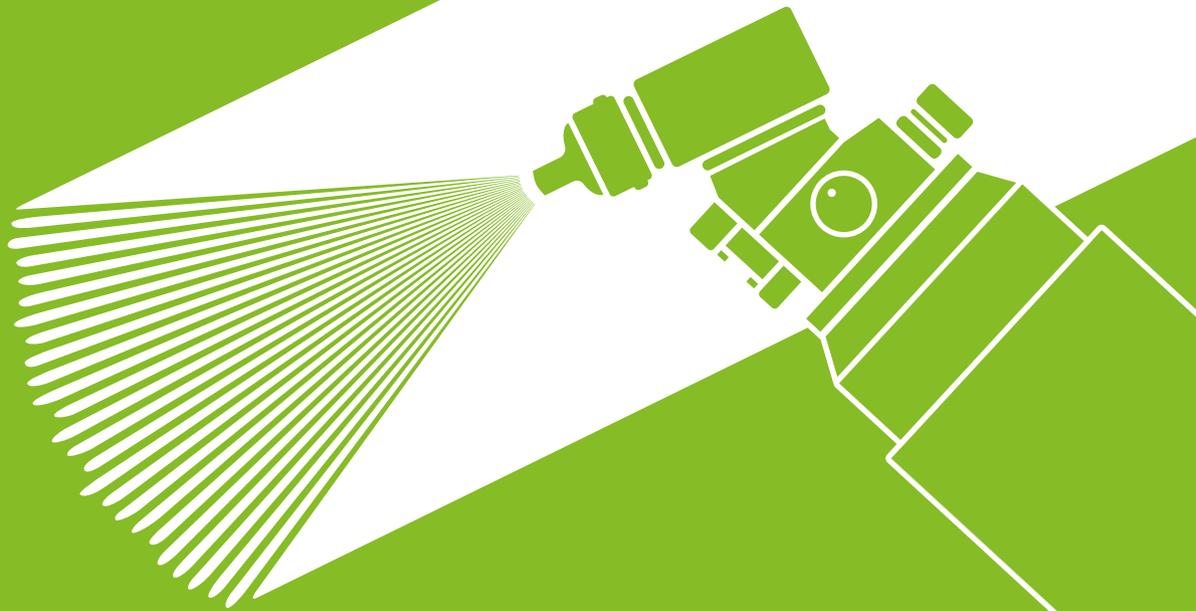


finish

INSIGHTS INTO THE WÖRWAG COMPANY



2016

Driven by color

Why Wörwag loves cars

WÖRWAG
Farbe. Beschichtung. Kompetenz.



SOUTH AFRICA

Road trip to the Cape of Good Hope **6**

How Wörwag employee Henry Pienaar found the road to happiness **14**

Michael Krüger talks about the challenges in South Africa **18**



PRODUCTION

Why producing paints at Wörwag is not only an art but can even call for a hands-on approach **20**



A LOVE OF DETAIL

Of model trains and Wörwag paints—and what brings them together **30**

FACTS & FIGURES

Curious constructions and records from the world of cars **4**

PAINTED FILM

How even German President Joachim Gauck is excited about this Wörwag innovation **38**

ESSAY

Why green is the color of hope but can also lead us astray **50**



CUSTOMER PORTRAIT

The yellow principle:
heavy machinery from
Bomag **40**

MOTOR DESIGN

Coated components
in the engine compartment
put paints to the test **28**



FROM COMMERCIAL VEHICLES TO STOVES

Four examples from
Wörwag's product range **44**

SERVICE

All locations and addresses:
the Wörwag company
at a glance **51**

EDITORIAL

Wörwag is on it

Dear Readers,

Every day we see countless cars drive by. The first thing we see is usually the color. And the paint needs to be exactly right for it. We at Wörwag are right in the middle of the automotive capital of Stuttgart. Car paints are our specialty and our passion. Of course, I take an especially close look. Is that paint one of ours? Was the exact same color tone achieved on all the parts? Could I imagine a car in this striking bamboo green or is it enough for the grass in my yard to radiate in a color like this?

Car production has become extremely complex. This applies to paints as well. The color tone cannot deviate, regardless of whether the coating was developed especially for plastic components or the body, and no matter which supplier it comes from. In spite of modern technology, manual craftsmanship and experience remain indispensable. That's why our production staff will take you on a tour of our wet coating production facility in this "car crazy" issue (page 20). It's a great feeling knowing that the quality work of our employees is part of practically every car color in the world.

Driving a car is also about pleasure. So we put the top down for a drive in South Africa (page 6). Henry Pienaar attends to our customers on-site at our Cape Town location. In this issue, he tells the story of his very personal, inspiring life journey (page 14).

Enjoy the issue.



HANNES WÖRWAG,
CEO

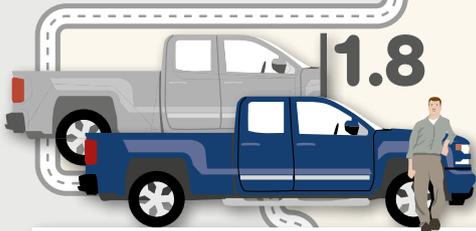
Insights

There are nearly 1.2 billion cars in the world. They are a good way to reach your destination. But they have also led to curious constructions and extraordinary records. A road trip around the world.



14 Isle of Man, Crown dependency

Three wheels, rear-wheel chain drive, and a peak speed of 44 mph (70 km/h). At just 4.40 feet (1.34 m) in length, the Peel P50 is the **smallest production car ever**. The Peel Engineering Company built 120 of them from 1961 to 1963. The car was relaunched in 2011—with either an electric motor or a 4-stroke 50-cc engine.



01 Los Angeles, USA

There is a reason why rush hour is practically an all-day event here. Los Angeles has **more cars than people**—an average of 1.8 per household—for a population of 3.9 million.



02 Ojos del Salado, Chile

An extreme driver from Limburg, Germany, reached an elevation of 21,804 feet (6,646 m). **No one has ever driven higher in a production car.** The record was set by a 15-member team in May 2007 with two Jeep Wranglers on Ojos del Salado, the world's highest volcano.



04 New York, USA

New York's SoHo neighborhood has the **most expensive garage parking spaces** in the world. A 99-year lease on a space can be yours for a million dollars—paid in advance—which is more per square foot than an apartment in the same building.



03 Buenos Aires, Argentina

Twenty lanes, 460 feet (140 m) from curb to curb: Avenida 9 de Julio in Buenos Aires is the **widest street in the world**. The narrowest is found in the town of Reutlingen in Württemberg, Germany. Spreuerhofstraße is an average of 15.7 inches (40 cm) wide, and at its narrowest point is only 12.2 inches (31 cm).



13 Copenhagen, Denmark

It's always a good idea to **check your car before driving**. In Denmark the law even requires you to take a look underneath. For if you find someone lying there, it's illegal—who would have thought?—to drive off.



12 Uffenheim, Germany

From Strawberry and Caramel to Piña Colada and Ocean Paradise, **"Little Car"** air fresheners for rear-view mirrors come in almost forty different fragrances. They were invented in New York in 1952 by Julius Sämman, a German from Uffenheim. A milkman had complained about the smell of spilt milk in his delivery truck.



06 Maranello, Italy

If you love good cars, you need serious money. A Ferrari 335 S Spider Scaglietti built in 1957 was auctioned for 32.1 million euros in 2016. That makes it the **most expensive car in the world**. Rumor has it the buyer was soccer star Lionel Messi.



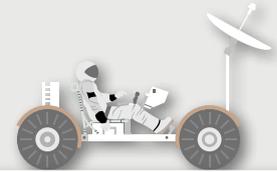
07 Abu Dhabi, United Arab Emirates

Living space in the desert: Sheikh Hamad bin Hamdan Al Nahyan from Abu Dhabi had the **world's largest mobile home** built for short trips. It is 65.6 feet (20 m) long, taller than a single-family house, and weighs 120 metric tons. It has eight rooms and eight bathrooms.



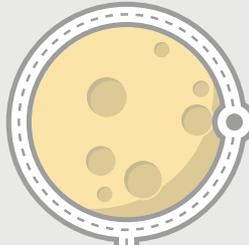
05 Hakskeenpan, South Africa

More jet than car: Englishman Andy Green, a former Air Force pilot, wants to set a **land speed record** in the Bloodhound SSC supersonic car. He intends to hit at least 1,000 mph (1,610 km/h) on an 11.8-mile (19-km) stretch of South African desert in late 2017. The current record is 763 mph (1,228 km/h).



11 Moon, orbit around the Earth

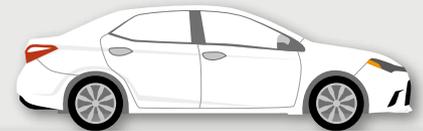
Heroes of electromobility: Apollo missions 15, 16, and 17 each used a lunar roving vehicle (LRV). Its (unofficial) top speed was 12 mph (18 km/h). No LRV made it into a museum—all three were left on the Moon.



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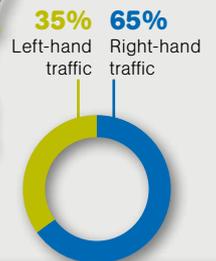
09 Beijing, China

Cars have long been the **number one means of transport** in China too. A good 150 million passenger cars are registered there, more than in any other country. The number is expected to reach 200 million by 2020.



10 Toyota, Japan

The Toyota Corolla is the **best-selling car in the world**—at a good 40.72 million since coming onto the market in 1966. This figure includes both the sedan and variants sold under many different extensions to the name.



08 Sydney, Australia

A good third of the world's population lives in countries where people **drive on the left side of the road**. Most of these countries are former British colonies like Australia. Left-hand traffic has a historical basis, because knights held their swords in their right hands. They could use them to better effect if they rode their horses on the left.

ROAD TRIP

Scenic drives

South Africa is an important country to manufacturers for testing series production cars. An adventure tour on one of the most beautiful coastal highways in the world shows which emotions cars can elicit in observers.

By Michael Thiem; photos by Laurent Burst

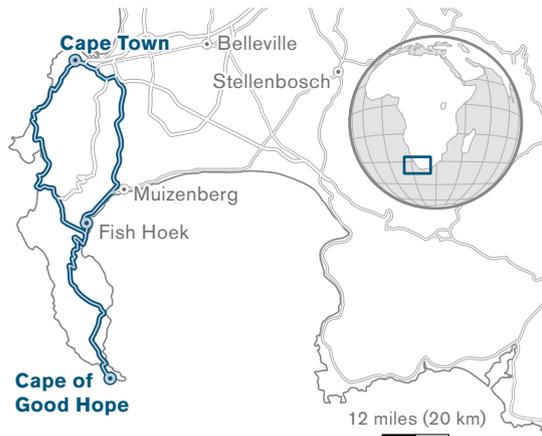


The ostrich also takes a good look—and continues eating. On the drive across the Cape Peninsula the observers are as varied as the spectacular scenery.



DREAM ROADS IN AFRICA: CAPE PENINSULA, SOUTH AFRICA

It's best to drive the route in a clockwise direction. Start the 110-mile (180-kilometer) stretch from Cape Town on the east side, head toward the Cape of Good Hope via Muizenberg, Kalk Bay, and Simon's Town. Enjoy the drive! Return the same way until Fish Hoek. Chapman's Peak Drive on the west coast provides a brilliant finale at dusk.



Say cheese! The full-grown South African ostrich, however, obviously knows that already. For he uses the narrow green strip separating the thundering Atlantic surf from the coast road of the Cape of Good Hope nature park as a catwalk. Almost as if he were being directed, much too pretty, in fact. Fynbos is what the vegetation on the Cape Peninsula's protected reserve is called.

South Africa is the mecca of disguised car prototypes. Much of life here revolves around the fascination of four-wheeled transport.

