durable polyester mod 1 testing (with 500 hours = 6 months standard UVA & 12 months "hot UVA")

Another observation from the 3000-hour UVA test was that gloss retention for all the super-durable resins tested (both aromatic and aliphatic) noted little change. In contrast, the Florida and Allunga tests, as well as the "hot UVA" tests, showed a greater change in gloss level over similar time scales (three years for exterior testing and 3000 hours for "hot UVA" testing). In fact, judged simply by the results of standard UVA testing, it would appear that the best resins to use are the high-Tg Aliphatic

system and the two high-Tg Aromatic systems. This conclusion would also seem justified by the exterior weathering results in both Florida and Allunga after three years. However, if we look at the results from both of the weathering sites after longer exposures, then we see a dramatic change in the performance of the aromatic systems. In all of the colours, at both sites, the gloss retention of the aromatic systems notes a dramatic decline between four and six years and after eight years the aromatic systems

are being outperformed by all the aliphatic systems (even the standard system). This might of course relate to a coating that features a design life of more than 20 years. Clearly, 3000 hours of standard UVA testing simply gives no indication of the potential coating failure that can be revealed by natural exposure.

How hot is "hot UVA"?

As can be seen from comparing the results

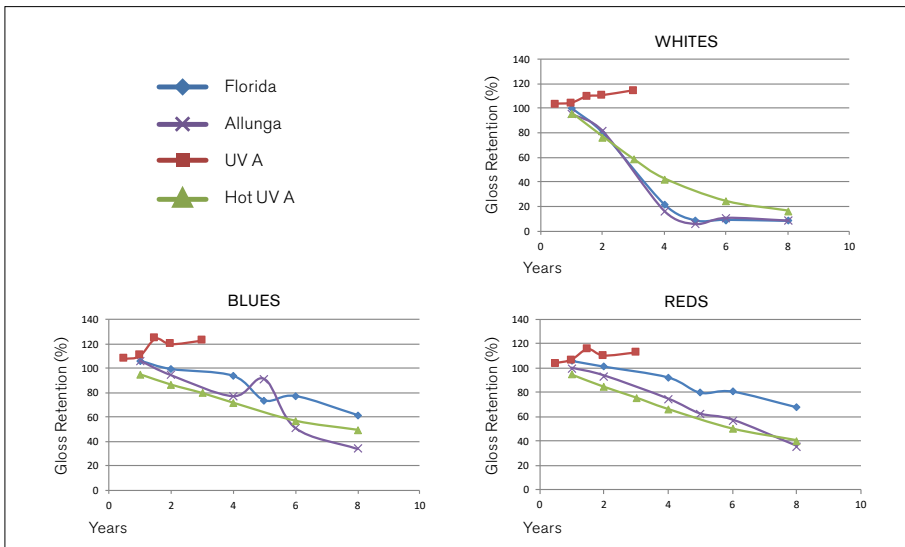


Figure 11: Summary of super-durable polyester mod 2 testing (with 500 hours = 6 months standard UVA & 12 months "hot UVA")

in figures 5 and 6, the "hot UVA" test is more aggressive than the standard UVA test. Given the longer cycle time at a higher temperature, this is not a surprise. However, what we are looking for is a method which can give some indication of what will happen in the real world, but in a shorter time. As already discussed, the EN 13523-10 standard equates 2000 hours of UVA testing with two years of exterior exposure. If we make the same assumption for the "hot UVA" test and compare the results, we see that the "hot UVA" results for the standard Beckry®Tech system are much more severe than with the standard UVA test and exterior exposure sites (figure 8).

However, if we instead assume that 500 instead of 1000 hours "hot UVA" is equivalent to a calendar year, then the results look very different (figure 9).

By studying the correlations for the other resins, it is apparent that the "hot UVA" test is not giving exactly the same results as natural weathering (which was the case for the standard Beckry®Tech). However, what we do see is that the "hot UVA" results follow a similar pattern to natural weathering. For example, the high-Tg Ar 4 resin has good gloss

retention for up to between four to six years (depending on colour and site), but that after this point performance declines significantly. "Hot UVA" testing also reveals a change in the gradient of the curve, noting more dramatic decreases in gloss retention after this inflection point. This is not something we see in standard UVA testing where, after 3000 hours, gloss retention is still at almost 100%.

