DVN-I
Automotive Interior

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Editorial

Auto Interiors Expo: A Cornucopia Of Technologies

Last week we visited the Automotive Interiors Expo in Stuttgart, Germany. Even though many technologies have been already showcased somewhere before, it was an excellent opportunity to get a complete picture of the diversity of the automotive interior ecosystem.

Close scrutiny of any given interior item reveals so much: surfaces, textures, decorations, coatings, textiles, backlighting, varnishes, inks, paints, embossing, sensor and control integrations, screens, chrome, haptic feedback mechanisms, and so much more. This week's in-depth article looks at this complexity. We dove deeply(!) into interior surfaces and the carriers behind them, to find there's an enormous amount of opportunity to create lighter, more sustainable materials, and to provide new user experiences through different look-and-feel and touch-and-hear. The interior realm is one of innovation, and that's why we (and you!) are here.

This week we also continue our Car Interiors Unplugged series, and in the Design Lounge you'll find the second part of our car-interior easter egg hunt.

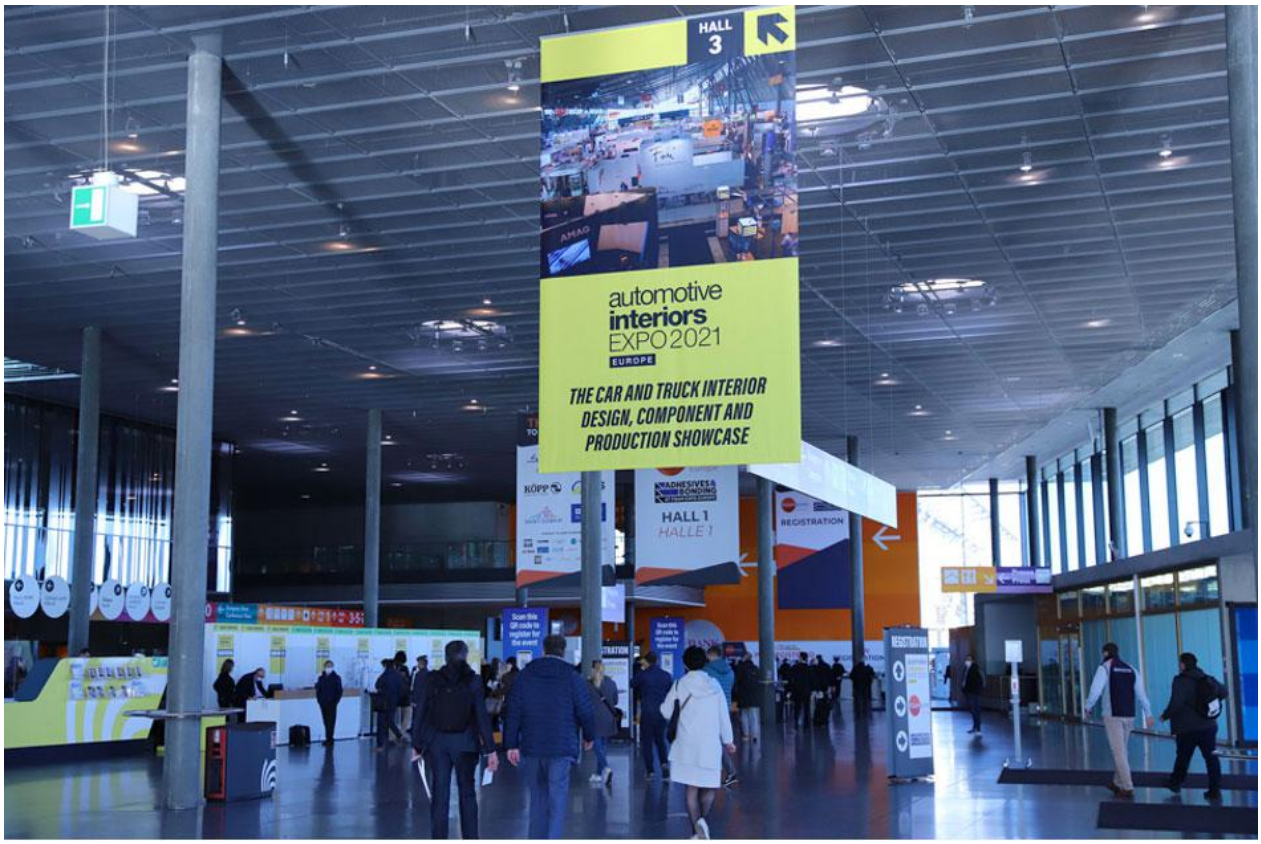
We're all sorts of glad you're here with us. If you're not a member yet, come and join in **here**.

Sincerely yours,

Philippe Aumont
General Editor, DVN-Interior

In Depth Interior Technology

Interior Expo: Technology Panoply



Automotive Interiors Expo Europe was back last week at the Stuttgart Messe. It's a showcase of interior innovation and technology with a focus on materials, decoration, and functional surfaces. We saw a lot of small and midsize suppliers exhibiting new textures, touches, looks, feels, and functionalities for tomorrow's car interiors. Maybe not so much purely technical innovation, but that certainly didn't mean we lacked for exciting things to see—just the opposite; we were favorably impressed by the wide array of technologies reflecting the diversity of what a car interior is made of.

Two years ago, we published Lighting, Screens, and Personalization: Trends at Stuttgart Expo, so it was particularly interesting to compare this year's show to the 2019 version. It would be worth presenting all the approximately 120 suppliers, but here we've selected the technologies that seem the most interesting, under three categories strongly represented at the show: Materials; Decoration, and Functional Surfaces, to which we will add a few other highlights.

All in all, the show gave a good indication of where the technology trends are driving the automotive interior industry, and where the supplier base is putting its innovation efforts. While functional surfaces mostly combine traditional plastic or textile surfaces with sensors, the electronic and digital side of these trends were not really present at this show.

Materials

Many material innovations were showcased here with a focus on Lightweighting, design, translucence, and sustainability

Continental

Continental is a major tier-1 supplier, but their presence here was linked to the ContiTech Surface Solutions business unit. They presented a VW Bus-based concept car called the AMBIENC3, packed with new surface solutions and innovative materials, to make a multipurpose room of the cabin: drive, work, relax—really an instantiation of the third-space concept (home, office…car).

