

# Design in Acrylics

The ACRYLITE® Magazine

2011 No. 10



04 *Filming – escape from the flames at the film set of “Hindenburg”*

12 *Glowing – colorful light installation in a southern French showroom*

14 *Basking in the sun – new roofs on the tropical houses give animals more UV light*

20 *Designing – Torsten Menzel produces decorative elements for musicals*

22 *Building – sustainability is becoming ever more important for shopping malls*



## Shape-shifter

Nothing is as it seems, whether a lamp or a vase. Giovanni Scacchi, a fabricator in the Italian city of Milan, reshapes the world.



Michael Traxler,  
Senior Vice President  
Acrylic Polymers Business Line

## Dear Readers:

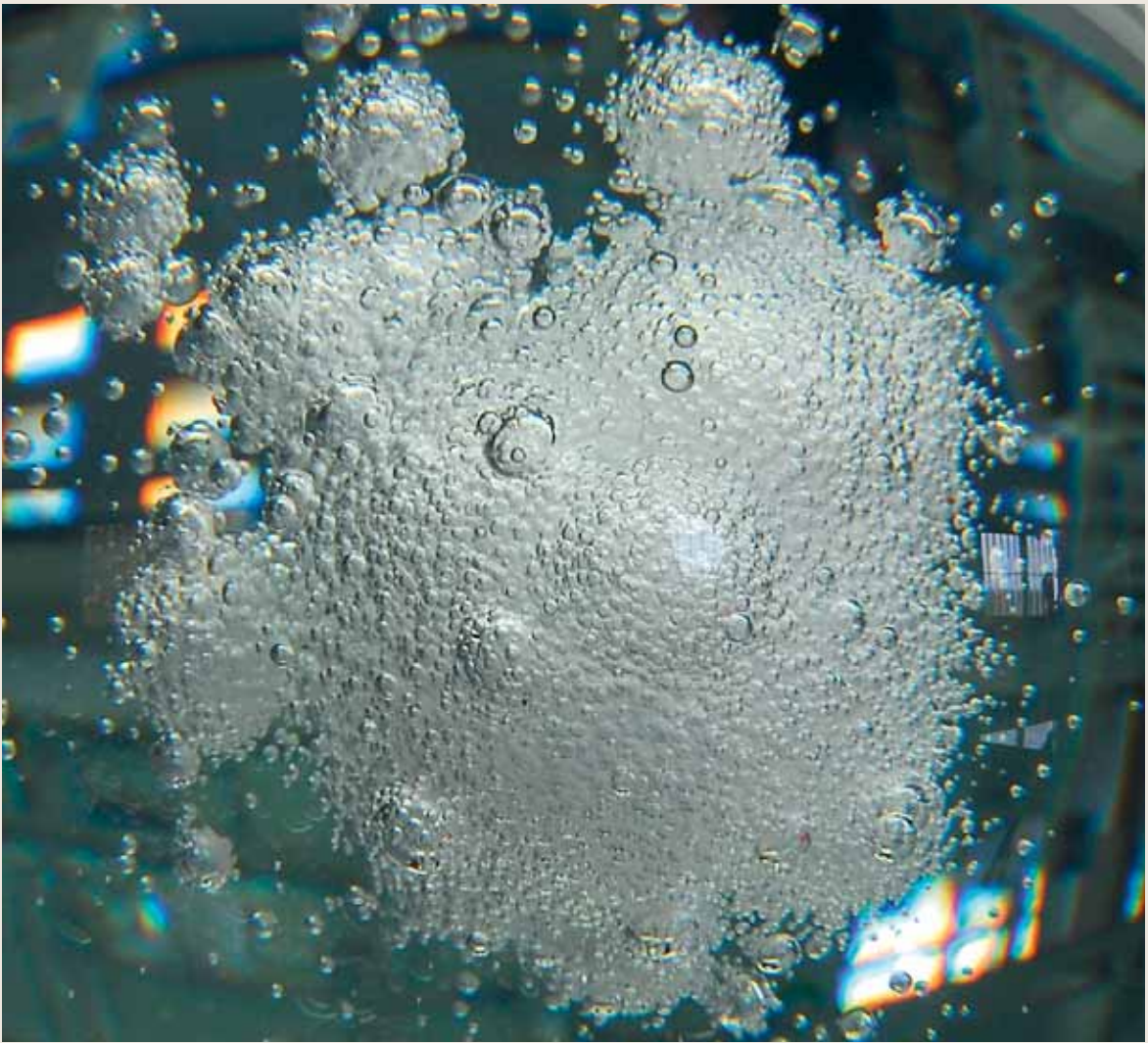
Inspiration doesn't come all by itself. It needs refreshing, passionate, enthusiastic and creative people who become engrossed by an idea. Like Italian architect Andrea Branzi and his countryman Giovanni Scacchi, who create unusually shaped vases with ACRYLITE®. At Krefeld Zoo, the passion for animals was the driving force. To let enough UV light into the tropical houses, Zoo Director Wolfgang Dreßen, architect Martin Busch and conservatory specialist Hubert Schröder were looking for a UV-transmitting roofing material. They found it in ACRYLITE® Alltop.

A TV movie inspired by historical shots of the Hindenburg disaster tells the story of this gigantic airship. To present the passengers' escape from the burning airship realistically and in a way that captures viewers' imagination, the cabin windows had to meet special requirements. ACRYLITE® turned this vision into reality for designer Benedikt Herforth.

Shopping malls are nowadays part of the cityscape all over the world. Their ambience has to be just right to turn them into havens of relaxation and pleasure. Architects around the globe rely on creativity and ACRYLITE® to make shopping malls a fascinating experience. As you can see, ACRYLITE® is full of inspiration.

I wish you an inspiring read!

*Michael Traxler*



## A moment in time

Air bubbles rise from unfathomable depths and freeze on their way to the surface. The giant marble in which they are enclosed reflects the world outside, creates new lines and concave spaces, giving rise to new worlds of its own. Though it is sufficient unto itself, a closer look shows that it is actually part of a sculpture, created by the Italian designer/architect duo Giovanni Scacchi and Andrea Branzi.

Read more about their work on page 6.



*Pleasant ambience with a natural touch: light panel with uniformly backlit birch twigs in a transparent panel.*

## It all began with an X-ray

*Light panel designers Rüdiger and Felix Szak explain in our interview how they use light and natural materials to create an individual ambience.*

► A breath of nature is making its way into restaurants, bars and offices. The grasses, branches or blossoms embedded in a transparent panel appear to be preserved in eternal ice. The organic materials are subtly lit by a homogenous LED area light that can be up to seven by ten feet in size. Father and son Rüdiger and Felix Szak developed the idea and translated it into practice in the form of light panels. This brought the duo an "if Material Award".

*Where did the light panel idea come from?*

Rüdiger Szak: An artist and doctor wanted to combine photography with X-ray pictures and illuminate the finished product. Our task was to create a very slim and uniformly luminous surface.

*You experimented a lot after making the prototype. What demands does the material have to meet?*

Felix Szak: We wanted to create free forms, and for that we needed good thermoformability. We also planned applications for wet rooms, ceilings and floors. For this, we looked for high-quality components for a modular structure.