That means "fine bush" and denotes low shrubs. More than 2,000 species of flora—including heather and orchids—can be found here. The ostrich loves this abundant bounty and doesn't let anyone watching him disrupt his meal.

Certainly not the impressively tall waves that break thunderously on the flat rocky

cliff formation. The flightless bird repeatedly stretches his long neck into the air and checks the situation by twisting his head in jerky movements. And then continues eating. It is the animal's form that especially fascinates us. The wild spectacle that nature is putting on display enhances the sense that a completely extraordinary moment is taking place. The ostrich disappears, withdraws from view.

Form follows function in the animal world, too—and inspires the observer. Car designers are also familiar with this symbiosis. It is precisely what they work toward, after all. The Mini Cooper S on the shoulder is a product of this philosophy. Aesthetically pleasing and powerful. Like the ostrich.

Welcome to South Africa, a country where many are fascinated by vehicles. The automobile industry is an important employer. Around 36,000 people work in production. 600 German companies have taken up residence in the country, among them nearly all the major car manufacturers and suppliers—from Volkswagen to Mercedes to BMW. South Africa is considered a mecca for disguised car prototypes. During Europe's winter, many relocate their series testing to here. That speeds up development. The time zone corresponds to central European daylight savings time. All conceivable basic condi-

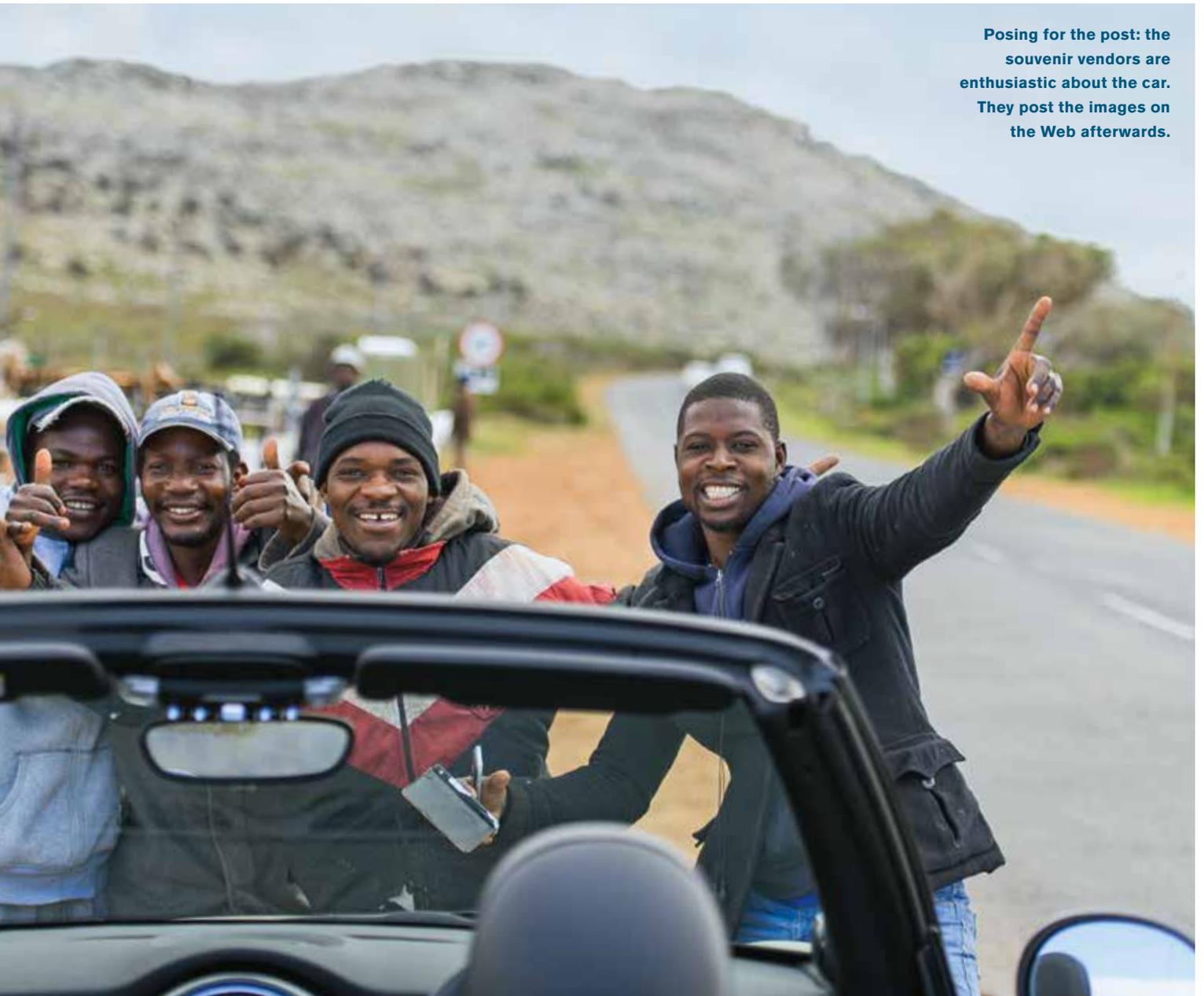


tions, including the most diverse road surfaces and temperatures, can be found out in the open here.

The first impression is decisive

An important factor of what are known as drive-by tests in market research is not measurable, however: subjective feelings, the emotional aspect of the car design. The first impression is decisive, like this moment at the shoulder of the M65 just before the turn-off to the nature reserve area of the Cape Peninsula. The street vendors' delight can't be

Posing for the post: the souvenir vendors are enthusiastic about the car. They post the images on the Web afterwards.

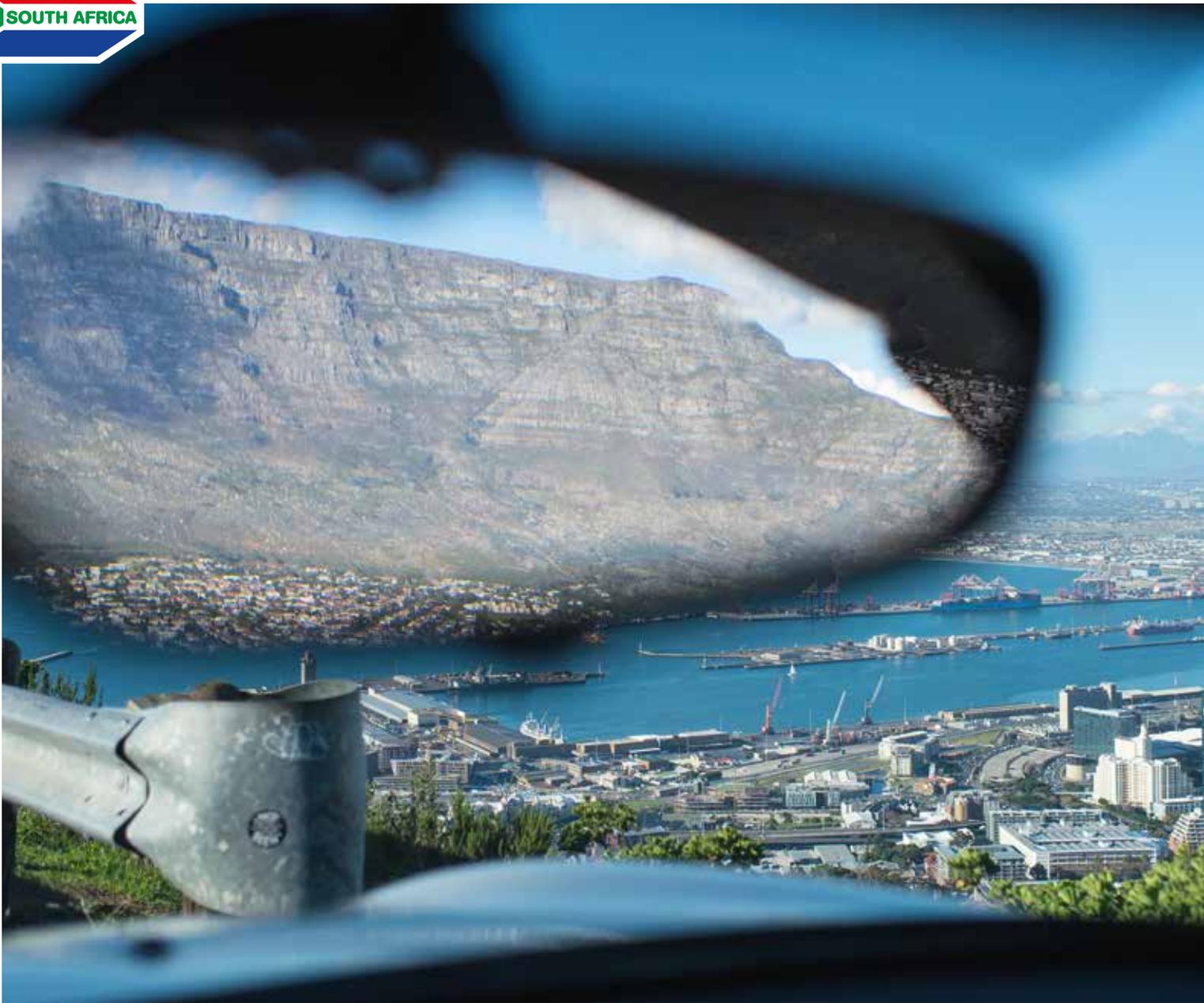


A sport, an attitude to life: passion is an integral part of surfing.

planned. When they see the Mini Cooper in Pepper White, which is also made by Wörwag, they flip out.

One of the vendors is Washington Guuama. He is from Zimbabwe, lives just 6.2 miles (10 km) away in Redhill and makes a living selling all kinds of lovely and not-so-lovely souvenirs. "A lot of cars drive past here. Few of them catch your eye and stick in your memory," he reports. The Mini Cooper definitely stands out above the crowd. The paint on the rear spoiler, bumpers, and other mounted parts are from Wörwag. Guuama likes →





DREAM ROADS IN AUSTRALIA: GREAT OCEAN ROAD

Around 7.5 million tourists roll along the Great Ocean Road between Torquay and Warrnambool, one of the best-known coast roads in the world. Spectacular scenery and locations steeped in history line the 150-mile (240-kilometer) route.



→ the color, and the car, too. “It has a fabulous quality, it’s simply an unusual vehicle,” he gushes and pulls out his smartphone. He and his friends ask people to come around for a photo shoot. Only then does he admit with a grin: “My favorite color is actually red. Ferrari Red. But Ferraris are rare here.” Color is emotion and therefore tends to be subjective. Just a matter of taste.

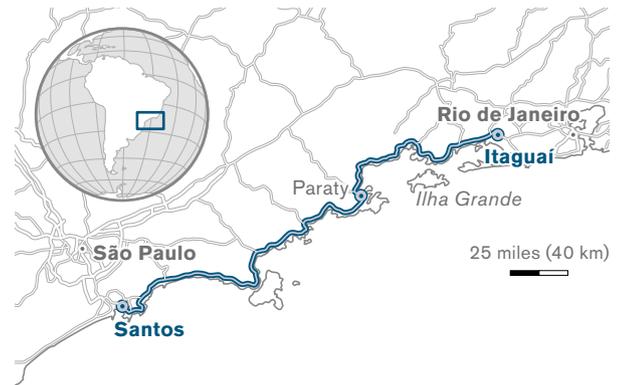
The dynamics are a different story. They are assigned numbers. Output, engine displacement, acceleration are hard, physical facts. But it is the application, the driving itself

Table Mountain behind the photographer, Cape Town below: two horizons at one glance.



