

finishextra

INSIGHTS INTO THE WÖRWAG COMPANY

Do you feel bronze?

How trends turn into colors
and how they affect us

WÖRWAG
Farbe. Beschichtung. Kompetenz.

Color trends and a



Rusty metal as a source of inspiration: the trend scouts from Wörwag love unusual spots in their search for new colors. Because these places stimulate and inspire the senses. A scrapyard brings to mind

thoughts of bronze, of patinas, of years gone by, and of depth. What colors move us? And which colors will we love two years from now? Our color detectives have struck gold in their search for trends—**Page 6**. We let a trainee

pile of scrap metal



Photo: shutterstock

mix his favorite color—**Page 12**. A psychologist explains the impact of this potpourri of color on our psyche—**Page 18**. And we ask ourselves the question that never goes away: Is black a color? Or isn't it?—**Page 22**

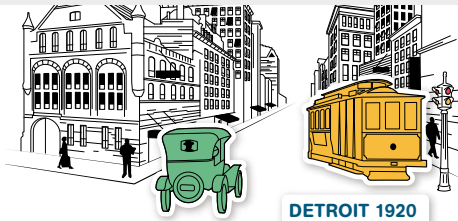


IMPRINT Published by: Karl Wörwag Lack- und Farbenfabrik, Strohgäustraße 28, 70435 Stuttgart, **Project Management, Editor-in-Chief** Daniela Renzo, **Concept** KircherBurkhardt (Stuttgart), **Layout, Implementation, and Image Selection** Rainer Czarnetzki, Lena Nominaniuk, **Project Management** Julia Welker, **Editing and Text Production** KircherBurkhardt Stuttgart, Elmar Brümmer, Bettina Langer, Reiner Schloz, Thorsten Schönfeld, Michael Thiem, **Print** RöslerDruck **Translation** RWS Group

01

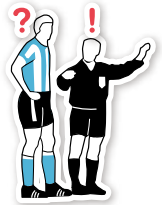
SIMPLY BRILLIANT

Red, yellow, and green have had a role in road traffic since 1920. That was the year William Potts, a policeman in Detroit, installed the first tri-color traffic light. His idea was to simplify regulation of traffic flow. He could not have



DETROIT 1920

imagined that his invention would one day change the face of soccer. Ken Aston was head referee at the 1966 World Cup championship. During the quarter-final game between Argentina and England at Wembley, a German referee expelled an Argentine player.



WEMBLEY 1966

INTERESTING AND ODD FACTS ABOUT COLORS

HOW RED, YELLOW, ETC. INFLUENCE PERCEPTION

02

WHY ARE THERE SO MANY RED GUMMY BEARS IN THE PACKAGE?

According to the manufacturer Haribo, every bag of bears contains the same ratio of flavors. The color red dominates because there are light (raspberry) and dark (strawberry) red bears.

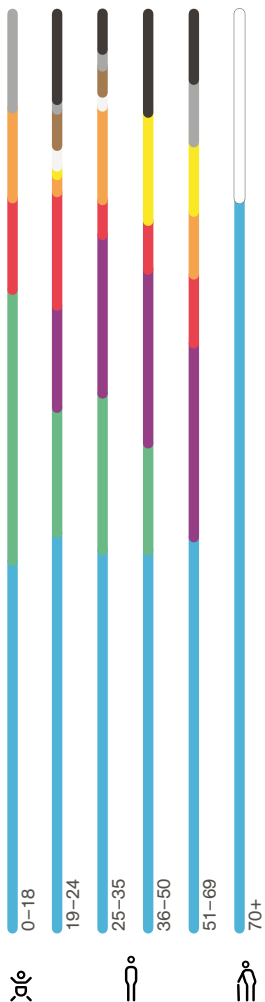
1/3
red



300 g / 84 pieces

03 FAVORITE COLORS

The eye perceives colors differently at one's age. Most people over 70 years of age regard shades of blue as soothing.



04

BLONDE, NATURALLY

A survey shows that most German men think blonde women are the most attractive.

47%
prefer
blondes



brunette **29%**, black-haired **18%**

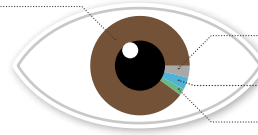
05

EYE-CATCHING COLORS

Humans can distinguish up to a million color nuances. Incidentally, 90 percent of the world's population have brown eyes. Brown evokes a feeling of trust in combination with certain facial structures.

Up to 1 million
nuances of color

90%
brown

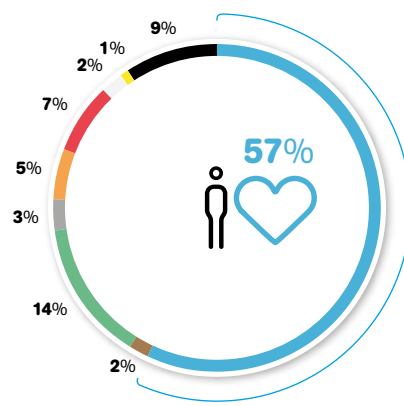
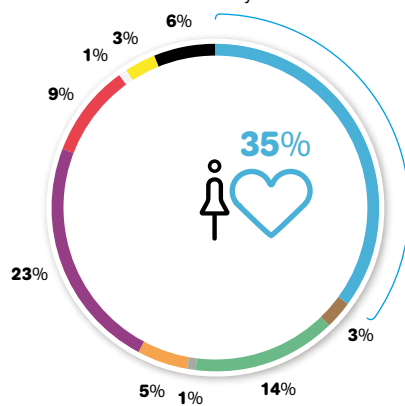


3-4%
gray
3-4%
blue
2-4%
green

06

TRUE BLUE MAJORITY

Regardless of whether you are young or old, male or female, when it comes to favorite colors, blue is usually at the top. Among women, only violet enjoys similar popularity. However, the fact that most hyperlinks on the Internet are blue is probably due to another reason: while many people suffer from red-green color impairment, blue blindness occurs markedly less often.





