CLARIANT

Automotive Styling Shades
2021–2023 TRENDBOOK

»For me, car colors are always an expression of culture.
They reflect fashions, technological developments and social trends.«

–
MARCO GANZ, SWISS DESIGNER AND ARTIST

A century of colors **REFLECTED IN AUTOMOTIVE HISTORY**

The history of automotive colors has famously dark origins. Anyone remotely familiar with the subject has heard of Henry Ford's rigid stance on the matter. Customers could have any color they want, the legendary pioneer of car mass production said when asked for more styles and shades, »so long as it is black«.

Of course, even Ford eventually had to accept that automotive styling shades are not just a luxury. The cars of the wealthy were sporting them from the beginning of auto history. But as soon as lively and lasting car colors became more affordable in the 1920s, the general public also began to eagerly expand its palette.

This palette is influenced by many things. By tastes and technologies, but also by trends spilling over from fashion and other industries. Even historical events affect the selection of car colors, which often reflect the mood of nations and periods.

To celebrate the new decade the world of car colors is about to enter, this edition of Clariant's Automotive Styling Shades Trendbook will take a close look at the decades of the past. Tracing the shifting global palettes from 1900 to today, it examines which colors were liked by whom – and what this says about the times.

Naturally, our Trendbook also explores current and future trends and their impact on car color. Since for each model year, color decisions are made at least four years in advance, we have decided to extend our forecast period accordingly. This »double issue« marks the transition to this practice.

Another novelty is that our styling shades are now available in digital form and can be viewed with the appropriate software, or even directly integrated into CAD programs.

Join us on our journey through the history of automotive colors and into the digital future – promising faster, more sustainable, and more personal solutions.

First half of
THE 20TH CENTURY

»Any customer can have a car painted any color that he wants, so long as it is black.«

–
HENRY FORD

DARK HUES WERE OFTEN A NECESSITY – BUT ONE THAT CLOSELY MATCHES OUR FEELING FOR THE TIMES.

A CENTURY OF COLORS – REFLECTED IN AUTOMOTIVE HISTORY

Shady tones
OF ELEGANCE

When watching old black-and-white movies, one can easily think that from 1900 to 1950 virtually all cars cruising the streets of New York and other early centers of motorization were black.

While cars did have other colors, this is not far from the truth. Black was indeed the dominant hue of the period, though not necessarily due to deliberate choice.

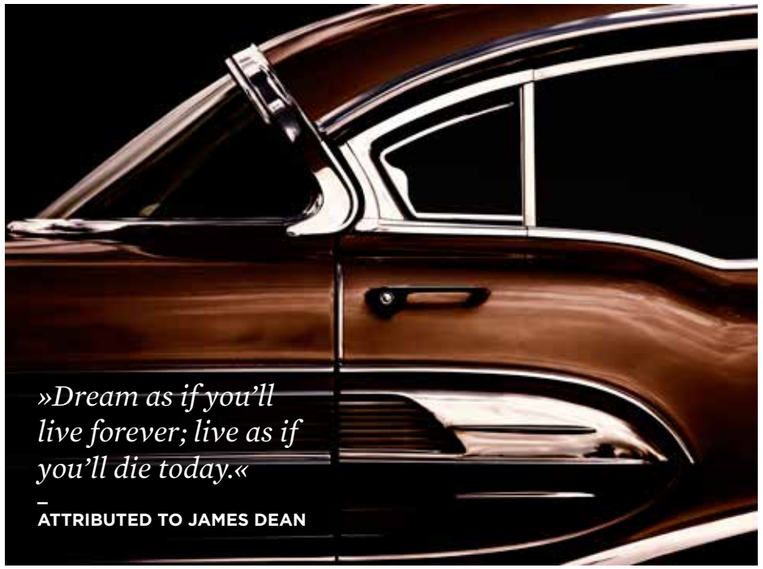
During the early years, giving cars bright colors simply proved too complex for assembly line production. Even just dispersing high amounts of vibrant organic pigments in coatings was not feasible in an economic fashion, and the inorganic brown and green pigments that could be used did not do much to lighten up the overall palette.

This changed to a certain extent when fast-drying nitrocellulose lacquers were introduced in the 1920s. However, they had to be polished often to stay shiny, and when the economy went down in the 1930s, manufacturers reverted to darker shades. Later war-time shortages even stripped away the chrome that had begun to embellish many cars.

In retrospect, the somber shades of the often stately and elegant vehicles fit our sense of the period. Its dark-suited gangsters could not well have gotten out of more conspicuously colored cars before entering a shadowy jazz dive and looking into the murky eyes of a mysterious moll.

In Europe, the general palette was similarly restricted – while for the global rich, the first »metallic« colors were made. Manufactured from actual fish scales, they gave cars the look of sleek ocean creatures.

1950s

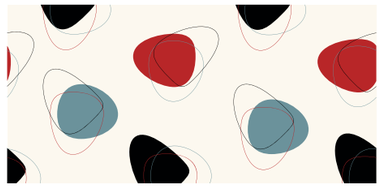


After an era that was dark in many respects, humanity was ready to return to brighter times. With growing prosperity, more vivid tones of red, blue and green started to pepper the streets like polka dots.

Like polka dresses, many cars set off their basic color with white, and chrome ornaments also made a shiny reappearance. After a drive-in dinner or movie, the owners of these artfully designed beauties returned to homes and devices that were undergoing a similar transformation.

It was the birth of »car culture«, which from the beginning revolved as much around car color as it did around models and »muscle«. In Europe, tastes still often tended a little more towards the tame. German car buyers, for example, often preferred muted whites and grays over jaunty reds, because they were not only thought less showy, but also more traffic-safe.

Yet while the car- and color-crazed rebellion spearheaded by the American youth certainly had greater appeal, it also had its tragic side. Perhaps no one represents this aspect of 50s »car culture« better than one of its central icons: a young actor who narrowly escaped an accident with a fast car in one of his most famous movies, but not in real life.



THEIR BEAUTIFUL SHAPES AND SHADES MADE CARS INTO SOMETHING THAT ATTRACTED YOUTHFUL AND ADVENTUROUS SPIRITS.

1960s

The candy shades that seem so typical of 1960s automotive color were not introduced by the industry, but by inventive young drivers. Fed up with factory paints, these »hot rodders« customized their rides with spray gun technology that was no longer a privilege of mass production.

Car makers were smart enough to pick up on the trend and added their own candy colors to the 60s palette. This palette also still included pastel hues originally used because clear paints tended to become chalky. Cars in softer tones than those of the »rodders« continued to be popular on both sides of the Atlantic, while trendy home interiors often featured both tints alike.

When one of Japan's largest automakers came out with its first models, they were offered to the public in pastel white and »roddy« red. Before, however, the company had to overcome laws forbidding these colors because they were already used by ambulances, police cars and fire trucks.

In Germany, too, there was a call for prohibiting certain car colors – or rather, their all-too-free use. The rebellious spirit that had been part of »car culture« from the start and was carried over into the 60s by young customizers now culminated in the wildly painted rides of the hippies. Instead of using spray guns, they often simply revamped their cars by hand.

Meanwhile, the industry finally managed to create metallic colors that would last (and were no longer made from tons of fish). Rising to the top of the US sales charts for the first time, they soon enjoyed similar popularity with other car buyers worldwide.

A taste for **SWEETER SHADES**

»You don't need anybody to tell you who you are or what you are. You are what you are!«

–
JOHN LENNON

All colors **WELCOME**

The 1970s have been described as the most play- and colorful decade of modern times. This applied to the design of wallpapers, chairs and glass sets. And it also applied to cars.

Even in Germany, where anything out of the ordinary had been sure to raise eyebrows not long before, endless pageants of unusual tints and tones now paraded the streets. If grouchy motorists still wanted to send the police after hippie cars, they would have to try and find them in this carnival of color first.

Especially the owners of small cars tended to make up in color what they lacked in size. This turned out to be a rule that automakers could continue to rely on when selecting color options for smaller models in later times.

Mixed into the colorful chaos that signaled freer minds and morals were earthy tones of brown, green and beige. Often deemed the gravest fashion sin of the period, they may in fact have spoken of a more virtuous stance on resource use and the environment. The two oil crises of the decade raised fears that the world's fossil-fueled joyride might be coming to an end.

In some resource-rich Latin American countries, by contrast, the energy crisis had just the opposite effect. Benefiting from rising oil prices, people could suddenly afford the large, luxuriously colored cars made in the USA. Some of them – and their regularly renewed paint jobs – cruise the streets there to this day.

A DECADE THAT CONFIDENTLY CELEBRATED ITS FREEDOM, AND AT THE SAME TIME DISCOVERED NEW RESPONSIBILITIES.

1980s

Though not without its excesses, where automotive colors are concerned, the 80s were in many respects a return to normal. After the liberated decade just gone by, more neutral tones began to reassert themselves.

By this point, it was common wisdom among car makers that daring colors do not sell well under a slow economy. Thus the recession of the early 80s also caused the lust for lively car shades to recede. Black and white became favorites on both sides of the Atlantic, and in many European countries, gray moved to the number one spot of the charts.

Curiously, when jobs and decent wages returned, the zest for chromatic extravagance did not. At the end of the decade, the French, the Spanish and even the Italians had generally preferred non-colors over all others.

One big exception was red, which, out of all motorists, German car buyers chose more often than any other color during the ten-year period. The hue had always been popular with sports car drivers, but now also became a trend color among less horsepower-oriented groups.

One major trend that was not restricted to certain regions and now firmly established itself across the globe was the popularity of metallic colors. The reason behind this was a change in technology: While before the tiny aluminum flakes that lent these colors their sparkle quickly succumbed to environmental conditions, the introduction of a clear, durable topcoat made them last much longer.

The advantages in general durability this two-layered solution brought soon caught on among car buyers – making even those willing to pay a premium for it whose primary interest did not lie in sparkle or color.

THE FASHION PALETTE OF THE PERIOD WAS FAR FROM UNDER-STATED, YET IN THE CASE OF CARS ONLY ONE COLOR REALLY STOOD OUT.

A return to blander colors – **AND BOLD RED**

»We fade to grey.«

–

BRITISH POP BAND VISAGE, 1980

1990s

GREEN AND BLUE SHOWED THE AWARENESS OF TWO TOPICS THAT HAVE SINCE FURTHER GROWN IN IMPORTANCE.

The early 1990s once more showed how clearly historical events could be reflected by automotive colors.

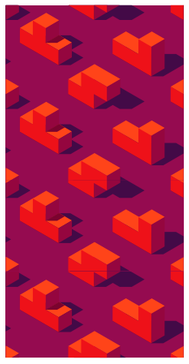
Political changes opened up a wider palette to many car buyers, who often preferred lively hues such as bright red over duller tones. Red also continued to be a favorite with drivers globally, only to be outstripped by a rather unlikely candidate around the middle of the decade.

Green had already enjoyed a short heyday when the environmental movement was born in the 70s. Now that love of nature turned mainstream, the color rose to the top of the charts in many countries.

Environmental concerns also led to yet another change in technology, which further sped up the demise of many brilliant shades popular in the decade before. Their brilliance had often been achieved with lead pigments. These, however, did not work well in the water-based coatings that now started to replace solvent-based varieties in Europe and other regions.

A rising interest in technology and the Internet may be the reason why, ultimately, blue outshone all other colors for most European car buyers of the decade. Blue and green, or fusions of both such as teal or aqua, were also popular in the Asia-Pacific region during the 90s.

The very tops of the Asian-Pacific charts, however, were already ruled by colors that would soon also thrive in the more mature markets of the West: sundry shades of white, silver and gray.