DREAM ROADS IN SOUTH AMERICA: COSTA VERDE, BRAZIL

Brazil's Atlantic Coast is nearly 4,600 miles (7,400 kilometers) long. The section between Rio de Janeiro and Sao Paulo— around 372 miles (600 kilometers)— is said to be especially beautiful. There are fabulous beaches, the charming colonial city of Paraty, and the Ilha Grande off the coast with its hills and protected Atlantic rain forest.



that turns horsepower into driving pleasure. The approximately 25-mile (40-km) coastline of the nature park on the peninsula promises a true orgy of the senses. It forms the natural habitat of the mid-engine sports car. Bend binger. Here roadsters become "roadstars." It's not for nothing that this stretch of asphalt is considered one of the most beautiful coast roads in the world.

Those who do the complete Cape Tour in a clockwise direction can marvel at the rocky cliffs of Chapman's Peak, especially in the late afternoon as the sun slowly sets. An

open convertible provides the best views of the route. But caution: wild baboons are also waiting for just such moments. There's a reason for the numerous roadside signs warning of animal assaults. Intelligent use of power makes a lot possible.

Raw power at the Cape of Storms

Nature flexes its muscles at this corner of the Earth. Its unbridled energy can even be felt wrapped in a weatherproof jacket here at the Cape of Good Hope. The wind blows relentlessly during the winter months. Tour guide

Gavin Clayton points out that the spot is also called "Cape of Storms." The coast road on the way to Africa's southwestern tip is almost at sea level. The waves often lash many feet high against the cliffs. Surefootedness is an absolute requirement. Not every two-legged creature is as steady on its feet as the ostrich. It's hard to imagine what those forces of nature must be like 185 miles (300 kilometers) farther out on the open sea. That's where the *Flying Dutchman* is thought to have sunk. And not only that ship. The rocky reefs and storms where the Atlantic and Indian →

Driving pleasure: the coast roads on the Cape Peninsula are among the most spectacular in the world.



→ Ocean meet have been dreaded by seafarers from the year dot.

Power is only one aspect when marketing a car. Last but not least, it always depends on how well you convey a certain attitude to life. Passion is an integral part of every cabriolet. Fun, panache, cult—it's all familiar to Melody Hey from her daily work. She runs a school for future

Fun, panache, cult: the joy of elegant locomotion connects car drivers and surfers.

surfers, the Surf Emporium, in Muizenberg. The town is well known for its colorful beach houses. In the seventies the government had economical housing built here on the outskirts of town. Today they are sinfully expensive. Idyllic beaches, picturesque cliffs, and a perfect ambience for water sports.

The surfing school was opened 13 years ago. Meanwhile, what began with a sun umbrella at the beach has become a very successful business. At first the school offered courses

only to girls. Today, boys come here as well to learn how to get on the board and—ideally—stay on it. “The conditions at Muizenberg Beach are optimal. The waves roll in uniformly, there are no dangerous currents,” says General Manager Hey and points to the fifteen teenagers who are taking part in a three-day trial course. They are already standing on their boards after a few hours. Alfonso Peters is a good teacher for them. He is considered one of the most talented long-board surfers in South Africa, and he has the sport to thank that he found his way out of Cape Town's troubled Manenberg district. Hey likes to see convertibles in the car park in front of the school: “I like these cars, even if there are surely more practical vehicles for transporting surfboards. But Minis and Beetles, too, for example, are so nice and iconic.”

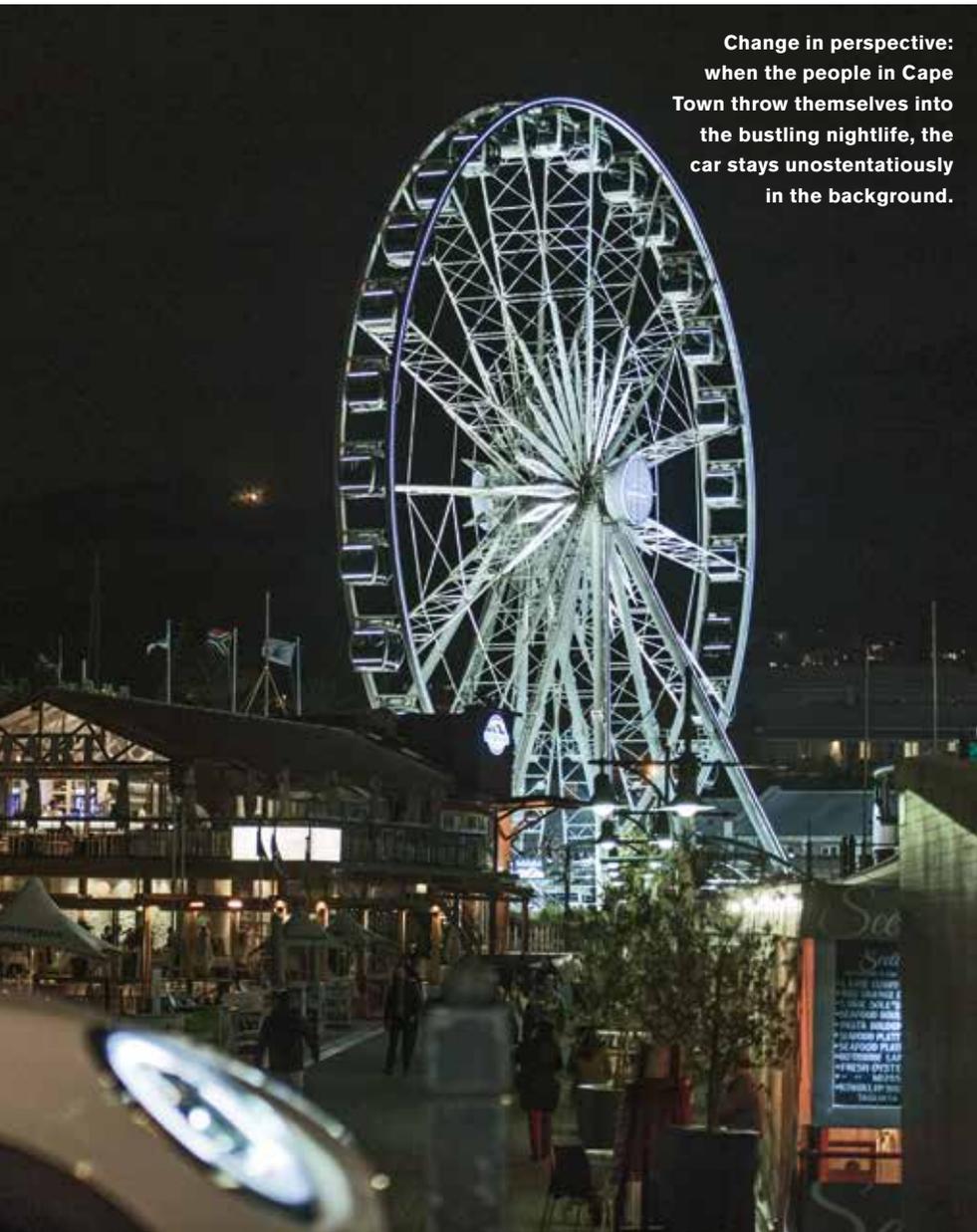
A side trip to the Cape of Good Hope is perhaps less “culty” but more of a tourist attraction. Everything there ultimately revolves around a wooden sign. Everyone has themselves photographed behind it. It is the moment when a car becomes secondary. Even if it's parked only a few meters away. The visitors join the others patiently waiting in line and check the memory chips in their cameras. The eyes are fixed on the motif. No one pays attention to the car. No one? A 14-year-old Japanese boy has broken out of



the line to touch the leather interior. “Cool. I like it,” he beams. A short time later his father calls to him: “It's our turn. Come here now! We have to take the picture.”

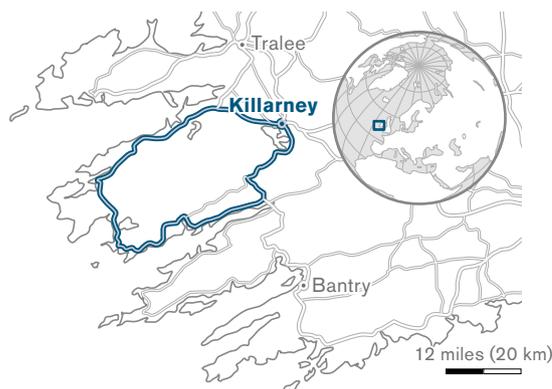
Many start on their way back directly to Cape Town once the obligatory photo has been shot. A change of scene. It is just after 6 p.m. The day is drawing to a close in Cape Town's “V&A Waterfront” by the harbor. The artificial light from the Ferris wheel, restaurants, bars, and ships outshine even the car's sparkle. Center stage now belongs to the nightlife enthusiasts. The car is swallowed by the darkness bit by bit—and becomes a silent watcher enjoying the sights. ■

**Change in perspective:
when the people in Cape
Town throw themselves into
the bustling nightlife, the
car stays unostentatiously
in the background.**



DREAM ROADS IN EUROPE: RING OF KERRY, IRELAND

The coast road in Ireland's southwest stretches 110 miles (179 kilometers) past extensive glacier valleys, delightful villages, and a UNESCO World Heritage Site. Additional highlights are the restored stone forts Cahergall and Leacanabuaile. One of the most picturesque Irish cities, Killarney, serves as the start and end point of the route.



Car Clinic

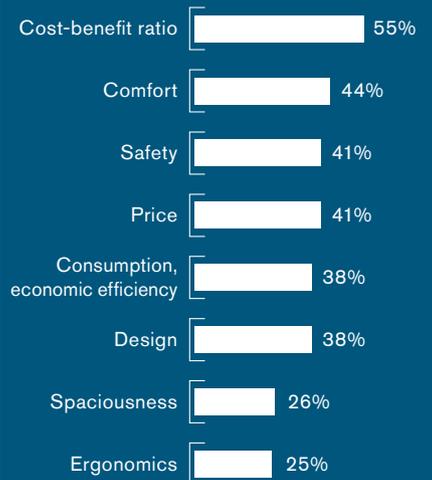
The name is misleading: usually cars are not worked on in the Car Clinic. This pseudo-Anglicism instead refers to a market research methodology that helps car manufacturers with product development. They are primarily conducted by external institutes. Cloaked in strictest confidence and elaborate secrecy measures, it permits representative testers to inspect a prototype or disguised concept car according to numerous criteria, test it, and compare it to rival products.

The principals hope these studies will deliver neutral assessments such as: How does the model come across to the testers? What effect does the form have? Do drivers feel comfortable in the new interior? What would they be willing to spend on it? Are the colors appealing? How do potential buyers get on with the control elements?

If sense of space, visibility, and driving behavior are tested, it's referred to as a "dynamic" Car Clinic. Furthermore, drive-by tests make it possible to capture spontaneous emotional reactions to the design.

STUDY

What is critical when buying a car?*



** Aral study: new car buyers in Germany 2015; multiple answers possible*

**Role model: Henry Pienaar
was shaped by the example
of Nelson Mandela.**



PORTRAIT

The road to happiness

Henry Pienaar has fulfilled his dream of a better life. The technical account manager at Wörwag in South Africa grew up in a township. With an iron will, he defied fate and found happiness. A portrait of strength.

By Michael Thiem; photos by Laurent Burst

One does not speculate on Nelson Mandela's physical stature. In South Africa, the man is quite simply a giant. Henry Pienaar agrees wholeheartedly. So it is with some apprehension that he approaches the bronze statue. At just under 7.2 feet (2.2 meters), the statue on Nobel Square in the elegant Cape Town harbor district of "V&A Waterfront" is so high that every visitor is obliged to look up to the South African father figure.

The Wörwag application technician proudly positions himself next to the Mandela statue and looks up at a face that has accompanied him throughout his life. "He means everything to me. It is thanks to him alone that apartheid was ended and we got equal rights," says Pienaar, who actually met the later statesman in person one time. On April 1, 1990 at the Standard House Building in Port Elizabeth. He still remembers the time and place perfectly. Just

two months had passed since Mandela's release from prison when Pienaar shook his hand at a gathering of the African National Congress (ANC). "I never wanted to wash it again," he says with a chuckle.