The interior uses TPO, PVC, and PU depending on the function. For example, the dashboard has PVC foil with the feel and touch of wood. Seat covering materials provide a soft, touch-friendly, pale-colored surface that is durable and easily maintained; if drawn on with ink, it can be wiped entirely clean with ease.

Other innovative features include the use of a breathable headliner material through which air can be blown, replacing the need for traditional vents. Meanwhile, the armrests in the rear of the vehicle feature backlit sections with integrated functional switches embedded in the material.

Covestro

Covestro produces a variety of PU- and PC-based raw materials for interiors, including those suited for soft touch and premium haptics. Working with Uedelhoven Studios, Covestro developed a dashboard demonstrator with multiple innovations. These included Insqin waterborne PU coatings in combination with Dispercoll U66: two water-based, low-VOC solutions to deliver translucent optical properties, coating adhesion, and deep color effects on dashboard covers and upholstery materials.
Insqin enables seamless trim components that integrate smart functions. Parts can be produced affordably with a wide range of haptics, transparencies, and ambient lighting effects.

For non-upholstered elements such as the steering wheel, their direct coating technology brings processing, control, and coverage advantages over traditional coating methods.

Fraunhofer

Fraunhofer Institute for Surface Engineering and Thin Films IST developed Morfabric, an adaptive textile-plastic hybrid structure. A 3D-printed plastic application on pre-stressed textile gives the textile its individual form. During the relaxation of the textile following the application process, a predetermined three-dimensional structure, defined by the user, is created. Thus, unique or complex shapes without any punching, pressing or embossing can be generated by the tension of the textile.

Taracell

Taracell is a Swiss engineering, planning, and production company for technical molded components. They presented their latest developments with trimmed-foam parts, including the first door panel made of 100 per cent biodegradable materials. Each component of the sandwich structure decomposes independently. They also showed a door panel made of 100 per cent reusable and recyclable particle foam, on which degradable organic textile has been applied without glue. Particle foam allows integration of air ducts, cable clips, sound grids, LEDs, and displays.

Joubert

Joubert Group, a French textile supplier, showed their new parcel shelf concept that offers 30 to 40 per cent weight savings. This lightweight textile parcel shelf is made of wire-in-spring steel with an elastic fabric in tension. The binding tape is sewn all around the parcel shelf and the lifting straps are directly sewn on the parcel shelf. It is a low-cost-tooling solution, easy to customize by choice of fabric and strap color, sewthread color, topstitching, etc.

ORV Manufacturing

ORV Manufacturing specializes in technical nonwovens. Their new Valtherm Acoustic Performance product range has been developed for sound absorption, especially at low frequencies, with good compression; recovery, and thermal insulation. It is made of recycled polyester fibers obtained from post-use PET bottles.

Kaneka, Formenbau, and Kurtz Ersa

With the new thermo coating (IMPFC – In-Mold Particle Foam Coating) technology, partners T. Michel Formenbau, Kaneka, and Kurtz combine the advantages of EPP and an attractive surface with any texture and any color possible, like a plastic-injected part. It saves weight versus a traditional injection plastic part, and has more soft-touch and shock absorption capabilities It suits for A-pillar claddings; door and instrument panels, and a wide variety of other applications in the interior of an automobile.

Kimoto

Kimoto Switzerland, part of the Japanese Kimoto Group, exhibited their LevSurf range of polycarbonate formable substrates, which have the high optical quality necessary for the integration of freeform displays. The 3D-formed substrate serves as a cover glass to offer the best visibility in automotive applications. The foil's hard coating layer is fully cured, which prevents damage during processing and therefore increases production yield. Kimoto is also introducing a new generation of glass lamination films with improved antireflection and anti-fingerprint properties for automotive touch panels.

Armacell Benelux

Armacell, inventor of flexible foam for equipment insulation, presented their portfolio of eco-friendly PET foam products for structural foam cores used in composite sandwich structures for the parcel shelf, trunk floor, or EV battery undercover; thin, flexible sheets that are used for vacuum thermoformed parts such as air ducts, door water shields, and roof liners. They're made of 100 per cent recycled PET, and can be recycled again and again.

Decoration

Decoration is the final layer of interior finish to personalize and to differentiate the entire cabin.

DesignLED

Scottish lighting supplier DesignLED presented for the first time as part of Faurecia FCE, which they joined in June 2021. They showcased their latest technology demonstrator, confirming convergence of displays and LED lighting in cockpits. Smart LED backlit surfaces can be used to augment the conventional high-resolution display user interfaces.

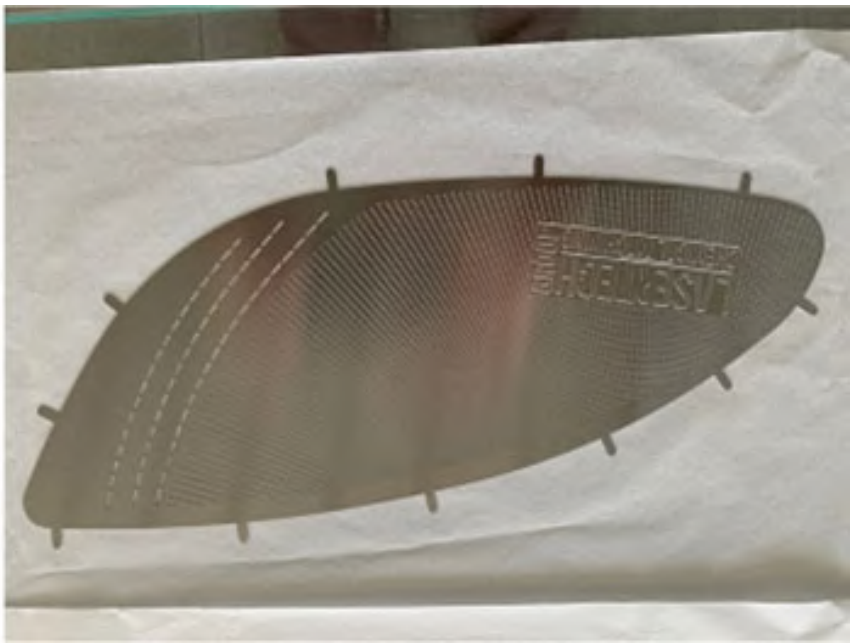
Walter Pack

Walter Pack is a supplier of functional decorative automotive parts, with a 40 per cent share held by Grupo Antolin. They showed their Smart Cockpit demonstrator, with state-of-the-art technology related to lighting and HMI, active surfaces, and electronics. There was dynamic lighting to create different driving scenarios, backlit surfaces in unique materials, a display deco module, sewn light guides, smart decor, natural active surfaces, light projections, and a driver monitoring system (DMS) all seamlessly integrated into the demonstrator.

