Design in Acrylics

The ACRYLITE® Magazine

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Spaced out

Visitors to the German Pavilion at EXPO in Shanghai were received by the blue underwater world of the harbor. More on Page 6.

Michael Träxler,
Senior Vice President
Acrylic Polymers Business Line

Dear Readers:

The World's Fair in Shanghai this year had a lot to offer in terms of architecture. The British Pavilion that looked like a giant dandelion clock with 60,000 transparent stems drew a great deal of attention. But Germany's representation at the fair was also a sight worth seeing. Visitors were led via a shimmering blue harbor with numerous ACRYLITE® elements into the pavilion itself.

Our material is also used in the United Arab Emirate of Abu Dhabi. On the new island of Yas, amid glamour, glitter and Formula 1, ACRYLITE® serves as street fencing.

It offers guidance in the context of a protected monument at the World Heritage Site "Zollverein Coal Mine Industrial Complex" in the Ruhr area. ACRYLITE® Black & White helps visitors find their way without impairing the original effect of the buildings.

Achieving the right effect was also key to designing the façade of the Reiss fashion label headquarters in London. ACRYLITE®, combined with a sophisticated lighting system, makes the building look as if it were wrapped in a gigantic curtain of glistening light.

At Restaurant Slowman, operated by celebrity chef Christian Rach, light also provides the right atmosphere for a cozy evening with good food. The bar with its gentle light is paneled with ACRYLITE® P95. These are just some of the examples you will find in this issue.

I wish you an eventful read!

A moment in time

The three-dimensional face is built up layer by layer, step by step, as if hewn from ice. It sports a frown and a calm gaze. Millimeter-thick sheets of ACRYLITE® compose a head that symbolizes the German economic miracle – minus the cigar, but with a furrowed brow and neatly combed hair. The neck, chin, mouth, nose and brow are formed from 99 sheets piled five inches high. There is symbolism in every layer. The object's transparency underlines the statement: economy, understood by all and useful for the greater community.

Read more about the man of parts on page 21.

Martin Berkenkopf (on right), Product Manager at Acrylic Polymers, shows how a sheet covered in algae may look after several years of service. Wolfgang Scharnke, Technical Project Manager for "AAA" holds up a clean sheet for comparison.

The clean guys

Product Manager Martin Berkenkopf and Technical Project Manager Wolfgang Scharnke make life hard for algae, mosses and lichen using ACRYLITE® multi-skin sheets with a special coating.

Warm and humid weather may cause algal growth on canopies, carports and greenhouses. This can be stopped by a special coating applied to ACRYLITE® High Impact AAA multi-skin sheets, that prevents algae, mosses and other soiling agents from adhering to the sheet. The coating is completely ecological. It is applied during production, is non-toxic and biologically neutral – a global novelty for plastic multi-skin sheets. Product Manager Martin Berkenkopf and Technical Project Manager Wolfgang Scharnke explain the special features of the material.

Where can the new multi-skin sheets be installed?
Berkenkopf: The sheets are suitable for all projects, especially outdoors, like canopy and patio roofs, conservatories, carports, amateur greenhouses, flat and curved skylights, façades, as well as roofing for children's playgrounds or outdoor facilities at homes for the elderly. ACRYLITE® High Impact AAA multi-skin sheets are available in Clear, White and Bronze, and with various surface textures.

What are the advantages of such a material?
Berkenkopf: To start with, there is no longer any need for time-consuming roof cleaning. It's not easy to remove stubborn dirt. The reduced need for cleaning cuts maintenance costs, which is an important point for architects, among others. And there is no greyish-green film that forms after a while and impairs the appearance. Nor is there any more need to use chemical cleaning agents. So ACRYLITE® High Impact AAA also helps protect the environment.

Greater algal growth has been observed in past years. Why is that?
Scharnke: The sulfur dioxide content of the air has dropped because our air has become cleaner. That is because industrial offgases are being filtered and decontaminated. The cleaner the air, the more microbiological organisms like lichens, fungi and bacteria settle in warm and humid places, and leave behind a greenish-brown layer of dirt.

How exactly does the coating provide protection?
Scharnke: The AntiAlgae Coating is based on nanotechnology: nanoparticles provide interaction between UV light and the coating. Algae, lichens and other soiling agents are removed in two steps. First, UV radiation decomposes the dirt particles on the multi-skin sheet. The decomposed organisms lose their hold on the sheet or are completely dissolved. The next step is the rinsing effect produced by rain. A thin film of rainwater is formed between the dirt particles and the multi-skin sheet, which rinses off the remaining dirt and keeps the roof clean.
Berkenkopf: This is a durable effect that is not washed off. Since the coating works in combination with UV light, the cleaner the sheet, the better the AntiAlgae effect. That's why the sheets should be thoroughly cleaned before installation.

How was the new material developed?
Scharnke: We spent two years researching the product – a short time for a project as complex as algal growth. Our team included a microbiologist, a chemist, a physicist, Martin Berkenkopf and myself.
Berkenkopf: It was an obvious choice for us to develop the new coating. ACRYLITE® is durably weather-resistant, and of course also enjoys the 30-year guarantee against yellowing for transparent products.
In addition, it is highly light-transmitting and offers protection against harmful levels of UV radiation when used as a roofing material. So it is the ideal material for outdoor use, where algae are nothing but a nuisance. **cat**

www.acrylite-and-energy.com

Visual, emotional, biorhythmic

Well-thought-out lighting for Hamburg restaurant Slowman.

Lighting designer Dr. Detlev Repenning (top) creates the right ambience for visitors to Slowman with his lighting concept. The restaurant became a TV studio for "Rach's restaurant school" during the summer.