The now 45-year-old turns around. For a moment he observes the dancers of the Indoni Dance Art & Leadership Academy. They are practicing on the granite floor in front of the statue for a performance later that evening. The performance deals with racial discrimination, and the power of resistance. Re-interpreted. Modern. The eleven dance and sing. Bodies interweave with each other to the rhythm of the drums before the performance concludes with a blood-curdling cry. In the distance, the majestic Table Mountain towers over the city. Pienaar likes it here. He wouldn't mind staying. But to tell the story of this man, who has been working in customer service with Wörwag in South Africa since 2003, it is necessary to visit other places in Cape Town.

Equal rights remains an ever-present topic, whether in the dance theater or at the annual carnival parade commemorating the legacy of slavery on the colorful streets of Cape Town's Bo-Kaap neighborhood.



A place for moments of reflection: Pienaar loves to visit Table Mountain.

A role model in the township

It's just after 11 o'clock. Langa Township is located around nine miles (fifteen kilometers) away from the harbor with the Mandela statue. Langa means sun. But it's only during the day that temperatures of 65° Fahrenheit (18° Celsius) make the South African winter bearable. At night, it gets cold. Those who don't live on the street might share a corrugated-iron hut with four to six others. The dwellings have neither heat nor running water. Even the elec- →



→ tricity through precariously strung power lines from the tall masts is only available when there's no short-circuiting somewhere along the way. In a little alleyway, a plastic bucket filled with soy beer ferments in the sun. Brewing takes place here. And drinking: in one hut, eight men pass around a 5-quart (5-liter) bucket of the beverage. The black township is home to 200,000 residents. They enjoy having visitors. Few strangers find the nerve to come here, yet if you look people in the eye, you lose your fear and discover openness and curiosity. "It's important for these people to see the other side too," finds Pienaar. "They need to realize that there is a life outside of the township. A better life. When they realize that, they start to think: How can I get out of here?" The government supports those efforts with social housing projects.

"They should realize that there is a life outside of the township."

Henry Pienaar

Pienaar managed the feat on his own steam. Yet he has remained one of them—even if he no longer quite looks the part. Today he is wearing a suit and tie, and has a smartphone in his pocket. Pienaar grew up in a township near Port Elizabeth. When his par-

ents could no longer provide for him, he was raised by adoptive parents alongside seven step-siblings. "I didn't mind living in the township back then," recalls Pienaar. Finishing primary school was a turning point for the then twelve-year-old. "I realized: If I want to change my life, I have to fight for it." It was an uprising against his seemingly foreordained destiny of living in the poverty of the township.

As a teenager, Pienaar was prepared to give everything to achieve his dream of a better life. Day in, day out. That included a nine-mile (fifteen-kilometer) walk to the higher secondary school and back each day. Study,



In the service of the church:
Pienaar ministers to families in the community.



Back to his roots: a visit to the township awakens memories. Pienaar wants to set an example and show people the way to a better life.



study, study. For life. After graduating, he began training as a paint lab technician. Yet only when he offered his labor without pay did he score the long-awaited job. "Professional experience is worth more than good grades," concludes Pienaar. "Qualification happens in the workplace." After five months, he had persuaded his bosses. He finally got a permanent position. From there, he began working his way up the ladder: test lab technician, process engineer, and finally, technical account manager with Wörwag since 2003.

His skills are meanwhile a known quantity. When Wörwag founded a subsidiary in Cape

Town in 2003, Michael Krüger recruited him to join the operation. The key account manager knew Pienaar from their days together in the offices of automotive supplier Venture in East London. Pienaar: "I'm very grateful to Wörwag. Working there has significantly improved my life." Pienaar is married, has two daughters (13 and 18 years old) and owns his own house. "My kids have it easier than I did. I can pay for their education." The eldest is studying biochemistry.

As an application technician, Pienaar handles the Rehau company in Port Elizabeth, just under three hours by car from East

London. Among other things, the company paints bumpers for Mercedes at the location. "He does his job very well," said Wörwag Managing Director Dr. Peter Moritz to customers, with Pienaar looking on. Concise, but clear words. The recognition means a lot to Pienaar. Praise for a black man in South Africa remains the exception.

Focus on family and church

Pienaar is a bundle of energy at work, and it's no different in his free time. The practicing Christian is an active member of his Old Apostolic congregation. As an elder, he tends to numerous families in his district in East London with a total of some 250 members. So he's busy almost every evening, with services on Sundays. Only work and sickness are excused. It's no surprise, then, that his visit to Cape Town also takes him to a house of worship, around 0.3 miles (0.5 kilometers) from Langa Township. The spare, unadorned architecture with the gray roofs is seen throughout the country. The interior is reminiscent of an assembly hall. The only thing to look at, a large Bible on display, keeps minds focused on what's essential. "We do without symbols and decorations on the walls," says Pienaar. "Only Scripture counts." And family. The four of them spend a lot of time together. Not only at church, but also with sports.

On Saturdays, they take part in the "park-run". His wife Cherydene joins him regularly on this run. In this he is also an Event Director at the local Kidd's Beach parkrun. Every week, up to 40,000 runners complete the 3.1-mile (5-kilometer) course through East London. Pienaar has done the run over 200 times. "I want to be the first one to do 250 runs. Apparently you get a golden jersey for that," he says with a grin. He reaches the finish line in just over 23 minutes. His best time over this distance is 20:16. Last year he entered the Legends Marathon. In 5 hours and 25 minutes, he ran an astonishing 42 miles (68 kilometers). When training, he usually does a lap around his old neighborhood. It's no big thing for Pienaar; he's loyal to his roots. The memory is alive. And he wants to inspire others. Tirelessly. The way Mandela showed people how to live. "For to be free is not merely to cast off one's chains, but to live in a way that respects and enhances the freedom of others." ■



A well-oiled team: Pienaar coordinates with Harald Schubert from Wörwag's partner company Duram (above). After work he meets key account manager Michael Krüger at the Panama Jacks restaurant.



INTERVIEW

“We’ve learned to improvise”

Michael Krüger is an old hand at Wörwag. He has worked for the company for 35 years, 13 of them in Cape Town. He has long since become accustomed to life in South Africa, and is not planning to return to Germany.

Interview by Michael Thiem; photos by Laurent Burst

Mr. Krüger, how did a native of Swabia end up in Cape Town?

I was young, and didn't have a family yet. I didn't mind traveling for days at a time. In fact, I have always enjoyed traveling. When Wörwag started becoming more international, I did a lot of projects abroad. In 1991, one of them took me to South Africa for the first time.

Now you're older and have two children, and you're intending to stay?

I feel at home here. By the way, I'm currently the longest-serving employee at Wörwag. I've been with the company for a good 35 years now.

“South African customers expect German quality too. And we have to be present for that.”

The company has changed a lot over this period. It has grown and is now represented in many countries. Do you remember what the beginning of this internationalization process was like?

Of course. After my apprenticeship as a paint lab technician I started working in Stuttgart in 1984 in base coat development, and then transferred relatively quickly to the technical field service. I was sent to Canada, the USA, Mexico, and then to South Africa. I would get a call, and jump onto a plane.

One of those jobs took you to Johannesburg. What project was that?

It was an automotive supplier who was painting the bumpers for the Mercedes C-class, and we were supplying the paint.

Was that the start of the company's success story in South Africa?

It was the first small step. We didn't get established in the country until 1999, with the second version of the C-class. The supplier in East London shifted to water-based paints. We started testing them and it worked out right away. Suddenly we were in the game.

How much pioneering work did you do?

A lot. Back then we usually communicated by fax and by pager. Modern technologies have made things considerably easier. We also had to improvise a lot more in our everyday production work.

When Wörwag decided to start a subsidiary in Cape Town in 2003, you probably didn't have to think twice about staying, right?

Indeed, I was on board from the start. We found a strong production partner in Cape Town with Duram, although no companies had any experience with plastic coatings at the time. We supplied the know-how. Ever since then, Henry Pienaar and I have been overseeing production, sales, and service.





How important is Cape Town for Wörwag?

We are small but successful here. South African customers expect German quality too. And we have to be present for that. Mercedes and BMW are the only companies here that use water-based paints, and we supply that type of product. Just like everywhere else in the automotive industry, quality is the number one factor in South Africa. Daimler, for example, makes nearly all of its C-class models in East London. The site received an award as the best supplier plant for the Group. Our paint certainly had something to do with that.

What are the biggest challenges in producing paint in South Africa?

We've learned to improvise. Sometimes we might not have a full staff because the public

MICHAEL KRÜGER

helped set up the Wörwag subsidiary in Cape Town. He has been working as a key account manager in South Africa since 2003 and feels at home in the country. Krüger (51) is married to a South African, and has two sons (9 and 7). He is also a passionate motorcyclist. "I don't miss Germany. I have everything I need here: family, the sea, mountains, great cities. My life is here."

transport system breaks down. When that happens, I do the paint myself. Or there can be power outages. But we still always meet all of our deadlines.

What products are produced or sold in Cape Town?

Here in Cape Town, we specialize in the production of water-based primers and clear coats in collaboration with our partner Duram. In addition, we sell base coats and hardeners, as well as coloring the base coats. My colleagues and I monitor production and make sure the formulations are followed. All the raw materials come from Germany. We determine the coloring process and monitor the tones here.

How are the connections with Germany?

They're great. My contact in Stuttgart is Sigurd Tetz from International Technology Management. We make the decisions ourselves, as far as possible. We solve a lot of problems right on the spot. ■

1

PREMIX DEPARTMENT

Daniel Schuhmacher (left) and Ruben Amaral use the dissolver to make color pastes out of pigments and bulk materials. The pastes are sent straight to customers or kept for further processing.



PRODUCTION

Masterful touch

Producing automotive paints is an art. Experience and a hands-on approach are crucial, as shown by a look at Wörwag's production plant in Stuttgart.

By Michael Thiem; photos by Frederik Laux; illustrations by cybertakel



2

GRINDING ROOM

Christian Wiesing uses a grindometer to measure the particle size of semi-finished and other products. Then he decides whether the results meet the specifications and can be further processed.

The paint production process has a number of cyclical elements. Some of them move rather swiftly. Daniel Schuhmacher and Ruben Amaral are working on the formulation. They set the dissolver, a mixer with a disc-type blade, at 330 rpm. The actual blade looks like one from an oversized saw with its teeth bent upwards. The dissolver is used to combine raw materials, solvents, and additives.

Schuhmacher and Amaral pick up a 25-kilo sack, cut it across the width, and start pouring pigment into the 1,200-liter container. "Careful. Not too fast. Otherwise it'll clump up," remarks Schuhmacher. "You quickly develop a sense for how much and how fast," he adds. In this case, 900 kilograms of titanium dioxide pigment are needed to make 1,600 kilograms of white color paste. The two colleagues

repeat this step of the process several times in a row. Half an hour later they increase the mixing speed to 1,200 rpm. The "dance of the pigments" has begun.

Making paint is like baking a cake. If the recipe is sound, the ingredients are good, and everyone follows the process, the result will be a success. But if someone steps out of line, the result will be ruined.

When the order has been received and planned, the first material step in production is dispersion. This takes several hours. During this time, Schuhmacher and Amaral monitor both the

temperature and the particle size, which can be anywhere from 50 to 300 micrometers depending on the recipe. Timo Dorigo, who is in charge of wet paint production, knows the importance of continuous quality control. "We have to respond immediately to any →

Making paint is like baking a cake. The recipe, ingredients, and process all have to be right.

3

MIXING STATION

Roland Cuno receives orders directly from the sales department. He enters industrial paint formulas at the mixing station, does samples, checks them, fills the product into containers, and prepares them for shipping.