What we learnt

The first key result of the study was that it is possible to improve the durability of super-durable polyesters. Both aliphatic modifications gave long-term improvements over the standard Beckry®Tech system. The aromatic systems, though better in the short term, lack long-term durability and note a dramatic decline in performance after between four to six years. ►

Figure 12:
Summary of high Tg Ar 3 testing
(with 500 hours = 6 months standard UVA & 12 months "hot UVA")

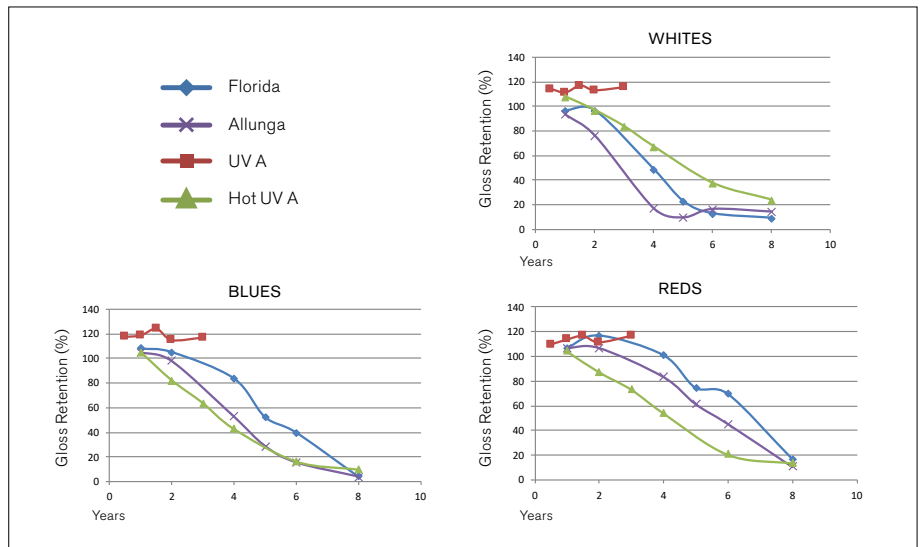
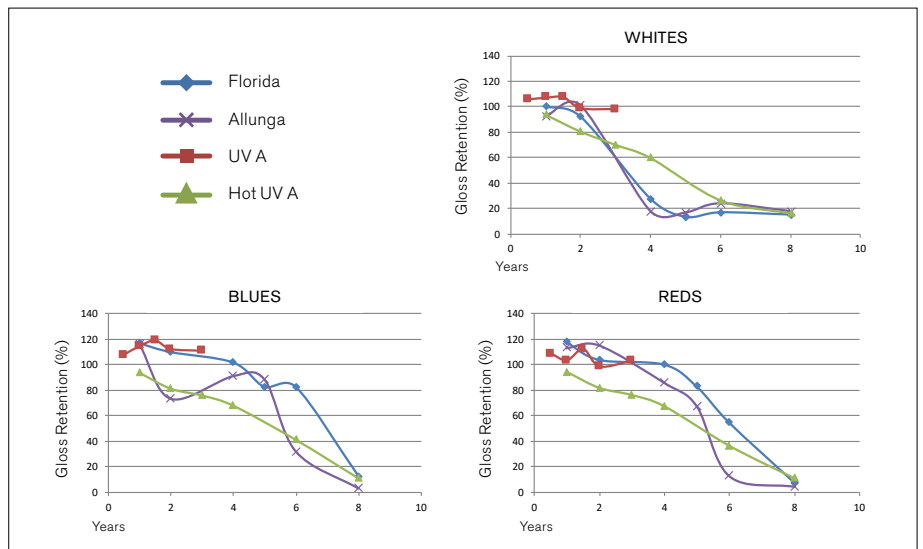


Figure 13:
Summary of high Tg Ar 4 testing
(with 500 hours = 6 months standard UVA & 12 months "hot UVA")



The second key result was the fact that the standard UVA test gives no indication of long-term coating performance after 3000 hours (especially for aromatics). Of course, this does not mean we would not start to see a decline in the performance of aromatics if the test was run for much longer. This misses the point, however. We need a test that can give results quickly. We can't afford to wait 6000–8000 hours for viable results.

This is in complete contrast to "hot UVA" testing. After just 4000 hours, the results of "hot UVA" mirror those attained from natural exposure. Clearly, "hot UVA" gives a much stronger indication of a coating's future performance, prior to time-consuming natural weathering tests. This will permit greater discrimination when determining which systems should be selected for natural weathering, saving both time and the not insignificant expense of external exposure.