Tints of nature **AND TECHNOLOGY**

»The Internet is becoming the town square for the global village of tomorrow.«

–
BILL GATES

Reduced
TO THE MAX

The design of the 2000s was crucially influenced by a US tech firm and its highly successful music player. When looking for what was reflected in the automotive colors of the period, one would probably see a hand-sized rectangular white object with a click wheel in the middle.

The new player not only had a huge impact on the music industry by offering consumers a convenient and highly fashionable device for carrying around downloaded songs. Its minimalist design and color scheme are also thought to be largely responsible for the sudden surge in popularity that whites, grays and silvers experienced with car buyers around the world.

The trend was especially marked in the USA, South America and the Asia-Pacific region. While also making itself felt in Europe, here techy blue, flashy red and stately black managed to retain some of their sway.

In many Asian countries, white carries the same associations of death and mourning that black does in Western cultures, which is thought to contribute to its lasting popularity. Especially when buying large and expensive cars, Asian customers often opt for the air of respectability and gravity that white conveys – much the same as Westerners do when selecting black for these vehicles.

For similar reasons, neutral colors such as black, white, gray or silver are also the shades of choice for company cars and corporate fleets. The trend for non-colors was further reinforced by the financial crisis and the more cautious mood it caused among consumers towards the end of the decade.

»A lot of times, people don't know what they want until you show it to them.«

–
STEVE JOBS

THE COLOR WHITE AND AN ALMOST CLINICALLY CLEAN DESIGN SPELLED FOR MANY WHAT WAS EXCITING AND NEW ABOUT THE DECADE.

2010s

By the 2010s, the trend for white, now further reinforced by the pervasive presence of smartphones in that color, had also taken firm hold of Europe and was steadily pushing the achromatic allrounder to the very top of the sales charts.

In 2017, almost every third car sold on the European market was white. Worldwide, the hue had reached a market share of close to 40%, and in the Asia-Pacific region, nearly every second car was bought in the fashionable non-color.

In white's wake, other neutral shades flourished as well. Together, white, black, gray and silver now account for over three quarters of the global market. The chromatic remainder of cars is mostly sold in shades of red and blue. Brown has also become popular, especially among drivers of the sport utility vehicles (SUVs) that have continuously gained ground in global traffic during the last two decades.

As before, economic and political insecurities are partly blamed for the decade's lack of chromatic liveliness. Even the most distinct new trend of the period – the matte finish – is most often seen in combination with black or gray colors. Sometimes called the »stealth look«, it takes the idea of chromatic restraint to an almost military-looking extreme.

However, industry experts see more colorful times ahead. In Asia, for instance, the rise of electric cars is expected to add further variety to the Eastern palette. And in the USA, observers report a comeback of the two-tone paint jobs last popular during the first heyday of automotive color in the 1950s.

New colors **ON THE HORIZON**

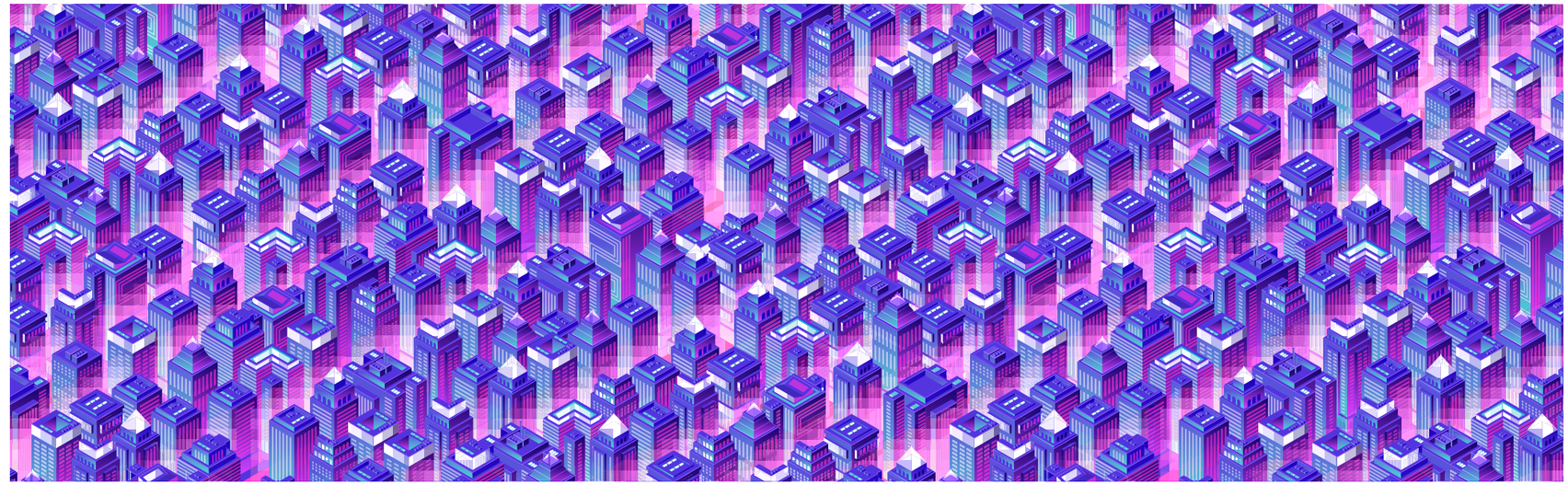
THE MARKET IS RULED BY WHITES AND NEUTRALS BUT MAY SOON RECEIVE AN INVIGORATING JOLT FROM MORE LIVELY HUES.

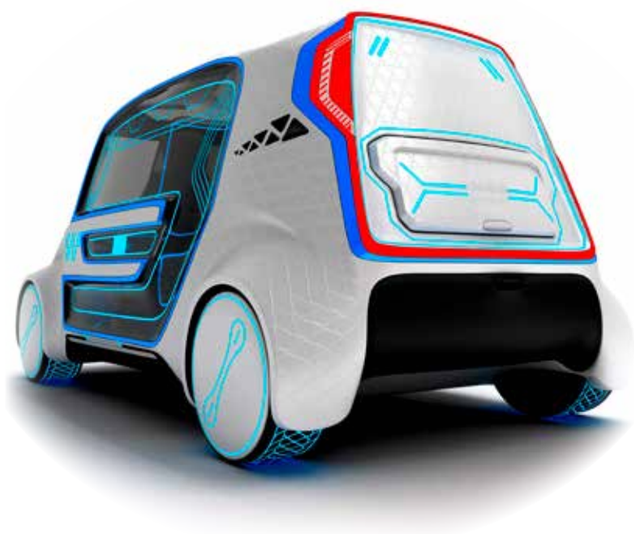
Moving at high speed towards **A MORE URBAN AND DIGITAL TOMORROW**

Recalling the car colors of the past is not just of historical interest but reveals long-term trends and correlations that help us to make more plausible predictions about the future. Never before, however, did these predictions have to take into account such a staggering degree of disruption. Business models that have been valid for more than a century must cope with an unprecedented plethora of changes.

The megatrends of urbanization and digitalization are driving solutions such as autonomous vehicles, integrated mobility and car sharing that are less polluting and make intelligent use of apps and Internet services. People will of course still own cars, because they want to protect and shape their private life. Uncertainties will grow, boundaries will be less clear, and ownership will become even more fluctuating and personalized.

This development is bound to shift the focus of color preferences, and it will very likely also lead to alternative methods of application. Stylish and individualized adhesive films that allow owners to temporarily change the appearance of their vehicles will become more common, as will small series of special shades for fleets and the use of automotive exteriors for advertising.





ELECTRIC CARS

There are currently about three million e-cars silently cruising the world's streets – still easily drowned out by the more than one billion conventional vehicles there are. E-car drivers recently claimed to have squeezed the record distance of 1,000 km out of a single charge, and the so-called »range anxiety« that has held many potential buyers back seems to be slowly abating. However, that leaves »charging time trauma« to be overcome, as filling up an e-model usually still takes a whole night and even a commercial fast charging station can't do it in less than an hour.

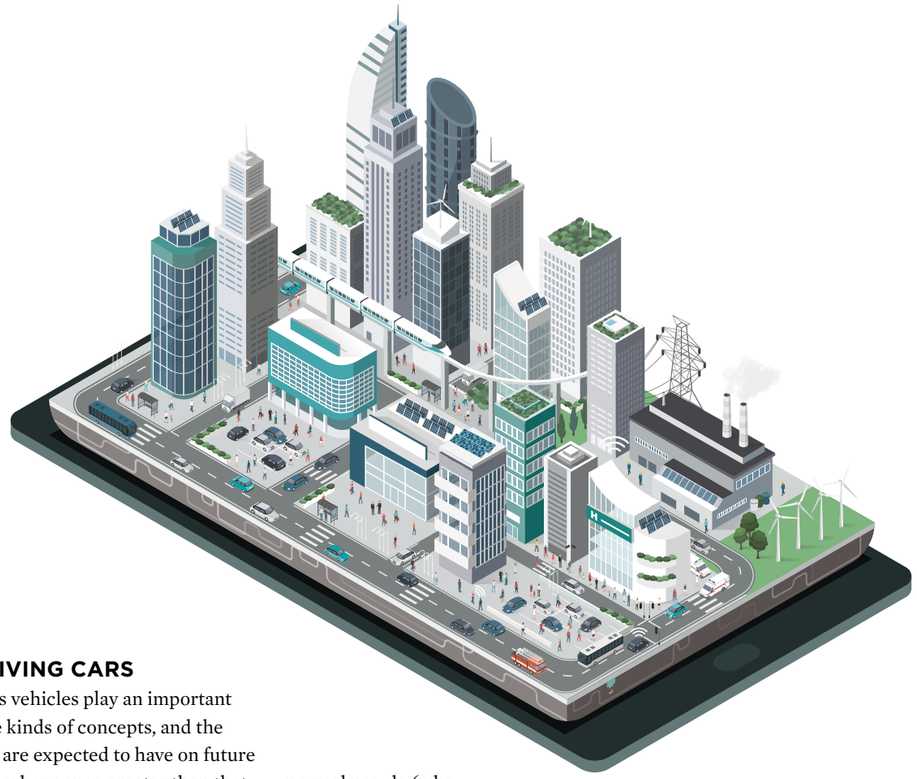
To ensure that there are enough stations, several companies from the automotive industry have taken to investing in infrastructure – a good example of how car makers are stepping out of the box to future-proof their business. Despite their growing pains, there seems to be general agreement that eventually electric vehicles will replace gasoline cars as surely as these replaced horse-drawn carriages a century before. Extrapolating from how quickly this happened, recent research suggests that in many countries electric cars might dominate the streets as soon as 2040. From 2017 to 2018 alone, their worldwide number has grown by a remarkable 50%.

URBANIZATION

One of the major reasons why electric mobility is thriving is urbanization. More than half of the global population now lives in urban areas, and there is virtually no country where cities aren't getting bigger. E-vehicles are not only credited with a smaller carbon footprint than conventional cars, they are also seen as a solution to the high levels of congestion, noise and pollution that often plague dense urban agglomerations. It is no wonder that China has far surpassed the USA and Europe in vehicle electrification, which the country also pushes for economic reasons and to become less dependent on oil.

China is also electrifying large parts of its public transport, one of the other elements that many new mobility concepts revolve around. An important catchword in this context is mobility-as-a-service (MaaS), which describes a shift from personally owned vehicles towards services that conveniently combine public buses and trains with private offerings such as ride- and bike-sharing. Customers can pay per trip or monthly subscription, and the hope is that they will find this on-demand mode of getting around more affordable and stress-free than paying for a private car and worrying about repair bills, insurance and parking spaces.

