Thu, 24 November 2022
Weekly Newsletter

DVN-I
Automotive Interior

NEWSLETTER #137

Editorial

Coming Up: DVN Interior Think Tank Seminar!

Last week, DVN interior attended the Automotive Interior Expo in Stuttgart, Germany. We found a wide array of fabrics; acoustical materials; shape-forming materials and foams; fasteners and adhesive systems; lighting, and more! Most of these technologies aim to upgrade user experience, through quality; color; texture; touch; feel; sound; insulation, and overall interior innovation were all represented.

That event was a fine warmup for next week's DVN Interior Think Tank Seminar. User experience; driving safety, and cognitive (over)load are primary topics we will **address** in context of HMI next Monday and Tuesday—don't miss it! There are only a few seats left, so if you are a DVN Interior member, just drop us **an email**, If you are not yet a member, come and **subscribe**. We're looking forward to meeting you there!

Sincerely yours,

Philippe Aumont
General Editor, DVN-Interior

In Depth Interior Technology

Interior Expo Showcases Innovative Technology

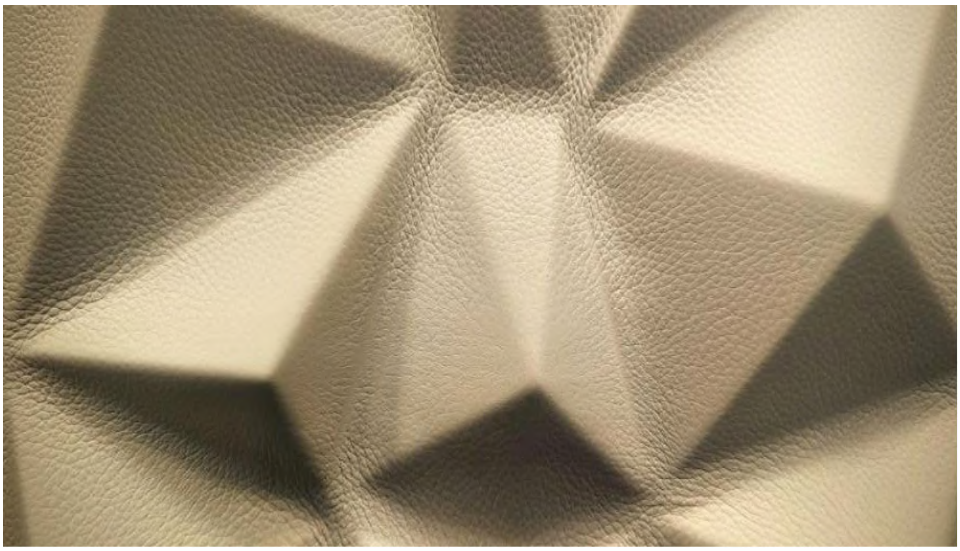
MESSE IMAGE

Messe Stuttgart welcomed visitors; speakers, and exhibitors to the 2022 Automotive Interiors Expo Europe, held on 8-10 November. Visitors could see and touch a wide array of new technologies and solutions— the latest developments in coatings, surfaces, materials, screen-printing, haptic technologies, and more—from at least 125 companies, as well as hear from more than 30 speakers. In today's article we share what especially caught our attention:

Conductive Transfers introduced a new affordable high-yield in-mold electronics process; a new matrix pressure sensing technology, and capacitive touch sensing solution called ElastaSens. It is a screen-printing technology that enables thin, lightweight, and cost-effective pressure map sensing solutions for seat occupancy detection and other automotive applications.

Ionbond presented decorative physical vapor deposition (PVD) coatings for interiors and exteriors. The company's Decobond PVD coating can be applied over any galvanic chrome-surfaced, electrically-conductive interior part. Colors include a variety of golds; copper; rose; nickel; smoky grey; anthracite; black, and 'dark black' to emulate metal's look; feel, and touch.

ORV Manufacturing's ultra-light sound absorbers for cars—in particular, Valtherm Acoustic 2475 PS—can be applied to all internal parts that could generate or amplify a reverberating resonance chamber effect. Examples include the car body; trunk; ceiling; pillar, and dashboard area. It is especially suited for e-mobility, allowing a significant weight reduction versus classic acoustic foams while preserving performance.



EGAS IMAGE

EGAS Consulting showcased Pelle3D's innovative 3D leather thermoforming process. Various samples of leather interior parts were on display, prepared using the leather thermoforming process, including door panels, front header, and headrest, demonstrating the potential of this new technology.

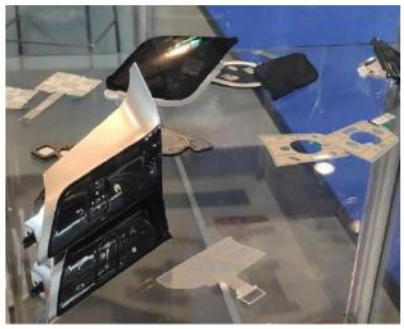
FeelInGlass unveiled their 'touch and feel' glass developments for future cockpits with hot-bent cover glass for displays with unexpected shapes. They presented innovative ways to integrate more functions through glass, turning it into a smart material.