The smell of fresh coffee fills the air. Guests at Restaurant Slowman are taking some time out on their workday. A few latecomers from neighboring offices who haven't made it in time for their lunch break order a quick snack. Tourists who have come to see Hamburg's Chile House in glorious sunshine are drinking a refreshing beer, looking straight at the building's unique sharp-angled corner that is unparalleled anywhere else in the world. Meanwhile, the restaurant's kitchen is working at full speed and preparing food for evening guests. Everything has to go fast and according to plan, but many operations are still unfamiliar to the keen kitchen staff. Not only is this a new restaurant, most of the personnel are new as well. Slowman has taken on the task of giving young people a new chance, despite their somewhat unconventional CVs. Entitled "Rach's restaurant school," the project has been filmed and was broadcast on television in the summer. Its success is due to the committed staff and the right ambience. Only if guests feel completely at ease will they be glad to stay and come again.

Change of mood at the flick of a switch

This was also important for Dr. Detlev Repenning when he thought about the right lighting for Slowman. Repenning is Managing Director of o.m.t. GmbH, a company specializing in surface and material technology. "When I devise a lighting concept, three aspects are crucial: the visual, the emotional and the biorhythmic aspects," Repenning explains. It is essential to know which mood has to be created at what time to provide the guest with a feel-good atmosphere. "The influence of light on the overall impression is still underestimated," says Repen-

Restaurant Slowman employs many young people whose training by Christian Rach gives them a chance to gain a foothold in the working world. They had to learn from scratch how to cook, present food, lay tables, serve at table and mix drinks. At the same time, Slowman was refurbished so that the interior provides a pleasant ambience for guests. The large-scale backlighting of the counter goes a long way to creating this mood.

ning. "Just because a lamp looks good doesn't mean it fits into the concept." So the lighting designer starts by considering the expectations and intentions guests have when they come to a restaurant. At Slowman, for instance, illuminated sheets of ACRYLITE® P95 make for two different moods. During the day, the white light has a larger share of blue. It appears cooler and simulates and supports daylight coming in from outside. In the evening, white light with a high proportion of yellow creates a calming, relaxed atmosphere. Changing from one type of lighting to another is done by simply pressing a switch. The light sources behind the material are not visible, which prevents so-called hot spots. This is due to the material's good diffusion, which distributes light uniformly across the entire surface.

Sundowner atmosphere is just right for wine

"I always think of light first and only then of the material," Repenning says. "ACRYLITE® makes it possible to achieve very soft moods using large backlit surfaces. That creates uniform ambient light." At Slowman, for example, a staircase lit via a large ACRYLITE® P95 sheet leads visitors up to the first floor. The material has a warm and soft effect, and its fine matte surface is pleasant to the touch.

The heart of the restaurant, the bar, supports this lighting effect. Backlit ACRYLITE® P95 sheets were used to turn an old counter into an atmospheric space. Apart from its decorative function, the material has a practical advantage too: guest finger marks, dust and surface soiling are not visible. The material is also insensitive to scratches that may occur during restaurant operation. The bar's lighting effect is reinforced in the evening hours by various shades of red that are emitted via ACRYLITE® sheets in the shelves of bottles behind the counter. "This sunset mood goes perfectly with cocktails and fine wines," says Repenning. But it would be too dark for eating, so additional spotlights illuminate the tables with direct light in the restaurant area.

The future belongs to vertical lighting

It is this alternation that makes for a successful overall concept in Repenning's view: "We use spots to accentuate certain areas. They are points of reference for the eye so it does not lose its bearings in the room. We use surfaces to create atmosphere." In the future, the expert forecasts that vertical lighting via walls will gain in popularity. "Because of its light-guiding properties, variety of colors and ease of fabrication, ACRYLITE® is specially suited for this purpose," he says when asked about materials. Guests at Slowman like the atmosphere, and the daytime lighting provides a cheerful touch especially on grey days. People recharge their batteries for the afternoon, and some of them may already be looking forward to dinner or an after-work drink. **ck**

Pleasant atmosphere in the dark: the material appears soft and warm.

www.slowman.de

Germany to go

At the German EXPO 2010 Pavilion, visitors embark on a journey through the Federal Republic. The concept reflects the variety that characterizes the country and its people.

Expo 2010 – Bubbles float above the heads of visitors, who began their tour of 'balancity' in the German Pavilion. They got back up to the "surface" by means of an escalator.

An unusual picture: Up to 600 people gather on three floors on the kind of galleries found in theaters. A gigantic pendulum hangs from the center of the room that is surrounded by balustrades. It culminates in a sphere of ten feet in diameter that is studded with 400,000 LEDs.

Suddenly two protagonists enter the room, the "power plant". They race around on kickboards and animate the public to clap their hands and shout. The people clap louder and louder and scream their hearts out. And the sphere reacts. Its myriad of lights start to shine and show pictures, of landscapes, cities, people, and finally of an enormous eye. This rotates back and forth on the globe and always focuses on that part of the room that is the loudest. The people produce more and more noise, and therefore energy. Finally, they make the pendulum in their midst start to swing, higher and higher until it swings up to 28 feet each way and sends a cool current of air through the room. The power plant was the last thing visitors were shown at the German Pavilion at EXPO 2010, before they made their way out again. It marked the end of a condensed trip through Germany.

The essence of the country

"What is Germany really like?" That is a question that is hard to answer spontaneously. Germany has conurbations and large cities, vast expanses of green countryside, the Alps in the south, the coastline in the north. In short, its landscape is as multi-faceted as its people.