VFP Ink Technologies

VFP Ink Technologies designs and manufactures high-tech industrial inks and varnishes. They presented a unique, highly stretchable conductive ink compatible with 3D in-mold (IME) for overmolded plastic parts. It integrates functional films with printed electronics and surface-mounted devices (SMD) into 3D plastic parts with complex geometry.

Lasertech



Lasertech presented their loudspeaker grid blanks made in stainless steel by chemical etching. The surface can be bright as a mirror, brushed, or micro-etched with fine pattern decoration. The material used is specifically designed for deep-draw forming and PVD coating or painting. With the same technology, footstep door plates and other metal plate decoration can be easily made.

Architexture

Architexture Design Consultancy, with presence in the UK, US, and China, creates bespoke textures, now producible with New Model-Tech Smart Skin Technology from Standex Engraving Mold-Tech. Here's the Manta Project, an internal design brief developed to demonstrate their new alternative to leather-look grains. Here, it's presented as the idea of reproducing Mondrian's artwork in monochromatics.

Varioplast

Varioplast presented the decorative frame of the Mercedes E-Class, giving the front display a chrome look using a two-coat paint structure. A robotic painting process now matches the exact contour of the component. This leads to a considerable reduction in the amount of paint used, as well as less overspray and scrap.

Varioplast's second PVD system, which can coat components up to 43 × 23 cm, is used to produce the 'chrome' ring trim for the current-production BMW Mini.

Elematec

Automotive design-parts supplier Elematec presented the Asheler design surface produced by Tatsuta Kagaku of Japan. By combining Asheler with light-transmission technology, designers can create surfaces with 3D embossing, transmissive symbols, or design transformation. With Asheler, it is possible to provide leather, wood grain, stone, metal, geometric or other designs.

Cubik

S-Cubik is a water transfer technology providing sharp geometric patterns—homogeneous drawings with chromatic contrasts—on any type of material that can be varnished. Sample patterns were inspired by wood grains, woven textiles, metal processes and geometric elements from the architectural world. It allows personalization by choosing a base color primer, a decorative film, and a final transparent effect (matte, high gloss, or even haptic: soft touch or grained). In the case of plastic materials such as ABS or ABS-PC, it is possible to mold the parts in the chosen base color and then apply the decoration directly on the parts without a base primer. It suits for parts such as panels, dashboards and grille covers.

Functional Surfaces

HMI's perimeter is extending, gradually taking over every surface available within the reach of drivers and occupants.

DuPont

DuPont exhibited an advanced suite of silver-bearing thick film paste conductors to enable in-mold electronic devices. The new conductors improve thermoformability, conductivity, and fine line performance, allowing extended freedom in the electronic design of in-mold electronic devices. These devices include touch steering wheels with transparent 3D-shaped surfaces and next-generation lidar systems.

Actronika

ACTRONIKA IMAGE

Actronika has developed haptic technologies that enable tactile feedback to be seamlessly integrated in human-machine interfaces. There are many types of touch-based solutions to respond to new consumer expectations for a safer, more seamless and comfortable user experience: enhancing a steering wheel with haptic alerts, equipping a car seat with musical bass-enhancing actuators, decreasing visual attention-grabbing distractions by using only touch, etc.

Silcos

SILCOS IMAGE

Silcos, based in Reutlingen, Germany, presented their offerings for lighted and tactile interaction areas within the automotive interior—such as their flat light guide, Siloptics Flexilight, which produces homogeneous luminous surfaces. They also presented their sensor technology approach to solve the problems of capacitive sensors, and most prominently how a combination of these two technologies enables the future illuminated HMI surface for seamless user interfaces within interior.

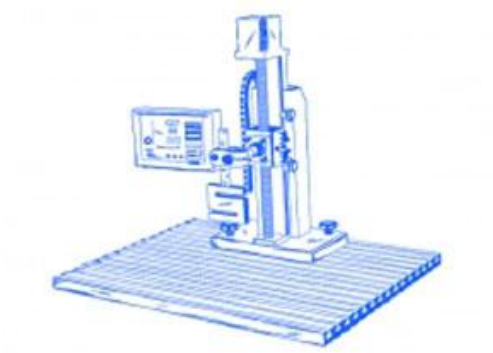
Conductive Transfers

Conductive Transfers, a British maker of printed stretchable electronics and heaters, showed their printable seat heating and sensing solutions.

Printable seat heating elements use a positive temperature coefficient ink, which means it is self-regulating, with an ultra-thin reflective layer in the ink stack.

They also showcased their latest printable sensor. Available with both capacitive and resistive functions, these incorporate sensing elements within the printing stack. The potential use cases in interior applications include HOD (hands-on driving) detection as part of ADAS integration.

Grewus



Grewus develops and produces acoustic signal sensors and haptic actuators. Their new technology makes it possible to quantify vibrotactile feedback. Two acceleration sensors measure haptic events for this purpose. The company's artificial finger collects data necessary for the description of haptic feedback. Among other things, it measures acceleration values under the influence of force, latency and trigger thresholds. Haptics includes acoustics, so acoustic parameters are collected in parallel. An intuitive GUI facilitates operation. The measurement results are conveniently evaluated with the analysis software. The data in the time and frequency domain is displayed, along with the calculation of the GHIV (Grewus Haptic Intensity Value, a name for haptic perception). In this way, active haptics is optimized and made quantifiable during development.

Forciot

Forciot, from Tampere, Finland, showed two main technologies. Their Hands-On Detection steering wheel aids with automated driving. And their stretch-pad module for car interiors is the world's first stretchable 3D multitouch pad.

The demonstrator has various panels that are integrated with touch and force, HMI control, backlight and morphing, all incorporated in a thin structure. The technology works on and with several surface materials and can be integrated into various products and equipment of different sizes and shapes. It can be used on rigid and soft surfaces, and it accurately reacts to and measures a broad variety of parameters such as force, weight, load, balance, pressure, and touch in real time.

Miscellaneous

So much to report on, it's a little difficult to know where to begin!

Leggett & Platt

Leggett & Platt Automotive, a US-based (Missouri) seating comfort group, introduced their Mid-Class Luxury Massage Chair, powered by a unique valve module innovation to provide functionality similar to high-end luxury massage systems but with significantly reduced complexity, thus saving on cost, weight, and packaging.