Covestro used the expo to highlight the latest interior automotive trends, including innovative materials, coated and uncoated PC and TPU films, and for example a new roll-up sunroof shade concept, the Nighthawk demonstrator, a drop-in material solution with reduced carbon footprint, and a new concept door panel and dashboard.

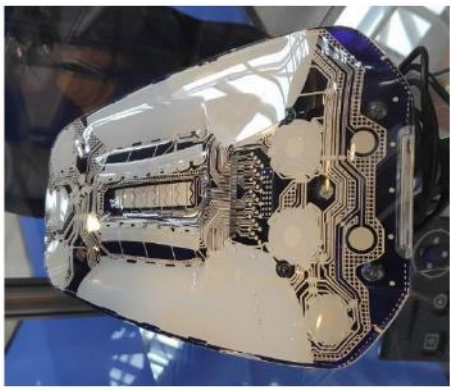
In an impressive interior construction, Covestro showed a lot of applications with new materials in combination with ambient and signaling interior lighting.

Another highlight included value-adding sputter coatings from **Arzuffi**, whose new Fast-Met roll sputtering system“ is a green alternative to electroplating, with a clean process at room temperature and free from chemical emissions.

Ash & Lacy vehicle & audio product manager Emily Evans (photo) presented the company's new photo-etching line capabilities: "From speaker grilles and treadplates to powertrain components and personalization, the opportunities are endless without tooling investment."



Molex presented many high-value examples with functional HMI foils.

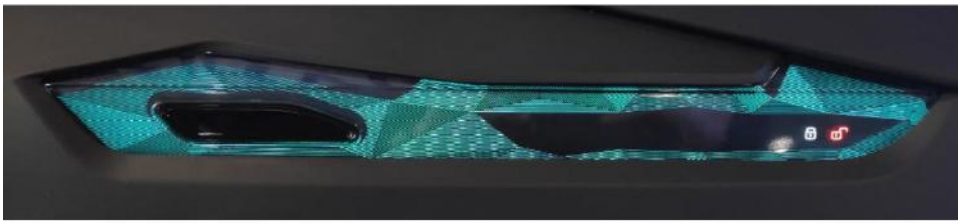


Dupont and **Tactotek** are also working intensively on package-optimized printed electronics technology for smart surfaces.

TG0 showcased their touch-sensing tech for HMIs, applicable anywhere the passenger interacts with the automobile. Center consoles and door handles; armrests and seating, to "transform the car interior into a next-generation driving experience". The company has developed a portable interaction library, the TG0 Demset, as a show-and-tell to inspire designers and engineers.

Niebling Formtechnologie presented high-pressure forming for FIM, saying “There is massive potential in automotive interiors for the FIM process as a greener, higher performing and more durable alternative to paint and laser etching. Demand for capacitive touch, closed surfaces, more decoration options and larger pieces is growing".

Kurz is well known for their versatile decorative films, which become high-quality smart surfaces with **PolyIC's** electronic films. Kurz showed an impressive variety of concept and series applications with decorative functional surfaces, shy technology, capacitive proximity sensors, haptic feedback and transmitted light technology, which can also be combined very well with customer requests such as the currently-trendy "Swarovski buttons".



Forvia DesignLED also showed functional surfaces with 3D effects, transmitted light technology, shy technology and elaborate light patterns such as a Swarovski design (photo, lit in turquoise). In the second image, a combination of display and ambient lighting was shown, harmonizing with each other in appearance and functionality and providing an affordable alternative to vehicle-wide displays.

Technology presentations at the Expo dealt with topics like functional interior lighting, advanced plastic-free material solutions, elegant chrome parts with control functions, smart surfaces, leather innovations, 3D printed electronics for HMI devices, interior design, vehicle audio, ultra-thin surface lighting, enhancing driver experiences, new interior concepts, haptic feedback concepts, intuitive and adaptive interactions using AI, mission zero emissions, sustainable interior coatings with sensory perception, and more.

For example, **DesignLED**'s technical director James Gourlay (photo) gave a presentation focused on personalized interior lighting to enhance the user experience and avoid cognitive overload: "Personalization is the ultimate customization in user experience. Light is increasingly used to personalize automotive interiors, for many tasks—decorative and functional use cases. The user customization of cockpit information displays for personalization is

also becoming common. We see a convergence of these technologies and capabilities, where interior lighting converges with displays, and lighting evolves into low-resolution display surface backlighting".