Bringing all of Germany under one roof was the demanding task to be met by the "Arbeitsgemeinschaft Deutscher Pavillon Shanghai GbR" (German Pavilion Shanghai association), which designed the German appearance at this year's World's Fair. Architects, exhibition organizers, event designers and exhibition builders held brainstorming sessions at the association and pooled their ideas. The result of all this brainwork was the pavilion concept "balancity", in which visitors to EXPO 2010 were able to immerse themselves from May to October. "Better City – Better Life" was the theme of the World's Fair, and appealed to exhibitors to think how better cities and better life might take shape. The German answer was "balancity", a blend of balance and city. Tomorrow's cities have to be built on variety and balance, not uniformity.

The workshop shows the diversity of German culture, which contributes to the balance of the city and its inhabitants. Works by well-known German authors can be heard.

Shouting, clapping and stamping – visitors to the power plant set a huge illuminated sphere in motion by making a noise.

"Our aim was to show the many facets of Germany through balancity."

Peter Redlin, Managing Director and Creative Director of the Stuttgart Agency Milla & Partner

Light created moods in the German pavilion, added specific touches and made it easier for visitors to find their way around the large compound.

Topsy-turvy world: Flowers growing out of the roof in the pavilion's park. A place of peace and serenity.

Bare rooms, cold light – the factory is a direct contrast to the park.

"Our aim is to show the many facets of Germany through balancity," explains Peter Redlin, Managing Director and Creative Director of the Stuttgart agency Milla & Partner, which was responsible for exhibition and media design within the association. Redlin and his colleagues spent three years working on the project before the German Pavilion opened its doors in May 2010. "On the one hand, we are a really innovative country that comes up with a multitude of ideas and inventions. On the other, we wanted the pavilion to show our roots and traditions, and last but not least our heterogeneous population and the multicultural character that defines our country today. Although we ourselves accept and in fact promote this diversity, it came as a surprise to many of the visitors to our pavilion, especially the Chinese."

Dramaturgy: playing with contrasts

The way through the 6,000m² German Pavilion led visitors first through a rising terraced landscape. At the end, visitors could look out over the pavilion and the surrounding countryside. Finally, a tunnel led back into the pavilion, the "city." There, ten different rooms awaited visitors and could be explored partly on foot and partly via moving walkways. Some of these rooms contained elements of ACRYLITE®.

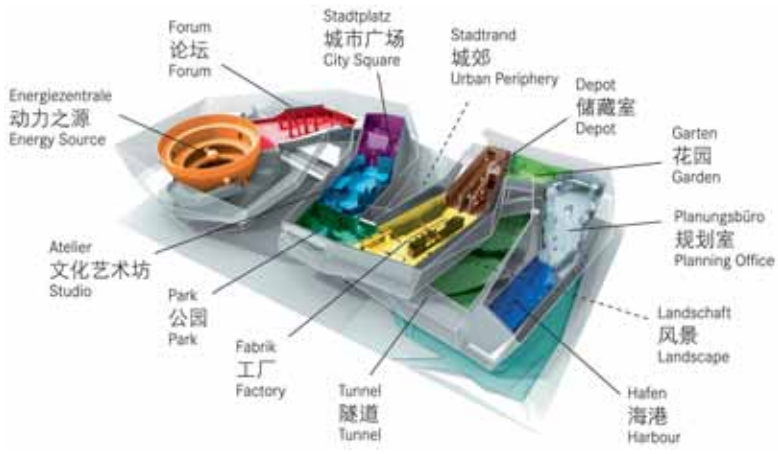
In the "harbor," for example, visitors crossed a deep blue underwater landscape full of water noises and reflections. Colorful iridescent bubbles made of ACRYLITE® Radiant hung from the ceiling and reflected incident light. People who walked through the room and looked up could see how the colors of this "water surface" changed with every step they took, in a gentle wave-like motion. Finally visitors broke through the water surface simply by taking the escalator to the next floor. And when they got there, they were welcomed by Hamburg HarborCity, complete with blue sky and the cries of seagulls.

The pavilion's dramaturgy played with contrasts from start to finish. Only a few stations away from the harbor, in the "factory," Germany presented itself as a production location. Nothing stood still here: the factory and its visitors were always on the move. A circular conveyor transported shadowy objects below the ceiling, while visitors were conveyed through the room on moving walkways. On their journey, visitors could illuminate various exhibits merely by gestures and call up short video sequences.

A little further on, Germany became a hands-on experience. Various innovative material developments from the Federal Republic were on show here and could be touched, felt and smelled, from poplar fluff to synthetic filament yarn. Some of the materials were presented in ACRYLITE® showcases. "The showcases were very unusually shaped, like stylized diamonds," Redlin explains. "We decided to make them from ACRYLITE® because the material can be bonded very cleanly with transparent

The moderator in the power plant looks like a dwarf as seen through a giant's eye. The sphere studded with thousands of LEDs changed from a pupil into an outsized globe, showing landscapes, cities and people. An incentive to think on a larger scale.

Walk-in sculpture: The German Expo pavilion is not a closed building, and makes no clear division between inside and outside. The entire compound covers around 6,000 m².



The structure of the German Pavilion shows a world in balance, an equilibrium between light and shade, art and nature, city and countryside.

bonds. With direct lighting from above, the showcases also appeared extremely high-class and noble, as well as keeping visitor's hands away from the exhibits." Some of the showcases had openings, and visitors could feel the poplar fluff directly inside an ACRYLITE® showcase, for example.

Anything but humdrum for the people involved

"It was anything but humdrum for us to contribute to the German EXPO pavilion," says Wolffgang Wiebel, who coordinated work related to EXPO 2010 in the Acrylic Polymers Business Line of Evonik in Darmstadt. "We fabricated a ACRYLITE® Xkin façade in the entrance area, for example, where all sponsors presented themselves. This façade consisted of individual parts that could be inclined at various angles to each other. It was impossible to use saws to obtain the required edges, so instead we used five-axis milling cutters to ensure a precise fit." The individual parts were made in Darmstadt in the state of Hesse and sent from there on the long journey to Shanghai. "That's a pretty long way," says Wiebel. But the purely technical and coordination challenges were only

one aspect of his job, as he goes on to say: "It's a very special feeling to know that you are making parts for a World's Fair, a real highlight in the working day."