The future: 2020s and beyond



SELF-DRIVING CARS

Autonomous vehicles play an important role in these kinds of concepts, and the impact they are expected to have on future mobility is perhaps even greater than that of e-cars – at least on the level of driving experience. While e-cars basically just replace one kind of engine with another, autonomous cars take the driver out of the picture, and thus perhaps much more that is personal and human. Whereas in terms of accidents and road behavior this will likely be a benefit, it might also spell an end to the highly individualistic and colorful »car culture« that has been an integral part of city landscapes since the 1950s.

So far, however, it is not at all clear where the driverless journey is going. While some experts on the subject speculate that as soon as 2030 a third of the world's traffic may be autonomous, other analysts are torn between four visions of future mobility of which only two get by without an actual human being behind the wheel. Meanwhile, in some cities of the United States driverless cars have begun experimentally chauffeuring around normal people (who often perceive them as overcautious). Experts think the trend will quickly gather speed once drivers see autonomous cars zip by them on special lanes in traffic, whose efficiency they are estimated to potentially improve by up to 270%.

DIGITALIZATION

The development at the root of many of these advances is digitalization. It is computers and wireless communication that enable the seamless bundling of MaaS services, allow driverless cars to safely navigate busy streets – and make plausible game-changing mobility visions that seemed like science-fiction just a while ago. Expectations of fully connected, autonomous »mobility ecosystems« have become so concrete that car makers are already thinking about how to fill their customers' time once it's no longer taken up with driving. Texting, web surfing or binge watching will probably cease to be prohibited in cars when you don't even need a driver's license to operate them. Future in-car entertainment systems will be able to do much more than play music.

The smart cars of tomorrow will not just communicate with each other and smart streets, but also with the organizer of our smartphone to automatically integrate daily chores like picking up dry cleaning or groceries into our itinerary. They will tell our living spaces to light and heat up when we come home – or even silently debate with our fully digitized kitchen which meals might best be prepared from the goodies in our trunk. While greater personal convenience is an important selling point of these futuristic concepts, it is also hoped that they will considerably reduce resource and energy use through efficient digital orchestration.

BICYCLES

Ironically, digital progress has also revived the use of a mode of transportation that many would consider much more primitive than cars, buses or trains. Bike sharing had already been experimented with during the 1960s. However, only modern GPS and smartphone technology has made it possible to conveniently track and receive payment for the bikes, which can be dropped off at strategically located docking stations or, in the case of more recent dockless models, wherever customers please.

The numbers of shared bikes have exploded in Europe, the USA and particularly in China. Despite problems with theft, vandalism and random disposal, experts think that the current transition to shared e-bikes, whose location and charge level is monitored by user apps, will accelerate the trend even more.

»STREETLESS« MOBILITY

While electric cars, autonomous vehicles and shared e-bikes still need streets and highways to make their way, there are also experiments that dispense with this »old-fashioned« necessity. Not content with trying to revolutionize e-car use and space travel, tech mogul Elon Musk wants to establish a »fifth mode of transportation« by shooting passengers through magnetic tubes at supersonic speed. Similarly forward-looking, the city of Dubai already established the first driverless metro in its region ten years ago. Now it plans to transfer traffic to the skies by offering its citizens self-flying taxis.

There are even signs that humanity's long-nourished dream of traveling the sky without any vehicle at all may at last come true. The jetpack – essentially a fuel-filled backpack with two rockets attached – has finally reached a stage that allows Icarus-like flight for more than just twenty seconds. On his demo flight in New York, the developer successfully took a tour around the sun-crowned Statue of Liberty without meeting the tragic fate of his high-flying ancient counterpart.

Reds: Fading in the rear view – **HIGH PERFORMANCE AHEAD**

Red pigments are among the most important organic pigments in the field of automotive colors. In pure terms of cars produced, they are currently outstripped by pigments creating the color blue, which can be found on more newly manufactured vehicles. Since red pigments have a lower capacity to absorb light, however, the amount of pigment required for each car is higher.

This is why Pigment Red 254, also known as »DPP Red«, is presently produced in far larger quantities than any other pigment used by the auto industry. The color red has always been popular among car buyers. Yet it was not until the turn of the millennium that this modern pigment really began to assert itself.

FROM LEAD TO LOW FASTNESS

As in other countries, the practice of using lead pigments for red car colors continued in Germany until well into the 1970s. Then their low resistance to acids and bases, the resulting poor suitability for waterborne coating systems, as well as environmental aspects caused their use to be reconsidered. Manufacturers turned to organic pigments to find a more acceptable alternative.

The organic pigment class of quinacridones (featured in our Trendbook 2017) already existed at this time. However, the properties of these pigments, especially their hiding power in solid colors, were not satisfactory, so that combinations with azo pigments based on naphthol AS chemistry (Pigment Red 170) and/or iron oxides (P. R. 101) were used. Unfortunately, the shades thus produced did not meet customer expectations in terms of weather fastness: The blotchy patterns of uneven fading they could cause gave solid reds a bad reputation among car buyers.

BETTER BUT PRICEY

These technical deficits persisted until the introduction of DPP Red made a pigment with high fastness and good hiding power available. Solid shades also benefited from the fact that, like other colors, they now generally received a clearcoat to protect them from UV radiation. While distinctly superior to its predecessors, however, the new pigment was also very pricey – with the consequence that now it was car makers who tended to shy away from shiny reds. Customers looking for them usually had to pay a hefty premium for their preference, or make do with more earthy and shaded tones that contained a high share of iron oxides.

As a result, demand for red shades rapidly declined in the 1990s. And although the patent for P. R. 254 has since expired and its price has dropped to about a tenth of the former maximum, solid red colors have not been able to fully regain their popularity. The fear of poor fastness and outrageous premiums has deeply embedded itself in the minds of auto customers, especially in Germany.

Instead of solid plain reds, red metallics and copper colors have grown in popularity. One of the more prominent reasons for this is that the visible layer of clearcoat on these shades works both as an effective protection against fading and as a powerful argument for the premium that usually has to be paid for metallic hues.

A NEW FREEDOM IN DESIGN

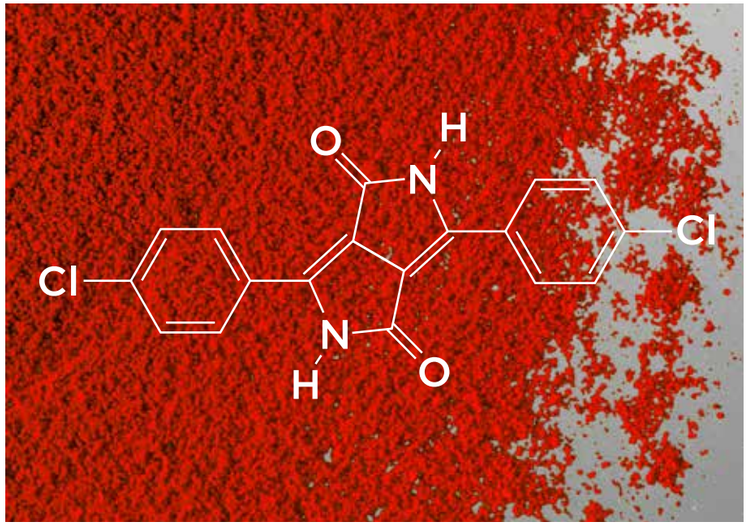
Recently, improvements in the production process have made it possible to create purer tones from iron oxide pigments – while preserving a comparable hiding power. The lower cost of DPP Red and the higher chroma of inorganic pigments now allow the economic formulation of bright red solid shades, instead of the drab »boxcar tones« that have long been common.

At the same time, metallic shades have benefited from the development of platelet-shaped effect pigments in yellow, orange and red that have both better hiding power and better brilliance. Thus, when looking for acceptable ways of obtaining the required brilliance, hiding power and weather fastness, color designers can now choose from a wide range of options. These new options will exert a defining influence on trends in the red color segment during the coming years.

REDS WITH »GREEN ROOTS«

Clariant traditionally has an extensive portfolio of red pigments, which is constantly being further developed. One remarkable advance aims at the use of renewable raw materials for synthesizing pigments. These materials have become a readily accessible source for succinic acid, for example. In collaboration with our suppliers, we have established such reliable quality parameters for the succinic esters we require that the finished pigment cannot be distinguished from one made with raw materials from petrochemical sources. This means customers can rely on receiving the same quality and color as before, plus contribute to greater sustainability – and all of this without significant extra costs!

In our Trendbook 2017, we have already presented our quinacridones (P. R. 122 and Pigment Violet 19) manufactured in this manner. What's new now is that we are also using increasingly higher amounts of renewably sourced materials for our DPP Red brands (P. R. 254).



The following products from Clariant's portfolio are suited for use in automotive OEM coatings:

Hostaperm® Red D2G 70 (P. R. 254): Increased weather fastness

Hostaperm® Red D3G 70 (P. R. 254): Increased color strength and improved hiding power

Hostaperm® Scarlet GO transparent (P. R. 168): Transparent pigment with particularly good weather fastness, also suited for shading at low concentrations

Hostaperm® Red P2GL-WD (P. R. 179): Highly transparent red pigment with strong brilliance, particularly suited for waterborne coating systems

Hostatint™ Red A-P2Y 100-ST: Highly transparent low-viscosity preparation for solvent-based colored clearcoats and UV-curable systems containing 15% P. R. 179. Can often replace a transparent P. R. 177 in full tones if this pigment is not readily available, or if the environmental impact of its production method is disliked by customers who value the sustainability of their raw materials. The deficient sustainability of P. R. 177 is also one of the reasons why it is not included in Clariant's portfolio. As a rule of thumb, in terms of pigment only 40% of the amount used in case of P. R. 177 is required when using Hostatint™ Red A-P2Y 100-ST.

Clariant's red pigments for automotive colors are flanked by highly fast azo pigments on the yellow side (see Trendbook 2019), and by our quinacridones on the blue side (see Trendbook 2017).

Color popularity in 2018

White still not waving **THE WHITE FLAG**

In 2018, white confidently continued its almost decade-long streak as the most popular car color of the world. Though chosen slightly less often than the year before, it still adorned a prodigious 38% of all newly purchased consumer vehicles – making it more than twice as popular than the next color on the list.

Yet the bland snow queen of neutral shades does lose some important ground in Asia, its traditional place of dominance, where warmer hues form a notable opposition. Elsewhere, even livelier shades are emerging from under the cover – perhaps heralding a new spring of more joyful colors.

EIGHT TIMES A WINNER

The car color statistics for the year 2018 fit well into the historical development laid out in this edition of our Trendbook: For the eighth time in a row, the color that rose to prominence with the advent of a minimalistically designed piece of electronic equipment claims first place in the global charts. Together with the other neutral shades that have dominated the first two decades of the new millennium, i.e. black (18%), gray (12%) and silver (12%), white now takes up 80% of the global auto palette. Like in the fantasy world of one of this decade's most-watched TV series, the joyless hues of eternal winter seem to be enveloping the globe.

From our historical account, we know that these shades are the colors of rationalism, prudence and respectability – properties whose popularity perhaps rises in proportion to the pace at which the world around us seems to be getting more complicated and harder to control. Is it possible that the exuberant car colors of the 1960s and 1970s were not just a revolt against but also a product of the blithely prosperous decade that had gone before?

SPARKLES OF HOPE

Whatever the reasons for the neutrals' seemingly unstoppable ascent: Car buyers who have nothing against rationalism and prudence but also enjoy a touch of excitement now and then need not despair. Almost a quarter of the white cars sold in 2018 had a pearlescent sparkle, and of the roughly 15 million cars sold in black, only every sixth had a coating without some kind of effect.