What now?

The fact that "hot UVA" provides greater accuracy in determining long-term coating performance compared with the standard UVA test is good news. New resins can now be screened better and in less time. The LTD unit already submits all new super-durable product developments to "hot UVA" testing, prior to standard and exterior testing. ■

Beckers raises the digital bar

Christophe PERIN

Digitalization is having a dramatic and lasting impact on all aspects of life, from communications and healthcare to space research and heavy industry, transforming both work and leisure. It has long been a high priority on the Beckers Group agenda, evidenced most recently by the launch of two new pilot projects, aimed at digitalizing the customer interface.

But first: what is actually meant by the word 'digitalization'? Ask two different people and you are likely to get two different answers. In a strictly industrial context, however, it basically refers to the process of employing digital technologies and information to transform business operations – which is what Beckers' two new pilot projects are determined to achieve.

The two projects focus strongly on improving the customer experience by accelerating and simplifying information access.

First pilot

The first project involves the development of a digital customer-interface that will enable our coil coatings customers to access a whole range of data that, until now, had only

been available by phone or via e-mail. The initial version of this platform will feature order tracking, colour-matching tracking and a document library that will include downloadable documents such as Material Safety Data Sheets (MSDSs), technical datasheets, quality control certificates and so on.

This initial version has already been shared and tested with one of our key strategic customers in France. Our digital agency is further developing the platform, planning a release of the first complete version by the end of 2018. Once launched and fine-tuned, the new platform will be made available to all Beckers France coil coatings customers in early 2019. Naturally, the platform will be accessible from all relevant electronic devices (PCs, tablets or smartphones).

Second pilot

The second pilot project, initiated early in 2018, has involved the creation of a dedicated intranet about one of our largest coil coatings customers. This dedicated website will enable Beckers' complete business teams (sales directors and managers, technical and sales assistants, supply chain personnel, R&D staff and other relevant personnel) to access the latest data and feedback on Beckers' business relationship with this customer. This modern communications platform will enhance the level of awareness and transparency of all transactions relating to this key customer. The format will facilitate more user-friendly data access, making it accessible from a tablet or smartphone. ■



New Alubond coating line for Europe

Mauro LOZZA & Nicolas SABATIER

One of the Mulk Holdings brands since 2004, Alubond operates an impressive distribution network in 80 countries. In 2017, the company opened a new coating line in Serbia.

Situated one hour north of Belgrade, in Banatski Karlovac, Alubond Europe was established in 2009. As part of its strategic expansion plan, Mulk Holdings opened Alubond Europe's Banatski Karlovac production facility for metal composite panels in 2012. The facility is focused on the production and supply of Fire Rated Metal Composite Building Envelopes to Europe, Russia and a number of neighbouring countries. Alubond Europe's initial production capacity of three million square metres of ACP (Aluminium Composite Panel*) has grown steadily. In

2017, the company decided to set up a new coil coating line, and to initiate production of A2 grade ACP**. The facility's product range focuses on high quality ACP, the majority featuring a PVDF coating for enhanced durability.

Beckers' relationship with the Aluminium Coil Coating Unit of Mulk Holdings UAE dates back to 2009, when it supplied Coil-Cote paint systems from its Ras-Al-Khaimah production facility to coat over 13 million square metres of ACP. It was only natural

that Alubond Europe should once again turn to Beckers for support in setting up its new coating line. Thanks to the professionalism of Alubond employees and Beckers' specialist expertise, the new high-quality ACP coating line is now in place. This marks the start of what promises to be a highly fruitful partnership. ■

*A sandwich panel featuring two aluminium skins bonded to an extruded core of polyethylene or mineral core.

** To be classified as A2 grade, a composite panel must contain a flame retardant to limit the risk of fire spreading in cladding.

Joining Beckers as laboratory manager at the Montbrison site in 1989, Jean-Pierre Genevay stayed with the company for the next 29 years, finally retiring in August as Senior Vice President for South Europe & Latin America.