*What was the standard structure you finally came up with?*

Felix Szak: An aluminum frame provides stability, dissipates heat and acts as an

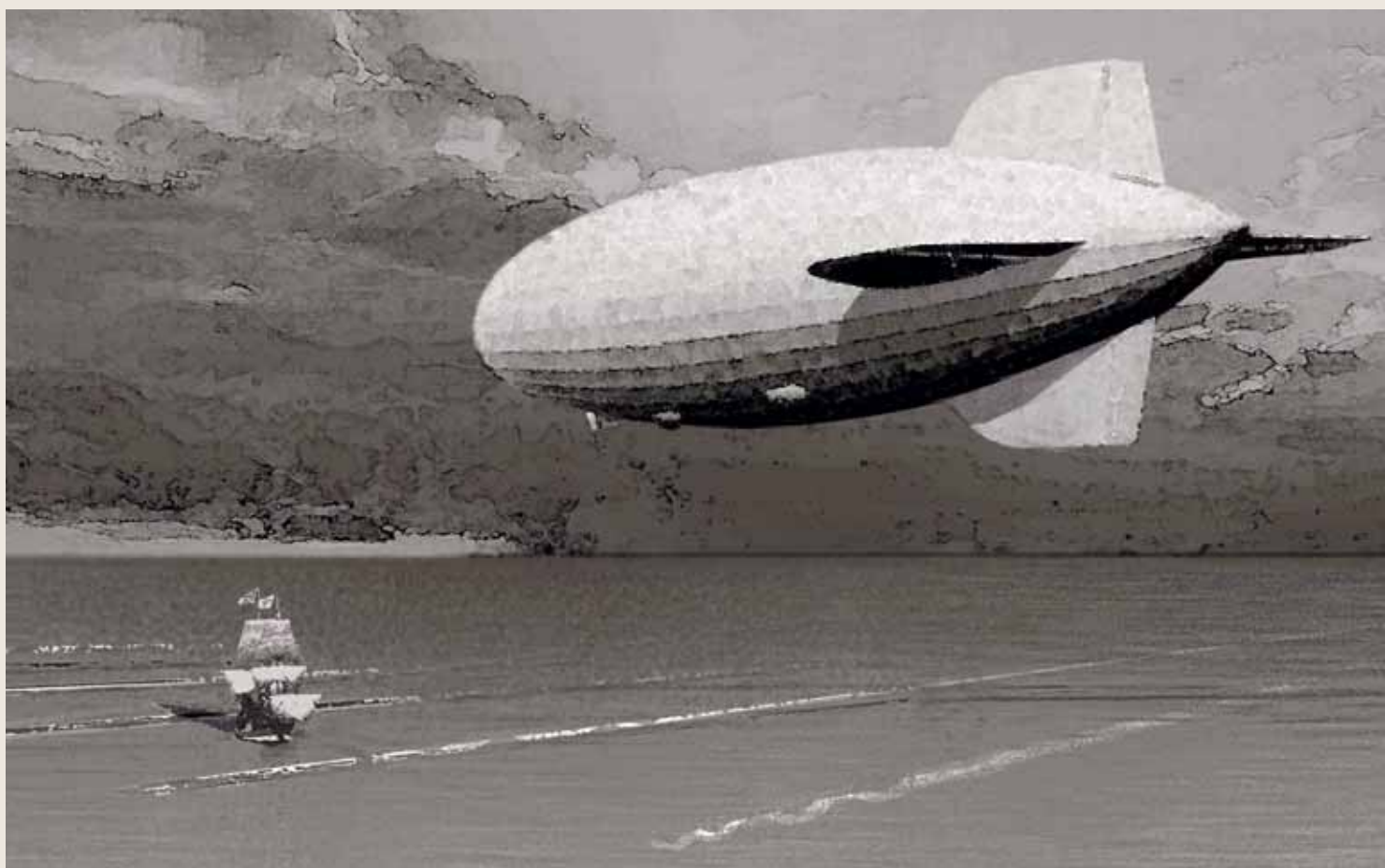


*Family matter: designer Rüdiger Szak and son Felix, product developer*

LED support. The light is distributed by ACRYLITE® LED (formerly EndLighten) and a reflector panel in the background, together with a diffuser panel made of ACRYLITE® Satinice as the surface. In our tests, ACRYLITE® LED proved to be by far the best solution for surface light distribution. The crucial properties were the high light output and the various sizes that are available. Added to this are the optimal and brightest possible light distribution for each size and the favorable pricing.

*What was your most unusual project?*

Rüdiger Szak: In cooperation with Evonik, Okalux and Osram, we developed a light panel made from insulating glass. We also realized a pilot project in the form of a light installation by artist Rita Kriege in Augsburg. cat



## A legend lives on

*For the TV movie “Hindenburg”, Production Designer Benedikt Herforth needed the right material to realistically reproduce the gondola of the zeppelin.*

► The picture of the Hindenburg falling from the sky in a flaming inferno is one that remains engraved in public memory. The pride of German aviation crashed shortly before it was due to land in Lakehurst, USA. Within seconds, 190,000 cubic meters of hydrogen exploded. Fire quickly ate up the outer shell of the zeppelin, which, together with its sister airship, was the largest zeppelin ever built. By the time the Hindenburg hit the ground, hardly any of the covering could still be seen. What was left was a metal skeleton that had almost completely collapsed, protruding from a cloud of flames and smoke. People ran around in a panic. Some wanted to help, others had just managed to escape from the burning zeppelin. Altogether, 36 people died in May 1937 when the zeppelin with the official name LZ 129 came to grief.

### *Recorded in motion pictures*

“I think the motion pictures are largely responsible for this disaster going down as one of the biggest in the history of aviation. The film material is of course grainy and black, as was usual back then, but it is amazing how calmly the cameramen kept their focus on the burning zeppelin, without a trace of the jitters,” says Herforth. As Production Designer, the man from Munich developed the entire set for the two-part series “Hinden-

burg” that is to be broadcast for the first time in February by TV channel RTL.

### *The stuff of dreams*

“It must have been fascinating to travel in a zeppelin. Today we can hardly imagine how it was to glide quietly along at low altitude,” Herforth goes on to say. For nine months, he worked on producing the film, looked for suitable locations for filming, designed the studio sets and selected materials. The biggest challenge, he says, was designing the interior of the zeppelin, because of the striking lack of similar objects. His research therefore took him first of all to Friedrichshafen Zeppelin Museum, where he found most of the material in the museum’s archives. These were the stuff of dreams for Herforth, with infinite amounts of microfilm, complete construction plans and innumerable inside and outside shots of the Hindenburg.

It was impossible to entirely reconstruct the aircraft due to its huge dimensions. The Hindenburg was an impressive 810 feet long and 135 feet in diameter at the widest point. So the overall views of the zeppelin were reconstructed using complex computer animations. When the big hangar opens in the movie and viewers watch in fascination as the LZ 129 pulls out, actors started by looking at a green wall. The



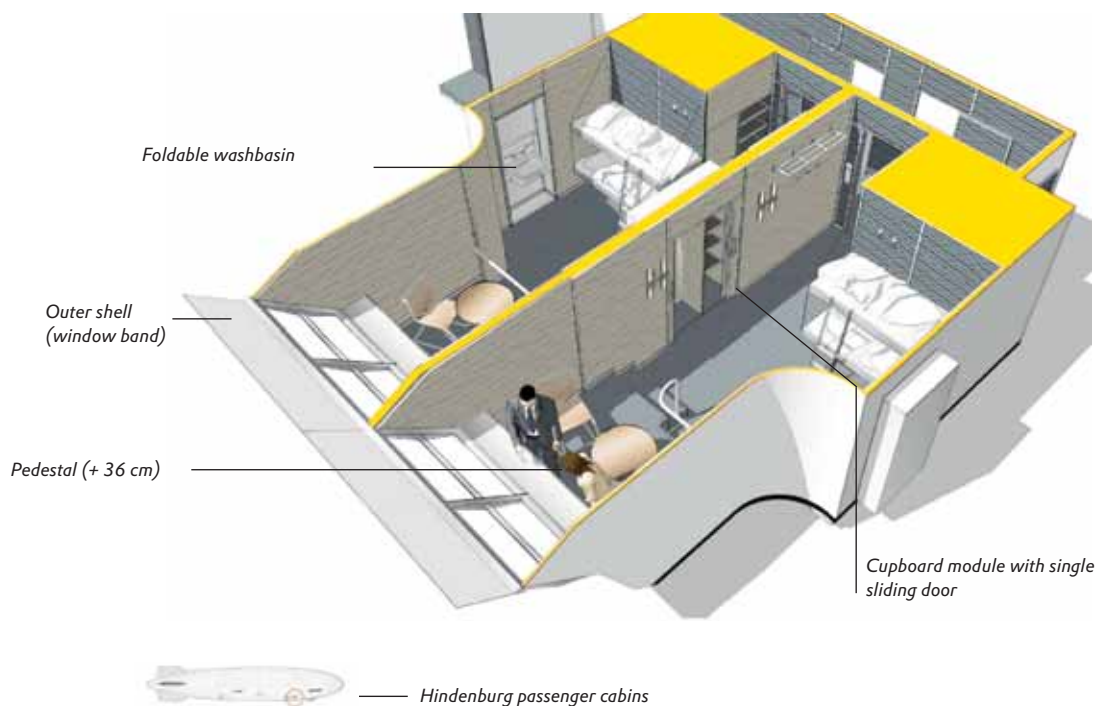
*Showing the right perspective: where a majestic airship glided past viewers in the original, cranes had to help out when making the movie.*



A glimpse into the reconstructed zeppelin gives an idea of the atmosphere in which passengers dined back then (top).