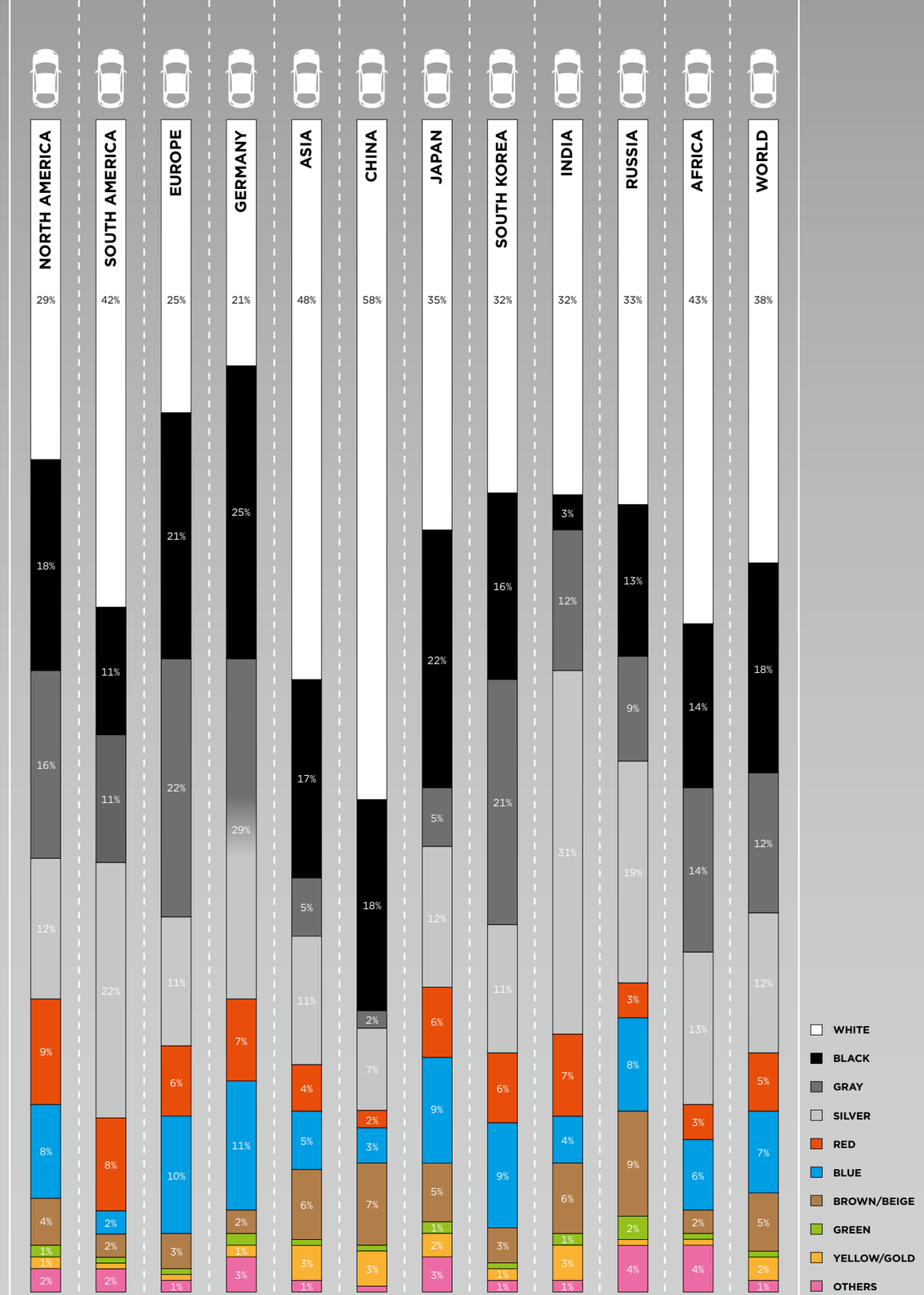
Then there is blue, which is often seen as a color of rationalism and technology as well, but which can easily be transformed into something much more interesting with a small dose of coatings expertise. Leading the resistance against achromatic rule, blue reached a solid 7% in the global car color charts of 2018, while in Europe, every tenth car was sold in some shade of the chromatic insurgent.

In Japan, where blue cars also sold very well, the techy hue has come to be associated with economic fuel use and eco-mindedness – thus taking over the role of green, which has all but disappeared from the popularity charts since its last short rise during the 1990s.

EMERGING COLORS

With a share of 58%, white still enjoys unrivaled preeminence in China, but has lost four percentage points compared to 2017, just like in Asia overall, where its popularity has dropped below the threshold of 50%. At the same time, Asia is the region where such extravagant car colors as yellow and gold are most popular – adorning an eye-catching 3% of all consumer vehicles.

The chromatic colors brown and beige likewise hold a solid 6% in Asia, and have jumped up two percentage points in North America, where they often grace luxury cars and upscale SUVs. Continuing the tradition of the 1960s »hot rodders«, an increasing number of North American small car and truck owners also opt for such flamboyant hues as orange and purple. In Africa, orange has equally gained some ground compared to 2017, adding to the splendidly large share of »other« colors that embellish the cars of that region.



SOURCE: Axalta Coating Systems, Global Automotive 2018 Color Popularity Report; Kraftfahrt-Bundesamt, Germany

Germany takes a small step back **TOWARDS COLOR**

Just like on the globe as a whole, the vast majority of new cars sold in Germany in 2018 had a neutral hue. Yet small increases on the distinctly chromatic side of the automotive palette, especially in the red and blue range, seem to signal a budding return to color. At the same time, the earthy enthusiasm for brown cars that marked the beginning of the decade has clearly cooled down.

NOT TOO WILD ABOUT WHITE

In 2018, car buyers in Germany have been a lot less wild about white than customers in Asia, the world or even Europe as a whole. Only about every fifth new vehicle that left the lots of car dealers with a new owner wore the notorious non-color. Still, all together, neutral shades of white, black, gray and silver continued to make up three quarters of the German palette – leaving only 5% more room for chromatic candidates than the global spectrum.

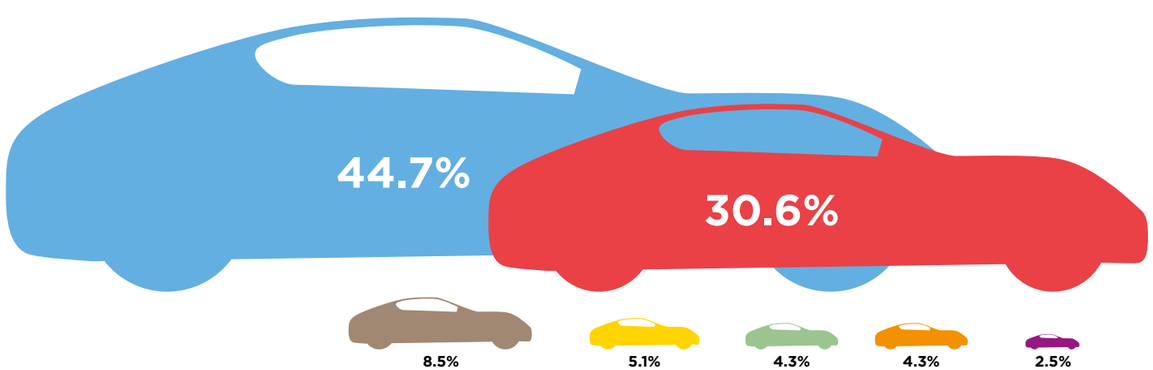
Yet within these 25% percent of non-conforming German customers, the ranks of those choosing »colorful« colors such as red and blue, as opposed to less openly chromatic hues like brown or beige, slightly rose. In sum, the number of newly registered red and blue cars increased from about 17% in 2017 to nearly 18% in 2018. That is far below the whopping 40% these two colors reached together towards the end of the 1990s but a solid step forward.

BROWN BACK DOWN TO EARTH

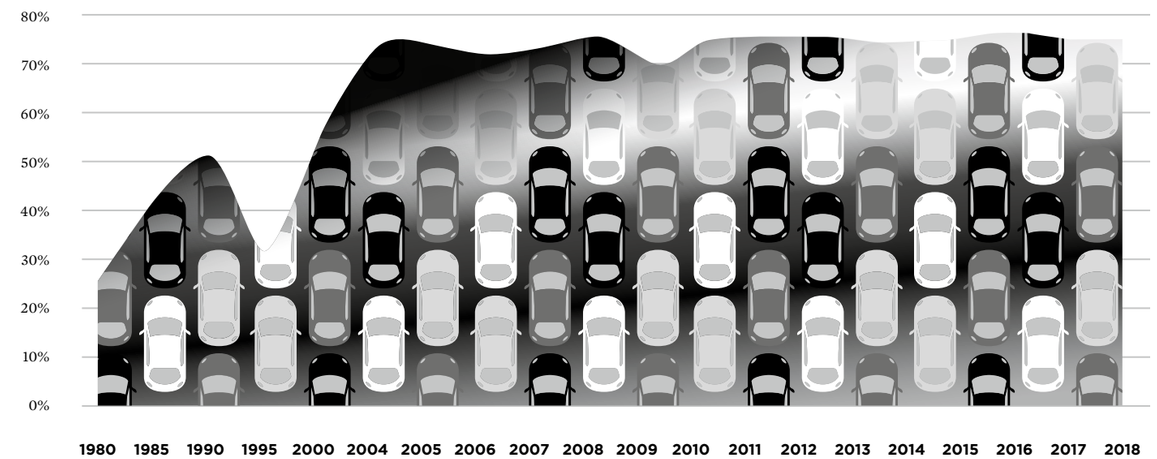
While red and blue were able to somewhat increase their clout among German car buyers, brown lost further ground. The hue that at the beginning of the decade still convinced a full 7% of customers with its earthy charm has been brought back down to earth with a bump. Only two out of hundred vehicles sold in 2018 were handed over by car dealers in shades of brown or beige.

On the most sprightly side of the spectrum, the colors that once flourished during the hippie and disco era continue to lead a wallflower existence. Only about three out of a hundred people who bought a new car in Germany in 2018 purchased it in yellow, green or orange.

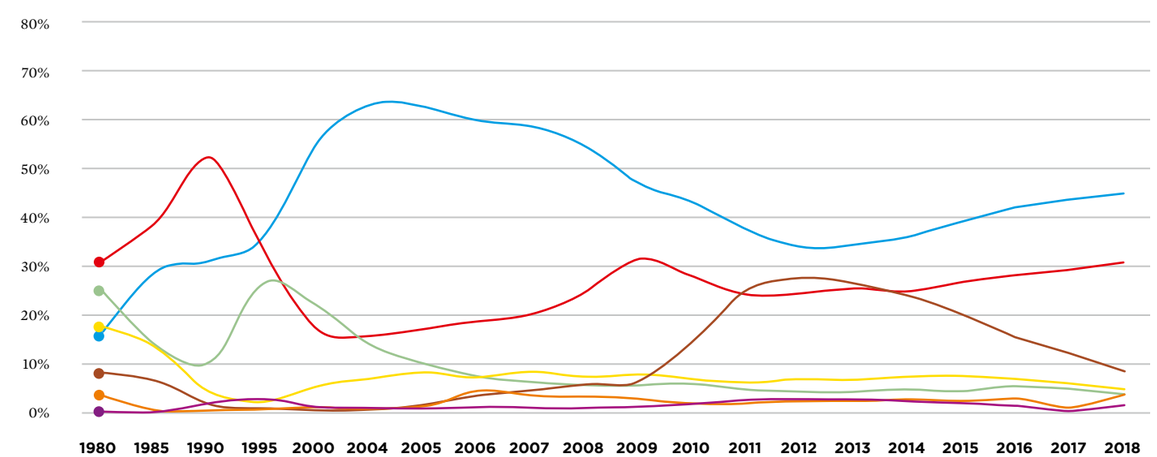
POPULARITY OF CHROMATIC SHADES IN GERMANY IN 2018



DEVELOPMENT OF ACHROMATIC SHADES IN GERMANY



DEVELOPMENT OF CHROMATIC SHADES IN GERMANY



SOURCE: Kraftfahrt-Bundesamt, Germany; numbers for green, orange and purple/violet 2018 are inferred estimates

The evolution of **AUTOMOTIVE COLORS**

When reflecting about color trends, some obvious drivers for the evolution of automotive colors quickly come to mind, such as fashion styles and social currents. But there are also environmental and economic requirements, as well as technical developments, that have considerable influence on the color palettes which will appear in the model years 2021 to 2023.