Jean-Pierre Genevay

Passing the baton

Christophe SABAS

Jean-Pierre has always been the very embodiment of customer focus, deeply committed to customer service and exceptional product performance. A born entrepreneur, his profound understanding of coil coating technology and the market's complexities has enabled him to create uniquely lasting relationships with customers throughout Europe and beyond. Under his leadership, Beckers has accessed several new markets and established new sites in the UAE, Turkey, Mexico and Argentina. Internationally recognised for his dedication to and

knowledge of the paint industry, Jean-Pierre was a board member of the European Coil Coating Association (ECCA), as well as being a member of the French Paint Association (FIPEC).

Jean-Pierre leaves his legacy in good hands, Eric Fouissac succeeding him as Senior Vice President for South Europe & Latin America. At the same time, Ahmed Mastari has been appointed Managing Director of Beckers France while Christophe Perin, currently Vice President of Coil Coatings

France, is to chair Beckers' coil coatings marketing committee.

Driving down the motorway back to Lyon after a recent visit to the Montbrison site, it struck me how many times Jean-Pierre must have driven this way over the years, to call on customers and confer with colleagues. At last he is free to pursue his many other interests, relaxing with his wife and friends. We all wish you a very happy retirement, Jean-Pierre! ■

First Strategic Partner Award from Chinese major

Emily WU

Beckers China has enjoyed close cooperation with China's Haier Group since 1999 and has gained recognition for its consistently superior performance, becoming one of a few select recipients of the HBIS* Strategic Partner Award 2017. The HBIS Group is one of China's largest iron and steel producing conglomerates.



General Manager Coil Coatings Beckers China Danny Huang receives the HBIS Strategic Partner Award

The Haier Group, first established in 1984, is a leading multinational appliance manufacturer, focused on high-end domestic appliances, with a more than 10% share of the global market. The Group operates four dedicated domestic appliance coil coating lines, supplying some 25% of the coils for domestic appliances in China. As a key Beckers customer, the Haier Group has long enjoyed close collaboration and expert support from the Beckers Coil Coatings team.

At the Award ceremony, Danny Huang highly praised the cooperation with HBIS and promised our continuous efforts to maintain high level services in the coming days. "The dedicated efforts of our sales,

technical and other support staff have jointly made the success; sales to Haier achieved new heights in 2017." Danny Huang added after the ceremony: "Consistent effort and an extraordinary level of commitment are critical to securing success at Haier as well as other key customers. By generating a win-win situation for both parties, we build long-term confidence in our ability to deliver on our promises, gaining our customers' lasting loyalty." Of course, the Chinese market is ultra-competitive and technically demanding, posing a challenge that Beckers China is keen – and well qualified – to embrace. ■

* HBIS Group acquired Haier's special steel business in 2015

Expanding prospects in Romania

Although currently dominated by imports of pre-coated steel, the Romanian domestic market offers significant growth potential, especially in the housing sector. Demand is expected to grow in roofing, rainwater systems, sandwich panels and more.

Krzysztof TABOR

Situated at the crossroads of Central, Eastern and Southeast Europe, Romania is a dynamic country, rich in history and of great natural beauty, with considerable industrial capacity. Posting an annual economic growth rate of 7% in 2017 (the highest in the EU last year), the country saw domestic steel production rise to a total of 3.3 million tonnes.

Two of the main players in the Romanian steel industry (also being two of Beckers' key customers) have been ArcelorMittal Galati and Titan Steel 1921. Both are based in Galati, Romania's largest commercial port, located on the mighty Danube.

Titan Steel 1921

A privately owned company with almost 100 years' experience of the steel market, Titan Steel has been a Beckers' customer for almost a decade. The company has a history of diversified steel production, ranging from cold rolling to galvanizing and colour coating for profiling and slitting.

The Titan coil coating line currently focuses mainly on standard and textured polyesters for roofing and cladding. Textured coatings have been popular in Eastern Europe for decades, especially in the roofing sector. Hardly surprising, given that metal roofing offers the ideal balance between cost, appearance and durability. Our close cooperation with Titan Steel 1921's coating line team has ensured the consistent supply of coatings tailored specifically to the needs of the Romanian domestic market.

ArcelorMittal Galati

A part of the world-leading ArcelorMittal steel group, ArcelorMittal Galati started its coil coating line in 2016, with Beckers as sole coatings supplier from the start. From the very first, we have cooperated closely with ArcelorMittal Galati crew and the CRM* laboratory in overcoming some initial start-up issues.