The player didn't understand and stayed put. In the end, Aston had to escort him off the field while gesturing with his hands and feet. Then he came upon a traffic light on the way home. It switched to yellow, and Aston took his foot off the gas pedal. Suddenly he had a brainstorm as his car came to a stop: He decided



LONDON 1966

to apply traffic light colors to soccer. By the time the 1970 World Cup came around, each player knew what was coming when the referee stood in front of him with a yellow or red card.



07

RED EQUALS DREAD

It spreads fear and terror in and out of school: the red pencil. An experiment showed that test subjects who used red pencils to make corrections to a text found 26 percent more errors than those who used a blue one.



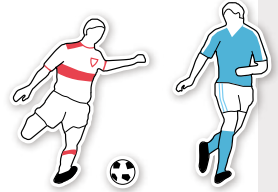
26%
more errors

08

FRIES ARE FAVORITES

German soccer fans love the fast food classic "red-and-white fries" (with ketchup and mayonnaise). Could that be the reason 25 percent of soccer club jerseys in the first to third leagues are red and white?

25%



09

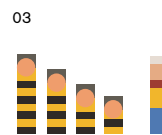
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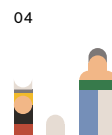
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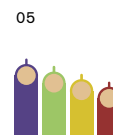
03



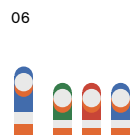
04



05



06



DO YOU RECOGNIZE THEM?

We can memorize units of form and color especially well. Especially those of famous cartoon characters. How fast can you identify the above depicted series heroes?

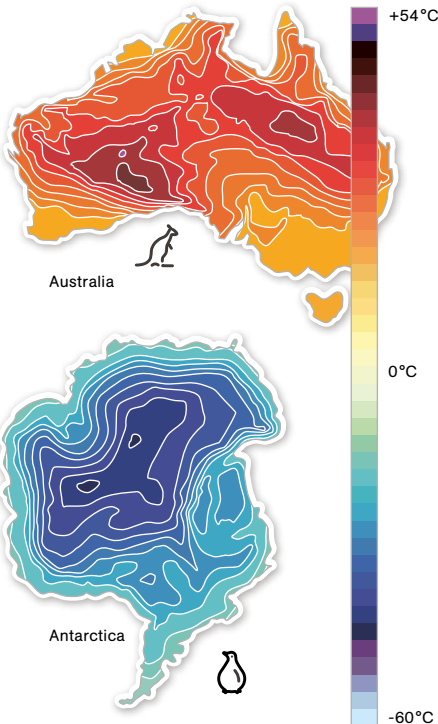
01 The Simpsons, 02 Ernie & Bert, 03 the Daltons & Lucky Luke, 04 Asterix, Obelix & Idéfix, 05 Teletubbies, 06 Donald Duck & Nephews

11

RECORDS ON THE WEATHER MAP

Australia recently introduced the color violet to their weather maps—for record temperatures over 50 degrees Celsius.

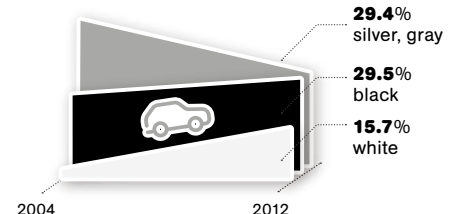
+50°!



10

STREET VIEW

Bright colors are a rare sight on German roads. In 2012, around 75 percent of new car registrations in Germany were for black, gray, and white models. Could it be related to the results of a study conducted by a British car dealer that showed birds preferred to relieve themselves on red and blue cars?



12

THE EYES DECIDE AYE OR NAY

The decision to buy something has a lot to do with visual perception.

93%



pay attention to an item's visual impression

6% are interested in the nature/characteristics of an item

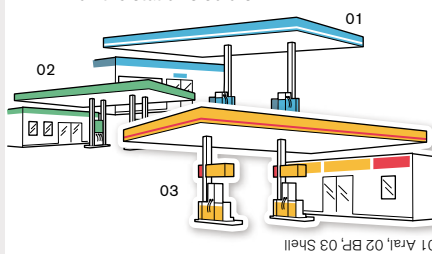
1% decide according to the taste or sound



13

HAVE YOU ALREADY NOTICED?

A driver can already see from afar which brand of gas he is heading towards based on the station's colors.



14

SIMILARITIES

The color and shape of stop signs the world over are nearly identical so that foreign drivers can react appropriately.



2014

Upheaval in the economy and society leads to a need for abiding values. Color researchers have derived Chrystal Caramel from the crystal vase designed by Patricia Urquiola. It is part of the "Recreate Century" color spectrum.



COLOR TRENDS

Kristin Jandke's Feeling for Color

Never mind clairvoyants: if you're looking for new color trends, you need to hold a mirror up to society. Trends are not set; they evolve. Wörwag, too, has its finger on the pulse. You can see that in our creation of new trend colors for exterior paints.

By Michael Thiem

“One central question is: How much anarchy, how many breaks with convention do we credit our target group, society, with?” Professor Dr. Christoph Häberle



**KRISTIN JANDKE AND
PROFESSOR DR. CHRISTOPH HÄBERLE**
from the Stuttgart design agency B612 develop, together with their colleagues, individual solutions for firms in many sectors. The team is comprised of graphic artists, industrial and textile designers, interior decorators, artists, marketers, and technicians.