→ irregularities,” he says. Because nearly every product takes a slightly different route through the production process, it’s extremely important for everyone involved to communicate well with each other. “With 3,000 to 5,000 active formulations and many overarching processes, we constantly have to check the status and progress of our production processes.”

For this reason, daily routines are marked by tight shop-floor management. Every morning the department heads meet for a “paint round” in which they go through the production steps together. “We immediately see if we have to intervene somewhere. It keeps everyone informed and we all know if there’s a problem,” says Dorigo. He insists on a clear focus. “We start by talking about anything that’s not working right. Afterwards, I’m just as eager to

hear the success stories.” The best result of this measure to improve communications has been a considerable increase in production. The company can also do more reliable planning to utilize the plant’s capacity.

The new “paint round” practice has led to a significant increase in productivity

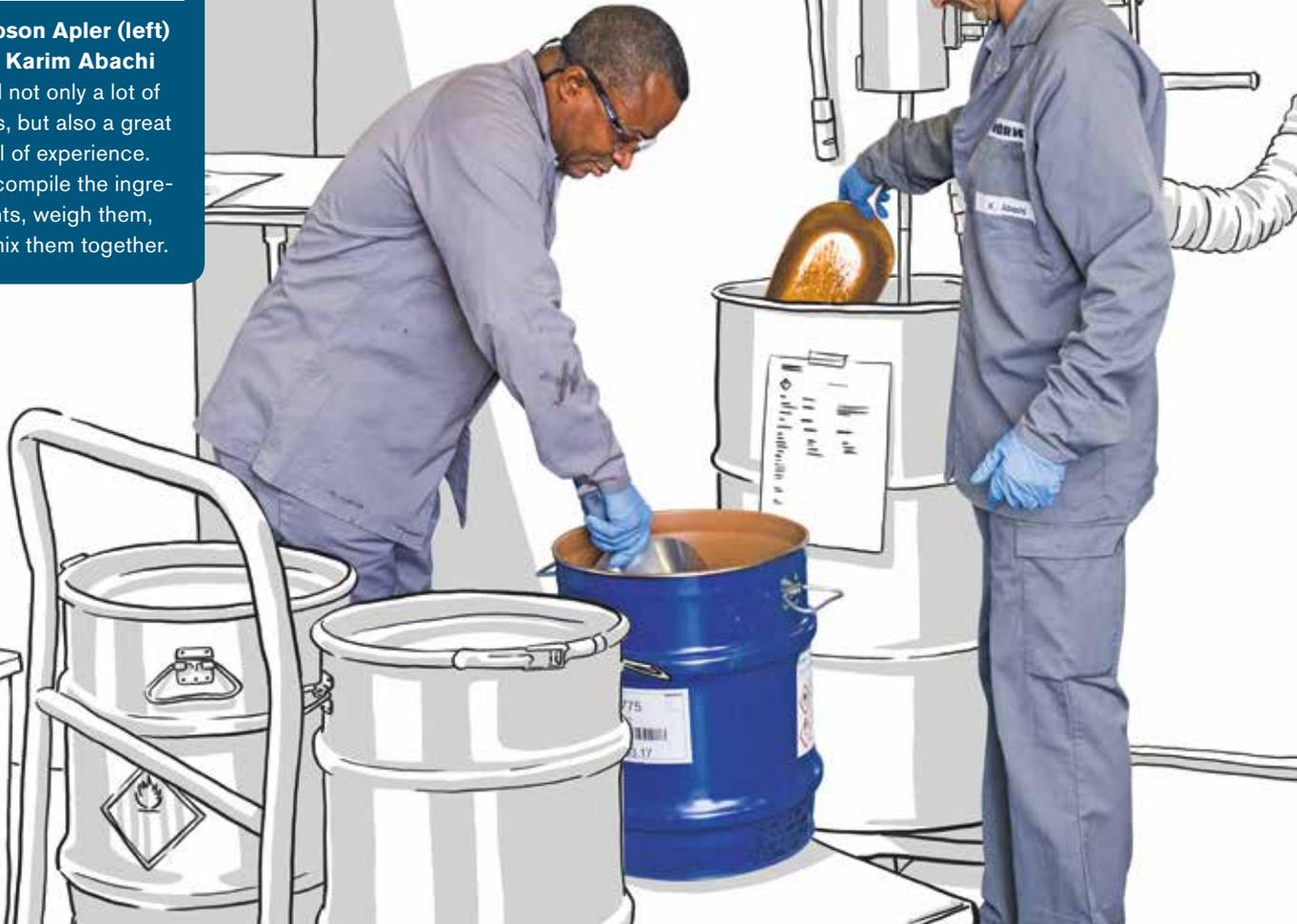
New machinery in the grinding room has shortened throughput times for the bead mills. Endurance is of the essence here too. For some products, a hundred or more hours are needed to grind the materials down to the desired particle size. Christian Wiesing does regular tests with a grindometer.

This device looks like a thick ruler made of stainless steel. A channel has been machined into it, with a depth that decreases at a linear rate from 200 micrometers to zero. A few drops of paint are put into the deep end. Wiesing uses a squeegee to pull the paint toward the zero end, and watches for the

4

SLURRY

Sampson Apler (left) and Karim Abachi need not only a lot of scales, but also a great deal of experience. They compile the ingredients, weigh them, and mix them together.



first smears in the paint film. A scale shows him the particle size of the paint in micrometers. “We also have to keep an eye on the temperature when grinding,” he adds. “We can’t let it exceed 70 degrees Celsius, or the paint will be ruined.”

The semi-finished products and color pastes are then stored for further processing or filled into containers and sent to customers. Roland Cuno prepares industrial paints for shipping. At the mixing station, he draws raw materials from tanks of five to 500 kilograms. “I enter the formulation, do the mixing, paint a test panel, check the result, and put the finished paint into containers,” he says. He is currently working on an ultramarine blue. “It’s great to see customers order colors other than silver, black, and grey,” he says with a smile.

Every gram counts

Cuno can mix paints by pressing keys on a computer, but base coat production still requires real hands-on work. Sampson Apler’s

great treasure is his experience. He uses a large scoop to weigh special-effect pigments for “Valencia Orange.” This recipe lists five ingredients, although other paints can have up to twenty. The amounts are listed on a production order with an A4 (approximately letter-size) format, which accompanies all steps of the process. “We have to work precisely,” Apler emphasizes. Some of the ingredients for this base coat have to be weighed down to a few grams. That corresponds to the exactitude of a letter scale. A scanning system helps to ensure that all the raw materials are included.

Depending on the product, there can be as many as 20 steps to go through. On a typical day, one hundred metric tons of primer, base coat, top coat, and clear coat, including semi-finished products, leave the factory—in containers ranging from one kilogram to a metric ton in size. The main plant in Stuttgart will be expanded by 2,000 square meters by the end of the year. “That will mean shorter distances,” says Daniela Off, who heads base coat pro- →



5

PAINT CENTER

Juliana Donner has a colorful job. To check the quality, she has test panels painted in all the production tones, simulating customer applications as precisely as possible.

→ duction. As Dorigo adds, “We’re optimizing our material flow, and we’ll have better transport routes and sufficient buffer zones.”

The crux of the production process lies in determining the color. But only a few employees have a ‘license to color.’ “It’s the most exciting step,” says Off. “You really have to know what you’re doing. And not everyone can do it.” One person who has been making the right decisions here for twenty years is Michael Körper. “The hardest part is to meet the requirements placed on each individual paint.” One can never claim to know all the secrets of coloring, he adds, because customer wishes are constantly changing.

Körper spends nearly two-thirds of his working day at the computer. He uses measurement values, customer specifications, and his own experience to develop the precise coloring strategy. A color tone navigator that was developed at Wörwag and is continuously optimized helps him in his work. It is essentially a digital color chart. It records every production order, and its

database stores his work for future batches. In making his decisions, Körper draws on proven paint recipes as well as on feedback from the quality center and modified application specifications from customers. “There’s always more to learn,” he observes. “Coloring is teamwork.” The process can take several days, because it’s not only about color. Gloss, special effects, coat thickness, and material properties all have to be taken into account as well.

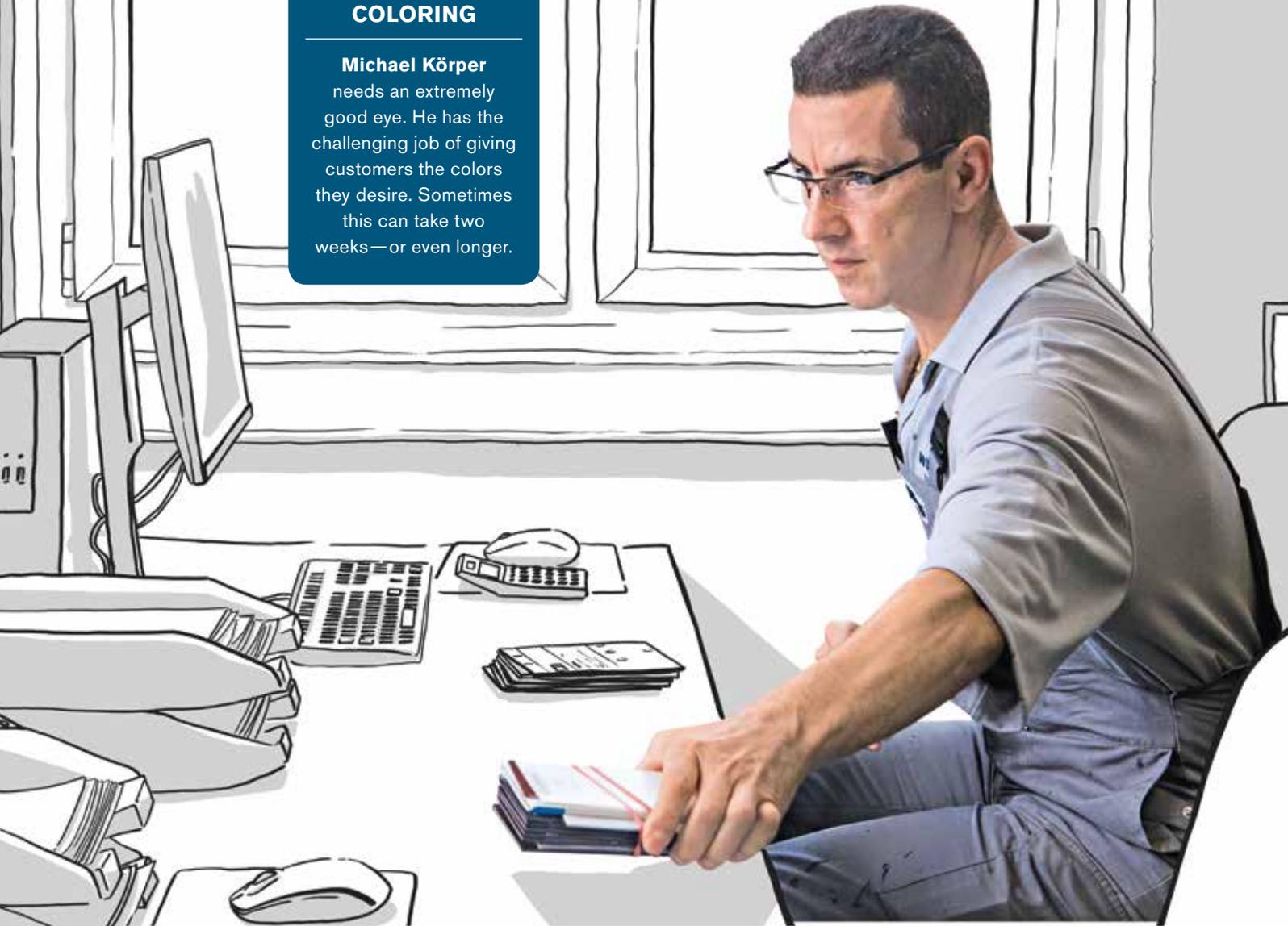
Several coloring steps are often needed

What Körper works out in theory, his colleagues put into practice. Color samples are repeatedly sent to the paint center. The paint is put on panels measuring 10 by 14.8 centimeters, simulating customers’ large-scale applications as precisely as possible. Juliana Donner, a certified automotive paint specialist, is one of only three women working in production at Wörwag. “I’ve always been fascinated by the huge spectrum of things you can do with paint,” she

6

COLORING

Michael Körper needs an extremely good eye. He has the challenging job of giving customers the colors they desire. Sometimes this can take two weeks—or even longer.



says, mentioning the numerous metallic paints with flop effects as just one example.