Visitors behave in different ways

Many visitors appear to have liked what they saw in the German Pavilion, Redlin reports: "We installed a fast track through the pavilion, but little use was made of it. The Chinese public is hungry for information and likes to spend time looking, reading and touching. On average, visitors spent about 60 minutes inside the German Pavilion." The organizers were also impressed by the pavilion and gave it first prize for the best realization of the Expo theme "Better City, Better Life."Germany has a very good reputation among the Chinese, Redlin says, especially with regard to its innovativeness and high product quality: "Visitors to our pavilion not only wanted to get to know our country, but also to feel it. Our highly interactive exhibition really hit the spot." There is a fundamental difference in the way the Chinese and the European public behave when visiting an exhibition. Generally, people behaved very respectfully, Redlin tells us: "Considering that up to 25,000 people visited the pavilion every day, there were remarkably few marks on the walls, which we often see."
The pavilion can no longer be viewed in its entirety. The Shanghai EXPO concept foresaw that the exhibition would be dismantled right from the start. Where only weeks ago, hundreds of thousands of visitors strolled and exclaimed, a modern residential area is now being built. The organizers of the World's Fair 2010 wanted to prevent the site from becoming a "ghost town" like former EXPO sites. These are no longer used, but often have to be kept up at considerable cost. The streets of the residential area have already been prepared. **kma**

www.expo2010-deutschland.de/en

"Temperatures in Abu Dhabi can go up to 113° Fahrenheit and more, so heat-resistant material is a must."

Reiner Lingelbach, Head of Sales Emerging Countries in the Performance Polymers Business Unit at Evonik

Abu Dhabi sets store by environmentally friendly materials. The street fencing on Yas is made of recyclable ACRYLITE®.

Highway to the high life

Abu Dhabi is well-known for its ambitious construction projects. One of them is Yas Island.

Coming from Abu Dhabi City and crossing Shamma-Saadiyat Highway onto Yas Island, drivers feel as if they were approaching an almost surreal world. A green oasis suddenly appears in the middle of the barren desert landscape pierced by inlets from the sea. Visitors might almost believe they are seeing a mirage. The buildings and parks that are glimpsed through the car window are very impressive. The highway takes the visitor right across the island. A line of street fencing made of ACRYLITE® runs down its center and separates the two lanes.

Dreams come true on this 15-square-mile island. It cost USD 40 billion to redesign the natural environment and build the chic leisure resort. Everything here is the finest of its kind. Fans of motor sports are especially catered to. The highway offers a striking view of Ferrari World, the biggest roofed theme park in the world. The red roof looks like a gigantic stingray come to rest on the flat sandy island. The park only opened in October and revolves around the famous car brand. Right next to it is the Yas Marina Circuit, currently the most modern Formula One racetrack, which cost USD 1 billion to build. The 4 mile circuit was planned by German architect Hermann Tilke, who also designed the circuits in Bahrain and Shanghai. The Yas Marine Circuit delighted the sheikhs, teams and drivers when it was opened last year. Sebastian Vettel was one of the drivers, and he won the race. His victory on Yas Island in November made him the new Formula 1 world champion.

Spectators and visitors who do not drive onto the island via the highway, but prefer to arrive by their own yacht or helicopter, moor their vessel in the nearby harbor or fly to the island's own landing strip near the racetrack. The island has a plentiful supply of luxury hotels and apartments – Yas Hotel even juts out over the circuit and offers a premium view of the races.

Prototype of a green city

But the sheikhs are interested in more than just pomp and splendor. The leisure complex on Yas Island is designed to attract tourists, wealthy vacationers who will leave large amounts of money behind them. Although Abu Dhabi owns about 90% of the United Arab Emirates' oil reserves and is the world's third-largest oil exporter, the oil wells will dry up some time in the future, and at that point tourism is to be a flourishing industry. To achieve that aim, a second version of the Louvre is set to open in Abu Dhabi in 2013, and a branch of the Guggenheim Museum is also being planned.

Tourism is only one item on Abu Dhabi's future agenda. Technology is another. In the future, Abu Dhabi intends to become a forerunner in environmentally friendly technology in the Persian Gulf. The model project is Masdar City, the world's first CO_2-free and car-free city for some 50,000 people, which will be operated solely by renewable forms of energy from 2020. The city's water supply will come from a desalination plant operated by solar power. Fresh-air corridors and parks will reduce the high temperatures outdoors,

Yas Island – Theme park for millionaires.

Luxurious Yas Hotel is built directly above the Formula 1 racetrack.

and nowhere in the city is to be more than 200 yards away from the electrically operated public transport system.

Durable and recyclable materials

Abu Dhabi intends to realize this principle of the green city not just in Masdar, but also in other parts of the emirate. The dual focus is on using environmentally friendly technologies and sustainable materials. These will be given preference in new buildings because of their long service life. What is more, these materials can be recycled and impose no burden on the environment. But of course, using sustainable materials is not meant to compromise on quality. All materials should be of high quality in order to fit in with the exclusive overall picture.

"ACRYLITE® fits perfectly into this green concept," says Reiner Lingelbach, Head of Sales Emerging Countries in the Acrylic Polymers Business Line at Evonik. The material can be completely recycled after use and in the form of transparent sheet, comes with a 30-year guarantee against yellowing. "But the ecological aspect is only one consideration. Many people in the Emirates and other countries in the region know and appreciate the difference between ACRYLITE® and the cheaper acrylic produced in Asia, for example," Lingelbach says. "A lot of them look into the product's characteristic properties and recognize its quality." In the long run, what is crucial is the material's durability, wide range of products and customer service. "So we have economic arguments in our favor as well as ecological ones," Lingelbach explains.