Today, Beckers supplies a whole range of colours that are available in several



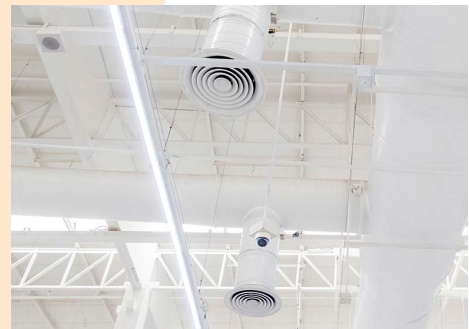
Coils ready to be coated

qualities, with the validation and implementation of additional qualities planned over the next few months. In connection with ArcelorMittal's planned acquisition of Italian steel producer ILVA S.p.A., the European Commission, under the EU Merger Regulation, made its approval conditional on the sale of the Galati operation, with a view to curbing excess market dominance. At time of going to press, the acquisition of ArcelorMittal Galati by Liberty House has been announced. How a change of ownership will impact on the Galati operation remains to be seen. What seems certain, however, is that whatever the future may hold, Beckers will be there! ■

*CRM Group is a collective research centre having as Core Members two major worldwide steel companies (ArcelorMittal and Tata Steel) and as Associated Members numerous companies producing non-ferrous metals, providing services to the steel industry or promoting the use of metals.

Beckry® Shield – the antibacterial solution

Saravanan NATARAJAN



Antibacterial coatings are part of the global strategy for mitigating bacterial pathogens. Growing understanding of microbiology is expanding the number of options available when designing surfaces that feature antibacterial properties. In this article, we review release-based antibacterial coatings and focus on the challenges and opportunities presented by the latest generation. In particular, we highlight recent approaches aimed at controlling the release of antibacterial agents, imparting multi-functionality and enhancing long-term stability

The main incentive in developing antibacterial coatings is to achieve an increase in the performance of functionalized surfaces that cannot be achieved by conventional coatings. The high-performance Beckry®Shield system offers excellent mechanical and bioactive surface properties. The thin coating ensures good stability in biologically-challenging environments, providing excellent mechanical (hardness, stress) and tribological (wear-resistance, friction, adhesion) performance, as well as impressive chemical properties (corrosion resistance).

The antibacterial process

Until recently, progress in the development of antibacterial coatings for a wide range of applications was slow, due to the low effective utilisation of the antibacterial agent, as well as the high cost. The Beckry®Shield system resolves these issues by employing a silver-ion-based inorganic antibacterial agent, applying a process based on the "Reactive Oxygen Antibacterial Mechanism". Silver ions denature bacterial enzymes by binding to reactive groups, resulting in activation. Silver deactivates the enzymes by

reacting with thiol groups to form silver sulfide. Silver also reacts with amino, carboxyl, phosphate and imidazole groups, as well as diminishing lactate, dehydrogenase and glutathione peroxidase activity. This synthesizes the elimination of enzyme activity, leading to loss of reproducibility and bacterial death.

The testing process

The chemistry of the antibacterial agent* is registered for use as an antibacterial coating additive, both with the Environmental Protection Agency (which administers the United State's FIFRA/Federal Insecticide, Fungicide & Rodenticide Act regulations) and the European Chemical Agency (which administers the European Union's Biocidal Products regulations 528/2012). This agent is approved for use in food contact coatings both in the United States and in the European Union. However, due to variations in customer process incidental food contact approval must be confirmed through independent testing of the individual customer's final products. The agent's average particle size is 1.72 microns: 90% of the particles are smaller than 3.75 microns, while 98% of the particles are smaller than 5.17 microns.

In 2015, we began our project to develop antibacterial topcoats, to be applied to two main substrates and finished in four of the most popular topcoats. A polyester topcoat was developed in conjunction with the control system, for intermittent food contact/interior application. The Beckry®Shield epoxy lacquer coating was developed in conjunction with the control system, for ducting/HVAC applications.

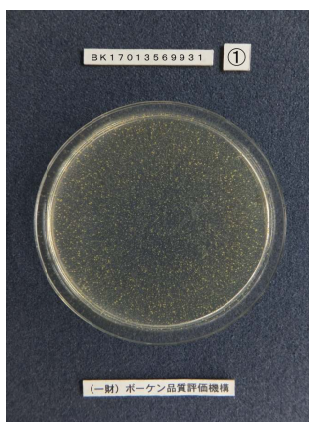
The antibacterial properties of these products were tested according to the Antibacterial Coating/Antibacterial Performance Test Method ISO 22196 (Appendices A,B,C,D) and JIS Z 2801.