To run comfort massage systems in vehicles, bladders are usually inflated and deflated by electronically controlled valve modules. This innovative solution requires no electronics or moving parts, so the valve module is slim and mounted close to the bladders. Furthermore, assembly on the customer's production line has been significantly simplified.

Berghof Testing

Most passenger seats have a seat occupancy mats, called passive occupant detection systems (PODS) to manage the airbag depending occupant weight (adult, child, shopping bag, or nothing). It activates systems such as the seat belt tensioner and controls the activation of the front passenger airbag in the event of an accident.

A PODS mat consists of a gel-filled cushion, pressure sensors, and an electronic control unit. Occupancy mats must be calibrated and tested, which is why German specialist Berghof Testing has developed their Seat Function Tester (SFT) and the Force Application Machine (FAM).

The system tests and calibrates the seat occupancy mat with fast, controlled and high-precision force control. The FAM covers three different tasks: occupancy mat calibration; seatbelt reminder testing, and body sense testing. It is also possible to combine all three processes in mixed operation with a single unit.

SFT assumes the task of testing the proper function of all motors, control knobs, and seat memory controls installed in the seat—such as pressure-sensitive passenger detection systems (passenger detection, seatbelt reminder), seat adjusters, seat heaters and massage mats, belt buckles and tensioners, foot compartment and ambient lighting, as well as the crash-activated head restraints.

Nitto

Nitto Automotive, based in Missouri, makes acoustical, structural, and sealant products primarily for the automotive industry. Nitto supplies automakers and suppliers with polymer-based materials like EPDM sealing foams, NVH damping materials, industrial tapes, venting membranes, and more. They manage various components of a display stackup, ranging from polarizing films to light-shielding bonding solutions.

They also showed their state-of-the-art filtration membranes for clean air.

Interior News

Antolin Joins CCC for Phone-to-Car Access Systems

INTERIOR NEWS

GRUPO ANTOLIN IMAGE

Grupo Antolin, the global Spain-based supplier of car interiors, has joined the Car Connectivity Consortium (CCC), a cross-industry organization developing global standards and advanced technologies for smartphone-to-car connectivity solutions.

CCC will provide digital access technology to easily and securely use mobile devices to access vehicles. It allows mobile devices to store, authenticate and share digital keys for vehicles in a secure, authentication for engine start privacy-preserving way that works everywhere, and opens new perspectives for car sharing.

Grupo Antolin offers a complete portfolio of solutions such as antennas integrated in the headliner substrate or the central console, sensors in the door handles or in the instrument panel as well as the ECU.

Car Access Systems is based on a variety of technologies from low-frequency for legacy systems to ultra-wideband for the latest digital key standard.

The CCC membership comprises smartphone and vehicle manufacturers, automotive tier-1 suppliers, silicon/chip vendors, security product suppliers, and more. The Board of Directors includes individuals from charter member companies Apple, BMW, General Motors, Honda, Hyundai, LG, Panasonic, Samsung, and Volkswagen.

Grupo Antolin launched in 2020 their Electronic Systems business unit. They have also multiplied collaborations with AED Engineering in automotive electronics, including ultra-wideband solutions.

This year, the Shanghai Antolin-NAEN Automotive Electronics joint venture was launched to develop advanced body control electronics and bring the newest generation of passive entry/passive start (PEPS) systems to the global market.

Billion-Euro Order for Continental OLED Displays

INTERIOR NEWS

CONTINENTAL IMAGE

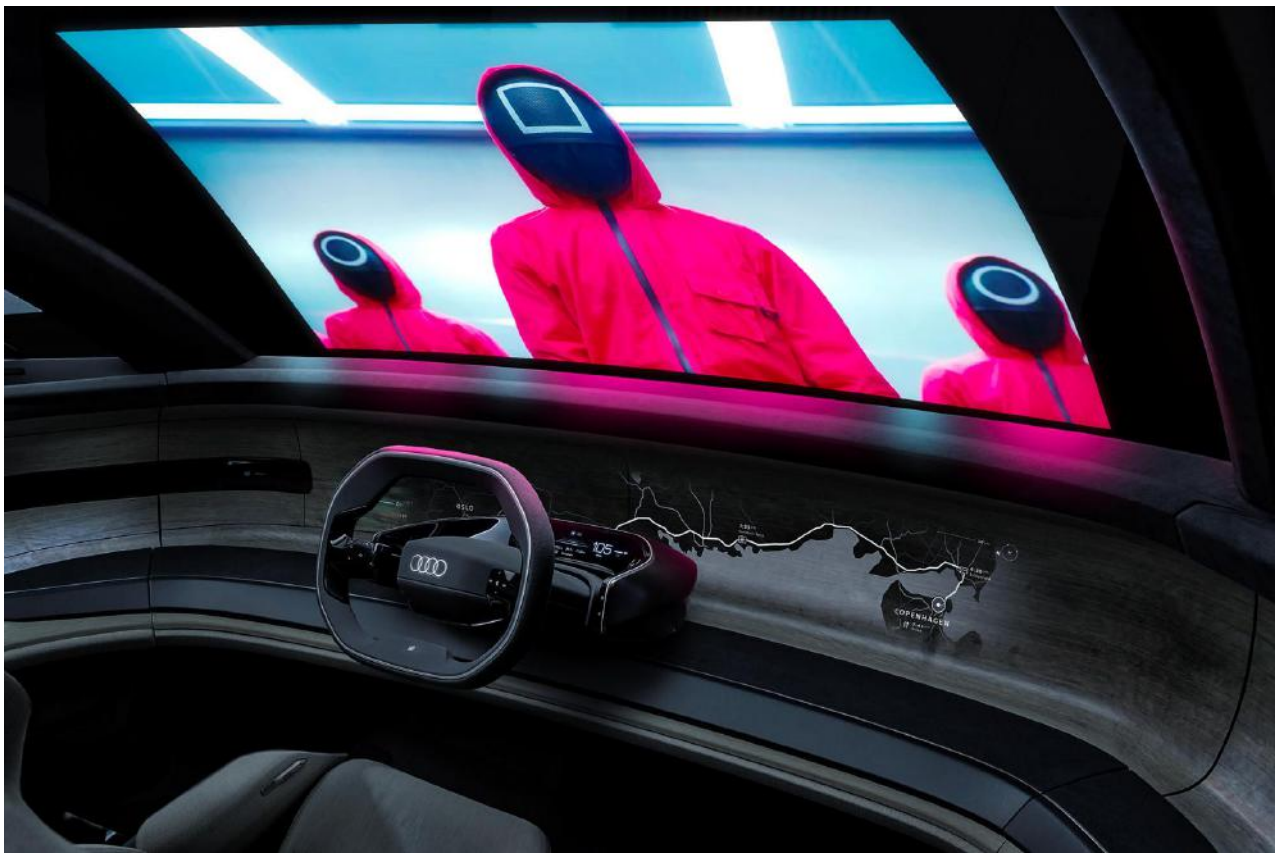
Continental has landed their first major order with its innovative OLED displays for car interiors. With a total order volume of around €1bn, the displays will be used, as Continental says, in a global automaker's high-volume production vehicle. Neither the maker nor the model has been publicly named.