Reconstructions of the Hindenburg took up a lot of space (below left), yet had a hard job reflecting the size of the airship that went up in flames in 1937 (below right).



airship was later projected into the shots. "But we did reconstruct individual elements of the zeppelin using the documents we collected, from the passenger lounge to the cargo hold and the tail fin, and the observation deck to the control room." But Herforth couldn't always stick 100 percent to the original: "The original passenger cabins were only 43 square feet in size. We had to enlarge them in order to be able to film at all."

#### Safety on set

Herforth chose to use ACRYLITE® among other materials, for the windows of the observation deck, for instance: "I use this material for many of my productions," the production designer explains. "During the Hindenburg disaster, many passengers escaped through the windows. I wanted to reproduce that as authentically as possible, but reduce actors' risk of injury to a minimum." Another reason was that using ACRYLITE® was close to the original. The builders of the zeppelin, says Herforth, used lightweight synthetic glass to reduce the

weight of the aircraft. So the only question was which thickness of material should be used. "To start with, we wanted to use a thickness of 5 millimeters. But the material refused to break even when well-built men jumped on it from a height of three feet. In the end, 3 millimeters turned out to be perfect."

kma

The original airship was the model for the indoor and outdoor film sets. Cabins and lounges were faithfully reconstructed to portray the disaster as authentically as possible.

<http://herforth.info>





# “The Italian approach to design”

*What Italian fabricator Giovanni Scacchi and architect Andrea Branzi have created together is more than just a vase. It is art. A definitive object. In which flowers can also be inserted, if desired.*

► The human brain is one big machine that simplifies the world. Our mother says ‘vase,’ we hear ‘vase’ and sooner or later, we understand that a vase is something you fill with water and put flowers in. And we never question that for the rest of our lives. A vase is a vase. But a visit to Giovanni Scacchi’s factory changes everything. Scacchi produces vases, but at the end of the tour, you know that a vase is more than a vase. At least it is in Guanzate near Como in Italy.

Entering the production building comes as a surprise. Everything is clean, as white as a cloud, where one would expect dirt, noisy machines and workers in blue overalls. But the building of Metea srl is sunlit, clean and peaceful.

Giovanni Scacchi, 45 years old, greets visitors with a friendly smile and

a firm handshake. His company has been in business for seven years, but the know-how behind it is much older and also belongs to the family. Thirty years ago, his father began trading in ACRYLITE®. Later on, he started to fabricate the material as well. The factory became more complex as the company developed its skills. In 2003, Metea srl was established as a subsidiary of the paternal company, and is managed by Giovanni Scacchi together with his sister Elena. Metea is something like the family’s ACRYLITE® playground. This building in Guanzate is where they try things out, experiment and innovate. A small group of employees works on products that are the first of their kind.

*Vase or work of art? – Giovanni Scacchi and Andrea Branzi know that an object can be both.*



*“Drawings that are too precise often lead to misunderstandings. The people who have to use them interpret them as absolutely binding.”*

*Andrea Branzi, architect*

#### *The creative duo*

Company owner Scacchi is not alone in exploring untrodden paths. Six years ago, he got to know architect Andrea Branzi via common friends. This was a meeting of two people who complement each other perfectly. As a designer, Branzi creates artistic objects and knows a thing or two about production technology. Scacchi on the other hand is a technician and an expert in complicated processes for machining ACRYLITE®, but he is not an artist. “When we met, Branzi fell in love with the material right away,” Scacchi says. “We then decided to work together and created a collection of four vases.” Since then their relationship has

grown stronger and they have meanwhile realized 20 designs.

Scacchi and Branzi usually meet up in Milan for a technical chat. “Of all designers, Branzi has the best understanding of how to use the special properties of ACRYLITE®,” says Scacchi, referring to the material’s almost complete transparency, its light transmission and brilliance.

#### *Everything flows and changes*

But sometimes they also meet in the factory, or in Branzi’s studio in a suburb of Milan. That is his creative hotbed, where he hatches ideas that may first seem totally crazy. “ACRYLITE® is ideally suited for transporting a topical subject – fluidity,” Branzi explains. We are in his office, surrounded by high shelves and mountains of models. The architect is referring to a theory that presents a different view of the present, one that is less rational, less mechanical, and puts greater emphasis on flow and change. In terms of design, this is expressed in organic forms, in shapes that imitate nature and are constantly shifting. “My vases have shapes that were certainly not around in the past century,” he explains. Branzi is always searching for new materials or, as he puts it, new interpre-



*Nature provides inspiration for shapes and colors, turning mushrooms into lamps.*

Having fun with unusual shapes and perspectives:  
Andrea Branzi (left) and Giovanni Scacchi.



Every detail is important.  
The colored adhesive is  
injected into recesses by  
means of a syringe.



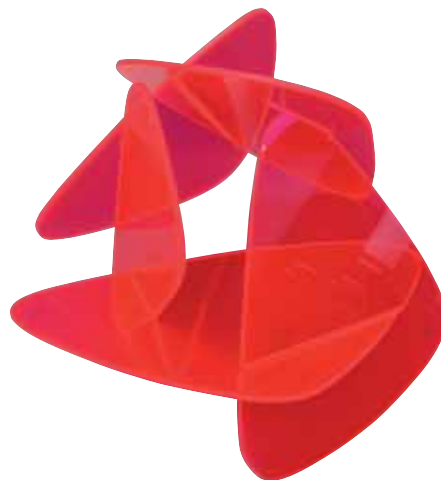
Creative space: Andrea Branzi in his studio. New and versatile materials inspire him to create unusual shapes. He turns everyday items into eye-catchers.

tations of materials. He speaks in a leisurely way and probably designs his models that way too. "Each object represents an entire discourse, a world view," he says. It is then Scacchi's job to translate this world view into practice, together with his employees. Branzi consciously prefers not to make precise specifications. It is not his thing to present construction drawings that have to be reproduced accurately down to the last detail. In Italy, with its many small and medium-sized enterprises, group work has always been the rule – manufacturing a product together that calls for extensive input by each employee, not just a few individual movements like on a conveyor belt.

"Drawings that are too precise often lead to misunderstandings. The people who have to use them interpret them as absolutely binding." Branzi, on the other hand, appreciates the changes that take place during the realization process. "In this respect too, my objects are the typical result of the Italian approach to design."

The road from draft to production is sometimes a long one. "The technical managers are the link between the 'artists' and us workers," says Emilio Sampietro. Some customers want the impos-

sible, adds his colleague Renato Cazzola, who has been with the company for 23 years. Sampietro, who is 38, comes from Como and used to work in a company that produced fabric. "I came here along with this machine," he says and shows a heat lamination unit. Guanzate also manufactures serial products as well as designer pieces. Production of the time-consuming designer pieces alone is not profitable enough. They are made in small numbers at high expense. The machine that Sampietro is operating makes the so-called gravestones: small squares of ACRYLITE® with embedded emblems or certificates for shelves at home.



In some works, form conceals function, or they have no function at all, like this object. It is called *Inside Out* and was designed by architect Angelo Mangiarotti.



*Giovanni Scacchi amid the works of art. Organic and ultramodern shapes and colors stand next to each other in his offices without appearing incongruous.*



*Straight lines can still be playful: Colored stripes turn a ACRYLITE® chair into a work of art.*

### *Routing and bonding*

Sampietro and Cazzola work on all the products. They appreciate the Sciami vase in particular for its complexity and beauty. The artistic structures involve many individual steps, even if that is not apparent in the end product. To start with, they call for only 20 transparent ACRYLITE® sheets that are precisely 20 millimeters thick. These are machined on a 5-axle CNC machine. A small drill is used to route tiny patterns in the surface, rings for example.

The following work step shows how extremely important details are. Each of the countless routed rings on the 20 sheets have to be blown through with compressed air. If even a tiny crumb were left in the depression, it would immediately be visible on the polished vase. It would look like a break in that particular ring.