The agent's antibacterial efficiency, tested on specimens of **staphylococcus aureus (NBRC 12732)** and **escherichia coli/E. coli (NBRC 3972)**, was calculated using the following formula:

$$\text{Antibacterial efficiency} = U_t - A_t$$

—————
*Supplied by LIFE Material Technologies Ltd. ▶

STAPHYLOCOCCUS AUREUS (NBRC 12732)



Beckry®Pol white topcoat control 0 hrs



Beckry®Pol white topcoat control 24 hrs



Beckry®Shield 24 hrs

ESCHERICHIA COLI (NBRC 3972)



Beckry®Pol white topcoat control 0 hrs



Beckry®Pol white topcoat control 24 hrs



Beckry®Shield 24 hrs

Test condition & Result	Staphylococcus		E-Coli	
	Control	Treated	Control	Treated
Immediately After inoculation (Uo)	4.08		4.11	
After 24h (Ut)	3.84	-	4.10	-
Average of Logarithm numbers of viable Bacteria (At)	-	<0.20	-	<0.20
Value of antibacterial activity (Ut-At)	-	4.0	-	4.3
Antibacterial Activity		99.99%		99.99%

Conclusions

After the addition of antibacterial agents, the coated particles were well distributed, apart from a small amount of conglomerates, featuring particle sizes of about 10 microns, similar to a conventional coating system.

It appeared that the Ag ion almost became part of the coil coating, as a direct result of the additive. This promoted the dispersion of antibacterial agents and improved the antibacterial properties.

difference between the conventional and antibacterial coating in terms of appearance, finish, physical properties and corrosion resistance. In light of growing market demand for ways to combat the global menace posed by bacterial pathogens, the innovative Beckry®Shield family of antibacterial coil coatings offers Beckers' customers a uniquely effective and highly competitive solution. ■

Same performance and looks – and antibacterial

The surface morphology of the colour-coated sheet was observed by using SEM (Scanning Electron Microscopy) to detect the effect of the antibacterial agent on the coil coating. There was virtually no

Lab upgrade for Beckers Malaysia

Dr. Karsten ELLER



From left: Analytical Chemist Phui Kuan Lee, Chemist Shane Quek, Lab Technician Mohamad Ashraf

Beckers Malaysia is a regional center of excellence for product optimization and analytical support. Since starting operations, the lab has seen steady growth in its commitments and, consequently, in the need for additional personnel and more space. Initially designed for a much smaller number of staff, the locale was no longer really fit-for-purpose and was in need of an upgrade. An interim improvement involved the partial redesign of the chemists' office in 2015, creating space for two additional members of staff. Nevertheless, in line with the unit's aggressive plans to generate more

work with a view to building a robust project pipeline, a more ambitious expansion was required.

It was decided to re-house most of the lab's coating testing instruments, including a microscope and a sample polisher, by taking over a room previously shared with another part of the organization, which kept its accelerated weathering machines there. This freed up space in what had been the testing lab, which can now be used as a 'semi-wet' lab for a certain amount of paint testing. The chemists' area, completely redesigned and

slightly expanded, now comprises an office for the project manager and workstations for other members of staff. Following a complete repaint, the lab now looks like new!

Safety and health were naturally key priorities in redesigning the lab, leading to a range of practical changes, such as relocation of the emergency shower, ensuring better drainage and increased water pressure. Other improvements included the addition of new safety labels and signs, as well as the mounting of additional suction arms in most areas.

As of February 2018, following the recruitment of two new chemists and a lab assistant in Malaysia, the regional center of excellence now has even expanded to other countries. Far to the northeast in Shanghai, China, we have recruited an additional chemist to support our current Product Innovation Manager. With its lab upgrade and newly recruited expertise, the team is well equipped to conduct extensive product development and provide our sites and customers throughout the region with exceptional technical support. ■

Smart sourcing for sustainable freight solutions



Matthias FISCHER

The Beckers Group operates an extensive supply network throughout Europe, involving substantial product volumes that require advanced logistics management and highly reliable and efficient freight specialists. To locate, compare and retain the best in the business, we have a dedicated in-house logistics team as back-up on all tenders for freight contracts.