McLaren Automotive's senior color and materials designer Liza Christensen (photo, left) revealed the importance of color and materials design within the development of the Elva and the emotional connection it brings customers. She explained how McLaren's lightest-ever road car drove a new concept of 'blurred boundaries': seamlessly blending the exterior and interior, while pushing many design innovations.

And **Grewus** managing director Elisa Santella (photo, right) said "Active haptics in automotive is a visible trend in HMI. The first reason is safety: anything you can do to help people not take their eyes off the road is essential! Reconciling safety with connectivity is a key challenge driving the development of next-generation vehicle HMIs. The second is improving the HMI experience for the driver and more possibilities to configure the car according to the requirements of each driver type".

Interior News

Antolin's New Overhead System Approach

INTERIOR NEWS

ANTOLIN IMAGES

Grupo Antolin just unveiled an innovative upper trim concept, targeting a simple and humanized design for overhead systems. It enhances interior packaging while offering a more comfortable and sustainable interior.

This functional prototype presents a portfolio of ready-to-market proposals, and is built on a perimetral 'smart frame' that allows for multiple configurations. For example, numerous finishes are possible: matte or piano black; brushed aluminum, carbon fiber, wood, stone, and more. It is compatible with a closed headliner or panoramic glass roof.

And it allows for seamless integration of features including overhead-console with capacitive switches; retractable sun visors; information display and visual comfort through light, and audio from different speakers around the perimeter for a surround effect or to create a personal sound bubble.

The conventional overhead console has been removed and an array of capacitive switches have been relocated along the perimeter frame. It creates new in-vehicle experiences through a natural way of interacting with the vehicle.

As a result, any passenger can have access to the customizable controls in any position. For instance, passengers in the front seats can deploy, when needed, the retractable sun visors hidden behind the headliner substrate. Each user can regulate the color temperature of their own individual spotlight from warm to cold light through a capacitive slider. Light intensity of those spots can also be adjusted to see clearly or to create ambiance, just approaching or moving away your hand.

Linked to different scenarios, an indirect, perimetral and dynamic light with waterfall effect provides information and warnings as open doors or battery charge levels, among others.

For thermal and acoustic comfort, there's dimmable glass in the panoramic roof. It ensures solar isolation by blocking the IR radiation. It also can be heated to defog it, and also showcases sound absorption.

Joynext, Huawei Partner for Smart Cockpit

INTERIOR NEWS

JOYNEXT IMAGES

Joynext—the automotive connectivity arm of Joyson Electronics—has a comprehensive memorandum of understanding with Huawei for coöperation in smart cockpit development.

Joyson's product portfolio includes climate control systems; electronic control units; sensor systems; driving assistance and navigation systems, and smart drive control systems. They provide airbags, steering wheels, safety belts and windshield washing systems as well. Joyson Safety is a result of KSS purchasing Takata.

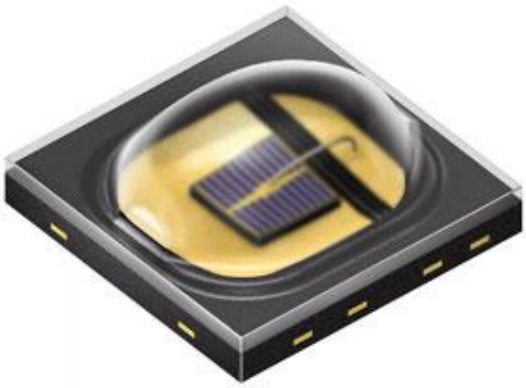
The two companies have crossed paths before. In 2021, Joynext and Huawei's Intelligent Automotive business unit signed an agreement focusing on in-depth coöperation on smart cockpits. A production vehicle model installed with that product is presently under development. Per the newly deepened coöperation, the two companies will pool their expertisee and advantages to jointly build an integrated product solution based on Huawei's HiCar platform.

New Osram IREDs are Better, Cheaper

INTERIOR NEWS

AMS OSRAM IMAGES

AMS Osram has expanded their Oslon Black product family with IREDs—infrared [light] emitting diodes—producing a rectangular beam to match the 4:3 aspect ratio of wide-angle cameras used in DMS-OMS applications (driver and occupant monitoring systems).



The new IREDs produce a 155° × 130° or a 135° × 110° field of illumination. Automakers using these emitters can reduce the complexity and cost of the optical stack in cabin monitoring systems while improving the quality and reliability of their IR images.

The new 940-nm IREDs will support safety-critical applications such as driver distraction and drowsiness monitoring; occupancy and child presence detection, and seat belt detection.