INFRARED REFLECTANCE

There are two reasons why automotive coatings should be highly reflective, i.e. »white«, in the near-infrared (NIR) range: It keeps the car cool even in direct sunlight and makes it detectable to LIDAR technology, which is one of the main technologies self-driving cars use to »see« their surroundings. While white and light-colored coatings readily fulfill these criteria, how can they be met by saturated color shades or blacks?

Organic pigments are typically transparent to NIR radiation and both carbon black and iron oxide black absorb it, so that cars coated with these pigments heat up easily and need more fuel, or electricity, for air conditioning. Though most of the heat inside a car is generated by the visible sunlight shining on the interior materials, coatings are a relevant factor in heat management. However, they play an even greater role for autonomous driving. Fortunately, the solutions for keeping cars cool and making them visible to LIDAR technology are based on the same fundamentals: combining organic pigments with NIR reflectors, such as inorganic pigments or aluminum, and avoiding carbon black.

OPACITY CHALLENGE

Formulating bright yellow or red solid shades that hide well at 40 µm has always been a challenge. Organic pigments cannot be used in high enough concentrations to achieve this goal. Therefore, they must be combined with inorganics, such as bismuth vanadate – yet even then the objective is hard to meet. Adding carbon black would not only make the shade duller but also reduce NIR reflectance.

A potential solution is what we call »pseudo-solids«: These formulations contain aluminum flakes that increase hiding power and NIR reflectance, as well as other opaque pigments that suppress undesired metallic effects, so that the resulting shade looks like a solid. While this was a silly method to use back when solid shades were still strictly applied as single-layer topcoats, it has since become a smart and economical strategy, because even solid shades now usually have a protective clearcoat on top.

COLOR TRAVEL

In the 2019 edition of our Trendbook, we have already discussed the benefits of colored aluminum flakes and their combinations with bright mineral flakes. It is a rather obvious solution to use such lamellar combinations in gold and copper shades and supplement them with organic pigments. In this Trendbook, however, we further explore the synergy between crystals of organic pigments and lamellar flakes to create what is called »color travel«: a flip-flop effect from one color to another. Unlike the typical interference pigments on the market, our formulations achieve vivid color travel without the addition of black and leave more room for varying the depth of shades and the extent of the »hue flop«.

TINTED CLEARS

In the last edition, we also predicted an increased use of tinted clears technology, which consists of applying two colored layers instead of just one. It has long been common practice to put on colored base coats in two layers, using electrostatic technology for the one and pneumatic methods for the other, which makes manual refinishing easier later on. So why not apply these two layers in different colors? If the second layer is highly transparent, it can increase the depth of the first layer's sparkle, resulting in very attractive colors that can support claims of automotive innovation and considerably increase revenue.

Yet this is by no means all that is possible with tinted clears: If instead of a highly transparent organic pigment a pearlescent mica pigment is used in the second layer, the result is an appealing pearl effect. This »tri-coat« method is not new and has been employed for decades, usually combining a white first layer with a silver mica pigment in the second. When mica colors other than silver are used, however, the down-flop effect on white is often not very attractive. For this reason, we adjusted the base color in a way that allows it to synergize better with the mineral ingredient – which results in subtle and surprising effects.

FALSE FLUORESCENCE

Tinted clears technology even provides a solution for the already mentioned challenge of creating bright yellows and reds with sufficient hiding power. When used for this purpose, the technology produces very bright shades possessing what we call »pseudo-fluorescence«. Real fluorescence makes colors appear brighter by transforming absorbed UV radiation into visible light. However, automotive coatings cannot efficiently exploit this mechanism, because their clearcoats contain UV absorbers that prevent the radiation from reaching the layer of color below. In addition, the fluorescent pigments available on the market are not durable enough to provide lasting effects on cars.

To circumvent these problems, we have used a different approach: In our composition, the first layer consists of a pale off-white whose hue has been adjusted to the second layer but whose reflectance is higher than the second layer's would be if it completely hid the first layer. The second layer does not contain highly transparent pigments and is applied in a thickness that creates a kind of »text marker effect«. By reflecting a lot of light, the first layer makes the second layer appear brighter than it actually is: It shines as if lit from underneath.

The evolution of
AUTOMOTIVE COLORS

NEW ASPECTS FOR DESIGNERS

The range of formulations made possible by our technological innovations is too vast to be covered comprehensively in this Trendbook. Yet we think that the examples we show reflect very well how these innovations can enhance both the creativity and feasibility of automotive color designs. We hope that our ideas offer designers some useful inspirations to pick up and expand on.

The car industry is currently going through a phase of transition, exploring alternatives to the traditional combustion engine, and trying out new ways of improving the safety and efficiency of transportation. Digitalization is playing a major role in these changes – and exerts its altering influence on our Trendbook as well. In addition to presenting them as traditional color swatches, we now provide our styling shades in digital form. The images of colored cars in the formulation chapter have all been generated digitally. It is also possible to view the shades in a virtual environment on Clariant's website. The main innovation, however, is that designers and developers who use rendering software can import the shades and view them on their virtual objects from different angles and under variable light settings.

As usual, we have structured our styling proposals along the color preferences of certain groups of drivers, taking into account not only their attitudes but also the way they make use of their cars.

JUST DRIVE!

These shades are like an understatement: They have wide mass appeal and little eye-catching effects. Drivers opting for these types of colors stay focused on the essentials. They primarily see their car as a means of transportation, which if needed, however, can do more than its externals show. That's how modern coolness works!

- **Steelish Gray**
- **Quite White**
- **Sleek Silver**
- **PerBlackxing Autonomy**

CONSTANTS OF NATURE

Cars sporting these shades are virtually timeless. The special effects are subtle and only reveal themselves from the right perspective. And yet they are always there and determine the world we live in. A show of natural dominance!

- **Absolute Zero**
- **Above the Treetops**
- **Grayvity**
- **Inertia**
- **Speed of light**
- **Logos**
- **Eternal Sequoia**
- **Quantum Charge**

TIME WARP

Just like the auto industry that is currently reinventing itself and developing a more optimistic and sustainable image, these shades exhibit vibrant freshness and surprising color changes. These types of shades serve as an additional motivation for drivers to experiment with new forms of mobility themselves. They define individual freedom!

- **Future Revised**
- **Hyacinthus**
- **It's Teal Time**
- **Digital Experience**
- **Pi-Red**
- **Golden H**
- **Fifties Diner**
- **Grassroots**

ROCK IT, SCIENCE!

Research is constantly advancing the state of technology because »better« is far from meaning »good«! People who explore the limits of what is feasible expect the same of their car colors. Thinking outside the box and testing unfamiliar options leads to new possibilities that were considered impossible before. That's the creative performance principle!

- **Bad Chemistry**
- **Fire Alarm**
- **Blushing Angel**
- **Deep Space Blue**
- **Bonfire**
- **Gamma Ray**
- **Serpent of Paradise**
- **Redshift 3.5**

AC 2301

STEELISH GRAY

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)

RECIPE

Hostaperm®[1] Blue BT-729-D	**0.50%**
COLOUR BLACK FW 255	1.00%
STAPA® IL HYDROLAN 2197	18.50%
Xirallic® NXT T260-23 SW Tigris Blue	80.00%

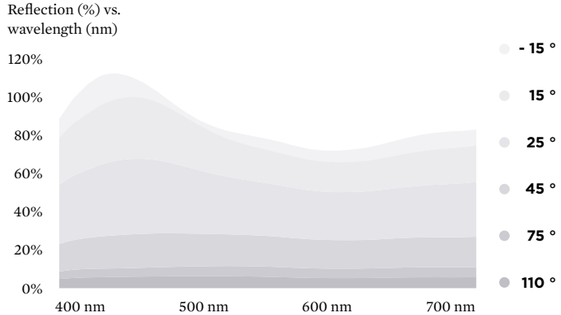
PIGMENTATION LEVEL

Pigment in wet paint	13.30%
Pigment to binder ratio	69.40%

NIR REFLECTANCE

900 nm	53.80%
1550 nm	64.70%

REFLECTANCE CURVES



AC 2302

QUITE WHITE

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)

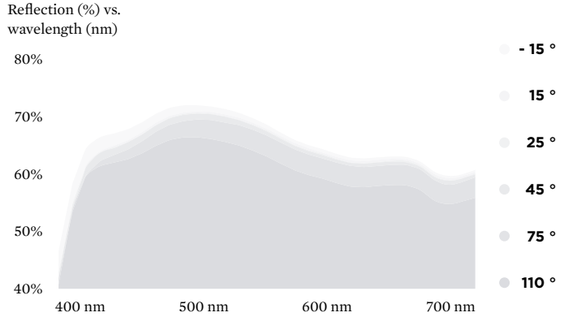
RECIPE

Hostaperm®[1] Oxide Yellow BV 02	**0.30%**
Hostaperm®[1] Blue BT-627-D	**0.05%**
Kronos® 2310	97.00%
STAPA® IL HYDROLAN 412 S	2.65%

PIGMENTATION LEVEL

Pigment in wet paint	19.8%
Pigment to binder ratio	128.9%

REFLECTANCE CURVES

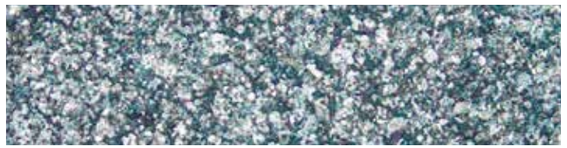


AC 2303

SLEEK SILVER

JUST DRIVE!

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)



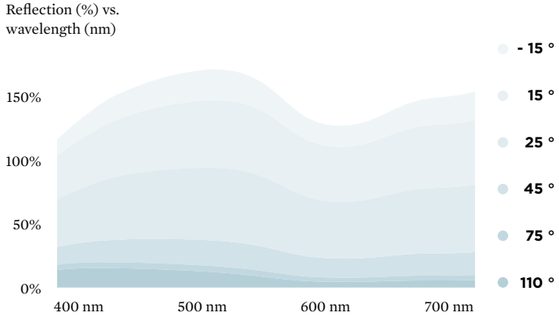
RECIPE

Hostaperm®[1] Blue BT-728-D	**1.00%**
Hostaperm®[1] Blue BT-729-D	**4.00%**
HOMBITEC® RM 220 pigment	30.00%
STAPA® IL HYDROLAN 2197	65.00%

PIGMENTATION LEVEL

Pigment in wet paint	4.20%
Pigment to binder ratio	21.40%

REFLECTANCE CURVES



AC 2304

PERBLACKXING AUTONOMY

RECIPE

Hostaperm®[1] Oxide Yellow BV 02	**10.00%**
Hostaperm®[1] Scarlet GO trans	**42.30%**
Hostaperm®[1] Blue BT-627-D	**16.90%**
Hostaperm®[1] Green GNX	**21.20%**
Kronos® 2310	9.60%