For Kristin Jandke, this vase is a crystal ball in which the color trend researcher from Stuttgart can see the future. Although that's not what she likes to hear. Jandke found the everyday object with the awkward name “Baccarat Variations Vase 06A,” by the Spanish designer Patricia Urquiola, at the furniture fair in Milan. The object unites handicraft with innovative working techniques and expressive ornamentation. Her thoughts when she sees it are transported to the 17th century. Associations with caramel, melting away in a skillet. Warmth. Sweetness. Hot sugar becomes a metaphor for an entire world. A world of color. A historicizing world that, thanks to a unique glass-cutting technique, is reflected in the crystal vase in rare variety—from dark brown to white, from hard tones to warm and mild ones. “Our sources are not the secret to our inspiration. Art is in how you interpret them,” reveals Jandke. “Inspiration sounds like an oracle, but for me it's just clues.” She calls the new trend color Chrystal Caramel.

Creative evidence room

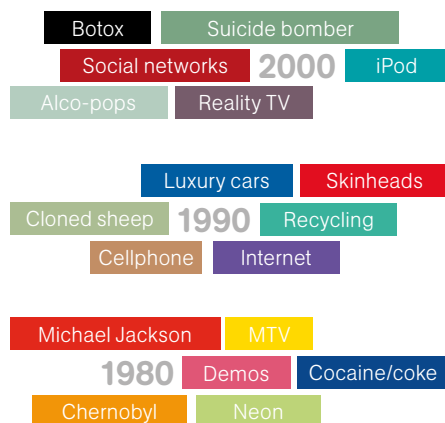
The clues are collected meticulously. They include vacation photos, material samples, sketches, magazine articles, packaging, broken tiles, stones, fashion accessories, cosmetics, and pictures of exclusive products such as the vase. The offices of design agency B612 on Tübinger Strasse in the western part of Stuttgart are an evidence room of creativity. A lot of the items collected are hung on what is known as a ‘mood board.’ This wall is alive. It changes. Rearranging the items, adding to them, and grouping them allows new worlds of life and color to crystallize. The name of the agency—which has worked for Wörwag since 2003 on such projects as discovering color trends for exterior and interior paints—is derived from the eponymous Little Prince's asteroid in the famous story by Antoine de Saint-Exupéry.

A design cosmos has developed in the back-room atmosphere of the agency. “The mood board shows us what the client's brand and product need in order to be a success in tomorrow's world,” explains Christoph Häberle, who founded B612 in 1996. He also researches and teaches as professor for packaging design at Stuttgart Media University. Being able to express yourself through color is the most differentiated form of non-verbal communication. It doesn't just involve individual preferences, but also collective attitudes to life and shared values.

But why should Chrystal Caramel be trendy all of a sudden? Humberto Maturana, the renowned Chilean biologist and psychologist, defines the term ‘trend’ with the image of a man who is standing on the edge of a cliff and still risks a step forward. “Each time he steps into the abyss, the cliff grows under his feet.” This means that, to make trends a reality, you just have to head in the right direction. Courage is one ingredient; precise observation is another.

Jürgen Ortmeier, head of development at Wörwag, sees it this way: “Trends are not set; they evolve within society. That's why we want to know which direction the world is developing.” As a result, the central question for Häberle is: “How much anarchy, how many breaks with convention do we credit our target group, society, with?”

Trends develop out of the *zeitgeist*. A trend can only develop once it has been accepted and is, indeed, desired. The germ cell of a trend is often a subculture. Take baggy pants, for instance. These loose pants, where the waistline is almost down at the knees, developed from the observation that prisoners have to hand in their belts, which makes their pants slide down below their hips. In the nineties, the hip-hop scene picked up this look. That was the beginning of gangsta rap. Snowboard →



Every era has its own favorite colors: events and themes are a reflection of society

1990

The world is growing closer together. Cell phones and the Internet have made globalization simpler than ever. Home computers have started to get colorful.

But there's fear in this decade, too—fear of wars in Iraq and the former Yugoslavia, as well as the cloned sheep Dolly.



1970

Between repletion,
tolerance, and
crisis: colorful doesn't
have to mean
cheerful.



JÜRGEN ORTMEIER, HEAD OF DEVELOPMENT AT WÖRWAG, *lives with colors. And loves blue tones. That's why he particularly likes the new trend color Diamond Eclipse. He considers it indispensable for Wörwag to set its own trends. This ensures that customers perceive the company to be a skilled partner. Wörwag offers an overall package: new colors and technical innovation.*

→ and skateboard fans followed. The sub-culture becomes fashion and the textiles industry brings out the designs to match. Trend scouts evaluate the market potential. Because underwear is now no longer covered, the designers can play with materials, colors, and advertising messages here, too.

The germ cell of almost all trends is to be found in the world of fashion. Nowhere else is it easier to change your personality. "Trends have a lot to do with identity," says Häberle. If you want to stand out from the crowd, you change what you're wearing. Once a trend has been established commercially, it spreads irresistibly to other sectors. Not always to all sectors. And always with a delay. From seasonal fashion and long-lasting consumer goods such as cars to architecture. When you consider that today's trend colors won't be seen on the street for four to six years, and new cars are generally driven for around ten years, it's obvious why vehicle paints are less garish than the colors found in fashion.

In 2000, the color white started to experience a renaissance on the catwalk. Apple's iPod followed, and some years later there were countless white variants of basic vehicle paints. The original hospital color is not only a trend; it's become a classic. White's share of the exterior colors exploded from

four percent to at least twenty percent within a few years.

The example of Japan shows that trend colors have to be adjusted to suit different sectors, markets, products, and distribution channels. While luxury vehicles in white sell like hot cakes there, a small car in white is seen as an affront. The Japanese associate white with greatness, freedom, and purity. It also symbolizes death and mourning. For that reason, a little white run-around is left on the shelf.