ACRYLITE® street fencing

ACRYLITE® P95 occupies a prominent position on Yas, right in the middle of the highway. It is used as street fencing to separate the two lanes, and encloses a green area of seven kilometers in length as the central reservation. Since the material was installed on both sides, the total length is 8 miles.

The matte white cast ACRYLITE® sheets sized 36.5 by 19.5 inches increase road safety. Pedestrians cannot cross the highway, and drivers are unable to execute daring turns with their cars. Installation began in September 2009, and was completed in time for the first Formula 1 race. Evonik delivered the 8mm thick sheets that are fastened in metal posts using U-profiles from Germany. The sheets were then cut to size and edge-polished on site. "Temperatures in Abu Dhabi can go up to 113° Fahrenheit and more, so heat-resistant material is a must," Lingelbach says. Cast ACRYLITE® GP can withstand temperatures up to 180° Fahrenheit without losing its properties. Its flexural and tensile strength are retained even in extreme heat, and its color does not change either. As well as being weather-resistant, the sheets are also largely safe from notched impact by stone chips.

The soft light of lanterns

ACRYLITE® P95 is also used at another site on Yas. At the entrance to the Ferrari World theme park, there are 40 large lanterns standing on a bed of gravel and inside a fountain. They are decorated on the outside with metal ornaments, behind which the matte velvety material can be seen. This is translucent and transmits 42 percent of light. The lanterns illuminate their surroundings and bathe them in soft, subdued light. The material is also weather-resistant and UV-stable. That means that sunlight does not alter the material in any way. The large-scale lanterns retain their high-quality effect for many years, create a pleasant atmosphere and are the perfect match for the island's image.

On the way back over the highway towards Abu Dhabi City, the desert looks even more desolate. Yas has impressed visitors with its glitz and glamour. That is just what the sheikhs intended. They want to raise awareness of Abu Dhabi in the world and demonstrate that they are opening up their country. Together with their neighbors from Dubai, they have begun the race to the future. **cat**

www.yasisland.ae

40 large lanterns bathe the entrance to the Ferrari World theme park in gentle light.

The massive shaft head frame of the Zollverein Coal Mine Industrial Complex is an impressive sight. Today, the complex of the industrial monument is used for cultural events like art exhibitions, concerts, cinema and theater performances. It is important for the guidance system to meet the conservation guidelines.

Strikingly unobtrusive

Visitor guidance system at the Zollverein Coal Mine Industrial Complex shows the way without detracting from the overall impression.

Industry is an important part of world culture. It influences not only social life but architecture and art as well. The Zollverein Coal Mine Industrial Complex in Essen illustrates this influence in a unique way. "The special thing about this complex is that it was planned and built all of a piece," explains Thorsten Seifert, who is in charge of the commemorative path installed by the Zollverein Foundation. "Engineers and architects examined together how to create a representative but functional complex." It was inscribed in the UNESCO World Heritage List in 2001.

"The mine is an outstanding testimony to industrial culture," explains Dieter Offenhäußer, Deputy Secretary-General of the German UNESCO Commission. "It shows the use of modern architecture in the industrial context and bears witness to industrialization, an important period for our development, in which coal working played a special role. It gave rise to a completely new social culture that still lives on today."

UNESCO monuments are subject to special guidelines that are designed to preserve them for posterity as well and as long as possible. Structural changes are strictly reglemented. At the Zollverein Coal Mine Industrial Complex, the visitor guidance system became a key challenge. It was to be neither too obtrusive, since it was not to change the impression of the monument, nor too unremarkable, because then it would have failed to fulfil its purpose. This balancing act called for a wealth of good ideas and suitable materials.

Guidance with obstacles

After its closure in 1986, the mine complex covering a total of 100 hectares, i.e.

Black and unobtrusive during the day, shining white signpost at night: ACRYLITE® Black & White.

Rapid guidance: A ground plan shows visitors where to go on the compound of the Zollverein Coal Mine Industrial Complex. Staff at the information pavilions help them with any other questions.

Eye-catching: Edge-lit house numbers and information signs on the historic buildings

roughly the size of 120 square yards, was to be renovated, opened to the public and in this way revived. Since it is a UNESCO monument, a European competition was announced for its design. One major aim was to make it easier for visitors to find their way around. "Another condition was to preserve the mine buildings as monuments and at the same time to convey their cultural importance," explains designer Christopher Ledwig at F1rstdesign, a company that includes architects, communications and industrial designers. In cooperation with landscape architects from the Oberhausen planning group, lighting specialists from Licht Kunst Licht and artists from Observatorium, they devised a concept that follows the principle "preserve and retain" and was particularly unobtrusive. That was one reason why this draft won the competition.

"The biggest challenge during implementation were the conservation guidelines," says Ledwig. "Nothing may be fastened to the buildings around the part of the mine visited by the largest numbers of people, the Ehrenhof. The same applies to the view of the boiler house. So we had to find circumspect ways to meet the requirements." The aim was to create a versatile guidance system that would cater for the permanent and temporary events at Zollverein and show all visitors the way. "Everyone finds their bearings differently," Ledwig states. Since Essen and the Ruhr area are the European capital of culture in 2010, up to 800,000 visitors to the mine are expected.