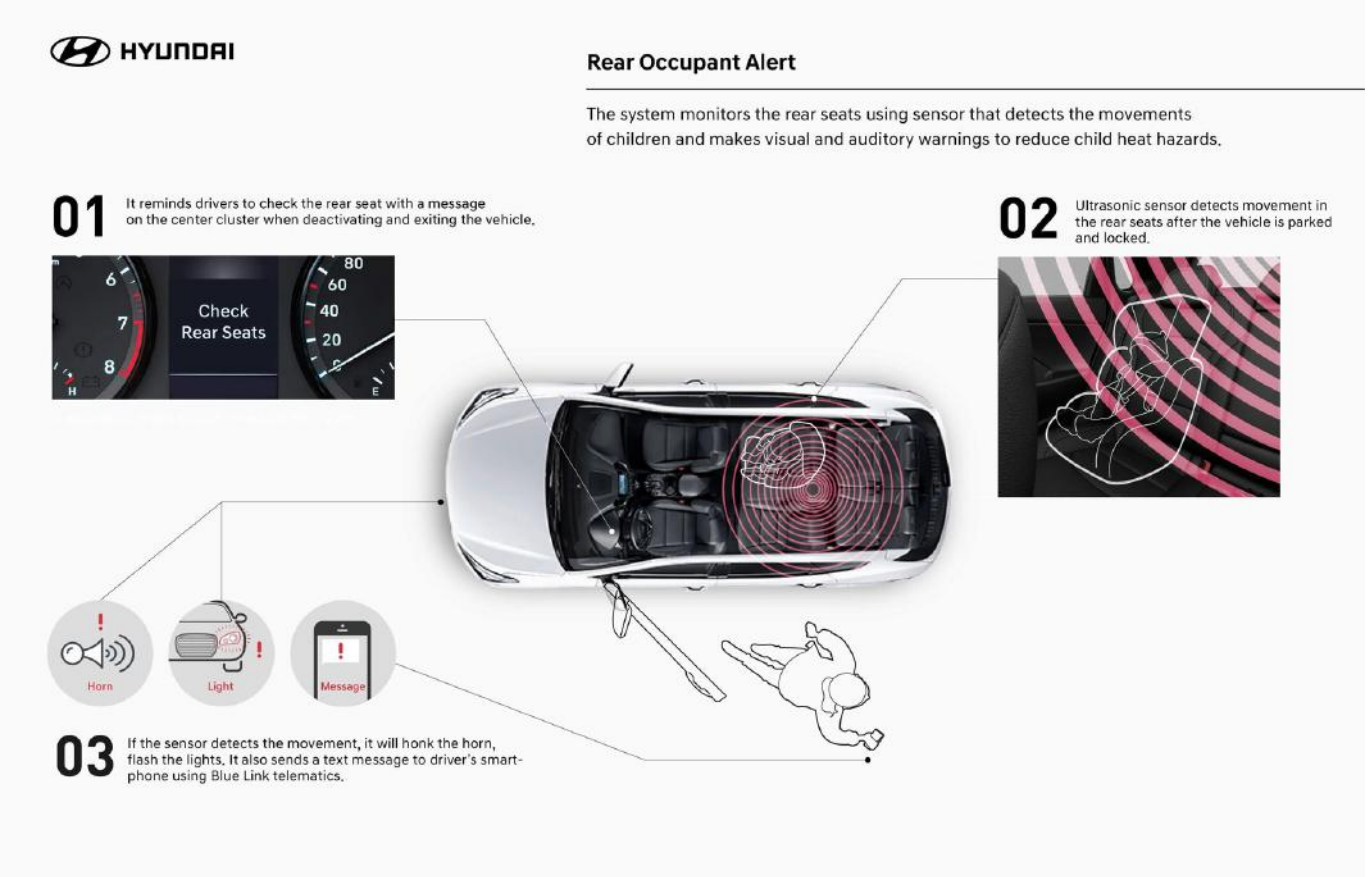
Today, cabin monitoring systems are based on illuminators which produce a circular beam. Manufacturers may apply a secondary lens on top of the LED to shape the beam to fit their camera's 4:3 field of view. This adds to the cost and complexity of the entire optical stack.

By contrast, when using these new products, there is no need for the additional lens, making a cabin monitoring system simpler and easier to design and make.

And the new IREDs' output is more homogeneous than a modified circular beam, with a better optical power distribution across the camera's field of view. This results in better imaging performance, and so more accurate and reliable performance of functions which require detailed image analysis, such as detection of driver distraction. The AEC-Q102 qualified products produce a centroid wavelength of 940nm with a maximum pulsed forward current of 5.0A. The new products share the same package and board footprint as the rest of the Oslon Black family, making it easy for customers to migrate designs from LEDs with a circular beam to the new products.