The fastest means of communication

The psychological effect is also enormous. According to a study by the CAR Institute (Center Automotive Research) in Duisburg, white cars are considered to be particularly noisy. We think vehicles that match our own personal tastes are quieter and more pleasant. Do we use color to orient our own behavior? "In every context, color has a learned meaning," according to Häberle. The professor lays a photo of a chili pepper on the table: "Here, we think of adjectives such as red and hot." The next picture is of a red sports car. Red means hot, which, in the case of a car, we interpret as fast. The proof of this is that the police pull over red cars more often. Color is the fastest means of communication. Hu-

Photos: iStock (2), Fotolia, Jos Schmid

1960

Being modern
is the latest thing.
Life is garishly colored.
A world on the move:
the Berlin Wall is
built, student protests,
moon landing.



1950

People
moving forward.
Life after trauma.
The fear fades
only slowly.
Prosperity is on
the increase.

mans use colors and shapes for orientation. The eye can perceive 1,000,000 nuances.

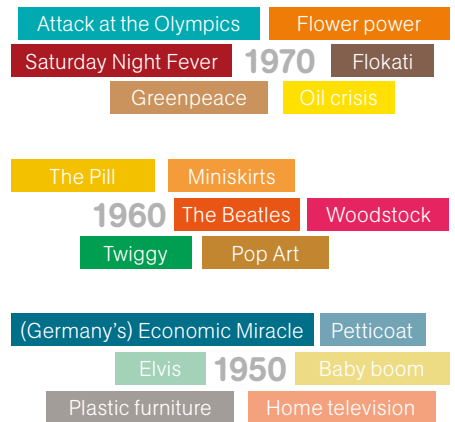
Every era has its favorite colors. At the end of the fifties, bright, fruity colors were dominant. This decade was marked by contradictions: much of the world was rising out of the rubble of the Second World War into an economic miracle. The expansion of the economy was pitted against a desire for security within the family and society. Buzzwords like Elvis, TV, economic miracle, and petticoat were in everyday currency. Things got more off-beat in the next decade. The Beatles electrified an entire generation and Pop Art and the miniskirt raised quite a furor. In the seventies, the colors were even more lush, including as they did psychedelic patterns in striking orange, dark brown, and garish green. They were the accompaniments to flower power, the oil crisis, and bell-bottoms.

Another indicator is cinema. Blockbusters confirm the mass appeal of color trends. *The Lord of the Rings*, for example, contained a mythical pallet of colors—from the iron gray of the armor to the idyllic green of the Shire. "Cinema shows us how willing the masses are to engage with a theme," Jandke explains. Filtering a single color tone from the orange vase is just one part of the color researcher's work. Technical feasibility is an-

other factor that determines whether something will become a trend. Surface, texture, and working all result in an unusual effect. Jandke works hand in hand with the developers at Wörlag. Anyone can do orange. But it takes that special Wörlag touch to make, say, Valencia orange. An audacious undertone and a flip—the way the color changes depending on the angle of the light—can turn an almost bronze brownish orange into trendy Chrystal Caramel.

Appearance alone is not enough

"The future will tend towards the green; that's no secret. But we need to define how this green will look," adds Ortmeier. The head of development knows that color can't just look pretty. "It won't sell until it works technically." The new trend colors from Wörlag therefore fulfill the requirements for use in the resource-saving IPP (Integrated Paint Process). The chief developer does not doubt for a moment that the research is worth it. You will only stand out if you take a stance. Three of Wörlag's twelve current trend colors are being brought to production maturity for an automobile manufacturer. Rosy prospects. Even if pink will probably only become a trend color for vehicle paints in Japan and South Korea. ■



**From pastel to funky:
colors from era to era, between
fear and transformation**

A man and a woman are standing back-to-back in a workshop. The woman, on the left, is wearing a white t-shirt and blue jeans, holding a yellow paint can and a white container. The man, on the right, is wearing a blue t-shirt and black pants, holding a yellow-green bicycle frame. They are surrounded by various paint cans, tools, and a large splash of yellow-green paint on the floor.

Overarching design:
Paint engineer Nicole
Hörner and future lab
technician Felix Bischoff
with the various ingredients
they will mix to produce
the yellow-green hue for
Bischoff's bicycle.

Yellow-green and pearlescent, please

The ideal paint for apprentice Felix Bischoff's new bicycle does not yet exist. How convenient that Wörwag's designers work just a few floors above his department.

By Thorsten Schönfeld; photo by Frederik Laux

Nicole Hörner and Felix Bischoff button up their lab coats, put on goggles, and pull on gloves. "The goggles are crucial. When you work with liquids and powders it's easy to get something in your eye," says Hörner with a smile. Hörner, a paint engineer, and Bischoff, in training as a paint technician, stand in front of several containers of what Hörner terms ingredients, as well as a white bucket that the two will soon be using to mix the paint. "This is what my bicycle should look like!" says Bischoff as he holds aloft an album cover of his favorite band, which has a yellow-green illustration.

The process they are about to embark upon is similar to that used when car designers commission paint from Wörwag. Photos from the world of furniture and design, or perhaps also the cosmetic sector, serve as models. Hörner and her boss Herbert Kost, who directs the Design and Pigment Development department, evaluate the models for feasibility.

One criterion concerns the desired effects: are they supposed to be conspicuous or subtle? Head developer Kost can tell immediately whether a designer's idea can be realized in paint. A chemistry lab technician, he has been in the business for 40 years. "We first have to figure out which pigments come into question," he explains. "It helps to look through the archive—for we might have developed a similar shade in the past." Then it's off to the lab.