Centralized process control

To achieve an optimal integration of sites and purchasing structures – and to exploit potential synergies – the Beckers Group has merged the purchase of freight services for six of its European sites, successfully coordinating the multiple demands of the tendering process.

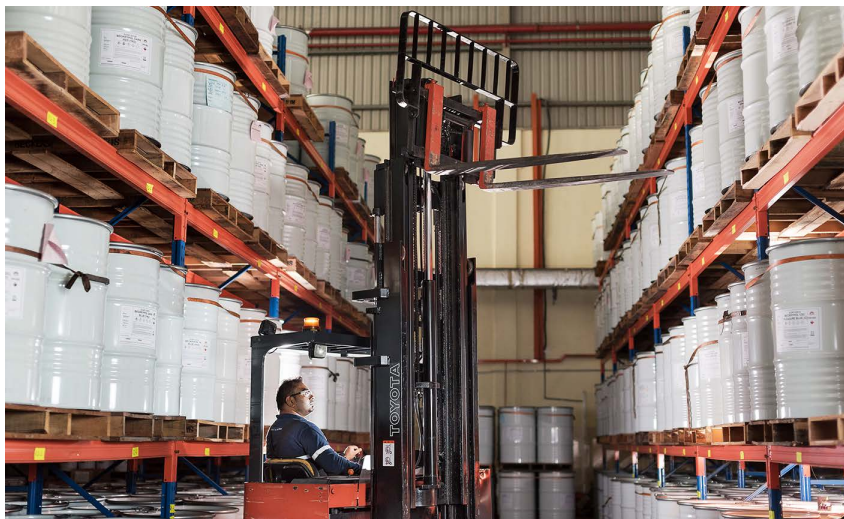
“Thanks to Transporeon’s Ticontract Tender Management, we now have a comprehensive overview of suitable carriers, their available trucks and their joint impact on the environment and sustainability,” explains Matthias Fischer, Global Category Manager, Beckers Group.

Electronic tendering platform pays dividends

Enabling the accumulation of a vast range of data for analysis, comparison and final evaluation, implementation of this innovative E-sourcing tool has paid dividends. Conventional Excel spreadsheets or non-specialized ERP purchasing platforms are simply unable to reproduce such diversity and depth of detail. The individual phases of the tendering process are also easily organized and backed by automated processes at every stage. Furthermore, the entire tendering process is in accordance with audit requirements.

Everyone gains

Strategic tendering at the European level has ensured greater market transparency, directly comparable quotes, increased delivery reliability and a greater range of choice. It has also simplified communication with the freight community, saving time and promoting flexibility.



Paints on its way to customer

The platform has led to closer cooperation with our inventory of proven service providers while attracting competitive quotes from new partners who can be integrated into our pool of freight carriers. This helps protect our customers from increasing market uncertainties in the form of driver shortages, capacity bottlenecks and the strict demands on the transport of dangerous goods – as well as making a major contribution to delivery security.

Sustainable delivery a ‘must’

Why sustainable freight solutions? Because almost every purchase decision increasingly involves environmental and sustainability considerations. We are keen to avoid polluting the environment and, ideally, should like to have a favourable environmental and social impact. The introduction of advanced freight logistics offers considerable opportunities for reducing our ecological footprint. Wherever possible, we opt for short procurement routes and local sources of supply. Otherwise, the broad focus is on sustainable transport. Much freight is still handled by road, of course. By carefully selecting our

freight forwarders, we contribute to the overall sustainability of the supply chain.

By pooling volumes, we create a more sustainable freight solution that further reduces our environmental footprint. Rationalizing loads and optimizing available freight capacity will cut consumption of finite fossil fuels (diesel/oil) and, thereby, carbon emissions. Recent figures for the international and national freight sectors, released by the European Commission, reveal unutilized capacity levels of 20 and 25 percent. Clearly, there is plenty of room for improvement!

Comprehensive data ensures quality service

To ensure that our freight carriers are fully capable of meeting our most stringent requirements, we have conducted an exhaustive review of key forwarding agents and amassed a huge amount of data on a broad range of freight handling operations. Only those who meet our stringent requirements will join us in the comprehensive restructuring of our transport network, helping us achieve a more efficient, cost-effective and sustainable future. ■



Beckers' Herve Fréry together with SOCATRAL's coil coating team

Cameroon establishes its first coil coating line

Herve FRÉRY

SOCATRAL (La Société Camerounaise de Transformation de l'Aluminium), part of the Cameroonian state-owned ALUCAM Group, an aluminium smelting operation, was established in the 1960s. The company is located in Edea in southern Cameroon, between Douala and Yaounde.