Rear Occupant Alert is Standard in Hyundai

INTERIOR NEWS



HYUNDAI IMAGE

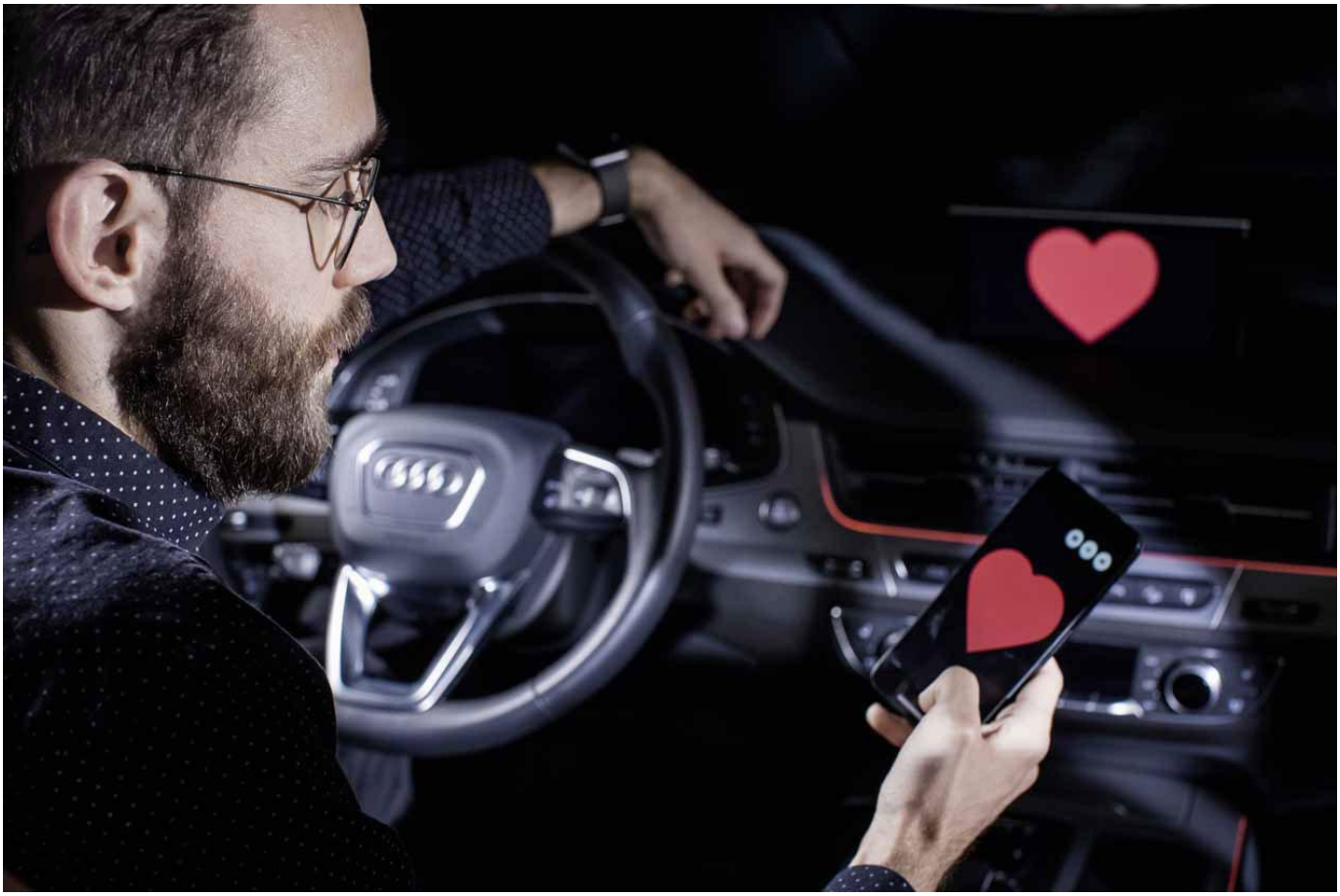
Hyundai has extended their voluntary commitment to install rear seat reminder systems in the majority of the company's vehicle portfolio. Most models in Europe—even Hyundai's entry-segment i20 vehicle—come equipped with a rear occupant alert (ROA) as standard, a technology which reminds the vehicle's driver to check the rear seat area to ensure a child or pet isn't left inside the car once parked to prevent left-behind helpless creatures perishing from heat or cold.

A more advanced, ultrasonic ROA is available as an option on several Hyundai models, and is standard fitment on premium vehicles such as the Santa Fe PHEV and HEV models.

Hyundai's global chief safety officer Brian Latouf says his company is "committed to providing leading-edge safety technologies for our customers, passengers and for other road users. With Hyundai's standard safety technology offerings, Hyundai is helping our customers avoid crashes and minimize the likelihood of fatalities and injuries on the road. These safety accomplishments are another proof point of Hyundai's leadership in the automotive industry".

Springer Research: the Car Becomes a Health Manager

INTERIOR NEWS



AUDI IMAGE

Soon, a passenger car will notice how the driver is feeling. The vehicle will measure the driver's heart rate, breathing rhythm and blood sugar level. If he is stressed, the car will start the massage function and adjust the interior lighting, sounds and smells to help the driver relax. Finally, the car has data from other devices such as wearables and accesses services in the smart home. This allows it to get a picture of the driver's vital signs.