Pigments that produce gloss

Bischoff has set his illustration aside. He weighs the first ingredient, a semi-finished product, and pours it into the mixing bucket. The base material consists in large part of a binding agent. Thickeners are added so drops won't form when the paint is applied, as well as water, solvents, and pigment pastes. Hörner takes two cans from a cabinet. One contains

aluminum pigments, the other a pearlescent gloss. The latter looks like flour, but produces a yellowish sheen when rubbed on the back of a hand, for example. "Pigments of this type are also used in cosmetic products like eye shadow," she remarks.

Then it's time to mix. The electric mixer, which looks like a cross between a kitchen appliance and a stationary drill, comes to life with a soft hum. As the pigments are added, the desired shade slowly appears. Despite all the ingredients in use, there is scarcely any odor.

In the right light

The developers also create paints of their own. Once a year they present them to car makers after applying them to pieces of sheet metal. The metal is bent in the middle to show the effect on vehicle contours. To see how the shade changes under different light conditions, the developers use a light cabinet—a separate room with special lamps that can simulate all nuances of light from dawn to dusk.

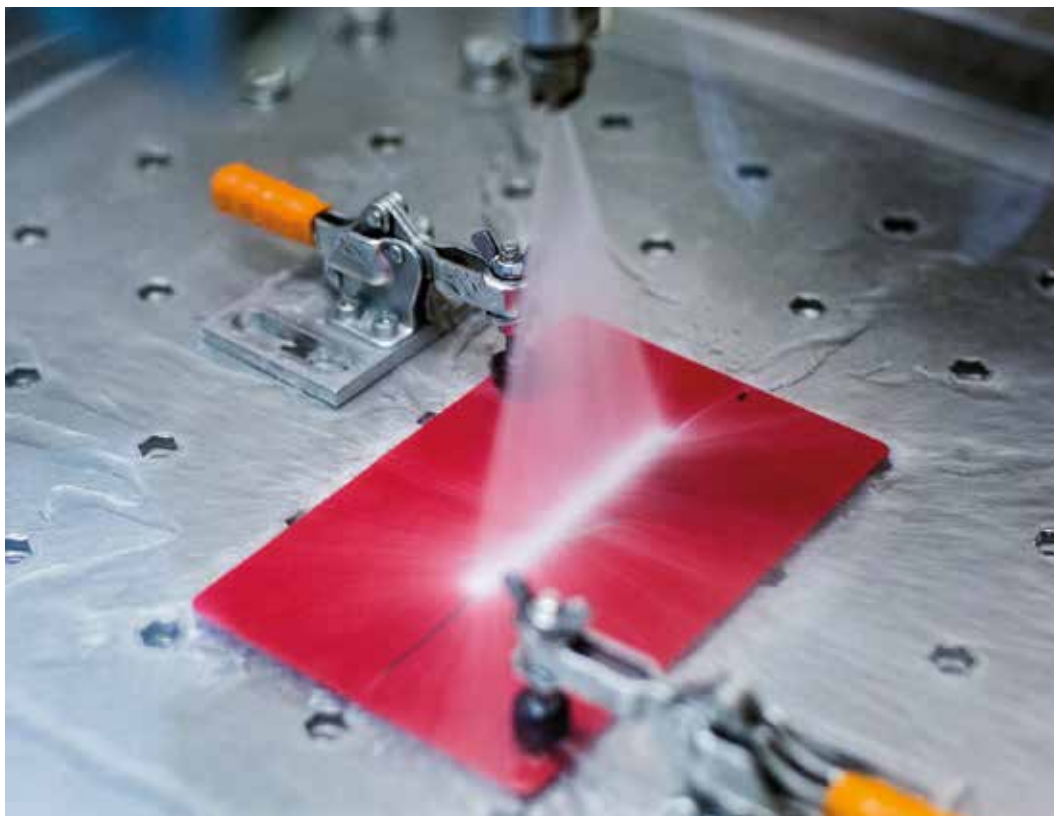
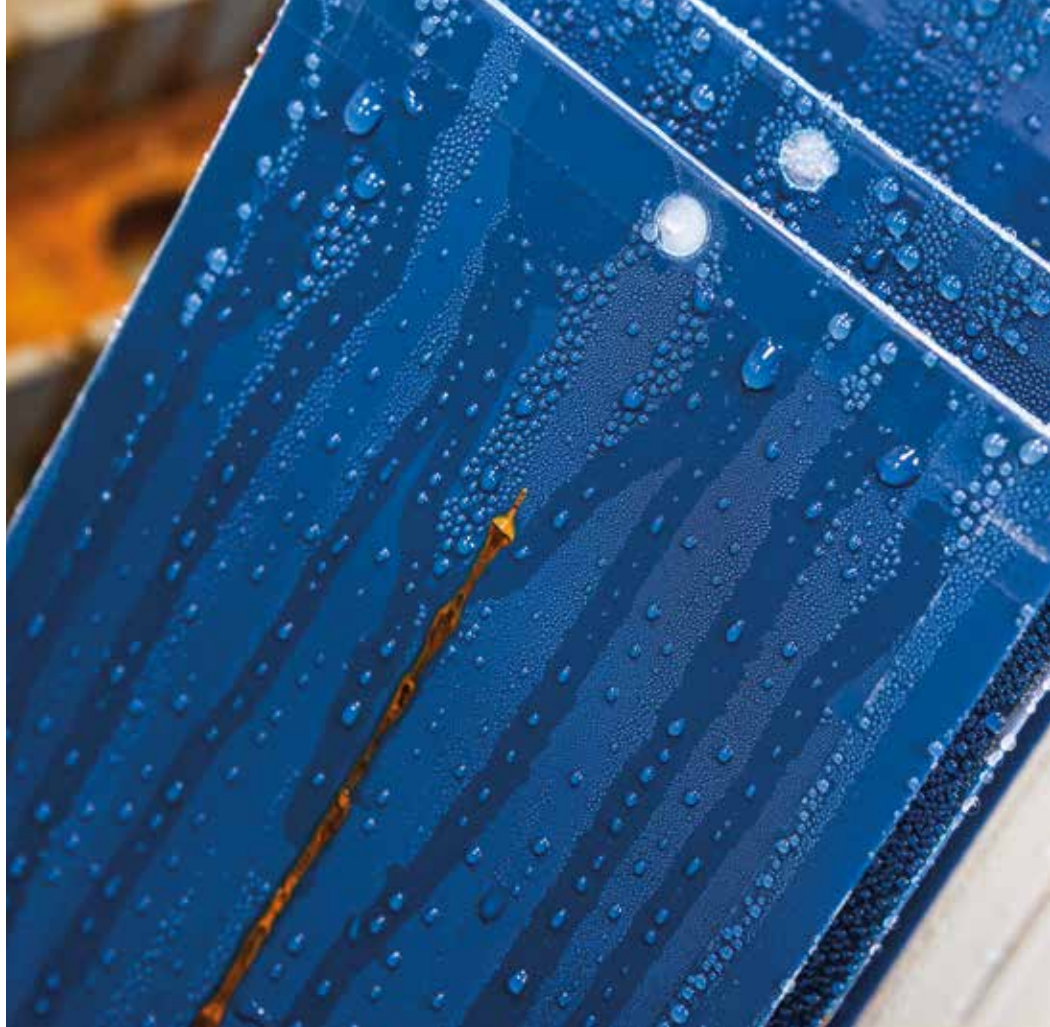
By the way, not only the color has to be right. The paint itself has to have physical properties that enable it to be used flawlessly at every paint shop. That is why Wörwag mixes it differently for every type of facility depending on information provided by the customer. If a car maker selects a certain paint, this product must first demonstrate that it meets the specifications over the course of complex and often lengthy tests (for more information, see the "Paint Under Stress" article in this issue).