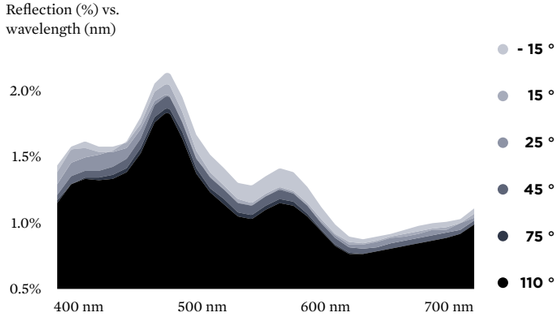
PIGMENTATION LEVEL

Pigment in wet paint	1.50%
Pigment to binder ratio	7.20%

NIR REFLECTANCE

900 nm	63.80%
1550 nm	71.10%

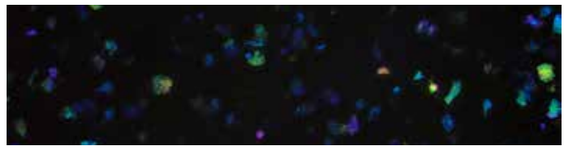
REFLECTANCE CURVES



AC 2305

ABSOLUTE ZERO

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)



RECIPE

Hostaperm®[1] Scarlet GO trans	**42.30%**
Hostaperm®[1] Blue BT-627-D	**16.90%**
Hostaperm®[1] Green GNX	**21.20%**
Xirallic® NXT M260-60 WNT Panthera Silver	19.60%

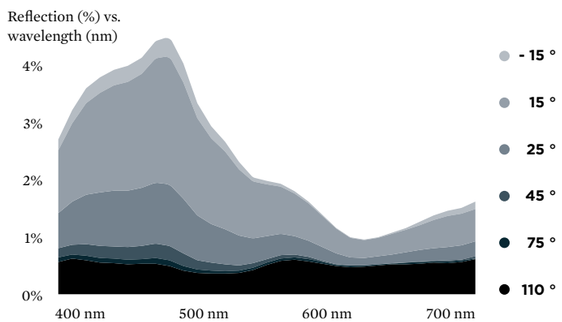
PIGMENTATION LEVEL

Pigment in wet paint	4.90%
Pigment to binder ratio	22.80%

NIR REFLECTANCE

900 nm	56.00%
1550 nm	61.60%

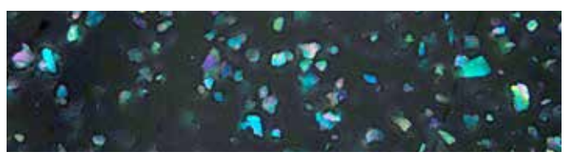
REFLECTANCE CURVES



AC 2306

ABOVE THE TREETOPS

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)



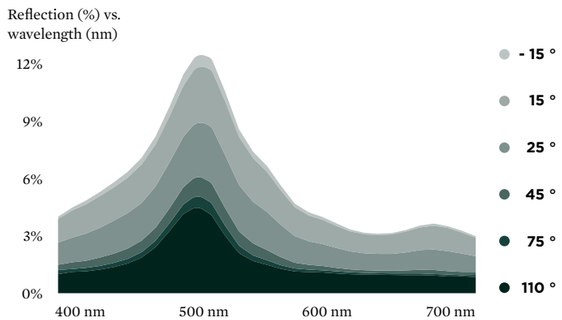
RECIPE

Hostaperm®[1] Yellow H5G	**47.32%**
Hostaperm®[1] Pink E	**12.49%**
Hostaperm®[1] Blue BT-617-D	**17.70%**
Iriodin® 96107 Icy White Lightning SW	22.49%

PIGMENTATION LEVEL

Pigment in wet paint	5.20%
Pigment to binder ratio	25.30%

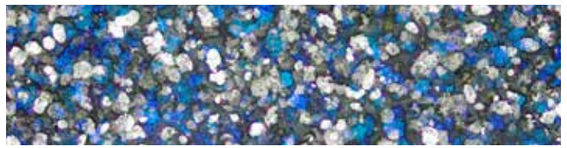
REFLECTANCE CURVES



AC 2307

GRAYVITY

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)



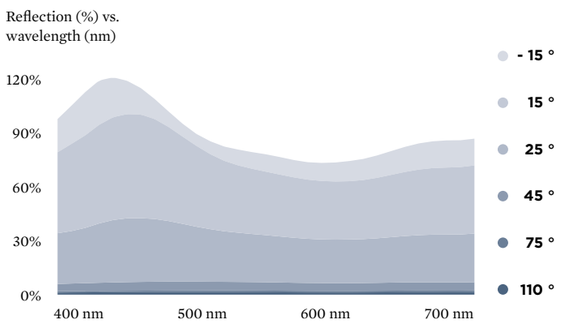
RECIPE

Hostaperm®[1] Blue BT-729-D	**1.00%**
COLOUR BLACK FW 255	4.00%
STAPA® IL HYDROLAN 2156	15.00%
Xirallic® NXT T260-23 SW Tigris Blue	80.00%

PIGMENTATION LEVEL

Pigment in wet paint	10.00%
Pigment to binder ratio	50.90%

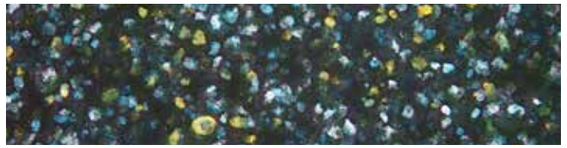
REFLECTANCE CURVES



AC 2308

INERTIA

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)



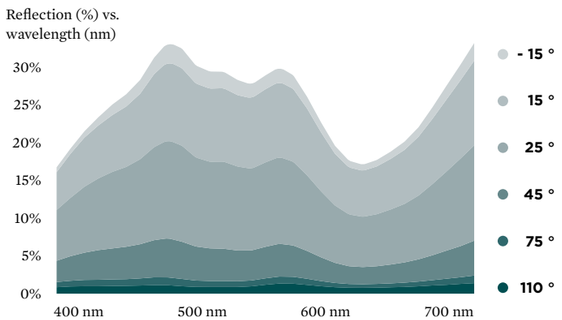
RECIPE

Hostaperm®[1] Scarlet GO trans	**31.60%**
Hostaperm®[1] Blue BT-728-D	**12.60%**
Hostaperm®[1] Green GNX	**15.80%**
STAPA® IL HYDROLAN 3580	20.00%
Meoxal® F120-30 CWT Taklamakan Gold	20.00%

PIGMENTATION LEVEL

Pigment in wet paint	5.00%
Pigment to binder ratio	24.20%

REFLECTANCE CURVES



AC 2309

SPEED OF LIGHT

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)

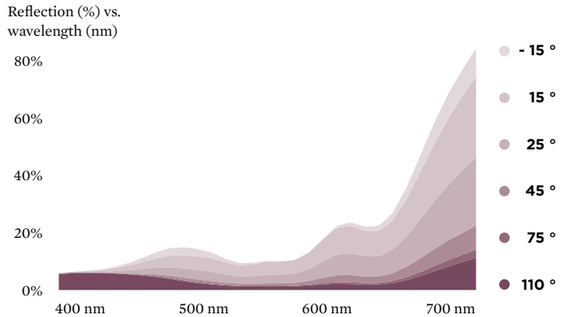
RECIPE

Hostaperm®[1] Pink E	**0.72%**
Hostaperm®[1] Violet RL special 01	**8.10%**
Paliogen® Blue L 6470	2.03%
HOMBITEC® RM 220 pigment	38.50%
Meoxal® F120-30 CWT Taklamakan Gold	25.33%
Xirallic® NXT M260-30 SW Leonis Gold	25.33%

PIGMENTATION LEVEL

Pigment in wet paint	4.50%
Pigment to binder ratio	21.30%

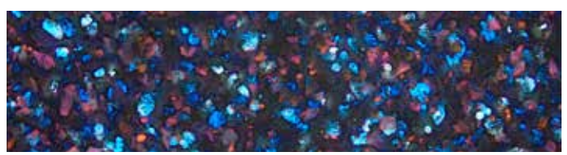
REFLECTANCE CURVES



AC 2310

LOGOS

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)



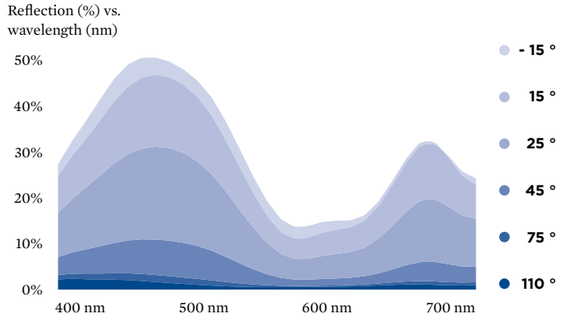
RECIPE

Hostaperm®[1] Blue BT-617-D	**1.00%**
Hostaperm®[1] Blue BT-627-D	**18.00%**
STAPA® IL HYDROLAN 2156	11.00%
Meoxal® F121-51 CWT Atacama Red	16.00%
Colorstream® F20-51 SW Lava Red	54.00%

PIGMENTATION LEVEL

Pigment in wet paint	11.10%
Pigment to binder ratio	56.60%

REFLECTANCE CURVES



AC 2311

ETERNAL SEQUOIA

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)

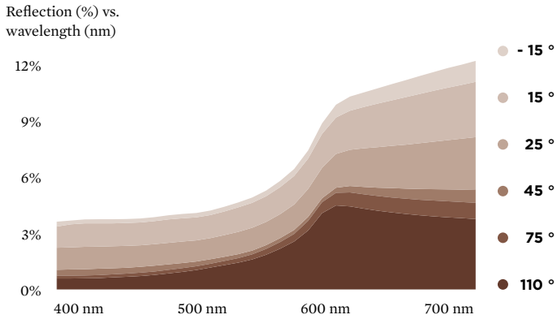
RECIPE

Novoperm® Orange HL 71	**25.00%**
Hostaperm®[1] Scarlet GO trans	**10.00%**
Hostaperm®[1] Red D2G 70	**10.00%**
COLOUR BLACK FW 255	8.00%
SOLAPLEX® 34H1004 pigment	37.00%
STAPA® IL HYDROLAN 3580	10.00%

PIGMENTATION LEVEL

Pigment in wet paint	3.70%
Pigment to binder ratio	19.10%

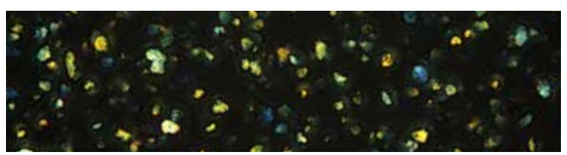
REFLECTANCE CURVES



AC 2312

QUANTUM CHARGE

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)



RECIPE

Hostaperm®[1] Scarlet GO trans	**36.90%**
Hostaperm®[1] Blue BT-627-D	**14.70%**
Hostaperm®[1] Green GNX	**18.40%**
Meoxal® F120-30 CWT Taklamakan Gold	30.00%

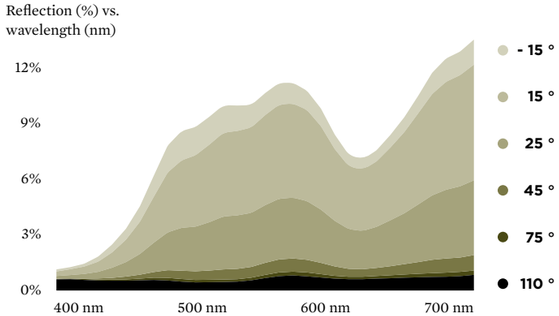
PIGMENTATION LEVEL

Pigment in wet paint	5.30%
Pigment to binder ratio	25.30%

NIR REFLECTANCE

900 nm	49.20%
1550 nm	59.60%

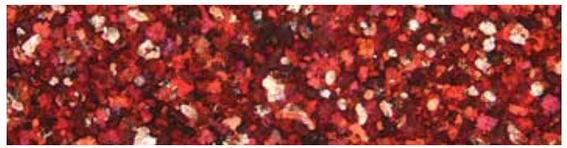
REFLECTANCE CURVES



AC 2313

FUTURE REVISED

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)