In this context, the topic of 'in-car wellbeing' or 'automotive health' provides plenty of scope for innovations and transformations for mobility. The time we regularly spend in the car can be usefully employed for continuous health monitoring. The car is becoming a kind of health center that collects data via sensors and passes it on to the cloud.

The prerequisite for this is the connected car. Algorithms use the data to calculate tips for improving the wellbeing of the occupants. A key feature of automotive health is the identification or early detection of diseases in the occupants of an automobile. The empirical study presented in Springer Essential showed that automotive health is of interest to customers: 37 per cent of the subjects would use health applications in the car if they were available, and 44 per cent weren't sure and said they might.

In the meantime, health applications are moving along a "continuum between protection of human life, diagnostics and health monitoring, health promotion and prevention, and mental promotion and improvement," as the Springer authors further explain in the chapter “Overview of Automotive Health”. “Automotive Health harbors great potentials of disruption of two industries by digitalization, healthcare and automobility," the authors said.

The Springer authors are convinced of the potential of automotive health. "It would be a mistake for the automotive industry to ignore these opportunities in terms of customer acceptance and market size, because customer benefit will be the deciding factor. The demand for 'extras' of this type will open up a significant market segment with the aging population and the new technical possibilities that are currently being developed."

Volvo EX90 Revealed

INTERIOR NEWS

VOLVO IMAGES

The seven-seat premium electric EX90 SUV is the first model of Volvo's new, all-electric vehicle generation. It is the first vehicle based on Volvo's new SPA II technology and software architecture. This new top model is scheduled to enter production next year, initially in the USA and later also in China. The market launch of the SUV is planned for the end of next year.

The EX90 is designed to learn constantly and gradually better accommodate both the driver and the vehicle environment. Regular updates will make the EX90 safer and protect the occupants and other road users from danger.

A combination of cameras, radar, lidar, and high-performance computers running Volvo's own software create a 360-degree real-time view of the car's surroundings. The lidar sensor, integrated into the roofline, keeps an eye on the road ahead even at high speeds and in all light conditions. Potentially dangerous objects should be able to be detected hundreds of meters in advance, according to Volvo. A Pilot Assist helps with lane changes, and the EX90 stops automatically if driver does not respond to warnings.

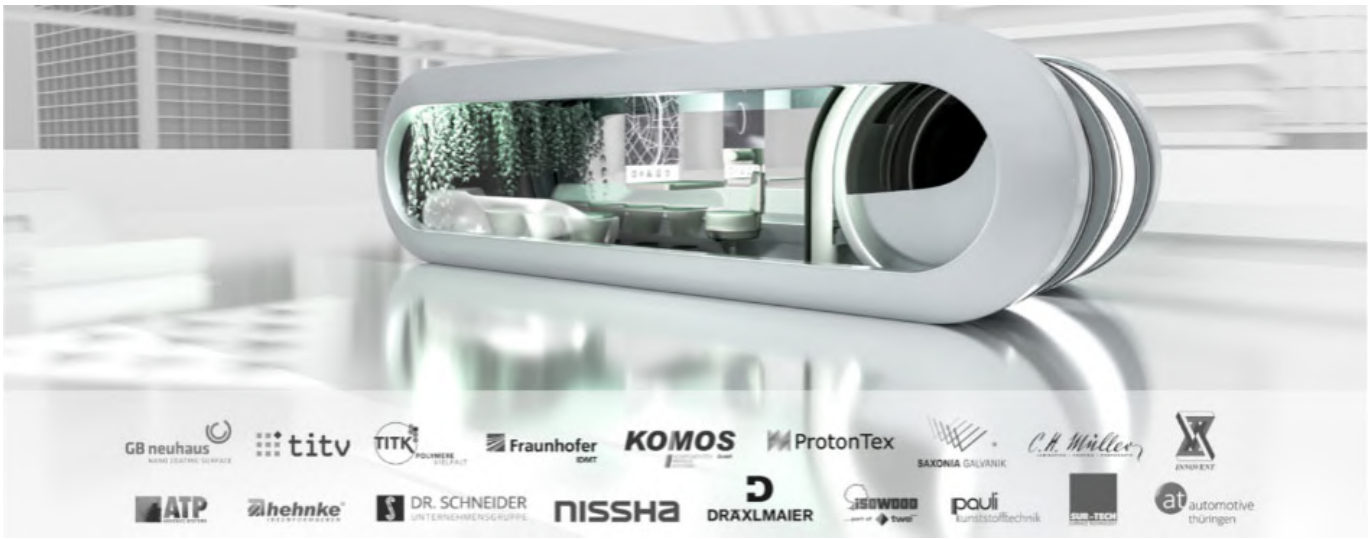
In the interior, a DMS is used for the first time: special sensors and cameras using specially developed algorithms detect when the driver is inattentive. If he fails to respond to increasingly insistent warnings, the EX90 automatically pulls over to the side of the road and makes an emergency call.