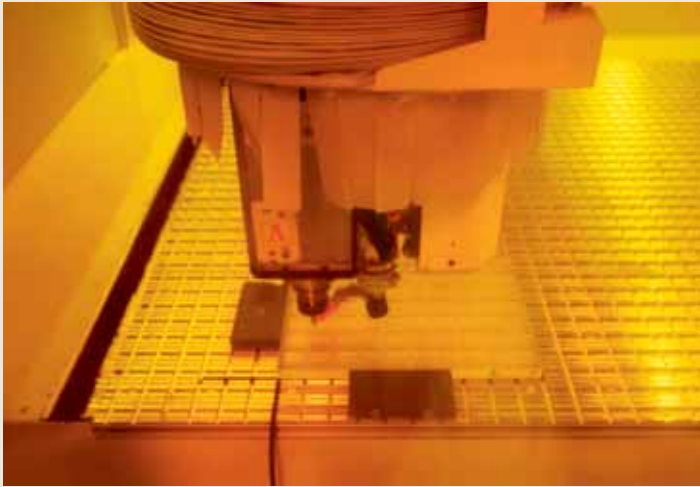
Sampietro usually leaves the following step to his colleagues. The depressions are meticulously filled with ACRIFIX® adhesive, but this is colored according to the company's own formulation. Cazzola and his colleague Davide Verga have the specially prepared three-component adhesive in front of them. They fill a syringe with the yellow com-

pound, squeeze a few milliliters into each of the holes and then distribute the adhesive generously over them.

### *In the beginning was a block*

When this has dried and cured in the oven, the sheets are calibrated. That means a thin layer of the material is machined off. Before this is done, large colored dots of adhesive can be seen on the sheets. Afterwards, only the depressed rings remain. If the vase is to have several colored rings inside, the procedure is repeated.

Afterwards, the sheets are bonded, this time without color. In the end they look like one single block. "It's our company secret how we mix the adhesive," Scacchi explains, holding up the finished ACRYLITE® block. The vase is then routed out of this block, sanded until smooth and polished. The end product is a massive transparent vessel with mysterious rings inside, 12 inches in diameter and 9 inches high. The rings actually do make it look organic. Only from a certain angle can one see that the vase consists of individual layers. The rings then appear as narrow lines. Otherwise, the vessel appears monolithic.



*Small circular movements: decorations are routed into the ACRYLITE® sheets. They are later colored by being filled with adhesive.*



*Smooth and glossy: what looks like part of a washing machine is the polishing unit that gives the vases the finishing touch. After that they appear like noble exhibits with an amber sheen.*

*“Of all designers, Branzi has the best understanding of how to use the special properties of ACRYLITE®.”*

*Giovanni Scacchi, fabricator*

“To begin with, you wouldn’t think such a beautiful product could be made from a rough block,” Sampietro says. “It is a very satisfying feeling to hold the finished vase in your hands.” His colleague Cazzola stands next to him and nods: “I would never work on a conveyor belt, not even for half a day, here you end up feeling as if the product was your own.”

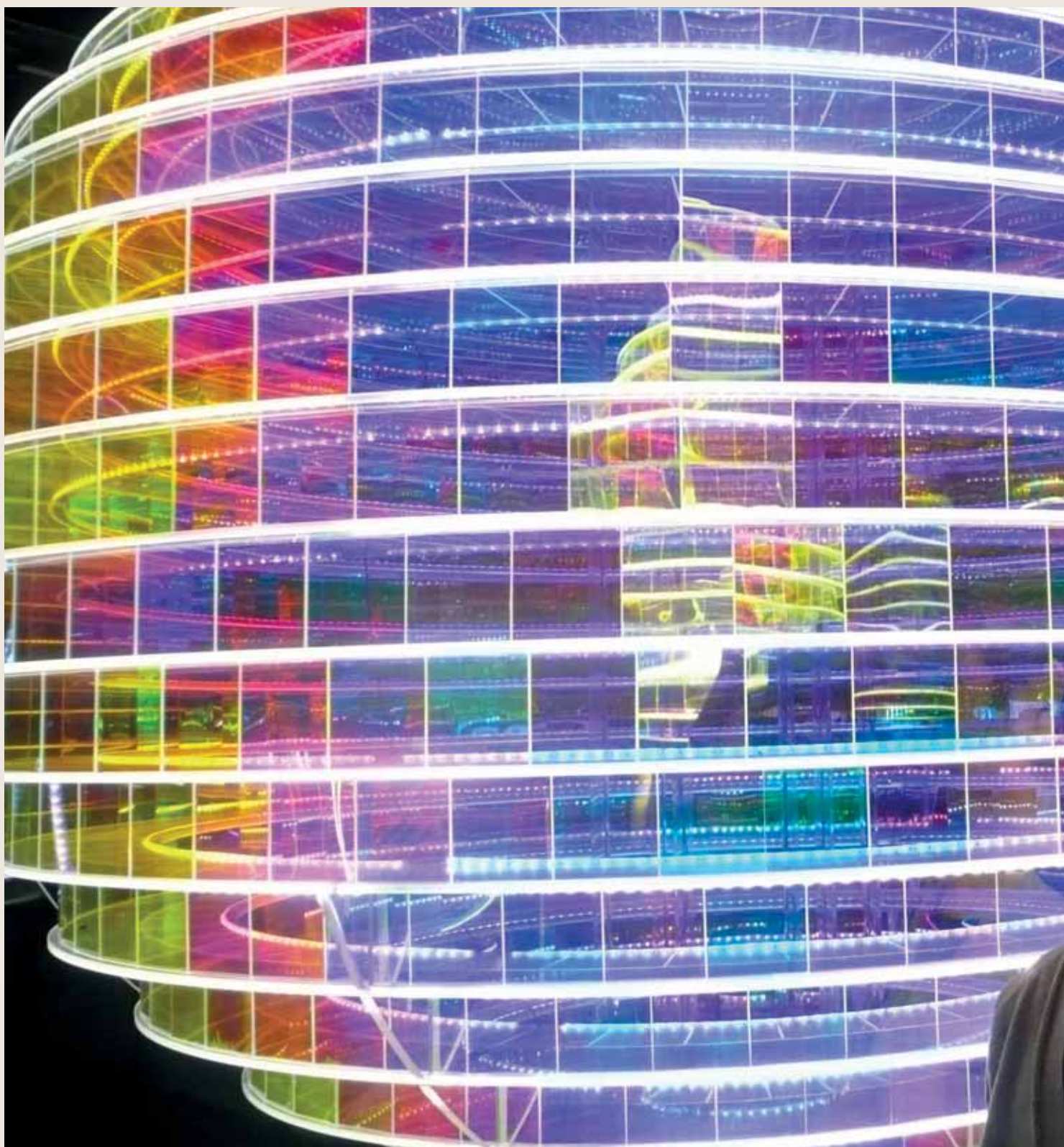
#### *What does the vase cost?*

“We don’t know. But we know how much it weighs.” How much? “A lot.” The two men grin. Neither Cazzola nor Sampietro has a Metea vase at home. It costs “a lot” as well. Scacchi says the price is around 5,000 to 8,000 US \$. And it weighs 50 lbs, by the way.

Most of the works of art produced by Sampietro, Cazzola and their colleagues will probably never come into contact with flowers and water. They are immediately placed in the buyers’ glass cabinets or art safes. Are they vases all the same? Another model designed by Branzi, the Enzimi, has flowers and water inside the walls of the vessel. Is that a vase too? To call it that would be far too easy an answer. **Sandro Mattioli**



*Scacchi layers one sheet of ACRYLITE® on another. The individual sheets are bonded into a block, from which the vase is made.*



## Colosseums of light

*A lamp designed by Philippe Héroult combines light, color and transparency in a special way to create an indoor rainbow.*

▶ An empty space is like a blank sheet of paper. Both cry out to be filled and to receive an individual signature. Philippe Héroult knows how to make a room unique and give it character. In Biarritz in southern France, the designer created a showroom in which one impressive exhibit stands next to the other. He was inspired by two things: "I work with materials that are very transparent and diffuse light," says Héroult, who trained as a wrought-iron craftsman and went to work at the castles of the Loire and in Versailles. Transparency in particular is a property that can be played with. The furnishings designed by Héroult add personal and sensitive touches, neither dividing room space crudely nor taking it up completely, since they can be seen through.

### *Design for day and night*

This is shown by his "Depth" design. Héroult installed the two lamps made of ACRYLITE® Radiant in his showroom. His intention was to create a strong element that is visible from outside and draws attention to his studio. "During

the day, sunlight falls on the lamps and makes the material shimmer in all colors of the rainbow. The color changes depending on the viewing angle," explains Héroult. "At night, LEDs illuminate the globes and create a magical combination of light, color and transparency."