After a good hour of work, the paint for the apprentice's bicycle is ready. All that remains is to test it on a piece of sheet metal. After it dries, Bischoff takes it out of the oven, carries it to the light cabinet, and assesses the color's changing appearance. Then he takes another look at the effect in natural light by the window. "Perfect!" he exclaims. A pearlescent yellow-green. Exactly what he wanted. ■

Presenting your new car paint

As a supplier for the automobile industry, one of the products Wörwag develops is paint for entire car bodies. The company's designers and pigment specialists develop paints not only when commissioned by customers but also based on their own ideas. They present the latter to selected parties once a year. It takes an average of six months from inspiration to presentation of each of these ten to twelve proposals. The paints contain up to three effect pigments as well as three to five color pigments. They can have as many as fifteen ingredients overall. Wörwag mixes volumes of up to 25 kilos at its development lab. Its regular production facilities supply volumes from 100 kilos to 20 tons.

Pretty aggressive:
The salt spray test lasts
up to 1,440 hours and
gives indications regarding
corrosion resistance.



Full blast:
In the pressurized
water test, water
blasts away right
on the cut.



CUSTOMER AND TEST LAB

Paint under stress

At Wörlag, one hundred employees use state-of-the-art lab equipment to ensure that the paint delivers what the color promises. And that expertise benefits external customers as well when quality and economy are of the essence.

By Reiner Schloz; photos by Frederik Laux



Heavy duty:
Construction machinery
has to stand the test
of time. The paint does
too—so it's tested to
the limit.

When Gabriele Roth talks about paint, she does so with an eye for detail. She speaks of DIN and ISO, of coating regulations and millimeter spacing. The head of the accredited test lab at Wörlag works with the hard facts regarding the quality of the protective coating, the adhesion of wet paints and powder coatings, and corrosion resistance under the most demanding conditions. As a member of the standards committee on test methods for coatings, Gabriele Roth knows first-hand how the tests must be conducted. The committee relies on these procedures. The tests are conducted with state-of-the-art technology in the accredited Wörlag test lab, which makes the facility something like a neutral paint inspection authority.

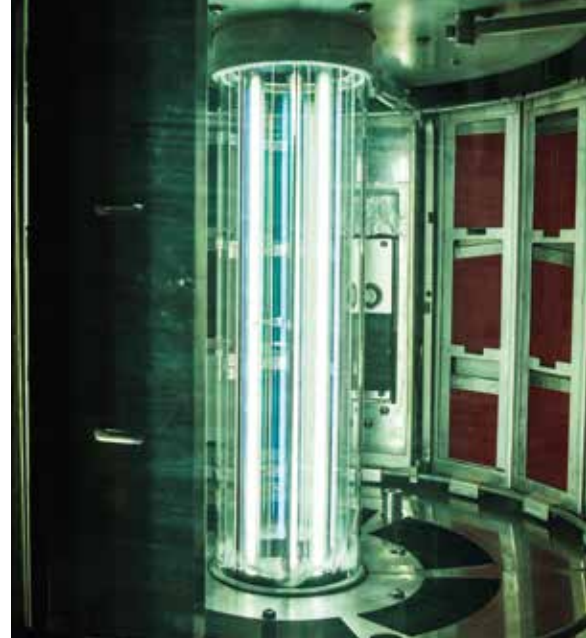
When it comes to expertise and technology, Wörlag has the ideal prerequisites to provide in-house development help. "But more and more external customers, particularly from the automotive industry, are using our facility as well," says Gabriele Roth, "to ascertain

whether their painted components can fulfill the desired specifications." Depending on the customer's wishes, the paint may be subjected to massive stress. For instance, in the chemical resistance tests. In these tests, the painted component might be exposed to aggressive liquids such as brake fluid or sulfuric acid, or operating materials such as gasoline or diesel in the spotting method. In contrast, the physical-technological trials test the coating's elasticity and adhesion. Cross-hatching at defined millimeter intervals can give an indication of this. Less delicate is the stone chipping test, in which the substrate is pelted with chilled-iron grit (grain size: four to five millimeters) or washed gravel (grain size: 9 to 16 millimeters).