Instead of the entire backlighting of conventional screens, OLED technology only lights up those pixels that are needed for the relevant information—whatever that may be at any given moment.The start of series production is planned for 2023. For Continental, the shift away from mechanical displays such as speedometers in cars towards infotainment systems with large displays is important. In May, Continental announced they had been awarded a contract for a pillar-to-pillar display. The trend towards monitors is unbroken in times of driver assistance systems, automated driving and apps. "What used to be horsepower is now screen diagonal and user experience," said Frank Rabe, head of the Human Machine Interface business unit.

Originally, the corporation wanted to close the plant in Babenhausen by 2025 as part of their savings and structural program. Now the research and development for display and operating technologies as well as parts of the administration are to remain at this site.

Audi Windshield-TV Concept

INTERIOR NEWS



Bright, colorful images projected on (in? Through?) clear glass: Star Trek's monopoly on them might be coming to an end. At least, that's what a patent filing by Audi suggests.

The patent filing describes the invention as *a display surface of a self-luminous screen element divided into first and second display regions by a bend region. A selective shielding unit transmits light from the screen element along a preferred direction and blocks light along a blocking direction and/or deflects light from the blocking direction. When installed in a motor vehicle, the display device faces a surface region at a distance from the screen element on which a reflection of the display content displayed on the second display region is visible from a predetermined viewing point. In this case, the preferred direction of the selective shielding unit in the second display region is oriented toward the surface region, and the blocking direction in the second display region is oriented toward the predetermined viewing point.* That's quite a chunk of patent-spec language, and what it describes sounds as though it could unlock big new doors in interior-projection and infotainment technology. We'll be keen to keep an eye on how this develops toward commercialization.

Hyundai Concept Teases Ioniq 7: EV Architecture Opens Interior

INTERIOR NEWS

HYUNDAI IMAGES

Hyundai has announced their first battery-electric SUV concept vehicle, the Ioniq 7. Of the three Ioniq models so far—also including Ioniq 5 and 6—the Ioniq 7 is the only model not yet presented as a study. At the L.A. Auto Show (in session as this newsletter goes live), they are providing a preview of the series version with the Hyundai Seven Concept. It's possible that the study will already look a lot like the production model intended to launch in 2023.

The light signatures known from the Ioniq 5, the so-called "parametric pixels", can be seen on the left-hand corner of the vehicle. The interior also continues the living room concept of the recently launched E-SUV coupe with lounge-style furniture and materials. Hyundai is not yet revealing anything about dimensions, engines or technical details.

The model is based on the E-GMP platform (Electric Global Modular Platform). In addition to purely electric drives, this also allows fuel cell versions and plug-in hybrids. The battery is located in the underbody between the axles. In this way, the engineers open an "intelligent cabin living space" with the platform. This makes it possible to adjust the seats variably, to implement connectivity functions generously and to install special equipment such as a drawer glove compartment. There is also a flat vehicle floor and significantly more space for passengers than in a comparable mid-size SUV. The Ioniq 7 takes its cues from the Sonata and Santa Fe in terms of size, offering three rows of seats, a large panoramic roof and Level 3 autonomous driving. A motorway assistant is also on board. Depending on the market, the E-SUV comes with camera exterior mirrors that show their images on two monitors inside.

TTTech Auto–Infineon Joint Project

INTERIOR NEWS

For three years, Austria-based TTTech Auto and Germany-based Infineon Technologies have developed, with 60 partners, key components for a failsafe electronics architecture for SAE L^3 and L^4 highly automated driving. The components are intended, for example, to process sensor data from radar, lidar and camera safely and reliably. Now the project is complete.

The architecture concept and its components are intended to ensure the safe operation of motorway pilot functions, valet parking and autonomous driving trucks - even if individual functions fail.

The mixed-critical approach is intended to enable computer hardware and software to run the applications of different ASILs (Automotive Safety Integrity Levels). A specially developed failover mechanism, consisting of a primary ("doer" node) and a fallback control unit ("fallback" node), is to provide the necessary fail-safety for the vehicles. If the "doer" fails, the "fallback" takes over within milliseconds. This mechanism is intended to ensure the system's failure functionality, for example for functions in the area of sensor fusion, trajectory planning and object recognition, according to SAE levels 3 and 4.

The modular concept is intended to enable flexible and rapid development of automated driving systems. For example, the combination of different standard elements such as SoCs (System on a Chip), automotive microcontrollers, power supplies as well as several cameras with the deterministic backbone network.

The joint research contributes to the completion of the European project "PRYSTINE" (Programmable Systems for Intelligence in Automobiles). It includes physical demonstrator car with all technological developments, that will be showcased on track during autonomous driving tests and will perform demonstration of everyday road situations (traffic light turning green, approaching intersection with pedestrian partially occluded and stopping in emergency lane). Driver monitoring technology, that can significantly improve the safety and comfort of drivers, will also be presented during the tests.

VW OHLF: Cellulose, Fungi Replacing Leather

INTERIOR NEWS

OHLF: 13 LABS ARE GROUPED AROUND THE CENTRAL RESEARCH FACTORY. IMAGE © ISABELL MASSEL

Volkswagen is working on car materials of the future: Innovations based on cellulose and mushrooms (biological polymers) could soon replace leather.

The Open Hybrid LabFactory (OHLF) on the outskirts of Wolfsburg is a research campus equipped with casting systems, injection molding systems, compression technology and industrial robots. The goal is to make textiles, metals, plastics and composites lighter, more sustainable, link in the circular economy, and just as stable as the materials of today.