This rolling computer of a car features photorealistic real-time graphics on the screens and head-up display. The functions are controlled via a centrally placed 14.5” touchscreen. Its Android Automotive operating system integrates various Google services such as the Google Maps navigation service and the Google Assistant voice assistant. Customers can also download additional apps via the Play Store. The vehicle's standard 5G internet connection is designed to ensure mobile data access. It not only forms the basis for app use and intuitive real-time navigation, but is also used for music streaming. Volvo has installed a Bowers & Wilkins audio system and integrated speakers in the headrests.

The Design Lounge

IZZI, Interior concept for future mobility

THE DESIGN LOUNGE



IZZI IMAGE

The Interior Cluster IZZI is a consortium of 18 industry partners and research institutes in Germany working together on R&D projects to develop future interior solutions. With trend analysis, workshops and networking formats, the cluster creates a framework for collaboration along the value chain.

The CONO was presented for the first time by the Interior Cluster IZZI at Auto Expo 2022 in Stuttgart.

CONO deals with the usability of the path. The concept comprises a passenger compartment and two individual one-seater vehicles. For intra-urban rides, the tiny vehicles can be encapsulated and moved independently of each other. The study thus combines the idea of micromobility with that of a multifunctional mobile space.

CONO integrates a wide range of interior solutions and innovations from the cluster partners. Sustainable materials, smart surfaces and innovative functions show the diversity of skills in the cluster. It includes functionalization of materials and surfaces; increased use of sustainable materials; interior and occupant sensing, and ambient light.

Natural as well as recycled materials are used without losing the charm of the futuristic design and color mood. It is based on composite materials made from natural fibers and duromer, bio-based matrices with high mechanical properties and good long-term durability. Besides the sustainability of the material selection, the focus is on a modular principle. This means that individual cushions can be easily replaced and included in the recycling process.

Showcar SMNR-Mercedes Presents Virtual Study for Gamers

THE DESIGN LOUNGE

VIRTUAL MERCEDES STUDY (MERCEDES-BENZ IMAGE)

Virtual vehicle studies have been popular with car manufacturers for many years. However, Mercedes-Benz has so far gone the furthest from the limitations of the physical world with their latest design.

SMNR (pronounced "Summoner") is a virtual machine designed by Mercedes in partnership with Riot Games, the developer of the game League of Legends. It's not just racing games for computers and video consoles that are of interest to car manufacturers. With the SMNR study, Mercedes-Benz now wants to score points with fantasy action fans as well. The coupé, which has now been presented purely virtually at the "League of Legends" World Championships in San Francisco, has been designed completely free of production constraints.

Organic shapes, a transparent shell and a luminous interior create a futuristic look. The free-standing wheels and the passenger cell are made of so-called 'energy fields' that also contribute to the futuristic look. The particles, which glow bio-luminescent like a deep-sea fish, are supposed to represent the video players and their avatars.

_Faraday Future

THE DESIGN LOUNGE

COFFEE CORNER
DVN
Interior

Faraday Future's 'Futurist Product Officer' has recently presented (besides his new job title) a new trend he's starting: the ‘co-creative relationship between car and driver’ is where the client becomes part of the user ecosystem. "The ultimate user experience is when you shape the product yourself; co-create with the new faraday app, is experiencing the car better and more", he said.

What is fascinating about the approach is the suspension of any disbelief and the captivating thought that there might be a whole lot of growth and purchase intent just in between the contradictions at the current state of mobility: car vs system; electric vs sustainable; analog driving vs autonomous, etc. On a relentless chase of new opportunities, Faraday Future attempts to challenge the relationship to cars, capturing a new wave of change.

A car on the road, a B-segment sedan for instance, has about 10,500 parts which, flawlessly assembled, aim to give a very specific sense of driving—a feeling of safety, a perception of quality, precision and comfort, and a sense of accomplishment after all for the purchaser. Notions that can only be described all together in one car interior, and have been perceived, developed and acquired along a hundred years. It might be that Faraday Future is now putting them forward as the fundamental constituents in order to orchestrate, plan and produce automotive experiences, to surprise and delight the participants, each one at a time.

Often, the ordinary use of a car is not enough to experience the entire panorama of such a complex chef-d'oeuvre in all its aspects. The new app arrives to emphasize and augment this trait of additional ‘hidden’ value everywhere in the entire vehicle. Like many real time mirrors on any single one aspect of the car, the app, intents to involve participants into an observing and learning process set by brand’s values. The looks, the sounds, the reads, the feels and the acts of your car as a true representation of your priorities. A somewhat instructive yet enlightening tool aiming on road drives or static discoveries. The goal is for every single person to feel that the car was tailored specifically for him or her. Meanwhile the brand is establishing awareness in key emerging markets, creating an overall immersive and memorable experience. Something between simulation and real life. Faraday Future co creative community believes that anything on a car can be communicated; you now can see cars as the social media of a new era.