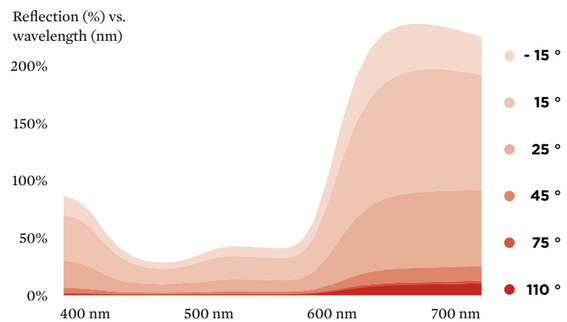
RECIPE

Hostaperm®[1] Red P2GL-WD	**15.40%**
Hostaperm®[1] Pink E	**1.82%**
COLOUR BLACK FW 255	0.10%
STAPA® IL HYDROLAN 2156	15.50%
Xirallic® NXT F260-51 SW Cougar Red	67.17%

PIGMENTATION LEVEL

Pigment in wet paint	5.90%
Pigment to binder ratio	29.10%

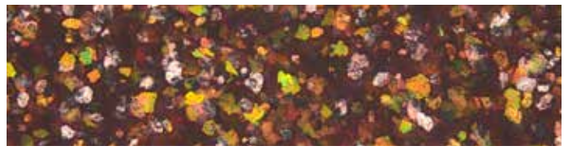
REFLECTANCE CURVES



AC 2314

HYACINTHUS

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)



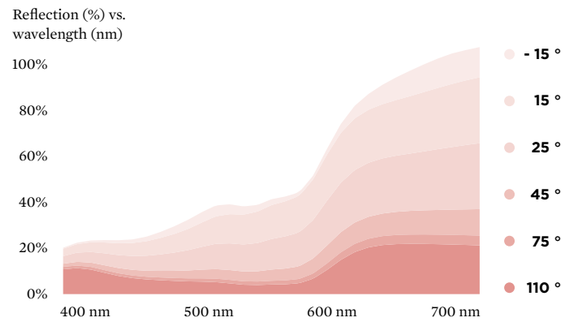
RECIPE

Hostaperm®[1] Red P2GL-WD	**1.10%**
Hostaperm®[1] Pink E	**5.40%**
HOMBITEC® RM 220 pigment	38.50%
STAPA® IL HYDROLAN 2156	11.00%
Meoxal® F120-30 CWT Taklamakan Gold	11.00%
Xirallic® NXT M260-30 SW Leonis Gold	33.00%

PIGMENTATION LEVEL

Pigment in wet paint	6.50%
Pigment to binder ratio	30.80%

REFLECTANCE CURVES



AC 2315

IT'S TEAL TIME

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)

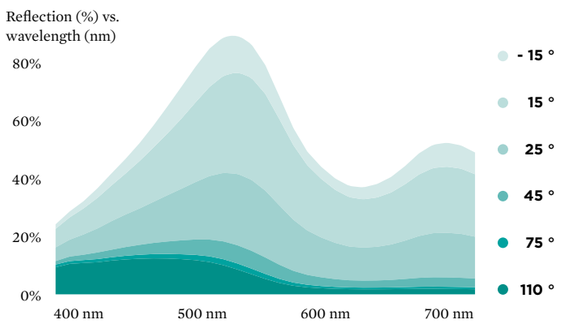
RECIPE

Hostaperm®[1] Blue BT-617-D	**6.00%**
Hostaperm®[1] Blue BT-729-D	**1.50%**
Hostaperm®[1] Green GNX	**0.50%**
HOMBITEC® RM 220 pigment	42.00%
STAPA® IL HYDROLAN 2156	10.00%
Meoxal® F120-30 CWT Taklamakan Gold	20.00%
Xirallic® NXT M260-30 SW Leonis Gold	20.00%

PIGMENTATION LEVEL

Pigment in wet paint	4.80%
Pigment to binder ratio	22.60%

REFLECTANCE CURVES



AC 2316

DIGITAL EXPERIENCE

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)

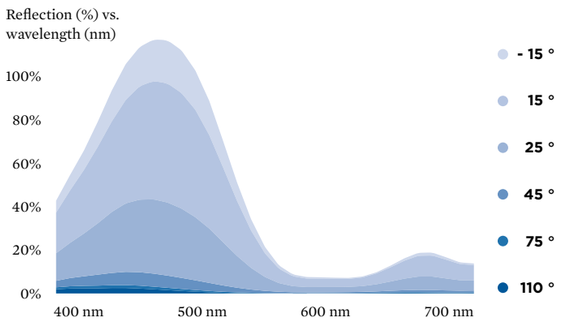
RECIPE

Hostaperm®[1] Blue BT-627-D	**23.80%**
Paliogen® Blue L 6470	6.00%
COLOUR BLACK FW 255	0.20%
STAPA® IL HYDROLAN 214	35.00%
Xirallic® NXT F260-51 SW Cougar Red	35.00%

PIGMENTATION LEVEL

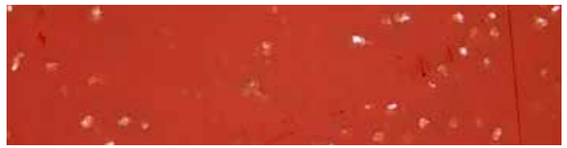
Pigment in wet paint	4.30%
Pigment to binder ratio	22.30%

REFLECTANCE CURVES



AC 2317
PI-RED

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)



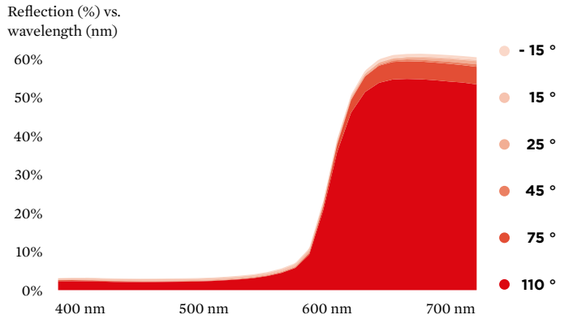
RECIPE

Novoperm® Orange HL 71	**25.00%**
Hostaperm®[1] Scarlet GO trans	**10.00%**
Hostaperm®[1] Red D2G 70	**11.00%**
Kronos® 2310	13.00%
SOLAPLEX® 34H1004 pigment	37.00%
STAPA® IL HYDROLAN 3580	4.00%

PIGMENTATION LEVEL

Pigment in wet paint	11.40%
Pigment to binder ratio	60.80%

REFLECTANCE CURVES



AC 2318
GOLDEN H

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)

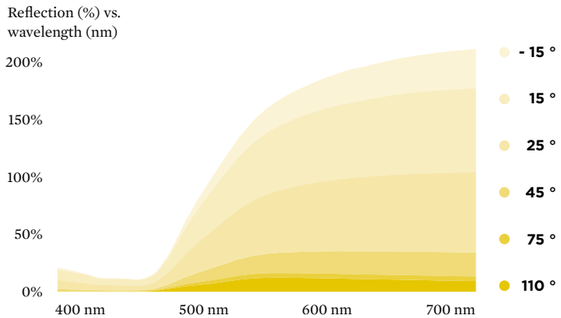
RECIPE

Hostaperm®[1] Yellow H3G	**5.00%**
Bayfast® Yellow 5688	35.00%
Irgazin® Yellow L 2040	10.00%
STAPA® IL HYDROLAN 2156	45.00%
Meoxal® F120-30 CWT Taklamakan Gold	5.00%

PIGMENTATION LEVEL

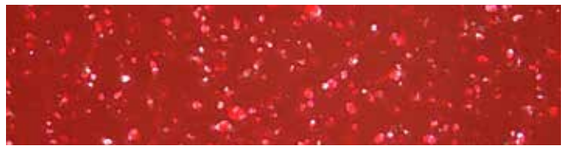
Pigment in wet paint	6.30%
Pigment to binder ratio	33.10%

REFLECTANCE CURVES



AC 2319
FIFTIES DINER

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)



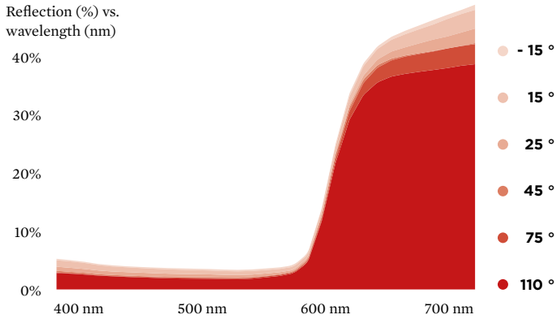
RECIPE

Hostaperm®[1] Scarlet GO trans	**2.35%**
Hostaperm®[1] Red D2G 70	**41.12%**
Hostaperm®[1] Pink E	**9.54%**
Kronos® 2310	18.80%
Bayferrox® 504	23.50%
STAPA® IL HYDROLAN 2197	4.70%

PIGMENTATION LEVEL

Pigment in wet paint	9.00%
Pigment to binder ratio	47.90%

REFLECTANCE CURVES



AC 2320
GRASSROOTS

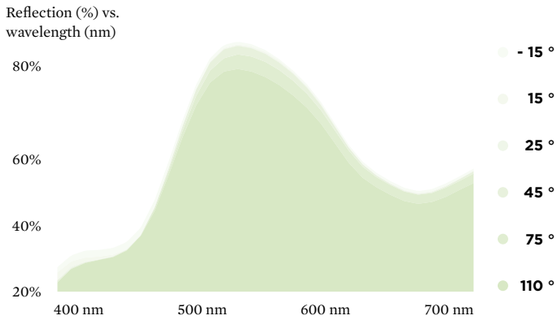
RECIPE

Hostaperm®[1] Oxide Yellow BV 02	**8.50%**
Hostaperm®[1] Yellow H5G	**1.00%**
Heliogen® Green L 9361	0.50%
Kronos® 2310	90.00%

PIGMENTATION LEVEL

Pigment in wet paint	20.30%
Pigment to binder ratio	131.20%

REFLECTANCE CURVES



AC 2321

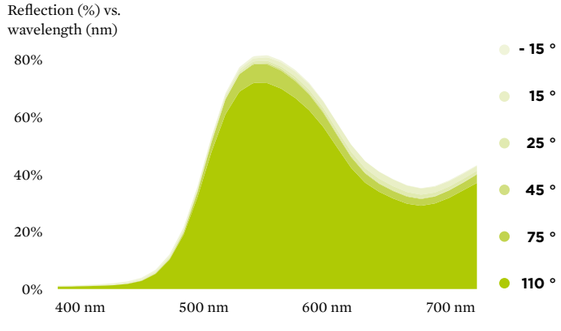
BAD CHEMISTRY

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)

RECIPE

BC1 (AC 2320)	
Hostaperm®[1] Oxide Yellow BV 02	**8.50%**
Hostaperm®[1] Yellow H5G	**1.00%**
Heliogen® Green L 9361	0.50%
Kronos® 2310	90.00%
PIGMENTATION LEVEL	
Pigment in wet paint	20.30%
Pigment to binder ratio	131.20%
BC2	
Hostaperm®[1] Yellow H5G	**30.00%**
Hostaperm®[1] Oxide Yellow BV 02	**53.00%**
Irgazin® Yellow L 2040	1.00%
Heliogen® Green L 9361	1.00%
HOMBITEC® RM 220 pigment	5.00%
Xirallic® T60-20 SW Sunbeam Gold	10.00%
PIGMENTATION LEVEL	
Pigment in wet paint	6.10%
Pigment to binder ratio	32.50%