Adding understated touches

The concept centers on large cast-iron models of the compound on a scale of 1:715. They take up a surface area of 43 square feet and are rust-colored, which fits in well with the heavy industry that previously occupied the site. The miniature mines are distributed across the entire compound and stand on 28 inches pedestals. "The models stand out from the pedestals because they are made of edge-lit ACRYLITE® P95 Bright Red," says Ledwig. "During the day, they appear to float in the air. At night, the luminous red edge draws visitors' attention and simultaneously lights up the model." The model shows visitors where they are, how big the compound is and which path leads to their destination.

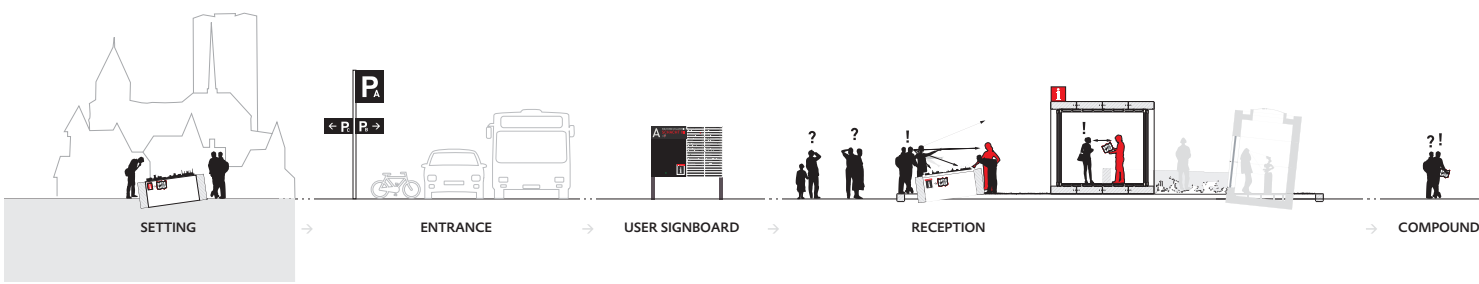
Light plays an important role in the overall concept. "That is why we use ACRYLITE® in many elements of the guidance system, because we need luminous objects to show the way in the dark, without detracting from the overall picture. This means we can implement a number of aesthetic solutions without infringing the conservation guidelines," Ledwig explains.

The guidance system consists of many other elements besides the mine models. "To cater for our international public and guide visitors to the right entrance, we have subdivided the entire compound into subareas A, B and C," Ledwig says. "The buildings are numbered consecutively in the ground plans and all have house numbers. These don't take up much space and are therefore quite inconspicuous." It was important to keep the house numbers as flat and lightweight as possible, so as not to impair the look of the building when viewed from the side. Furthermore, they were only to be fastened to the layers of mortar between the bricks to prevent damage to the stones themselves. "That can only be done with a comparatively lightweight material," Ledwig says. At the same time, the intention was to backlight the numbers to help people find their way in the dark. "ACRYLITE® is light-guiding and therefore shines very brightly, without the need for powerful light sources," explains Ledwig. "So we applied black film to white ACRYLITE® GP WH10 sheets for the house numbers, letting only the number and name of the building shine through." The doorbell signs and information point signs were made according to the same principle.

For culture and the economy

Commercial use of the buildings on the extensive compound made additional demands on the guidance system. After all, the various companies based there want people to find them. That is particularly true of popular attractions like Shaft 12, the coal washing plant or the coking plant. These are used as locations for parties, art exhibitions and theater performances. Large illuminated company signs, colorful logos or permanent advertising signs are prohibited, though, because they would constitute too great a change in the façade of the building. "The main characteristic for which a structure, landscape or other feature was included in the list of World Heritage Sites naturally has to be preserved," Offenhäußer explains. "But in principle, changes are possible." The World Heritage Committee in Paris must be consulted if major interventions are to be made. But the aim is not to cocoon the monument either. "We are always open to compromises if changes are desired," says the Deputy Secretary-General of the German UNESCO commission.

Ledwig has come to the same conclusion. "Tenants and leaseholders ex-



Visitors can look at the small models dotted around the complex to see where they are at the moment.

pect us planners to find a way to present them to the outside world," he says, describing the main challenge. "That is why we give thought to the possibilities that exist when working with protected monuments." Every draft goes to the World Heritage Committee, which decides whether the proposal can be implemented or not.

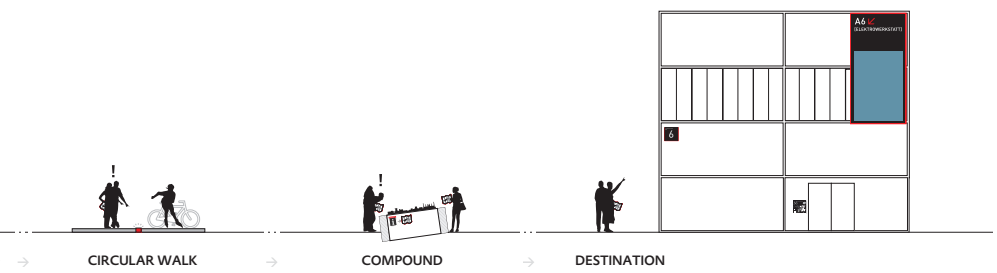
Loadbearing joints

And indeed, a solution was also found for displaying the leaseholders' signs. Lettering measuring between one and a half and two and a half meters in height is fastened to those buildings that receive the most visitors. The smaller letters are mounted on a bar that matches the color of the building and has already been approved by the monument protection authority. The bar is hung up by means of screws placed in the joints. Large lettering requires two parallel bars. Here too, weight is a crucial consideration.

"ACRYLITE® Black & White makes this possible," Ledwig explains. "Since the material is comparatively lightweight, it can be fastened without damaging the substance of the monument. During the day, it is black and does not distract attention from its surroundings. The buildings are perceived in their original form." At night, when the letters are backlit, they shine with a white light and can be seen from afar.