ALUCAM's annual aluminium production has risen to almost 100 000 tons. Some 30% of this production volume is transformed by SOCATRAL into coiled sheet (for roofing and cladding) and aluminium discs (for kitchen utensils).

Expanding capability

Responding to growing market demand, SOCATRAL decided to expand its product capability, and during 2016 inaugurated the first coating line to be established in Cameroon. The new coating line was built by Spanish engineering company INCO. A monolayer line featuring conventional convection curing, it can process 1 200 mm wide strip at a line speed of 40 m/min. Consequently, the company is now able to offer a range of pre-coated aluminium products across the whole of the African continent.

Many buildings in Cameroon feature pre-coated steel, in the form of corrugated roofing. However, the country's extremely high temperatures and moisture levels lead to significant and rapid corrosion. Thanks to its much greater resistance to corrosion than pre-coated steel sheet, pre-coated aluminium has gained steadily in popularity in recent years, firmly establishing its position on the market.

Expanding market

Impressed by our product portfolio, comprehensive service offer and local presence, SOCATRAL felt confident in turning to Beckers.

Beckers initiated supplies of coatings in December 2017, in combination with provision of the entire Beckers service package, including a comprehensive training programme for

all operators. So far, supplies have focused on five colours that have already gained local popularity, but deliveries of several new colours are planned for the near future.

To promote the superior corrosion resistance of aluminium, as opposed to steel sheet, SOCATRAL has launched a major advertising campaign. Initially targeting the domestic Cameroonian market, the campaign will eventually be broadened to cover neighbouring countries such as Nigeria, Benin and Togo.

Expanding prospects

The prospects for the next five years are highly promising and we expect to see dramatic growth in this exciting market. Clearly, the Beckers concept works: innovative high-performance products, unrivalled technical backup, great service and forward-thinking marketing support – what's not to like? ■



Interior SOCATRAL plant



The first coils coated with Beckers' paint



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Dear Readers!

It gives me great pleasure to once again take over the role of editor-in-chief for Beckers Magazine. As one of our most important channels of communication with customers, I consider it an honour to oversee the content and I believe the Magazine will clearly demonstrate how deeply ingrained Customer Focus and Sustainability are in the Beckers' "DNA".

Beckers provides the same high level of service to all its customers, be they in Eastern Europe, Africa or anywhere else. "Adding value beyond the surface" is what our staff strives for – all the time, everywhere. This has been crucial to Beckers' success to date, as it will continue to be.

The same may be said of Sustainability. Beckers' vision is to become the most sustainable industrial coatings company in the world. This may be seen in our holistic approach in selecting the most sustainable suppliers, developing our coatings with more sustainable raw materials, minimizing Beckers' own impact on the environment and providing more sustainable solutions for our customers – allowing them to minimize their own environmental impact, or that of their products during their lifespan.

Waterborne coatings are by no means new, but are these days benefiting greatly from the tailwind of environmental regulations. Asia, previously less concerned about solvent use, is now sometimes actually a trendsetter for other parts of the world. Increased solid content is another route to reduced VOC emissions, and high-solid products are clearly gaining market share. Combining waterborne coatings with high solids naturally provides the best of both worlds: our new Beckqua®Color for the automotive plastics exterior market offers distinct competitive advantages.



The waterborne option is not automatically more sustainable, however. It can be, but environmental impact should be based on a full life-cycle analysis, not solely on the composition of the coating. Industry studies have shown that for objects with long lifetimes, such as buildings or infrastructure, coating durability is the critical factor. That is why it is essential to understand the relationship between coatings composition and durability. Over the years, Beckers has invested substantial scientific resources in studying this topic, exposing countless samples at weathering sites across the world. As it often takes years before performance differences can be spotted, the world's laboratories are constantly looking for faster ways to judge the performance of their newly developed products. Unfortunately, no one has yet come up with a truly reliable accelerated weathering method. Nevertheless, we are getting steadily better at forecasting true product performance under natural conditions.

This latest edition of Beckers Magazine provides more in-depth background on all the above topics. I hope you will enjoy reading it as much as I did.

Your COO,
Dr. Karsten Eller



Adding value beyond the surface

www.beckers-group.com



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