To do a trial coat, she pours a cup of “Electric Green” into the paint system, inserts a plastic panel for the substrate, and starts the procedure. A maximum of two coats are applied on a light or slate-grey primer. The plate then lands on Körper’s desk. And the process starts from the beginning again: coloring, painting, testing. Until it’s right. Cycle upon cycle. Finally the tone is perfect. A masterful touch. “Metallic blue and orange are the trickiest,” says Off, “especially because producers keep narrowing their tolerance ranges.”

When Körper is satisfied, every batch that leaves production goes to Dirk Langenbahn at the paint lab for a final round of quality tests. The comprehensive check includes physical properties

like the percent of solid matter, pH value, and flow performance. Langenbahn examines the surface of another test panel for hollows, streaks, bumps, and tiny cavities. To do this he creates a paint film with a linear decrease in thickness, which is referred to as a wedge coat.

The filling process
has to work smoothly too.
Cleanliness is
of the essence.

Everything has to work in the final step as well. Cleanliness is crucial in the filling department. Branislav Vejin is very careful about this. “There are special sieve requirements for each product,” he says. Random quality checks are carried out here as well—up to three times for large batches

of 2.5 metric tons. When the 10-kilogram, two-handed shipping container is filled, Vejin closes the lid, carefully affixes the label, and then places it onto the pallet. And the production process is complete. ■

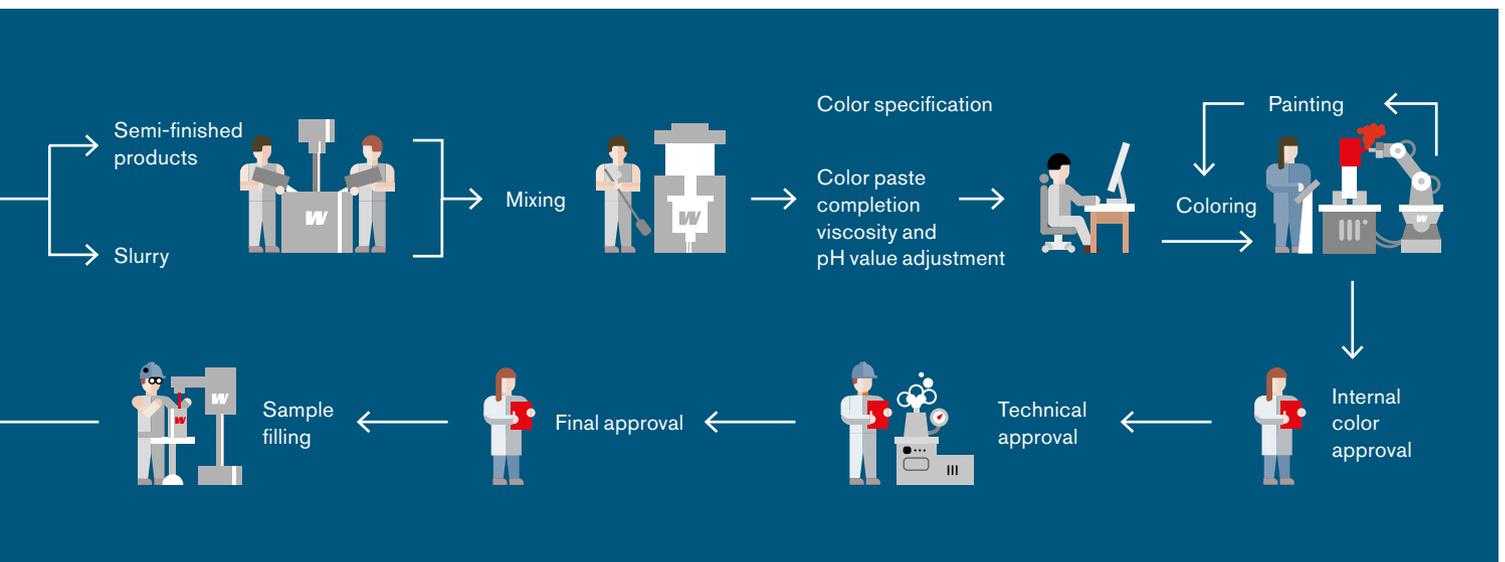
8

FILLING STATION

Branislav Vejin

pays great attention to cleanliness at the filling station. Smooth operations are essential in the last step of production too.

He prepares 300 to 400 containers for shipping every day.





The concept of beauty is slightly different here, of course. That's understandable. What could be beautiful about an engine compartment? And how are aesthetics defined in this case? "I'm no tinkerer," admits Axel Wolf, account manager for top coats. "I just want to know where the oil goes in and how to refill the brake fluid without spilling any." UV coating specialist Fred Wagner, by contrast, knows the car junkies. "Some of them go for gold parts or install light-emitting diodes." Nadine Hochlinger from color design thinks of it this way: "Perfection is when the function and

appearance harmonize." Ramona Baumgärtel, director of the development lab for top coats, adds: "When you look at an engine and discover parts that are coated with our paints, that does make you proud."

Performance alone is no longer enough. The engine is no longer the exclusive domain of fanatics, and its importance as a selling point has extended well beyond the premium segment. Automobile designers are always on the lookout for new ideas. Plastic components with embossed logos, metallic-look hoses, and trim in the color of one's choice are just a

Automobile designers are always on the lookout for new ideas. Evaluating the technical feasibility is often an afterthought.

ENGINE DESIGN

Simply gorgeous

Designers have long since discovered the engine compartment. Yet there is scarcely any place in the vehicle where coated components are subjected to such stress.

By Benjamin Baumann

few of the special requests that regularly find their way to Wörwag. Extras such as pressure hoses in Ferrari Red and the rings of the Audi logo coated in Wörwag paints have been on the agenda for years already.

Entire product ranges in demand

The key factors are always temperature resistance, often corrosion protection, adhesion with plastic components and, of course, resistance to lubricants and gasoline. "For many years, we've been supplying metallic single-coat paints for components like engine

compartment covers, which fulfill the specifications of different carmakers and give plastic components a technical, metallic look," says Baumgärtel. Wörwag is currently developing a paint for a plastic engine compartment cover.

For engines, demand spans the entire product range from water-based or conventional liquid coatings in single- or multilayer variants to UV coatings and powder. The latest trend: textured coatings. An engine so pretty you want to touch it? Wolf shrugs. "In my car, the engine compartment has to be small enough to keep the martens out." ■



NADINE HOCHLINGER AND FRED WAGNER concern themselves with engines for different reasons. In the Wörwag development department, Hochlinger, a chemical engineer, has been responsible for design since 2013: "Using accent colors in the engine compartment as well is innovative. I find the interaction of technology and color design a very exciting thing." Her colleague Fred Wagner is a coating technician who has been with the company since 1987. Wagner, who specializes in UV coatings, notes: "It's used to coat engine blocks, oil filters and drive shafts, among other things."

Photos: Image Source / Alamy, Boris Schmaleberger



"Let's hear it for us. A whole country is celebrating, and I'm in the middle of it. Hopefully to be continued at the next World Cup championships."

PETER VON NORDHEIM, Wörwag applications technician at the Daimler plant in Wörth, on the converted Actros truck with which the German World Soccer Championship victory was celebrated in Berlin in 2014. The color of the coating was High-Gloss Black by Wörwag.

LOVE OF DETAIL

Full commitment

Las Vegas to Venice, followed by a jaunt to the Matterhorn, then off to Sweden: a journey like that can be completed within a few minutes at Hamburg's Miniatur Wunderland. The perfect settings within the biggest model train exhibit in the world are embellished with countless regular and special vehicles whose life-sized versions are coated with Wörwag products. A trip around a gigantic playroom.

By Michael Thiem; photos by Julia Marie Werner



"A case for the cleanup crew. Whether it involves snow, dirt, or garden waste: municipal vehicles are not only eye-catching, but indispensable in German cities and towns."

ADAM LISON creates base coatings for utility vehicles, including the color Deep Orange, which makes municipal vehicles impossible to miss.



Steep steps wind their way from the picturesque harbor up to the colorfully painted houses. The inhabitants of Riomaggiore can only move through the narrow lanes and alleyways on foot. There are no vehicles in the tiny village. The community in the province of La Spezia on the Italian Riviera is the easternmost of the five Cinque Terre villages. The San Giovanni Battista church dominates the idyllic setting from above—as does Michael Schmidt, who has to take care he doesn't accidentally crush the harbor with his knee.

The 60-year-old has been working on the small-scale replica for nearly six months. He breathes a little more life into Riomaggiore with each detail, which he makes out of wood to a scale of 1:87 with extraordinary precision. Schmidt is a professional carpenter. In his former career he sometimes needed two assistants and lots of man-hours to mount a stair stringer. Now he holds the same side piece between thumb and index finger and places it accurately in a few minutes.

After Schmidt took early retirement five years ago, he joined the 30-strong model build-

ing team at Hamburg's Miniatur Wunderland. "If you know how much work is put into these models, you just have to love them," he says and gazes thoughtfully at the tiny red, orange, yellow, and violet wooden houses. The green hills of Tuscany rise gently up behind them. The artificial grass is electrostatically charged so that the blades stand upright as in nature.

1.2 million visitors annually

Rome, the Ligurian coast, Venice, and Tuscany depict four highlights in the new section



"I think red is pretty cool, because I associate three things with it: love, Ferrari, and Coke. What more do you need?"

SEVASTOS KAVANOZIS, *Division Director Top Coats*. He not only likes to drink Coke, but also has the matching color in his product range, in this case Coca Cola Red for the truck coatings. Wörwag also manufactures the coating for the Coke refrigerators.



that will be finished at the end of the year. The small wondrous world that it will become a part of attracts 1.2 million visitors from all over the world to Hamburg's Speicherstadt, or City of Warehouses. A one-of-a-kind microcosm has been built on 13,993 sq ft (1,300 sqm) in 580,000 man-hours so far, and it keeps on growing. "We are doing everything possible to make sure the exhibit's visitors come in smiling and leave enthusiastic," co-founder Frederik Braun says. The idea has been a success since it opened in 2001. The Miniatur Wunderland Hamburg is

"We are doing everything possible to make sure the exhibit's visitors come in smiling and leave enthusiastic."

Frederik Braun

ranked 6th on the list of Europe's most popular permanent exhibits.

A lion lurking in the arena

What would Rome be without its Colosseum? Teresa Liening is building a replica of the biggest amphitheatre of all time. Well, only half of it, to be exact. That's because the model is cut in half so visitors can see into the interior. There is a lion already lying in wait for a miniature condemned plastic man. "For the first photographs," Liening says with a chuckle, just coming from the milling work- →



"I like to put out fires for our customers. Otherwise, I'm quite happy when the fire trucks drive past me."

THOMAS BAJOR, *Wörwag Applications Technician at the Daimler plant in Düsseldorf. Wörwag provides fire departments with base and top coats. Team transports and fire engines are coated with Flame Red (RAL 3000).*

→ shop with new components. The walls are hollow to accommodate the elaborate wiring. Countless LEDs are supposed to immerse the imposing ancient Roman structure in special lighting effects. White? Yellow? Yellowish-white? The color is still being discussed.