Two Months of Salt Spray

Even more extensive—and above all longer—are the corrosion tests in artificial environments. These are geared towards identifying rusting around the edges and potential weak points in the paint as well as surface rusting. The alternating climate test alone usually takes 10 to 15 weeks, in which the component is exposed to condensation, varying ambient temperatures, and salt spray. The test →

Shortened outdoor exposure:
The paints are exposed to
high-energy light and
extremely high humidity.



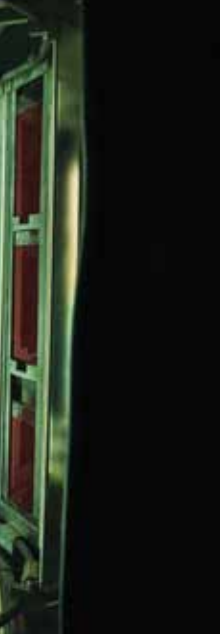
Question of
millimeters (above):
How deep does
the rust go beneath
the cut?



Measured approach:
The cross-hatch test
checks the adhesion
of the paint.

Caution! Falling rocks!
The stone chipping
test device is filled
with chilled-iron grit
for the test.





“With the powder-in-powder technique, we achieve the highest quality, greater efficiency, and production increases of up to 20 percent for our external customers.” Jochen Reihs, head of the customer lab for vehicle manufacturing at Wörlag



Nasty chemicals:
In the spotting method (above), the coating is exposed to substances such as gasoline, oil, or cement remover.

→ specimen spends up to 1,440 hours in an aerosol consisting of a five percent saline solution. DIN standards define how to evaluate any bubbles or cracks and the degree of corrosion upon conclusion of the tests is also well defined.

But Wörlag's customer service goes even further. In many cases it's not the paint that is responsible for any deficiencies that occur, but the way it was handled or the shape of the component. “So then we take a closer look at the customer's production facilities,” says Roth. Especially with powder coatings, users' require-

ments go far beyond the mere test procedures. The powder-in-powder technique is viewed as especially economical, and is the top choice for manufacturers of agricultural and construction machinery, where components to be painted may weigh up to 30 metric tons and have plenty of edges and corners. Jochen Reihs, head of the customer lab for vehicle manufacturing at Wörlag, notes: “The requirements in terms of adhesion, corrosion resistance, and efficiency of production are very high.”

Working with customers, Wörlag has achieved considerable success over recent years. In the powder-in-powder technique, a single curing procedure is sufficient to bond the primer and the top coat to form a robust coating. Moreover, 85% of the exhaust heat can be fed back into the oven because—in contrast to wet paint—no solvents are used. To reduce energy consumption even further, work is under way on a low-temperature powder. In other words, at the same temperature but with a shorter curing time and higher throughput.

And development is continuing in the field of application technology too. Tribo-charging promises optimal coating, adhesion, and efficiency. The powder is charged and the component is grounded. The powder is applied with a spray gun mounted on a special handle that makes it possible to easily reach every nook and cranny of the component. Reihs: “This enables us to achieve the highest quality, greater efficiency, and a roughly 20 percent production increase for our external customers.” He adds that you have to look at the process both in its entirety as well as noting the details. And Wörlag regularly passes this knowledge on to customers in training courses. All course information is available at: www.woerlag.de under “Centre of Excellence.”



GABRIELE ROTH, DIRECTOR OF THE ACCREDITED TEST LAB AT WÖRLAG, is a member of the “General Test Methods” standards committee and thus knows all about paint testing procedures and their evaluation criteria. “In testing, we don't just fulfill our customers' requirements, but also advise them as to which tests are really useful for which purposes.”



Grasshopper green?
It's not as easy to relish
this beer.



Blue traffic lights?
If standard colors
were changed,
traffic would come
to a halt.

PSYCHOLOGY

“Color influences our sense of taste”

Does red evoke infatuation or trigger anger? Does pink have a calming effect? And how does green light influence wine tastings? Psychologist Dr. Daniel Oberfeld-Twistel explains how colors can outwit the psyche.

Interview: Bettina Langer



Red heat?
A stadium with red grass
would disturb even
hardcore soccer fans.

Dr. Oberfeld-Twistel, have you ever tasted white wine with red food coloring?

No, not yet. It is well known, however, that even experienced wine experts can be fooled and suddenly believe their white wine that looks red has the flavor of red wine.

Your research has shown that the effects of color are even more far-reaching.

Yes, that's true. At tastings done with our partner, the Fritz Allendorf wine estate, we served wine in rooms with differently colored lighting. We found that this ambient light also affects taste. People in red rooms described their wines as significantly sweeter and fruitier than those in green or blue surroundings. They would spend nearly six euros a bottle for wine tasted in red lighting, but only four euros for the same wine in green lighting.

Why does color influence us so strongly?

It makes sense that color would help us classify food and gauge its edibility. Food that

looks unusual, like brownish spoiled fruit or the green beer they serve in Ireland on Saint Patrick's Day, gives us pause. But we haven't yet been able to explain why light too has an effect on taste.

Which colors do people find most desirable?

Blue lighting was considered very pleasant at our wine tastings. That fits in with general color preferences. In western cultures, adults list blue as their favorite color by far. Red and green are also well liked. But yellow, orange, brown, and all the others bring up the rear. Children show much greater variation in their favorite colors.

What goes on in our minds when we see something like a violet fire engine?