Héroult entrusted APR2 with the production and installation of these works. The fabricator created a ring-shaped sheet structure of clear ACRYLITE®. The engineers then inserted squares of ACRYLITE® Radiant into this structure and bonded each square separately, piece by piece, ring by ring. To finish off, a rope light was installed on the inside.

"Sunlight and LEDs make the material appear radiant and bring it to life," says the designer. Light of such color depth gives its surroundings a completely different impact. This is how Héroult has put his mark on the room, in a subtle and sensitive way. cat

[www.philippe-herault.com](http://www.philippe-herault.com)



*Eye-catcher in designer Philippe Hérault's showroom: the bigger of the two lights is 71 inches high and 63 inches wide.*



*The showroom in Biarritz, France. It's clear looking in from outside that light is the dominant element there, as decoration, exhibit and signpost.*



*Reflections and different colors make the light installations appear to move.*



Light plays a very important role in the life of birds. Their entire biorhythm is geared to daylight. When the tropical bird house at Krefeld Zoo was given a new roof that made the house brighter, the wattle-necked jacanas nested for the first time. The number of offspring rose unexpectedly one year after the roof was replaced.

## It's all about animals

*After a hailstorm, the monkeys, caimans and tropical birds at Krefeld Zoo needed a new roof over their head. The roof was meant to recreate a natural habitat for the animals, with the right amount of UV light and a permanently hot and humid atmosphere.*

Most people think of the risk of sunburn and skin cancer when they hear of UV light. But in moderation, it is vital for almost all living organisms. The UV-B portion of sunlight is especially important, since it helps us to form vitamin D. It regulates the level of calcium in the blood, supports bone growth and the nervous and muscular system. "Animals from warmer climate zones in particular depend on a lot of natural light," says Dr. Wolfgang Dreßen, Director of Krefeld Zoo. "Normally, artificial light sources and UV radiators are used in our latitudes. These use a lot of energy and are therefore very cost-intensive and only locally effective." So when the zoo had to replace the roofs of the tropical houses, it was clear that they had to be highly transparent and let in UV light.

### *The world of exotic species*

The three tropical houses are the main attraction at Krefeld Zoo. Following the monkey and bird houses, the rainforest house was built in 1998. It is the most impressive of the three in architectural terms, and allows reptiles, amphibians and mammals to move freely amid the vegetation of a South American rainforest on a surface area of 1,315 square yards. White-faced sakis jump across paths from tree to tree and use visitors as stepping stones. They are quite without fear. Turtles, caimans and large freshwater fish like silver arowana and stingrays swim around in a man-made river. "The animals and plants need the entire spectrum of natural sunlight, not just because of its brightness," Dreßen explains. "UV light is especially important. Insects can see it, many plants absorb it and blossoms reflect its rays. Reptiles need it for their skin and bones to harden." For many species of birds, these rays make it easier to find a partner during the mating season. The plumage of males and females reflect UV light differently. Special attention had to be paid to this aspect when renewing the roofs in 2009.

### *A storm with grave consequences*

A hailstorm swept through Krefeld in May 2008. "Some of the hailstones were the size of tennis balls and

came down at a speed of more than 93 miles per hour," Dreßen tells us. About 90,000 cars in the region were damaged, nearly all glazed roofs were broken. Animals in outdoor enclosures at the zoo were affected: nine flamingos died. The roofs of the tropical houses were also destroyed. "The sheets looked as if someone had blasted them with a machine gun," says the zoo director.

The animals' needs were the main concern when it came to replacing the roof. The chosen material was to be UV-transmitting and offer maximum hail resistance, as well as showing good heat insulation and withstanding an atmospheric humidity of 90 percent. "UV transmission was the main problem," says architect Martin Busch, who was in charge of planning the construction work. "Most materials block out UV light. Only ACRYLITE® Alltop met our requirements."

### *The right mixture*

The people in charge chose a quadruple-skin sheet to prevent heat from escaping via the roof, as far as possible. "That enabled us to improve the U-value, especially in the monkey and bird houses, where double-skin and triple-skin sheet had formerly been used," says Zoo Director Dreßen. The roofs with the new sheets now have a U-value of 1.6 W/m<sup>2</sup>K. Before it was much higher.

The suitable solution for Krefeld Zoo was a product that combines one of the key characteristics of ACRYLITE® Alltop – UV transmission – with the heat-insulation properties and impact strength of a ACRYLITE® Resist quadruple-skin sheet. "That means the sheets can withstand hailstorms and falling branches. Yet they let three-quarters of UV radiation into the building," says the architect. Impact strength is especially important for the bird house, part of which stands with a beech wood.

### *Customized fastening system*

Hubert Schröder, Managing Director of Schröder Conservatories, the company that installed the roofs, developed a special glazing bar to install the 32 millimeters



*People are not the only ones to need sunlight for their wellbeing. Sunlight has a positive effect on chimpanzee Charly's health and mood too.*



*The rainforest house is home to a large number of reptiles. They need UV-B radiation to form vitamin D3, otherwise their bones soften and become deformed.*

*The blossoms in the butterfly house reflect UV rays and entice insects to pollinate them.*



5,240 square meters of ACRYLITE® cover the roofs of the four tropical houses, the main attractions at Krefeld Zoo.

The tropical monkey house was built back in 1975. The tropical bird house built in 1989 shelters birds from Asia, South America, Africa and Madagascar. The rainforest house built nine years later allows animals from the South American rainforest to move around freely.

thick ACRYLITE® quadruple-skin sheets quickly and easily on the roofs. Originally, the buildings had been roofed with different materials, and there was no uniform fastening system. "It was important for the aluminium glazing bar to be thermally separated," Schröder explains. "This improves the roof's heat insulation and prevents condensation." The relatively large center-to-center spacing of the glazing bar (1.24 meters) means that little material is wasted through cutting to size.

When it came to replacing the roofs, their shape posed a particular challenge. "The monkey house has very large surface areas, so we needed sheets that were 46 feet long," says Schröder. But the biggest problems were encountered with the rainforest house, whose roof is shaped like a steep cone. "So it was impossible to put up scaffolding around it. Luckily, two rails belonging to an inspection unit had been pre-installed on the roof. We were able to work safely on the roof using a specially constructed ladder."

#### *Building with living obstacles*

With a well-trained team of eight people, Schröder built the roof structure under the management of architect Martin Busch. The animals living in the tropical house were always in on the act. "As soon as part of the roof was opened, we had to close it as soon as possible to stop animals from escaping," explains Busch. "We had to employ a number of tricks." Since most animals would rather be in the light than in the dark, the areas being worked on were covered with dark fabric. "That stopped the birds in particular from being curious and made work easier," says Zoo Director Dreßen. Throughout the building phase, the workers made sure not to endanger either visitors or animals. The zoo remained open to the public as usual, with very few interruptions. "Zoo keepers, tradesmen and architects worked in close cooperation," says Dreßen. "Not a

single animal escaped or was harmed." Work was concluded at the end of October 2009 and a total roof area of 6,000 square yards was covered. A butterfly house was added in 2010, which was also equipped with a UV-permeable roof. Using the UV reflections, the plants there are able to attract the 30 types of butterfly from Asia, Africa and South America. That is how the insects recognize where to gather certain types of nectar and where to land on plants.

#### *Good vibrations*

The effort has already paid off. The tropical plants now only need artificial light during the darkest part of the year, and no more UV radiators are needed for the reptiles. "But we see the biggest effects in the bird house," says the zoo director. "We had sensational breeding success there only one year after the construction measures, including two species that have never raised young at our zoo before: wattled jacanas, which are also called Jesus birds because of their big feet, and black-necked aracari, a South American species of toucan." jh

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



The shapes of the tropical house roofs made it hard to reglaze them. The conical tropical house roof in particular made the roofing work a balancing act. To make work easier, Hubert Schröder from the commissioned company developed a thermally separated glazing bar that is specially adjusted to the ACRYLITE® quadruple-skin sheets.



*Siemens has changed track: instead of fluorescent tubes, the logo is now lit by energy-efficient LEDs. To achieve the same color effect and luminosity with the light-emitting diodes, the material had to be perfectly adjusted to the LEDs.*



# Beacon in the night

*The lettering of the Siemens corporate logo had to have the desired color effect, luminosity, and long service life. With ACRYLITE® and the right LEDs, the name now glows in the familiar corporate color petrol.*

Seven illuminated letters up to ten feet high glow from afar in the color petrol every evening on factories and office buildings. They show viewers at 3,000 sites around the world which company is located here. Like beacons in the night, they act as a point of reference and enhance the company's familiarity. The Siemens logo glows in the characteristic corporate color petrol, a shade between green and blue.