930 trains on 8 miles (13 km) of track

In addition to the detail in the model buildings, 930 trains with a total of 10,000 cars add to the fascination. The total length of track amounts to over 8 miles (13 km). The system is operated by an observable control

The vehicles move as if by magic—and are even caught in real speed traps.

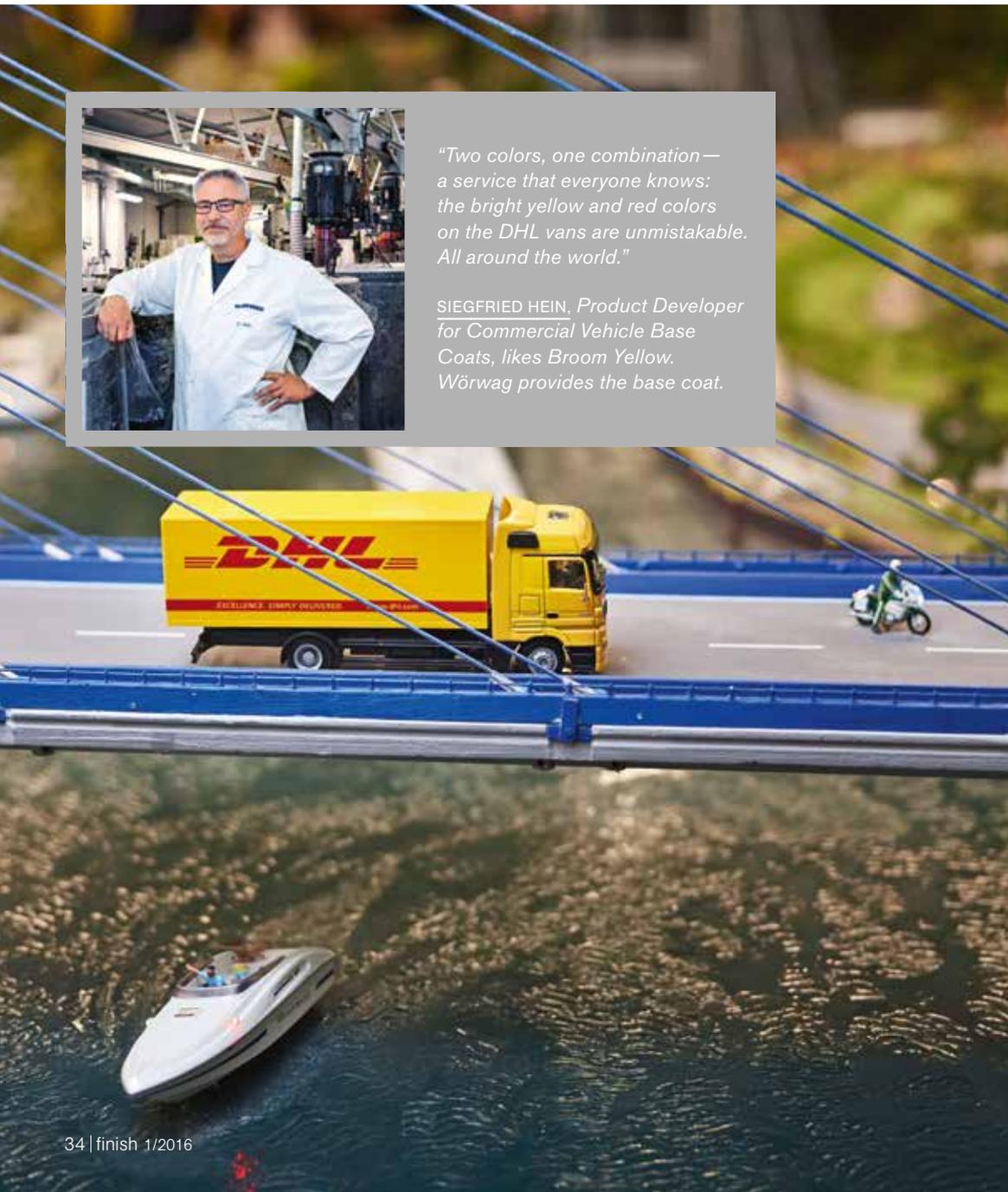
center with 76 monitors. Forty-six computers control the model train system. What's more, 10,000 cars are components of this immaculate setting, of which nearly 300 move on the roads as if by magic. They signal, obey traffic lights, overtake, accelerate, get caught in actual working speed traps, are stopped by the police, and drive back to the charging station when their batteries run low.

The computer calculates the status of each vehicle 20 times a second. Many move without a programmed destination. They have already traveled 869,919.7 miles (1.4 million



"Two colors, one combination—a service that everyone knows: the bright yellow and red colors on the DHL vans are unmistakable. All around the world."

SIEGFRIED HEIN, *Product Developer for Commercial Vehicle Base Coats*, likes Broom Yellow. Wörwag provides the base coat.



kilometers) that way. Small magnets at the steerable front axes steer the cars. They find their way via wiring that is embedded in the driving lanes. The vehicles display headlights, tail lights, blinking indicator and warning lights, brake lights, various emergency vehicle lights, front flashers, fog lights, interior lighting, and even flood lights.

The airport sets new technical standards

“One of our principles is to confront every technical challenge we come across, even if it seems hopeless at first,” explains Gerrit,

who created the miniature world jointly with his twin brother Frederik. “With that attitude we have found technical solutions again and again that amaze visitors.” That especially applies to the airport, their most demanding project so far. The “Hamburg Airport” emerged after six years and 150,000 hours of work. The highlight is the simulation of takeoffs and landings at one-minute intervals. On occasion an oversized bumblebee finagles its way between a Boeing 757-300 and an A380, which is one of the thoroughly charming touches the Hamburg model build-

ers added, even though it is sometimes deplored by other model builders.

Striving for perfection

One of the perfectionists is Jens Körner. He has been in charge of everything on wheels since 2003. “You need a certain amount of insanity in combination with enthusiasm for the job,” he opines. Many of the vehicles are created wholly by him and his colleagues. That includes the large number of street sweepers on the road in Rome. “We examined the traffic very closely on location. These →



“In the thick of the action. Our coatings are always there as well. Only the police decals bother me a little.”

IBRAHIM DADKHWA, Water-Based Top Coat Production Master responsible for the series production color Arctic White. The police patrol cars and personnel carriers are coated with it. The lettering and decor are added later.

→ machines caught our eye,” according to Körner. Technical details like flash frequency or the shape of the brushes are as important as the colors and inscriptions. “Perfection is when you can get very close and have to think about whether it is genuine or a model.”

Days are 15 minutes long in Wunderland. It grows dark and gets light again with that frequency. The nights are animated by a twinkling backdrop of 335,000 LEDs. Ideal for spectacular activity. In the fictitious city of Knuffingen the fire department is called to an emergency every ten minutes, with up

The firebug plaguing Knuffingen can't be caught: the castle has been on fire more than 700,000 times.

to 34 vehicles responding. The fires are always reliably extinguished; only the arsonist escapes regularly. So Knuffingen Castle has caught on fire more than 700,000 times during its 16-year existence.

Additional countries are being planned

A number of details in Riomaggiore, such as balconies, clothes lines, furniture, curtains, and many painstakingly placed figures are still waiting for model builder Schmidt to complete them. After all, the visitors will be able to look into a lot of rooms later on. Vesuvius



“You can't ever get rid of earworms. Who doesn't remember the Aral gas stations commercial with the Fats Domino song 'I'm walkin'?”

MARIANNE VOLENTIR, Specialist Commercial Vehicles Basic Coatings, is responsible for the Aralblau (Aral blue) base coating at Wörwag. She herself has never run out of gas.

is being built in the next room. Constructed from kinetic sand (which doesn't dry out), and equipped with suitable atmospheric lighting and sound effects, the volcano is set to erupt and send dramatic streams of lava into the valley when finished. There's no doubt: Schmidt and his co-workers will not run out of work any time soon. The France, England, and Australia sections are in late-stage planning or already under construction. The universal model building motto applies in Hamburg as well: the tinkering is the main thing. That's why the system can't ever be completed. Ever. ■



Portraits: Boris Schmalenberger

Great fun on the mini-earth

The Miniatur Wunderland, which opened in Hamburg's Speicherstadt in 2001, is the largest model train exhibit in the world. Visitors meander through 1.68 acres (6,800 sqm) featuring replicas of central Germany, Bavaria, Hamburg, Austria, Switzerland, the US, Italy, and Scandinavia. The exhibit is open daily from 9:30 a.m. to at least 6 p.m. The hours are expanded on selected days, weekends, and during vacation periods.

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www.miniatur-wunderland.de



Wunderland up close: the love of detail is not only present in the individual models like the Elbphilharmonie (above), but also in the technical features of the system.

Knowledgeable: ▶
Helge Warta answers the questions posed by German President Joachim Gauck.



Tangible:
the coating on a roll causes a stir. ▼



PAINTED FILM

High-tech on a roll

**A big platform for innovations:
Wörwag presented its painted film technology
at Woche der Umwelt (Environment Week)**

By Daniela Renzo; photos by Dirk Deckbar

▲
Elegant:
nearly 12,000
visitors came
to the Bellevue
Palace park.



▲
Imaginative:
painted film motifs
on little metal boxes
as giveaways.

German President Joachim Gauck set aside plenty of time for the Wörwag booth. And all of his questions were answered. In June, our company was at their best not only in deference to Germany's head of state at this year's Environment Week in Berlin. Wörwag used the two-day event at the Bellevue Palace park to introduce their painted film technology, which is extremely environment-friendly and energy-conserving in comparison to conventional coating pro-

cesses. "It was a great honor for us to be allowed to present here. We are very proud of that," says Helge Warta. The head of painted film technology and cooperation partner Schüco Polymer Technologies KG presented the developed decorative painted films to mask plastic windows and other components. That was the reason why the jury of experts chose Wörwag for Environment Week from a pool of 600 applicants. Nearly 12,000 guests attended the event. ■

Together:

Dr. Achim Gast, Dr. Peter Moritz, Dr. Michael Schwake from the DBU (German Federal Environmental Foundation), and Jörg Glocker (right to left) want to cooperate on future Wörwag projects and act on behalf of the environment.



Advising:

Terry Warta explains the painted film's advantages to guests.



Innovative:

Schüco presents its new window system with Wörwag decorative coating.

Prestigious: Wörwag is one of about 200 companies with an information booth.

ENVIRONMENTALLY FRIENDLY AND EXTREMELY RESILIENT

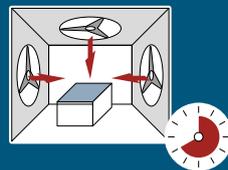
The innovative painted film technology was primarily developed by Wörwag and has been improved on continuously. The approach to first produce the paint as a length and wind it on a roll is new. The film is then cut and transferred by means of lamination without additional effort to the component during production. This enables components to be produced and coated in one step.

In many cases, the painted film is an alternative to wet coating plastic surfaces. The advantages: no overspray, hardly any drying time, immediately ready for use, extremely weather- and scratch-proof. The lengths are manufactured at Wörwag in Stuttgart-Zuffenhausen in clean room conditions. Several thousand square yards of painted film leave the plant annually. Enough to cover 77 soccer fields and in every imaginable color, if required. What makes it so special is that metallic effects can be incorporated into the painted film and—if desired—they can be embossed.

Wörwag painted film is available for two application areas: decorative painted film is used to mask window frames; the transfer coating is for coating car components. The new adhesive coating is used to coat the water deflectors in nearly all Daimler models.