Although the many large and small signs appear rather inconspicuous at first glance, their number, variety and glowing touches will make it hard for future visitors to the Zollverein Coal Mine Industrial Complex to lose their bearings on the extensive compound. **jh**

www.zollverein.de/english



The visitor guidance system on the Zollverein Coal Mine Industrial Complex has many components. Since people have different perceptions, this is to ensure that all of them can find their way.

Showcasing industrial culture

Thanks to a ACRYLITE® conversion, the old warehouse of machine manufacturer Bucyrus has become a prize-winning corporate head office.

Seen from the ground, the driver of the excavator is barely recognizable – his driver's cabin is as high up as the third floor of a house. The boom he moves is as long as a football pitch and delves up to 48 yards deep into the earth. Building machines of this size is what makes the world go round at Bucyrus International Inc. in South Milwaukee. The machine manufacturer located in Wisconsin, USA, has a long tradition of mining and excavation; its machines were used back in 1904 to excavate the Panama Canal. This is a tradition the company looks back on with pride and displays at the company museum inaugurated in 2009. The museum was reopened in the refurbished head office building, and offers visitors the opportunity to try out for themselves in an interactive simulator what working life is like for an excavator driver. Renovation of the corporate head office was based on the idea of turning an old warehouse for heavy trucks into an attractive yet functional room, which was to reflect the history of the company, its tradition and products, and be inviting to customers and employees.

Showing off high ceilings

The design company Building Service Incorporated (BSI) in Wisconsin took on this task. The architect's main aim was to showcase the high ceilings as a characteristic feature of the industrial building. They achieved this by means of a lighting concept that combined two kinds of lighting installations: traditional ceiling lamps in association with an LED luminous wall. The wall was to consist of a steel frame structure to be lit by LEDS and covered with fabric. But this construction did not comply with the fire regulations. When looking for an alternative, the architects discovered ACRYLITE® Satin Ice, and were immediately convinced by its matte appearance and good light-guiding properties. "ACRYLITE® Satin Ice has the ability to 'glow' when lighting is installed behind it," says Chris Walgreen, who was in charge of the project at BSI. In addition, the material shows no finger marks or scratches. Walgreen was also enthused by its ease of fabrication. "All these factors made ACRYLITE® Satin Ice the perfect choice," Walgreen continued. "We had samples from other suppliers, but ACRYLITE® was the convincing material for our requirements." The result is a modern company cafeteria and recreation room, and a corporate museum with a special kind of lighting.

Customers and employees are not the only ones who are pleased with the new design. The American Society of Interior Designers paid tribute to the overall design in February 2009 with its Silver Award in the category Office/Corporate over 25,000 square feet. **pao**

www.bucyrus.com

Venerable but modern: the company museum at Bucyrus International Inc. links the past with the present.

How to combine industrial charm with modern fire regulations? ACRYLITE® Satin Ice was the solution.

A man of many parts

Ludwig Erhard bust made from transparent ACRYLITE® sheet.

People saw Ludwig Erhard, the Minister of Economics and subsequent Chancellor of former West Germany, as a man with a round face, an impish smile, a deeply furrowed brow and neatly combed back silver-grey hair. Today, they still connect him with Germany's economic miracle. His face full of character has been kept for posterity in the form of a miniature three-dimensional bust made of millimeter-thick ACRYLITE® sheets. For accurate reproduction of detail, it was important to use a material that is easy to machine. And, since the bust was also to have a symbolic nature, this material was to be highly transparent and modern, with a durably noble appearance.

The miniature bust is handed over by Evi Kurz, Chairperson of the Ludwig-Erhard-Initiativkreis Fürth (an association devoted to applying the great thinker's ideas to the solution of today's economic problems), as a gift to guest speakers at the award ceremony of the Ludwig Erhard Prize. Dr. Karl-Theodor Freiherr zu Guttenberg received the prize in 2009 as German Federal Minister of Economics and Technology, and this year's recipient was German Federal Foreign Minister Dr. Guido Westerwelle.

Erhard in detail

The idea for the bust was hatched on the 25th anniversary of the economics minister's death in 2003. Christian Nowak, Managing Director of the Chamber of Commerce and Industry in Fürth and founder of the Ludwig-Erhard-Initiativkreis, commissioned a bronze bust of Erhard. Initially, there was no mention of a miniature: the Erhard likeness was to be twice the size of life and grace the square in front of the town hall in Fürth. "An artist crafted the head based on photos taken from different angles," Nowak says. It took three months for every hair to be in place and for the lines around the month to mimic those of Erhard.

Downsizing

In 2007, the wish arose to make the bust smaller, because German Chancellor Angela Merkel was to receive an Erhard bust made of sintered titanium powder to mark the 1000th anniversary of the town of Fürth. For this, a company specializing in 3D scans scanned the 23 inches bronze head. The data collected in this way gave rise to a mold capable of reproducing even the tiniest detail.

"Our present for guests was to be lighter and less expensive that the titanium version," Nowak explains. "It was also important for us to find a modern material that symbolizes the new body of thought." He therefore turned to ACRYLITE® fabricator Reza Tabrizi in Fürth. "The Initiativkreis asked me to think about how to produce a bust in a creative way that would also illustrate Erhard's social market economy thinking," Tabrizi recalls.

Layer for layer

The result was a 7 inches high bust of transparent ACRYLITE®. The special feature was that the head was made not from one piece, but from a total of 99 sheets. "To do this, we had to laser the contours of all the sheets precisely according to the model of the 3D scan," describes Tabrizi. For this, the bust was virtually broken down into layers, whose contours were transferred to the sheets. Although the only 2mm thick sheets have vertical laser-cut edges, the finished bust appears three-dimensional to the viewer.