"The color was clearly specified, but is not easy to match," says Andreas Stolzenberg, Sales Manager Solid State Lighting at light bulb manufacturer Osram. Together with staff at Evonik, the Osram team worked on a suitable combination of light-emitting diodes and ACRYLITE®.

"The Siemens philosophy is to look for long-term solutions. When we look at investments, we always consider the life cycle costs. Buildings usually remain in use for 50 or 100 years," explains Jesper Friis, who handled the project at Siemens. So the new illuminated signs not only had to be a perfect match in terms of color, they also had to be durable and less expensive to repair and maintain than the existing units.

It was therefore an obvious choice to replace the fluorescent tubes used so far with energy-saving, long-life LEDs. "Whereas an electrician had to clamber up to service the logos every 40 months, the LEDs work without maintenance for up to 165 months," Friis explains. "We also achieve energy savings of more than 70 percent as compared with the old units that used high-voltage neon tubes."

## Customized color effect

To make full use of the energy-saving potential offered by LEDs, the material from which the letters are made has to be highly light-transmitting and ensure the right color effect. "Viewers also perceive brightness as a color effect," explains Martin Hoffmann at Evonik. "That is why we have not only produced the matching ACRYLITE® LED color, but also defined precisely together with Osram how many LEDs we need for which size of letter to create a uniform impression."

This authentic color and durable colorfastness was crucial for Siemens. "What also convinced us about the material developed by Evonik was that it is insensitive to UV light," says Friis. "It retains its quality and the color of our logo therefore remains the same in the long term." It is not only UV radiation in countries like South Africa or Australia that represent a challenge for the material – in other regions, it is exposed to extreme cold combined with wet weather, snow and hail. It withstands all of these without any problem.

So far, 30 logos have been replaced on buildings in Europe. Soon, the familiar seven petrol-colored letters will be installed at other locations around the world too.



## Inspiration combined with tradition and vision

*ACRYLITE® has always inspired people, from its first application right up to today. It is the material of choice for innovative ideas. A variety of properties and intelligent functions enable path-breaking projects that are continually new and different, but all retain the familiar high quality of this material.*

► Progress and innovation are drivers of the economy. No product stays the same for decades, either in industry, architecture, lighting or technology. New ideas, creative approaches and the realization of previously inconceivable concepts are essential for the success of a company. ACRYLITE® has been there from the start in many fields of application and has opened up new avenues. ACRYLITE® entered the field of mass-produced automobiles, where it replaced glass in taillight covers. Meanwhile, these taillights are only one aspect of a much broader range of items used in mass-produced cars, which extends from large car body components to glazing. But ACRYLITE® is not just installed in vehicles, it can also be found in consumer electronics appliances. When Braun launched its so-called "Snow White's coffin" – a combined record player and radio with a transparent cover made of ACRYLITE® – it was a real sensation. Today, viewers are fascinated by huge flat-screen televisions. This would not be possible without PMMA. Those are only two among countless examples of how ACRYLITE® has triggered, supported and promoted developments.

### *A material for different needs*

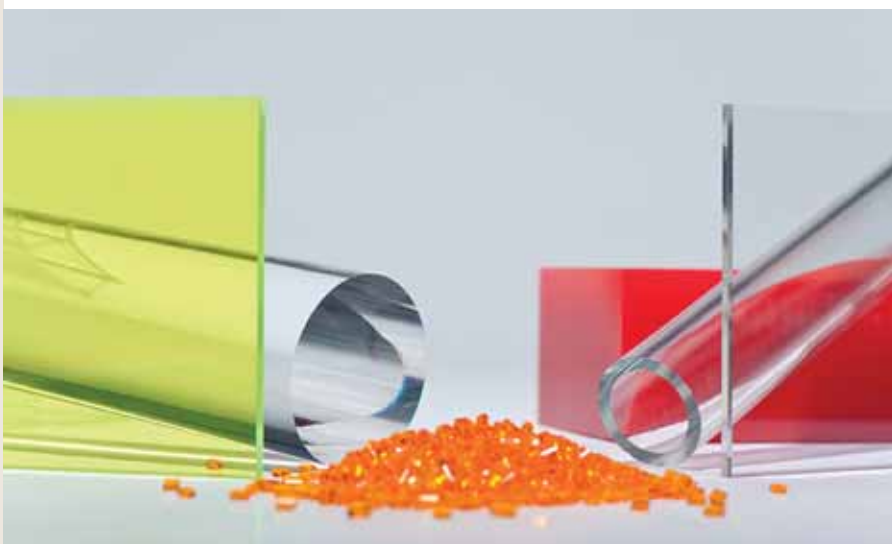
"We have continually developed the inherent good properties of ACRYLITE® ever since it was invented," says Bernd Petri, Communications Manager Acrylic Polymers. "Our material's customized functionalities enable creative professionals to

come up with a succession of new ideas and to look to the future. That strengthens our pioneering role around the globe." A topical example from the private construction sector: ACRYLITE® with an Anti Algae coating prevents algae, mosses and pollen from adhering to carports or conservatories. The surface based on nanotechnology is non-toxic and biologically neutral. This is a huge time saver for house owners, because the material rarely needs to be cleaned.

### *New symbol of dynamic innovation*

The innovative potential, inspiration and creativity embodied by ACRYLITE® are now symbolized by a new brand mark. The "Swing," whose three elements grow out from a central point and unfold dynamically represents the infinite design possibilities offered by the material. The symbol invites users to rediscover ACRYLITE®, with its variety of colors, freedom of form, surface impressions, intelligent functionalities and combination with light. Some materials have also been renamed in this context, but the formulation, raw materials and production processes remain the same. All that have been added are new products that provide inspiration for the applications of tomorrow. ck

[www.acrylite.net](http://www.acrylite.net)



*A constant source of inspiration, from 1974 up to today: When Dr. Otto Röhm invented ACRYLITE®, he never dreamed how versatile its uses would be. The brand names show the purposes for which the specific material grades are used.*

*The 12 ACRYLITE® family brands:  
ACRYLITE® Alltop  
ACRYLITE® Heatresist  
ACRYLITE® Heatstop  
ACRYLITE® Hi-Gloss  
ACRYLITE® LED  
ACRYLITE® Optical  
ACRYLITE® Reflections  
ACRYLITE® Resist  
ACRYLITE® Satinice  
ACRYLITE® Solar  
ACRYLITE® Soundstop  
ACRYLITE® Textures*



# Material of the future

*Michael Träxler, Senior Vice President of the Acrylic Polymers Business Line, talks about tomorrow's innovations.*

► *Mr. Träxler, the ACRYLITE® brand has been given a facelift with the new brand mark, and the product names have also changed. Why was that?*

Träxler: ACRYLITE® is now over 35 years old, but it has never stood still, it is a material for the future. I am fond of saying that people who want to change the world should know about ACRYLITE®. That may sound a bit exaggerated, but ACRYLITE® goes on developing all the time. The new developments are a far cry from the material's beginnings or the product as it was in the 1980s and 1990s. Today there are many things that seemed impossible back then. And this development continues.

*What are the central fields of development from your point of view?*

Träxler: The television is a good example. All of a sudden, there is an enormous market for PMMA that no one thought of just a few years ago. LED television technology altogether would not be possible without PMMA. But the same applies to applications in the field of solar energy and everything to do with transport. This is because we are involved in all areas of construction and because automotive glazing is set to become a key sector for us.

Another exciting field is the combination of ACRYLITE® and light. Although light-emitting diodes have been around for 50 years, they are gaining in commercial importance. This is because the LED itself has been further developed, but also because the theme of lighting is undergoing change. Just think of indirect lighting, area lighting and the standard combination of functionality and design.

*What does ACRYLITE® stand for?*

Träxler: Creativity and inspiration are the messages our product conveys. I'm quite sure that in 20 to 30 years' time, there will be all sorts of applications with ACRYLITE® that we cannot even imagine today.

As I said, the example of LED TVs shows how rapid and all-embracing such a development can be. Five to ten years ago, no-one would have dreamed we would revolutionize TV with PMMA and build large, extremely flat TV sets.