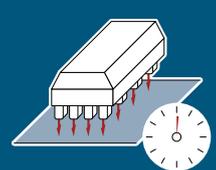
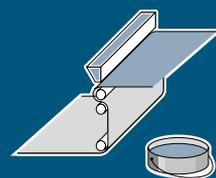
THREE ARGUMENTS IN FAVOR OF PAINTED FILM

Conventional coating



CO₂ emissions in manufacturing 335,000 sq yd (280,000 m²) area: 2,311,149 lbs (1,048,320 kg) CO₂

Coating with transfer coating



CO₂ emissions in manufacturing 335,000 sq yd (280,000 m²) area: 337,783 lbs (153,216 kg) CO₂

1. The transfer efficiency is almost 100 percent. There is no overspray.

2. The drying time is reduced. Energy savings amount to 80 percent.

3. CO₂ emissions are reduced by more than 80 percent in the production process.

CUSTOMER PROFILE

Yellow for success

Roads connect. Bopparder Maschinenbau-gesellschaft (Bomag) paves the way there. The heavy equipment technology of the world-wide leading manufacturer of asphalt and earth compactors has already helped create 3,728,219 miles (6 million kilometers) of roads. Unmistakable: the yellow protective skin of Wörwag coating.

By Michael Thiem



Milling, crushing, vibrating, tamping, rolling: Bomag heavy machinery for compacting asphalt and earth flatten everything in their path. After all, that is what they were built for. They mill the asphalt surface, crush it on-site, then it is either disposed of or re-used. These giants move tons of earth in any weather conditions, entire swathes of terrain are given a facelift. It gets very rough and tumble. But only at first glance. The unbridled power masks the precision, workmanship and sixty years of experience of a world market leader in the field of compaction technology behind it.

Bomag has been building earth, asphalt and refuse compactors, soil stabilizers, recyclers, milling machines and pavers since 1957. Karl Heinz Schwamborn founded the company in a two-car garage opposite the freight depot in the German town of Boppard, pop 16,000, about 56 mi (80 km) down the Rhine river from Mainz, Germany. That same year he revolutionized compaction tech-

nology by designing the world's first double vibratory roller with an all-drum drive. By 1970 Bomag was the leading manufacturer in the vibratory rollers sector. The machinery has been displaying its characteristic bright yellow color since the early 90s. The coating is still made by Wörlag. Bomag Yellow makes road construction engineers jump for joy because the reliable machines make their work easier.

Driving progress

Expertise and innovation have been the trademark of this "hidden champion" from Day 1.

One example is the Economizer. The measuring instrument for compactors, such as tampers, vibratory plates or rollers, continuously determines the degree of compaction during the work. A scale with 10 yellow LEDs tells the operator when the optimum compaction has been reached. After all, it is a main contributing factor in the road's life expectancy.

In 2001 Bomag introduced Asphalt Manager, the world's first system for automated control and optimization of asphalt density. It was a milestone in measurement technology. Even today Bomag, which →

1986

Bomag takes the leap to China with a licensing agreement. A few years later the German company forms a joint venture with the Chinese company Boma. In 2002, Bomag China is established in Fengxian, a Shanghai city district.

1987

The cooperation between Bomag and Wörlag begins. The partnership will celebrate their 30th anniversary in 2017.

1973

Sustainable investments: Bomag opens the doors of their Research and Development Center, which is still unique in compaction technology today.

1962

Bomag presents the BW 200, the first self-driving tandem roller in the world. The 7-ton vibratory roller becomes a sales hit. It is sold around the globe, even as far as China, for a good thirty years.

1957

Bomag was founded in Boppard am Rhein, Germany. The world's first double vibratory roller with all-drum drive revolutionizes compaction technology.

Bomag GmbH

Founded: 1957 in Boppard, Germany

Employees: 2,500 employees worldwide, ca. 1,400 of them in Boppard

Sales 2015: around 680 million Euros

Application areas and product lines: compaction (tampers, vibratory plates and drums, multi-purpose compactors), asphalt construction (tandem drums, combination drums, pneumatic tire rollers, road pavers), earthworks (single drum rollers, soil compactors), recycling and stabilization (cold milling, cold recyclers, soil stabilizers)

Locations: six subsidiaries in Germany, twelve country companies. More than 400 dealers in over 120 countries.

→ became a part of the French Fayat Group in 2005, is seen as an innovator in the industry. The Boppard company is committed to basic research, and operates the largest development center for compaction technology in the world.

The cooperation with Wörwag began in 1987. Werner Böh, a sales rep at the time, and Richard Wörwag introduced a 2K polyurethane primer that was far superior to the coating system previously in use. The product convinced management. “A producing company like us is dependent on reliable suppliers and a dependable supply chain. We have both,” emphasizes Volker Laux, General

Manager Purchasing at Bomag. “Wörwag is one of our oldest suppliers. We are looking forward to continuing our cooperation.”

Coating solutions made to measure

In 1989 Wörwag first presented powder coatings at Bomag. “At first there was a lot of skepticism. It disappeared pretty quickly when we reduced the pre-set coating time from 45 minutes to twelve in a test,” Böh remembers. As it is a one-coat system, the transparent finishing coat is not required. Bomag built a powder coating facility that started operating in 1990. The components coated here can be subsequently coated with spe-

cial colors—without any surface roughening. Sales Manager Sven Pechwitz on the subject: “Besides the leaner process, this marked a breakthrough in the collaboration with Bomag.”

Today many Bomag components are coated with powder coatings from Wörwag. Liquid coatings are now only applied to heat-sensitive parts, components from external suppliers and small series with special colors. A pillar of Bomag’s work is the UV coating on the inside of the roller drum casings. About 250 to 300 tons of highly weather-resistant powder and liquid coatings in Bomag Yellow and RAL color 7021 (black

1997

On its 40th anniversary, Bomag inaugurates a modern facility for efficient, environmentally-friendly powder coating in Boppard.

2001

Bomag introduces Asphalt Manager, the world’s only system for automated control and optimization of asphalt density.

2003

Bomag starts operation of a new, ultra-modern powder coating and paint shop for large components.

2005

Takeover by the French Fayat group.



Everything in yellow: the Bomag product range stretches from the 132-lb (60 kg) tamper to the 56-ton refuse compactor.



The characteristic Bomag Yellow is made by Wörwag. The parts are coated in the heavy equipment manufacturer's powder coating facility.

gray) are used annually. The heavy equipment manufacturer has obtained its coatings exclusively from Wörwag for years. "Many joint projects, for example in China and Brazil, have cemented our relationship," says Pechwitz.

In view of the extreme demands on the construction machinery, high surface resistances and corrosion protection are the most important criteria that the coating systems must fulfill. "Feedback from the users and long-term observation of the utilized machinery result in frequent new coating requirements," explains Market Manager Matthias Knapp. "A lively dialog with Bomag and their suppliers often leads to new collaborative developments." Only those who stay innovative are ready for the future.

Sixty percent gradeability

The same applies to Bomag machinery—starting with 132-lb (60 kg) tampers to the tandem drums to the 56-ton refuse compactor. That is also evidenced by two new products: a drum with a gradeability of 60 percent (31 degrees) and an asphalt milling machine with a working width of 7.2 ft (2.2 meters). Thanks to the distinctive color made by Wörwag, you can recognize them from quite a distance. The yellow machines are on the road. ■

2006

On October 1, 2006, Bomag takes over the road paver business from Fayat subsidiary Marini.

2008

Bomag is awarded the "TOP 100" quality seal, thereby joining the ranks of Germany's one hundred most innovative medium-sized companies.

2014

The "Top Job Prize" designates Bomag as one of the best employers among Germany's medium-sized companies.



Photo: Boris Schmalenberger

MATTHIAS KNAPP

looks at freeway construction sites in a different light these days. "As there are often Bomag construction machines doing the work, being stuck in a traffic jam has become more interesting," says Matthias Knapp. The market manager has been working at Wörwag since 1998 and oversees industrial and powder coatings in the ACE (Agricultural & Construction Equipment) and Trailers sector.

2015

Bomag sets new standards in efficiency and environmental-friendliness with its new generation of single drum rollers. The machines are in the 11 to 26-ton weight category and shine due to their state-of-the-art engines and intelligent performance regulation.

CUSTOMER APPLICATIONS

Tough customers

Ever greater demands are being placed on modern paint and coating systems. Here are four examples of innovative Wörwag products for extreme conditions.





Under pressure

Product: commercial vehicles

Customer: Daimler (Gaggenau)

Coating: Wörolux mono-layer UV coating

Area of application: commercial vehicle axles

Coating used since: 2010

Special features: very good corrosion protection, high impact and chemical resistance, adheres to seven different surfaces, can take almost every 2K top coat, cures extremely quickly.



Under duress

Product: kitchen stoves

Customer: Miele (Gütersloh)

Coating: Wöralit W851 powder coating

Area of application: control panels

Coating used since: 2000

Special features: this coating system's resistance to hot grease makes the control panel highly resistant to surface diffusion of greasy vapors that rise when the oven is opened.

Under deadline

Product: transport vehicles

Customer: Daimler AG (Düsseldorf, Ludwigsfelde)

Paint: Wörolux W 1K top coat, W380 product series

Area of application: delivery and transport vehicles for the Royal Mail, the United Kingdom's national postal service

Paint used since: 2004

Special features: the Royal Mail Red color is produced exclusively for this company.







Under scrutiny

Product: cosmetics presentation box

Customer: Marie-Laure PLV (Épinay-sur-Seine)

Coating: liquid coating, product KL1389, R3218

Area of application: limited series of presentation boxes for cosmetic items

Coating used: 2015 (one-time order)

Special features: HD (high durability) clear coat is extremely resistant to scratches and therefore considerably tougher than conventional clear coats.

ESSAY

Green

By Horst Walter, freelance journalist, for whom the color green makes him think of Sarah

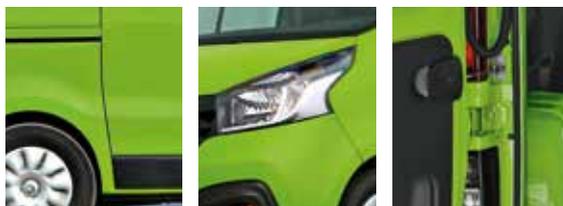
Green is the proverbial color of hope. But it doesn't tell us how long we should hold out hope and when we should let it go. Not even Sarah, with her unbelievably green eyes, said that. No, what Sarah did with her hopeful green gaze was coax gifts of the expensive sort out of the besotted beholder. So green, as we see, can also lead one astray.

If you google "green," you'll get about 14 billion hits, not the least of which are "British Racing Green" and "Peacock Green Metallic," which Wörwag has in its portfolio. If googling in your free time makes you green about the gills, these green idioms might make you feel less blue: would it be right to say that the Opel 4 PS, popularly known as the "Treefrog," was green with envy? How else can we explain that it copied its role model, a yellow Citroën, in everything but the color? Is the grass really greener on the other side of the fence, or does it only seem that way? The obvious person to ask—your neighbor with the green thumb—is unfortunately busy tending to her garden.

A greenhorn, alas, wouldn't know the answer. But whether you've got the green light or are going green, more often than not, green is good. It's not just the color of hope. Green is nature, green is environmentally friendly, green is progress. The greener our world, the better it is for us. Or would one have to be a little green to believe that? Perhaps it's all about the mighty greenback.

Others wonder: is getting back to nature the truest form of progress? Is a green light our greatest hope? Why don't we just paint the whole world green if the color, as we have heard, can actually balance out the rhythms of sick patients' hearts and kidneys?

Anyone who knows Sarah, at least, knows that not every bright green light leads to greener pastures. As I said: Sarah has amazingly green eyes. But she doesn't separate her garbage.



More than a bit green: in bright bamboo green, the Renault Trafic is a transporter of a different color. The color accent comes from Wörwag.

LOCATIONS

Wörwag worldwide



Development



Production



Service



Sales



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