The OHLF is representative of the public-private partnership model, with members such as the city of Wolfsburg, the Automotive Research Centre Niedersachsen (NFF), the Fraunhofer Society and the Technical University of Braunschweig, and on the private side, many automotive suppliers and metal and plastic processing companies, and VW themselves.

VW made a general decision to no longer use animal products for the all-electric ID. family. The idea is to substitute leather with material made from pure cellulose, potentially extracted from canola seed and coniferous wood—though these are by no means the only option. Biomaterials can also be produced in the lab.

Cellulose is an important raw material in materials research. The OHLF researchers feed bacteria in a sugar solution. They, in turn, generate pure-form cellulose. Once the growth process has ended, when the workpiece has reached the desired size, the researchers use washing processes to remove the bacteria and dry the sourced cellulose over several steps. This is followed by post-processing and drying, then the experts use an organic plasticizer to generate the desired smoothness of the material.

Another research project is looking into the possibilities of natural polymers based on fungal mycelium (the fungal network as a whole).

During tests, they simulate any stresses and strains that seat covers are subject to in cars. It includes tests for mechanical stresses, for ageing behavior as a result of heat and UV radiation, and for soiling tendency, due to suntan lotion, abrasion resistance, tear resistance, and also consumer tests like quality feeling.

The Design Lounge

Hunting for Easter Eggs Inside the Car, Part II

THE DESIGN LOUNGE

TESLA MODEL S PLAID CLUSTER/DISPLAY ANIMATION

The 'easter egg' topic we overviewed last week seems to be progressing from the hidden thematic execution to a type of sub-theme from automakers' design studios. Tesla seems to have ‘kick-started’ this trend by expanding their ‘ludicrous’ performance mode to now become a Plaid edition, supplanting their performance edition. The reference comes from the cheesy 1987 Star Wars parody movie Spaceballs, in which the protagonists' acceleration went from Light speed to Ridiculous speed to Ludicrous speed to Plaid.

Initially, Ludicrous was Tesla’s acceleration mode within their Performance versions. With the introduction of their Plaid Performance Model S, Tesla has now created a type of sub-theme for their highest-performing vehicles. Even the exterior badging references the movie's graphics:

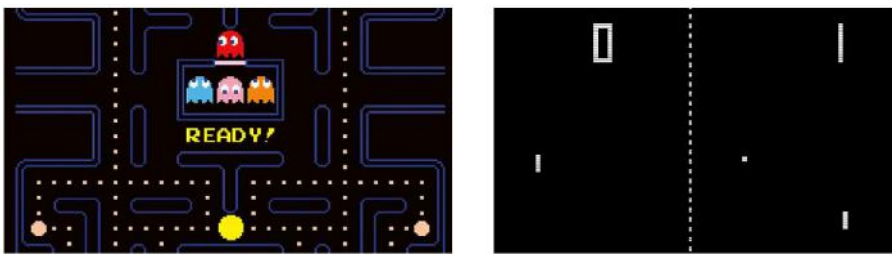
SPACEBALLS ‘LUDICROUS / PLAID’ FILM SCENE

TESLA MODEL S PLAID BADGING

Although ‘sub-branding’ has been used by OEMs for years to differentiate option packages for years, as in the Levi Strauss edition Jeeps of the 1970s (which did not actually use cotton denim, for it would not wear well enough or meet American flammability regulations—lookalike nylon materials were devised instead).

Typically, these were co-branding opportunities used by automakers to help hone (and sell) their vehicles' image. Levi's being perceived as a tough, sturdy, American brand and material, the mesh with Jeep's projected image was a natural. Today, automakers are now adding these kinds of sub-themes not as co-branding opportunities but with a more lighthearted emotional attachment to the non-automotive world.

Look at Hyundai’s newest Ioniq 5 with their pixel-effect exterior lighting signature. This low-res application is a nostalgic nod to iconic video games of the past. Although not used as an interior theme, this kind of sub-theme detailing adds an engaging emotional element toward their light signature.



LOW RESOLUTION, ORIGINAL 8-BIT PAC MAN AND PONG VIDEO GAMES

HYUNDAI IONIQ 5 PIXEL LIGHTING

Upcoming EVs are also introducing sub-themes into their design execution, such as GM with their Hummer EV and Nissan with their Ariya. To emphasize the go-anywhere capability of the newest Hummer EV, a moon-landing reference is created throughout the interior by inclusion to the UX/HMI screen, speaker grilles, and rubberized floor coverings.

HUMMER EV ‘MOON’ UX/HMI BACKGROUND

HUMMER EV ‘SEA OF TRANQUILITY’ MOON LANDING REFERENCE

HUMMER EV ‘SEA OF TRANQUILITY’ CARGO FLOOR MOON LANDING REFERENCE

Nissan's Ariya EV takes inspiration from Japanese artisans on how the vehicle design is experienced. Their new styling direction called "Timeless Japanese Futurism", defines the company’s products from here on. Instead of abstract dot patterning or elephant skin surfacing, the Ariya uses these Japanese cultural references as a sub-theme for its interior detailing, such as…

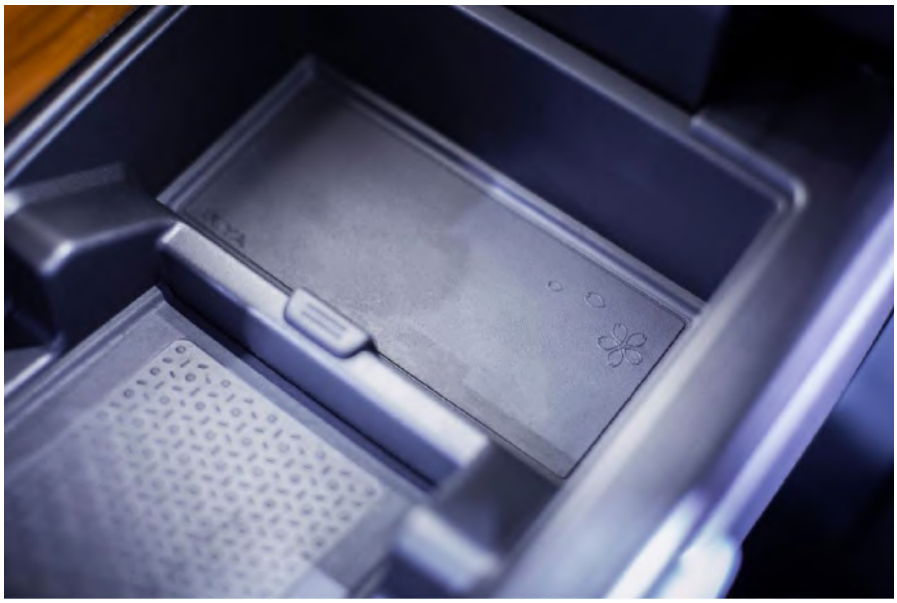
…**ANDON** (行燈)

An *andon* is a paper lantern used to illuminate homes with a soft glow, dating back to the days of the samurai. The lantern consists of a wooden frame with a thin piece of paper stretched around it. A candle placed inside produces a warm light that accentuates the surroundings …

…KUMIKO (組子)

A traditional Japanese technique found in lattice woodworking and practiced by only the most highly trained craftsmen, *Kumiko* is a complex, beautiful geometric pattern that has been used for centuries.