The individual layers were fastened together with pins on a square ACRYLITE® pedestal. But because it is made of layers, the bust is not completely static. "From the nose down, the head can be turned about 15 degrees to the left and right," Tabrizi explains. "The layers then shift and give the impression that Ludwig Erhard is frowning." For Christian Nowak, the bust is also a symbol. "It demonstrates Ludwig Erhard's flexible mindset," he says. "Its transparency stands for the social market economy as seen by Erhard." **jh**

www.tabrizi.de

More than just a façade

The London headquarters of the Reiss fashion label is clothed in a floating curtain of light.

Both the collection and the Reiss flagship store are unusually striking. With its out-of-the-ordinary fashions, the company underlines the uniqueness of the people who wear its designs. But it also displays its own individuality: its headquarters in the City of London is wrapped in an extravagant façade, which reflects the label's many facets and its philosophy, as well as fulfilling practical functions.

The project competition made clear specifications. The façade was meant to be eye-catching and indicate that fashion is created and sold in the building behind it. The aim was to achieve optical unity between the various areas such as salesrooms, offices, cutting rooms and design studios, as well as the penthouse apartment on the top floor. At the same time, the façade was intended to meet demands for modern building management and create a pleasant climate inside the building.

Standing out from the retail crowd

Fashionistas strolling down London's Oxford Street walk straight towards the building in Barrett Street. It is noticeable from far off because it glitters and shines in the sunlight, creating a gigantic bar code effect, then suddenly takes on a completely different appearance when the light changes. At night, this impression is reinforced. Then it appears as if the building were wrapped in liquid light that imitates the folds of an enormous silk curtain.

Idiosyncratic curtain

British architects Squire and Partners came up with the idea for this opaque but dynamic light-transmitting curtain. To create shifting effects, the translucent elements of the curtain had to be machined. Vertical routing to different depths combined with matte and polished surfaces makes sure the light is refracted in a multitude of ways. The changing incidence of light in the course of the day supports this effect. The façade material for this purpose had to be light-transmitting and stable. "At the start of the project, all that was clear was that the building was to be surrounded by a curtain of light," reports Thomas Ries. He is an architect in the Acrylic Polymers Business Line at Evonik and works on project development with a focus on façades. "The decision in favor of the material was only made once the project was underway."

Glass was ruled out right at the beginning because it is too heavy and unstable for this project. In their search for the right material, Squire and Partners came across ACRYLITE®. "They decided to use block elements," Ries reports. "These are ideal for the project because they can be machined in different ways and thus enable variable material thickness without losing their stability." The material's UV resistance also ensures that the panels do not yellow or become fragile. The light transmission and effect of the façade are preserved on a durable basis.

Profiles help to ring the changes

Seventy-three ACRYLITE® blocks had to be cut to size to completely clad the five-storey building. The initial sizes of the ACRYLITE® blocks were 5 by 2 and 3.8 by 1.8 meters at a material thickness of 50 mm. Few companies can machine such large workpieces. With the necessary equipment, like a special CNC milling cutter, and a large dose of experience, Heinz Fritz Kunststoffbearbeitung converted the blocks to the required shape and size, and profiled them to different depths. "The installation length is between 4.2 and 3.4 meters, and the width is between 1.6 and 1.4 meters.

Barcode, luminous waterfall or curtain of shimmering light? The flagship store of the Reiss fashion label in the City of London catches the attention of passersby from a long way off, and also has a strong impact seen up close.

The thinnest sections were machined down to a residual thickness of 20 mm," says Ries. "The routing depths vary between 10 and 30 millimeters."

Before and after routing, the blocks were evenly heated in an annealing oven to remove any stresses from the material. This equips it in the best possible way for durable outdoor weathering and the related stresses. To reinforce the lighting effects, certain parts of the panels were polished or dulled. Depending on the way light falls on the façade, viewers see a constantly shifting play of light because the rays are refracted differently by the routing patterns. The heterogeneous surface treatment also provides pleasant glare-free light, which is especially important for work in rooms such as studios and offices behind the façade. These also require a pleasant climate with acceptable temperatures.

Fascination combined with function

Especially the rooms facing south have to be kept cool by the façade. Although ACRYLITE® intercepts a portion of solar heat, the architects decided to back up this cooling effect. To do so, they installed the façade at an accessible distance from the wall of the building, leaving room for air to circulate and maintenance work to be carried out. The ACRYLITE® panels are thus spaced 40mm apart and about 60 cm from the wall of the building. Each individual panel is mounted on two T-shaped steel consoles and on vertical stainless steel rods that are fastened to the façade structure at individual points concealed by routed recesses. Since wind can easily be trapped between the façade and the building, the connections with the façade structure are slidable. The spacing of the panels ensures that wind loads are dissipated. "That works even if the panels expand longitudinally due to heat," Ries explains. "Special attention was paid to fastening the sheets to the structure so that differences in linear thermal expansion and extreme wind loads can be durably dissipated."

A glowing face at night

The almost invisible fastening makes the façade appear to float independently of the building. It is an eye-catcher that can be seen from afar, not just during the day, when sunlight is refracted in the panel profiles, but also at night. "LED strips are mounted behind the ACRYLITE® blocks," Ries explains. "They can be separately controlled and are programmed to make the façade shine in a cold white light at the bottom, that becomes warmer on the way up." The optical brilliance of ACRYLITE® causes the curtain of light in the City of London to ripple and shimmer, and gives the Reiss flagship an unusually striking outfit. **jh**

Glare-free light, agreeable climate: The heterogeneous surface of the ACRYLITE® blocks creates pleasant temperatures inside the building. That is appreciated not just by the fashion label's customers, but also by staff in offices and workshops.

www.reissonline.co.uk

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