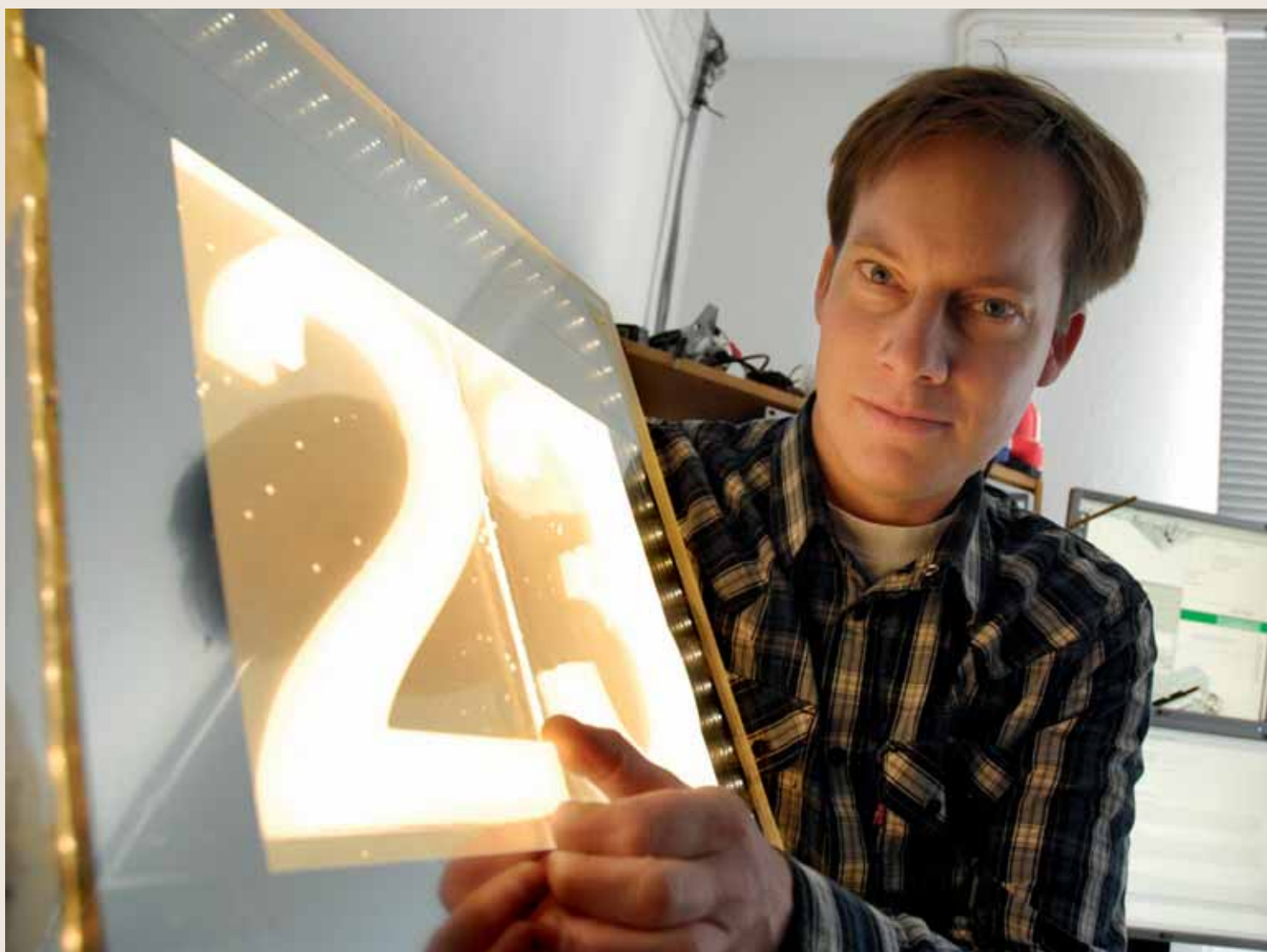
*What does ACRYLITE® have to do as the material of the future?*

Träxler: Its light-guiding properties will be just as important as classical attributes like low weight and impact strength. The automotive sector is a key area. Others are solar energy, where the material's versatility is a bonus in various applications, including ones that rely on customized transmission properties, and where precise Fresnel structures are required for effective focusing. ACRYLITE® is in demand wherever energy is generated or needs to be saved. Whatever sector we operate in, energy generation and energy efficiency are vital considerations.

The situation after the recent events in Japan shows that we have to explore new avenues. Our material will help with this too. Key points for us are sustainability and recyclability. There are few plastics that can be reintroduced into the production cycle. But we must be able to use products for tomorrow's world in good conscience. That is possible with ACRYLITE®.

*The tradeshow appearance at Euroshop underlined this view to the future. What was in store there for visitors to the show?*

Träxler: Our intention was not to impose any constraints, but to give people the opportunity to try things out and experience how they can be even more successful using our material. And that means more than just the sheet product. There are various product geometries, not forgetting our molding compounds. All of this is ACRYLITE®. We opened people's eyes to the fact that it is far more than we can imagine at the present point in time. ck



## Building with light

*Thorsten Menzel is in his element working with light. Custom-built items for light installations are his trademark.*



*Thorsten Menzel in front of one of his projects. An apartment block for senior citizens in Bielefeld is given an individual character by illuminated lettering on the façade.*

► Thorsten Menzel is an early bird. At 7.30 a.m. on the dot, the tall blond engineer opens the door to his office and the adjacent workshop. “Luckily I live next door,” he says with a grin. Bielefeld in northwest Germany, where his company is located, is just getting into gear for the business day, like Menzel himself. After mooching around the hardware store last Saturday, he came back with an idea that he wants to try out right away. Thirty-nine-year-old Menzel sits down at his computer and gets down to work. Drawing programs and modern tools help him to plan light designs. Light installations, their control and the relevant software are his core business. Everything is custom-made. Although Menzel’s company T.C.M Light Solutions also prepares projects for serial production, he hands them over as soon as they reach that stage.

Menzel is a busy man. There are very few firms that offer custom-built light installations. He receives most of his orders from the glamorous world of theater, television production firms, musicals and large-scale events, which ask him for decorative elements. “Blue Man Group, Beauty and the Beast, Tarzan, Expo, Yma, and the ‘Satire Summit’ staged by German broadcaster ARD,” he lists. He has planned, prefabricated, set up and checked installations for all of these.

### *Behind the curtain*

Menzel often stands on stage at these events, albeit in the wings. “I really enjoy coming up with new ideas for these events,” he says. “And I know all the musicals – from behind,” he laughs. He discovered his passion for theater and light while still at school. In the school’s theater group, he was responsible for

lighting and the technical side of things, and did not join in the acting like everyone else. Even music prompts him to invent: as an 18-year-old DJ, he built his own trailer with a music system and light machine. The machine was also his own work: “That was my mobile disco.” After school he went on to study electrical engineering at Bielefeld University of Applied Sciences, and did an internship during his studies at the municipal theater. Straight afterwards, in 1999, he set up his own small engineering office and received the first request from a client straight away. “It was a huge order,” he reports, and you can still hear the pride in his voice. Menzel supplied a luminous tunnel with flickering light for the musical *Dr. Jekyll and Mr. Hyde*. The tunnel, consisting of ACRYLITE® double-skin sheet to which luminous film was bonded, went on tour to Bremen and Vienna. A second version has meanwhile been created for Cologne.

### *Crystal-clear presence on stage*

Before an installation glows, a lot of interim steps are required: “The creative team consisting of set designer, director, choreographer and light designer come up with an idea, and I examine whether it can be technically implemented with the available funds. The funding is often what limits the project – technically, almost anything goes,” he says.

A material similar to glass is often in demand for use on stage. “This is the most sophisticated material in terms of lighting engineering. It can mirror the performers, be seen through and it can be made to glow.” But because glass is very heavy and difficult to fabricate, he usually falls back on ACRYLITE®. This offers the same appearance, and makes it easier to carry out changes: “Often, I



The engineer developed glowing ginkgo leaves for the dance and acrobatics show Yma at Berlin's Friedrichstadtpalast.



The artwork on its way to the big performance.



Colorful and spectacular: the stage set for the show.

have to drill holes to mount fastenings, and I have to change the shape of the material." He points to a hot-air gun, which he uses to bend the material without any problem. That works well due to the material's good thermoformability.

"A lot of changes are requested before the premiere, because artists sometimes change their mind," he says. That piles on the time pressure, and calls for quick solutions. Meanwhile, Menzel has five employees and various freelancers who assist him with his projects. "Of course, we also get small orders, and create lighting concepts for car interiors, for instance."