Finally, detailed easter eggs are also included such as the sakura, or cherry blossom, that represents a new beginning. This design approach of including easter eggs and design sub-themes without co-branding create a refreshing new direction of design detailing, interest and involvement for future consumers.



News Mobility

_Car Interiors Unplugged • Summary Series II

NEWS MOBILITY

SICHERHEIT-HAMBURG IMAGE

02 Mobility Value and Exchange_

During an earlier time in China, someone took a piece of paper and agreed with everyone else that this had a specific value in coins, a lot of coins, so many that previously their weight alone was setting the limits of the exchange policy across the empire. That was Ming Dynasty banknotes in early 1400s. From then on, greater amounts of coins, illustrated on that piece of paper, could travel further away transporting value into a much greater extend, enabling exchange across vast territories, creating a dynamic economy. That piece of paper had no intrinsic value, but served as an idea of implementing something, to do something else. It became the implicit contract between people and the decisions they believed would be made in the future, and it was about preserving the value of that one act of faith. Similarly, today, credit cards are part of everyday life as the symbol of a triumphant consumer culture with no limits to its reach. It has conquered the world through the great constant of human affairs: money. Money let us buy our dreams and in our specific case, the cars of our dreams. Automotive, one of the largest industries by revenue, constitutes alone a vast territorial economic empire. Indeed, we could see cars as the circulate trade certificates of the industrial based society. Unlike real estate, you can buy a car in one place and sell it in another. Moreover, the ever-evolving relationship between car and territory combined with connectivity, are gradually merging into a much greater technological space. Maybe the automobile of the future is a new form of exchange overall.

In the early 1920s, streets were defined by any type of activity that could take place between buildings. Merchants, craftsmen, postmen, artists and all sorts of people, getting in and out, were animating the open space. That is where life was happening with all its experiential aspects and related emotions. The language of the street has changed by the mechanical culture of the automobile and by the 1930s, streets were perceived as ‘freedom to move’. Later on, traffic engineering, inspired by preexisting water traffic projects, thought out streets as solidified rivers of circulation. Terms such as fluidity became tech

language of the time. Three decades later, scientists took over the mission to define future through their own etymology: speed, acceleration, torque, aerodynamics and then efficiency, and more ‘efficiency’ again by the late 90s, but this time defined by economists. The term mobility here is referring to capital investments assembled towards a specific technology.

Optimization, corporate practices and exponential growth of connectivity led to financial models demonstrating the efficiency of shared mobility. Under this doctrine, we undertook a new concept of merging public transport features with the private space of car interiors. Selling mobility as a service, completely detached from one specific interior, proves out to be theoretically promising and effective. But what exactly is the precise value that converts pure logistics and transportation into a mobile experience and what is the value of it? How much does that cost?

The future as depicted today, by super scalers and system integrators, relates to living-rooms on wheels with people in them texting messages, working while commuting or consuming digital products throughout their journey, settling thus the profile of a new economy. Consumption shifts from physical to digital by creating in-vehicle experiences. Experiences that we will have to design, invent and produce in order to render interior spaces attractive. Never before, in automotive history was necessary such attempt since there was no need. People were naturally fascinated by cars, just because it was exiting. We all know a great one interior when we see one.

Speculating on trends and predictions, durable assets are gradually conquered by ‘soft’ investments, generating passive income such as the use instead of the car itself. Breeding wealth on immaterial assets is strongly accentuated in today’s economy redefining value under new and mostly unknown upcoming premises.

Parked cars and empty rooms, vacant space in time, was up to now irrelevant information. Harnessing the excess capacity of any setup is when you don’t have to build hotels or buy cars but you use the time as the uniqueness and the experience of being there at a specific moment. The idea of ‘superfluous ability’ augmented durable assets through time and space, like assigning them a superpower and rapidly conquered popularity in the automobile sector. We are entering an era where physical objects acquire multiple dimensions of time usage. And this is possibly a moment in history that everything we have created and produced so far becomes an infrastructure for future assets. We humans have the capacity to build tools and then depend on them.

Show-car exercises allowed to shine a halo-glow of glamour over possible future products merging home and car interiors into one seamless journey. And it is this journey that becomes the product itself to sell and capitalize upon. Even if most remained untouched by any public concern, designers being always ahead of their times, had already sensed a much more abstract notion of shared value. Today’s technology can in fact enable access to a product that physically does not exist. The mode of use becomes the product itself, underlining the ability to create assets out of a notion or an identified necessity.

Tier-1 suppliers have to shift from selling equipment to selling outcome. Digital abstract assets, hovering over durable goods, empower and multiply transactions to a new economy. From physical possession to digital access and rights, a new world of exchange unlocks. We are now attributing worth to things that had no inherent value before or perhaps we could not understand earlier due to lack of technology. We can now transfer value by creating fractional properties of the real product, like if we had a big chunk of material and we chip out coins, a lot of coins…a genius approach ‘hacked’ by crypto technology.