REFLECTANCE CURVES



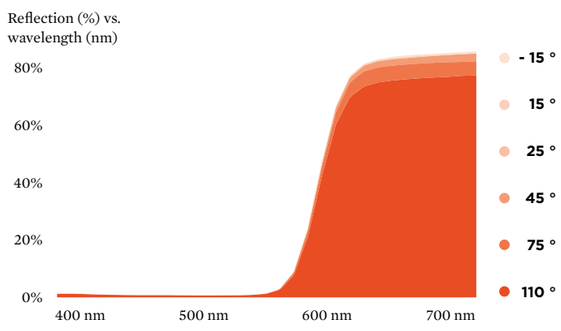
AC 2322

FIRE ALARM

RECIPE

BC1	
Hostaperm®[1] Oxide Yellow BV 02	**10.00%**
Hostaperm®[1] Yellow H5G	**0.50%**
Hostaperm®[1] Scarlet GO trans	**0.50%**
Kronos® 2310	85.00%
SOLAPLEX® 34H1002 pigment	4.00%
PIGMENTATION LEVEL	
Pigment in wet paint	6.90%
Pigment to binder ratio	44.40%
BC2	
Hostaperm®[1] Yellow H5G	**10.00%**
Hostaperm®[1] Scarlet GO trans	**70.00%**
HOMBITEC® RM 220 pigment	20.00%
PIGMENTATION LEVEL	
Pigment in wet paint	2.60%
Pigment to binder ratio	11.90%

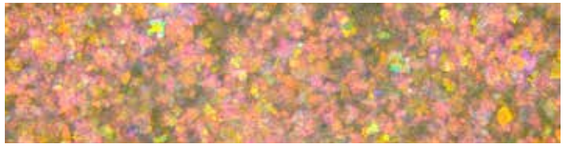
REFLECTANCE CURVES



AC 2323

BLUSHING ANGEL

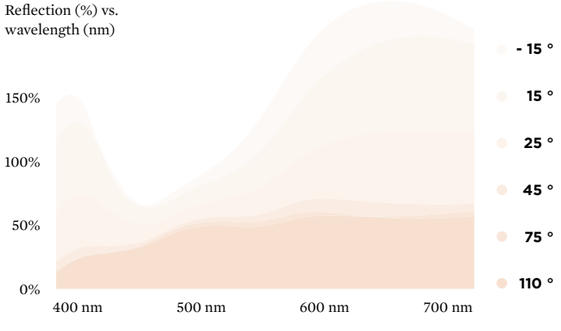
MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)



RECIPE

BC1	
Hostaperm®[1] Oxide Yellow BV 02	**10.00%**
Hostaperm®[1] Yellow H5G	**0.50%**
Hostaperm®[1] Scarlet GO trans	**0.50%**
Kronos® 2310	85.00%
SOLAPLEX® 34H1002 pigment	4.00%
PIGMENTATION LEVEL	
Pigment in wet paint	6.90%
Pigment to binder ratio	44.40%
BC2	
Xirallic® T60-21 SW Solaris Red	100.00%
PIGMENTATION LEVEL	
Pigment in wet paint	7.00%
Pigment to binder ratio	35.30%

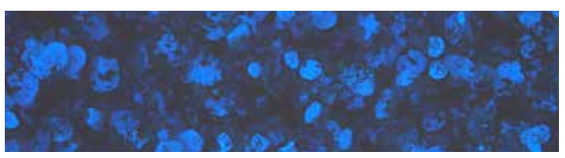
REFLECTANCE CURVES



AC 2324

DEEP SPACE BLUE

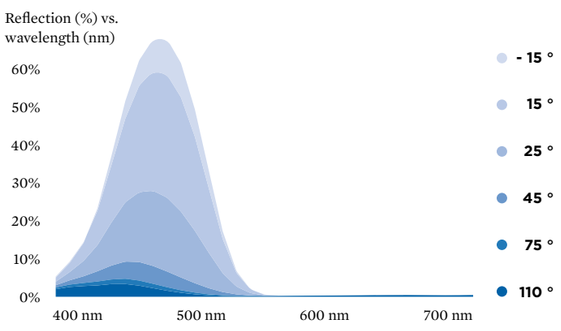
MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)



RECIPE

BC1 (AC 2316)	
Hostaperm®[1] Blue BT-627-D	**23.80%**
Paliogen® Blue L 6470	6.00%
COLOUR BLACK FW 255	0.20%
STAPA® IL HYDROLAN 214	35.00%
Xirallic® NXT F260-51 SW Cougar Red	35.00%
PIGMENTATION LEVEL	
Pigment in wet paint	4.30%
Pigment to binder ratio	22.30%
BC2	
Hostaperm®[1] Blue BT-627-D	**75.00%**
Paliogen® Blue L 6470	25.00%
PIGMENTATION LEVEL	
Pigment in wet paint	0.50%
Pigment to binder ratio	2.60%

REFLECTANCE CURVES



AC 2325
BONFIRE

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)

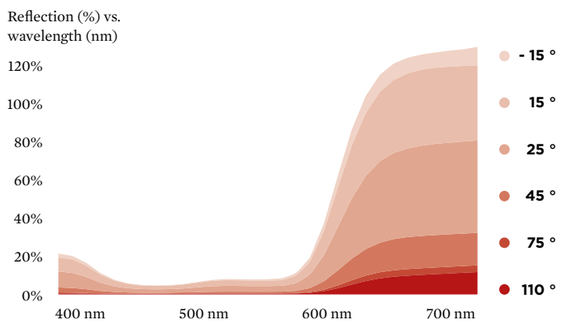
RECIPE

Hostaperm®[1] Brown HFR 01	**0.75%**
Hostaperm®[1] Red P2GL-WD	**21.38%**
Hostaperm®[1] Pink E	**3.02%**
STAPA® IL HYDROLAN 2156	5.35%
Meoxal® F121-51 CWT Atacama Red	42.77%
Xirallic® NXT F260-51 SW Cougar Red	26.73%

PIGMENTATION LEVEL

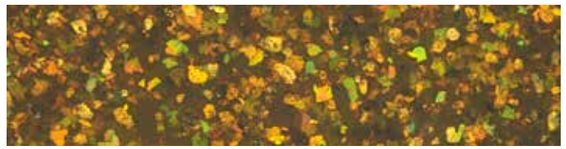
Pigment in wet paint	7.60%
Pigment to binder ratio	37.70%

REFLECTANCE CURVES



AC 2326
GAMMA RAY

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)



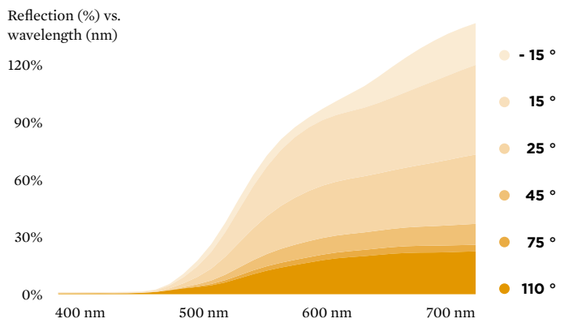
RECIPE

Hostaperm®[1] Yellow H5G	**5.00%**
Bayfast® Yellow 5688	34.80%
Irgazin® Yellow L 2040	10.00%
COLOUR BLACK FW 255	0.20%
Meoxal® F120-30 CWT Taklamakan Gold	25.00%
Xirallic® NXT M260-30 SW Leonis Gold	25.00%

PIGMENTATION LEVEL

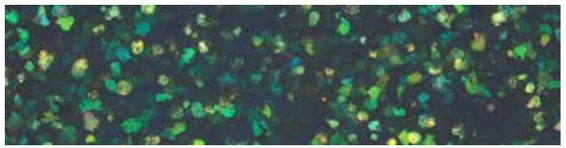
Pigment in wet paint	6.30%
Pigment to binder ratio	31.50%

REFLECTANCE CURVES



AC 2327
SERPENT OF PARADISE

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)



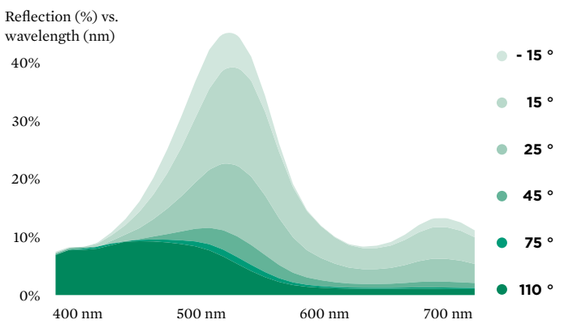
RECIPE

Hostaperm®[1] Blue BT-617-D	**12.00%**
HOMBITEC® RM 220 pigment	38.00%
Meoxal® F120-30 CWT Taklamakan Gold	25.00%
Xirallic® NXT M260-30 SW Leonis Gold	25.00%

PIGMENTATION LEVEL

Pigment in wet paint	6.50%
Pigment to binder ratio	30.40%

REFLECTANCE CURVES



AC 2328
REDSHIFT 3.5

MICROSCOPIC PHOTOGRAPHY (x 200, brightfield)

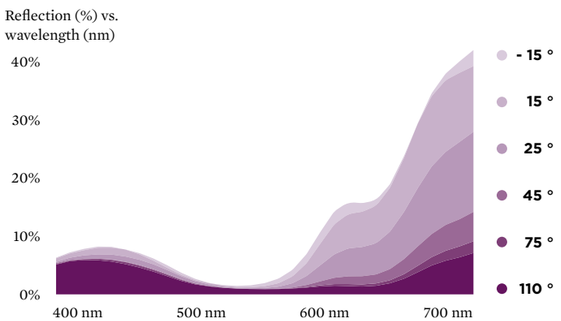
RECIPE

Hostaperm®[1] Violet RL special 01	**10.00%**
Hostaperm®[1] Blue BT-627-D	**2.00%**
Paliogen® Blue L 6470	2.00%
HOMBITEC® RM 220 pigment	38.00%
Meoxal® F121-51 CWT Atacama Red	24.00%
Colorstream® F20-51 SW Lava Red	24.00%

PIGMENTATION LEVEL

Pigment in wet paint	3.10%
Pigment to binder ratio	14.80%

REFLECTANCE CURVES



Originals

PIGMENT CONCENTRATIONS

C.I.	PIGMENT	PIGMENT CONCENTRATION IN MILL BASE [%]	PIGMENT CONCENTRATION IN TINTER [%]
P.Y. 184	Hostaperm® Oxide Yellow BV 02	60.0	30.0
P.Y. 213	Hostaperm® Yellow H5G	26.0	10.0
P.Y. 154	Hostaperm® Yellow H3G	30.0	12.0
P.O. 36	Novoperm® Orange HL 71	40.0	14.0
P.R. 168	Hostaperm® Scarlet GO trans	30.0	5.0
P.R. 254	Hostaperm® Red D2G 70	40.0	14.0
P.R. 179	Hostaperm® Red P2GL-WD	10.0	3.0
P.R. 122	Hostaperm® Pink E	15.0	5.0
P.V. 23	Hostaperm® Violet RL special 01	20.0	6.0
P.B. 15:2	Hostaperm® Blue BT-627-D	17.0	6.0
P.B. 15:1 Cl	Hostaperm® Blue BT-728-D	20.0	5.0
P.B. 15:1 Cl	Hostaperm® Blue BT-729-D	15.0	4.0
P.B. 15:4	Hostaperm® Blue BT-617-D	18.0	4.0
P.G. 7	Hostaperm® Green GNX	20.0	5.0
P.Br. 25	Hostaperm® Brown HFR 01	17.0	6.0

The styling shades in this brochure were made in a waterborne basecoat system, the basics of which are described in Clariant's QC test method 2/7. However, the concentrations and dispersing conditions have been optimized for this purpose.

PUBLISHER

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Marketing and Sales Coatings

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MARKETING AND SALES COATINGS

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