What all applications have in common is that clients are looking for innovative solutions. This was also the case with the façade of a housing project run by Bielefeld's public-benefit housing company (BGW) – an estate with housing appropriate for elderly people with an immigrant background. The people in charge of the project want to create a pleasant and hopeful environment there. With this aim in mind, façade designer Petra Breuer developed lettering that was meant to express the idea behind the project. Menzel came up with a lighting concept in which the large letters in German, English and Turkish that are installed in the façade start to glow in the dark and give the buildings their characteristic appearance. "It is meant to make them unmistakable," he says. A far cry from glamour? "No, I try to add an artistic touch to every building, using individual lighting design," Menzel explains. People appreciate this and look closely at the buildings. "I noticed at the start that everyone who walks past these buildings looks at them for at least

*"It can mirror the performers, be seen through and it can be made to glow."*

a minute," he says with obvious satisfaction. The large ACRYLITE® sheets to which individual letters are bonded were integrated into the combined heating system and the house façade was rendered. "This was a one-off." But not only that, Menzel discovered an additional benefit. Since the sheets are very thin (1.5cm), they can be easily embedded in the façade. The insulation remains virtually intact at this point. There is no need for a deep light box as would normally be the case. In this and other projects, Menzel is always exploring new paths and collecting ideas, even when he goes shopping or is on vacation. Yet he underlines: "It is essential to give yourself time." This is an attribute he has acquired with growing professional experience, and now knows: "Never let yourself be put under pressure. Some things can't be done in a day." pao



Guideline for design: the model of the ginkgo tree for Yma.



## Retail halls of fame

*Changing environments, different service offers, sustainable concepts: shopping malls return to town*

► Victor Gruen was ahead of his times. This architect dreamed of community centers for downtown America, where people could not just shop but also enjoy cultural and social life, as was the tradition in European towns and cities. His vision did not catch on in 1950s America. Instead, shopping centers were built purely to cater for consumption, and were cut off from the surrounding area. Europe blindly followed America's example, with locations outside the old town, mall entrances straight from the car park and façades plastered with advertising posters. In no way did these buildings meet town planning objectives.

### *Filling retail temples with life*

Not until the mid-1990s did new concepts emerge that put shopping centers back in town and linked them up with other public spaces, like Fünf Höfe in Munich or de Klanderij in the Dutch town of Enschede. The specification for realizing these centers is quite simple: they should fit into the urban environment, say by using open structures and attractive façades.

This open environment is also hoped to help fill the center with people. "Life flourishes in surroundings than

can be experienced," says Andrei Florian, architect and Associate Partner at ATP Architects and Engineers. "The aim is to create a place where people feel at ease and can shop if they want to, but can also do other things." The buildings are therefore enlivened with cinemas, gyms or restaurants, even at night and on the weekend. They are multifunctional. The lifestyle centers currently being planned in the USA follow this concept. So Victor Gruen had the right idea after all.

### *Most recent offer: sustainability*

Seamless integration of the centers into existing structures is an ideal that many architects and town planners aim to achieve. Another is the sustainable design of such malls. "Clients are increasingly committed to sustainability and environmental issues," Florian reports. "Recycling and the CO<sub>2</sub> balance are contemporary criteria for building such sustainable shopping malls." As process architect, he planned the construction of the Austrian "Atrio," which won the 2009 International Council of Shopping Centers (ICSC) Best-of-the-best-Award for Sustainable Design as the world's most sustainable shopping mall. The 652 "glowing piles" under the building gain energy from geothermal sources, which saves about 500 tons of CO<sub>2</sub> per year as compared with a mall that is not operated with alternative energies. Since these malls cover large surface areas, there is enormous potential for using geothermal accumulators. But don't such considerations restrict creativity? No, says Florian: "Sustainability is part of architecture and construction. Consciously and explicitly demanding sustainability is a challenge, not a disadvantage."

### *Global demand*

To attract clients, the shopping centers have to become objects of desire and



*Partition at Wantong Shopping Mall in Beijing: Passersby experience a play of shifting colors, that change according to the viewing angle.*



Holder of an award as the world's most sustainable shopping center: "Atrio" in Austria. Geothermal energy is obtained from 652 glowing piles beneath the building. Since shopping malls usually cover large surface areas, they are very suitable for this type of energy generation.

conjure up a glittering dream world. ACRYLITE® is frequently used in malls all over the world. In June 2010, large light boxes were installed below escalators and suspended ceilings at "Palace 66" in Shenyang, China, to illuminate the interior. Since December 2010, a light installation made of clear material and a partition made of ACRYLITE® Reflections (formerly Radiant) has created the desired mood at Beijing's Wantong Shopping Mall. The partition, which shines in all colors of the rainbow, structures the room but does not completely shut out what is behind it due to its slight transparency.

In Iran, 3,500 miles away, Mahestan Shopping Mall in the west of Teheran has window fronts, lighting and a façade designed with ACRYLITE®. These transparent elements give the building a more sculpted appearance and contrast with the straight lines of its grooved structure.

Eight-hundred miles further south is Dubai Mall. This is unusual not just because of the range of wares on offer, but also due to its location next to Burj Khalifa, currently the world's highest building measuring 2720 feet. Several tons of ACRYLITE® were installed inside and outside the mall in March 2010.

"The material's advantages are its light weight, easy fabrication and impact strength," says Florian. He himself used differently colored, curved and partially textured sheets of ACRYLITE® to cover the light columns in the outdoor area of the "Varena" mall near Salzburg. "Using this material made it possible to create 43-foot-high light columns that were easy to bend and are resistant to UV light. They house the light sources and create a variety of attractive colors in daylight, which are produced purely by optical overlaps and viewers' movements."

#### Vision for the future

Discussion about the future of shopping malls revolves around their location and the materials used. Malls of the future are to fit in with existing downtown structures. It is important for the mall to match its environment and be closely networked with it by a sophisticated pathway system. Multifunctional centers meet the economic interests of operators, promote public welfare and respond to citizens' needs. Which materials will play a role in future? "Ones that are tough, inexpensive and recyclable on the one hand, and of course still available. And they definitely have to be the stuff of dreams," Florian says. cat



UV-resistant and easy to curve: the ACRYLITE® sheets of the 43-foot-high light columns at the entrance to "Varena" near Salzburg.

[www.acrylite.net](http://www.acrylite.net)

The Mahestan Shopping Mall building has a sculpted appearance, due to numerous façade elements made of ACRYLITE®. These withstand all winds and weathers, as well as the hot climate in Iran.



Credits:

## Design in Acrylics

This is a publication of the:  
Evonik Industries AG  
Acrylic Polymers Business Line  
Kirschenallee  
D-64293 Darmstadt  
Germany  
Phone +49-6151-18-01  
Fax +49-6151-18-02  
www.acrylite.net  
www.design-in-acrylics.com

Please send notice of changes in address to:  
design-in-acrylics@evonik.com

www.acrylite-shop.com

Edited by: Profilwerkstatt GmbH,  
64295 Darmstadt, Germany  
Phone +49-6151-599020  
www.profilwerkstatt.de

Editors in Chief:  
Doris Hirsch,  
Acrylic Polymers  
(responsible under Journalists' Law)  
Susanne Diehl,  
Acrylic Polymers  
Martina Keller, Profilwerkstatt  
Dr. Claudia Klemm, Profilwerkstatt

English Translation: Mitzi Morgan

Art Direction: Annika Sailer  
Typesetting/Layout: Profilwerkstatt

Managing Editor: Ralf Ansorge

Printed by: Zarbock GmbH & Co. KG, Frankfurt

Printed on paper bleached without chlorine.

Photos:  
Engelhardt/sellin – page 23  
Gustavus, Stephan – page 21  
Hallmann, Hella – pages 14–15  
Herforth, Benedikt – cover, pages 4–5  
Jantscher, Thomas – cover, pages 22–23  
Lietzmann, Christian – page 21  
Mattioli, Sandro – cover, pages 2, 6–11  
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Tabrizian, Ali (3<sup>rd</sup> Dimension of Design) – page 23  
teutopress GmbH/Thomas Gebauer – cover,  
pages 20–21  
VHERY.COM – cover, pages 12–13  
Wildhirt, Stefan – cover, pages 15–16  
Zoo Krefeld – pages 14–15

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(Status: 04/2011)