Even if we're fond of the color violet, something that doesn't meet our expectations makes us suspicious, or at least cautious. Psychologists refer to this as cognitive dissonance.

Do colors make people happy?

We know that strong colors—or more pre-



DR. DANIEL OBERFELD-TWISTEL
researches and teaches at the Department of Psychology at the Johannes Gutenberg University in Mainz. His work focuses on visual perception, psychoacoustics, methods, and statistics. His favorite color is blue.



A violet fire truck?
Hard to imagine a vehicle
of this color fighting
its way through traffic.

“Food that looks unusual,
like brownish spoiled
fruit or beer dyed green,
gives us pause.”

Dr. Daniel Oberfeld-Twistel

cisely, saturated colors—can trigger emotions. Red, for example, excites or arouses us, an effect that can be measured in physical responses such as pulse rates and skin conductivity.

Why? Is that because we have come to associate red with danger or sexual attraction over the course of evolution?

Probably not. A red strawberry, for example, is not in any way dangerous. It's more likely that a culturally acquired association is at work. Many warning signs, for example, are painted red. The exact reason for this is still unclear.

What goes on in our eyes when we see color?

Our retinas have three types of light-sensitive cells, or cones, that are involved in our perception of color. When the cones that are most sensitive to light with the longest wavelengths are stimulated, we see red. It's possible that their activity may trigger greater stimulation and arousal in purely physiological terms than that of the other cones. But we still know very little about this.

Psychological studies have shown that men find the same woman more attractive in a red than a blue shirt.

That's true. The authors surmise that this is due to the cultural association between red and sex. Or maybe the reasons are entirely unromantic: the man is aroused by the color red and projects this emotion onto the woman. The infatuation that he feels would then just be his own physical response to the color.

Is this stimulating effect one reason why many sports cars are red?

That's possible. There's a study, not about sports cars but about locomotives, that shows how color alters our perception of sound. People were shown slides of trains with red or green shading, with a soundtrack of train noises in the background. The soundtrack played with the red trains was perceived as louder than that with the green trains.

Pink, on the other hand, is said to have a calming effect ...

This idea arose in the USA in the 1970s in connection with the question of what color to

paint prison cells. “Drunk tank” pink cells were built, which supposedly had an incredible effect. We have cells like this in Germany today too. But there isn't a single study with rigorous methodology that has actually demonstrated this effect. We've also come to realize that concentrating on the shade can lead to incorrect conclusions. Brightness and saturation are every bit as important. Emotional effects are only achieved with strong, saturated colors. In fact, saturation has a greater effect on stimulation than the shade. If the shade has too high a component of white or black, the effect fades.

What do you think of books that extol the healing properties of colors, or recommend that rooms be painted in certain colors to promote creativity?

There are all kinds of theories out there about color. Very few of them are grounded in science, however. Most are derived from fables and legends. Many questions about the psychological effects of color simply do not yet have answers. Which is what makes this area of study so intriguing ...

ESSAY

Black

By Elmar Brümmer—a magazine author
for whom *long black* is the coffee of choice

Everything has always been so colorful in this magazine. So it's high time to look at the hue that will never make it into the rainbow. Which for many people means it's not a color. For others it's just a state. But for a good many more, it's an attitude.

Hardly any other color evokes such strong associations as black.

Psychologists suspect Stone Age existential anxieties are involved. To paint too black a picture and so on. We don't even want to know what else might be hiding in the shadows there.

Because then black wouldn't be *beautiful* anymore. But it is—at least for Coco Chanel, who said that “women think of all colors except the absence of color. I have said that black has it all. White too. Their beauty is absolute. They offer perfect harmony.”

So that's how the little black dress got started—because it creates contrast.

The architect Amandus Sattler had this to say about the favorite color of the creative class: “Would you hire someone wearing a tie with yellow polka dots to design your house?” Exactly.

And Henry Ford, who put half of America on wheels, expressed the resolute quality of black as follows: “Customers can have their cars painted in any color they like—as long as it's black.”

So it all comes down (among other things) to what you believe. You can't go wrong with black. Black makes you look slender. Black gives you elegance without risk. Perhaps people with a fondness for black are simply tolerant. And leave colors to the flowers.

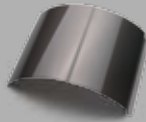
Or to the paints ... ■



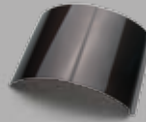
Wörwag has been providing
the Obsidian Black Metallic paint on Mercedes-Benz E-class
models for many years now.

2014

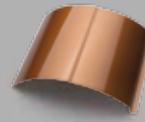
Color trends



Romantic
Seduction

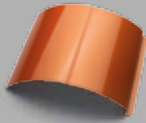


Shaded
Ebony

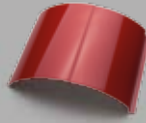


Chrystal
Caramel

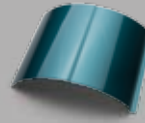
RECREATE CENTURY



Mango
Lassi

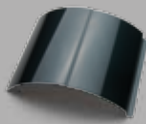


Red
Spot

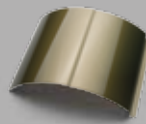


Aztec
Diamonds

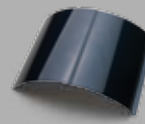
GLOBAL PATCHWORK



Moorland
Green

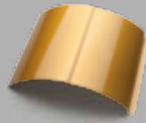


Greeneye
Butterfly

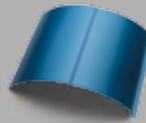


Diamond
Eclipse

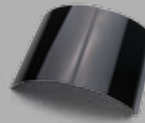
THEATRICAL NATURE



Yellow
Dioxide



Bombastic
Blue



Dramatic
Depth

SENSE OF TOUCH

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