Since 1900, the most familiar and the most enduring image of mobility is the car. Nevertheless, both before and after, mobility is represented by many objects and symbols. We get the impression that while car took over the street space back then, has also incorporated all street activities within: buying or selling, entertaining, communicating, mailing, chatting. In the most recent years, car interiors embodied not only ‘the street’ but also ‘home’ by assimilating notions of comfort, cruising and autonomous driving. Now comes the time to extract them back and dial them into new products. The street/space and the mobility/time are now interpreted under a new state of affairs. It is almost as if we were deconstructing an interior to its basic modules (which is exactly what initially was put together to make it) in order to recompose something else that enables a greater exchange of value. Thus, while money has lost its essential materiality and virtual products are conquering anything durable, it is a promise to an involvement. Car interiors are highly experiential, sculptural environments in motion. The old problem of all types of money transactions is acceptability. Trust lies in the counterweight of the promise to get paid the exact amount and this is paramount to the modern economy, it is a user religion. And it is not as much about religion but enhancing the trust on the financial instrument used. As a credit card is backed up by an institution, OEM brands have to endorse our exchange and guarantee this unique experience within the global financial system and its complex tech superstructure.

Today, new automotive brands are created in the attempt to integrate all extracted pixels of automotive mythology to a new vision of mobility. Car Interiors have always demonstrated the talent of collaborative effort to connect the pieces into a whole that is superior to the sum of its parts, shifting ‘consuming’ into

‘experiencing’. Although tech apps multiply algorithmically, the worth of mobility equals the amount of technology per square inch, which is the gold-standard equivalent in car interior business. While still straggling to fight inflation, maybe instead of any marketable reproduction (of car interiors) all we try to do is put this magnificent super product into its new scale of values.

We were struck as kids, by how expensive cars were compared to any household product. Unlike houses though, we thought some brilliant people conceived them on wheels, as a form of mechanical mobile currency to travel along with us and its precious gadgets. Like the Chinese banknote in a sense, it has an itinerant value and an exchange potential. The difference is that unlike banknotes or credit cards, here is an intrinsic value that guarantees the faith structure of money. In addition, if we were to see cars as traveling property, we could speculate on a distinct value related to our experience within. Indeed, that precious life-enhancing, interior setting, surrounded by the car body, being the protective metal shield, made that door opening moment, a hedonistic act. The premise of getting somewhere, assuming a new role, becoming someone else, provides the aspiration towards a specific purpose. The ride itself was so exiting that the act alone created decades of mobile mythology, inspired dreams and fed imagination to some of the greatest narratives for the motion picture industry. We have to confront the ultimate question: how can the infinite and abstract be apprehended, measured and quantified?

In physics, mobility means transfer of energy, while in economy it means transfer of value. We are in front of a complex self-contained yet interconnected superorganism of relocation of value. The idea of embedded mobility is maybe another form of currency.

_____*INDUSTRIOUS_*

General News

More E-Cars in China than Total Cars in Germany

GENERAL NEWS

NISSAN IMAGE

Registrations for battery electric cars are increasing worldwide. In the Chinese market, the past third quarter was particularly strong.

Electromobility will catch up with combustion engines in the foreseeable future, with pure battery cars (BEV) in particular driving this growth. This is shown in a current analysis auditing company PwC, in which the registration figures in 14 selected markets worldwide were evaluated. In the third quarter of 2021, new registrations of BEVs rose by 123 per cent in all the markets analyzed compared to the same quarter of the previous year.

China, with sales of 782,000 BEV units in this third quarter, comes to a growth of 190 per cent compared to the previous year. This means more BEVs are newly on the roads in China than vehicles of all drive types were registered in Germany in the same period (626,672). But in Europe, too, the growth in BEV registrations in the third quarter of 2021 compared to the previous year was considerable: with an increase of more than half in the five largest European markets of Germany, UK, Italy, France and Spain.

The market share of all e-vehicles in Europe, including plug-in hybrids (PHEVs) and hybrids, has jumped in the last two years and is approaching parity with combustion vehicles. Compared to the same quarter last year, the BEV share increased the most for the first time (53 per cent), outpacing PHEVs (45 per cent) and hybrids (19.7 per cent) in Q3 2021. However, the distribution of the various electric drives varies greatly from region to region.

In Germany, the hybrid still dominates with a market share of 16.6 per cent, although PHEVs (11.9 per cent) and BEVs (11.7 per cent) have caught up in the last twelve months. In the USA, on the other hand, internal combustion engines are still the drive of choice with 91.6 per cent; full hybrids lead the electric vehicle field with a 5.1 per cent market share, BEVs achieve just 2.4 per cent, and PHEVs are a distant 1.0 per cent.

In Europe, the Volkswagen Group and Tesla were the main beneficiaries in the first three quarters of 2021, with Volkswagen selling a total of 209,800 fully electric vehicles. Worldwide, the ID.4 led the group's newly registered BEVs with 72,700 units by the end of September. So far this year, Tesla's Model 3 (23,982 registrations) is neck-and-neck with VW's ID.3 (21,539 registrations) for the top position in the German market.

Will Car Software Value Triple by '29?

GENERAL NEWS

VW IMAGE

The value of vehicle software could almost triple by the end of the decade. Which software areas will see the highest annual growth rate and why are some automakers competing with automotive suppliers in the sector?

The main growth drivers are software for Automated Driving Assistance Systems (ADAS), including Driver Monitoring Systems (DMS) platforms and high-performance computing (HPC). The annual growth rate for HPC software is 37 per cent, according to a Berylls' analysis. By comparison, software for automated driving is at 16 per cent. According to Berylls partner Matthias Kempf, this is due to the "mixture of penetration effects and increase in computing power with simultaneous increase in complexity".

The market volume of automotive software per vehicle averaged €820 in 2020. It is expected to increase to €1,260 in 2025, and to €2,375 by 2030 with a CAGR of 13 per cent (2020-2030). The increase in value of automotive software is distributed as follows:

- Mobility 15 per cent
- Commerce & Retail 15 per cent
- Connected Services 12 per cent
- Infotainment 7 per cent
- Driving Experience 4 per cent
- ADAS / AD 16 per cent
- Platform, Security, Certification, Validation 16 per cent
- HPC SW 37 per cent

For suppliers, says Kempf, the programming sector in particular offers new opportunities. The software sector is particularly interesting for companies that produce chips - such as Nvidia or Mobileye. "The same applies to platforms and ADAS, although in the case of platforms some [automakers] will take over the value creation themselves. At least that's what VW, Volvo and Mercedes-Benz are trying to do, for example." This is because the carmakers are pursuing different strategies, especially when it comes to the so-called operating systems ("Vehicle Operating System"). Others want to buy in the technology. "Google will probably dominate infotainment a lot in the future," says Kempf. "The question remains how far OEMs will let Google into the vehicle beyond that. Times are going to change for the large system suppliers who have so far integrated hardware and software in an intelligent, decentralized control unit".