With each being responsible for creating purpose or meaning in own cars, Faraday Future app brings computational theory one step closer to existentialism.

News Mobility

AV Research Consortium for Light-Based Communication

NEWS MOBILITY

HELLA IMAGE

Self-driving cars should communicate safely and clearly with pedestrians and other road users. Industry and researchers are now investigating the use of lighting technology in a joint project.

Until now, drivers have often communicated with pedestrians and cyclists via eye contact or gestures. That usually works without any problems. But how does communication take place in an autonomous vehicle when there is no longer a driver behind the wheel?

The main focus is on the question of how communication between an automated vehicle and other road users can be ensured with the help of automotive lighting technology. In addition to Hella, the Karlsruhe Institute of Technology, the Fraunhofer Institute of Optronics, System Technologies and Image Exploitation, the Würzburg Institute of Transportation Sciences, Saarland University and the companies Electric-Special Photronic Systeme and Version1 are involved in the "INITIATIVE" project.

Among other things, the participants are investigating how an automated vehicle can use light-based systems to signal that it has detected a pedestrian or cyclist and that they can safely change sides of the road.

For example, the use of LED-based status indicators or displays on the vehicle body is conceivable. Hella's development boss Michael Kleinkes says "The main difficulty is that the form of communication must be visible at all times of the day and night and easily and quickly understood by every road user". Such a uniform communication methodology does not currently exist, he said, but "it is a basic prerequisite for automated driving to become a reality at all".

In addition, the project will investigate how a camera-based artificial intelligence can be used to detect the intentions of the people involved both inside the vehicle and in the traffic area, and how these intentions can be considered in communication.

The research project has a duration of three years and was started in April 2021.

Ford, VW End Argo AI JV—Now What?

NEWS MOBILITY

FORD IMAGE

Ford and Volkswagen have announced they are shutting down their joint venture, Argo AI, whose mission was to develop fully automated vehicles. Ford posted a third-quarter loss they largely blame on newly revealed plans to shut down Argo AI, a self-driving vehicle development company they had invested in.

CEO Jim Farley said Ford now believes mass deployment of fully self-driving vehicles is "a long way off"; CFO John Lawler says it could be "five-plus years away". Ford originally had planned to begin commercializing L^4 vehicles in 2021 before pushing back that timeline due to the coronavirus pandemic, and probably many technical issues still to be solved.

Farley said Ford is "optimistic about a future for L^4 [AV's], but profitable, fully autonomous vehicles at scale are a long way off and we won't necessarily have to create that technology ourselves".

Doug Field, Ford's chief advanced product development and technology officer, said developing fully autonomous vehicles is the most difficult challenge now facing the industry. "It's harder than putting a man on the moon," he said. For now, Ford would rather collect monthly ADAS subscription fees from millions of customers than wait years or decades for an urban robotaxi service to begin generating profits.

Is there a business model for fully autonomous vehicles, then? Probably yes for mobility operators, but probably not for private owners. Therefore, the mass market will continue to prioritize ADAS over AVs—L^2 to L^3 systems wherein a driver-facing camera monitors the human driver to make sure they are keeping eyes on the road.

Argo AI was co-founded in late 2016 by Brian Salesky, who previously helped start the Google self-driving car project that became Waymo, and Peter Rander, who had worked on Uber Technologies' autonomous-vehicle operations.

General News

Stellantis Buys Aimotive

GENERAL NEWS

AIMOTIVE IMAGE

Stellantis has agreed to buy Aimotive, a startup developer of advanced artificial intelligence and autonomous driving software. This acquisition enhances Stellantis' AI and AD core technology, expands their global talent pool, and boosts the mid-term development of the all-new STLA AutoDrive platform.

Aimotive's technology product portfolio is focused on four key areas within artificial intelligence and autonomous driving:
• aiDrive: Embedded software stack for autonomous driving
• aiData: Artificial intelligence operations and data tooling
• aiWare: Expertise and intellectual property for silicon microchips
• aiSim: Software simulation for development of autonomous driving

Stellantis' software teams are already developing the three new technology platforms—STLA Brain, STLA SmartCockpit, STLA AutoDrive—to be deployed at scale across the four new STLA vehicle platforms (STLA Small, STLA Medium, STLA Large, STLA Frame), starting in 2024. The software strategy, as announced during Stellantis' Software Day in December 2021, is expected to generate approximately €20bn in incremental annual revenues by the end of the decade, as part of the Dare Forward 2030 strategic plan bold objectives, backed by more than a €30bn investment in electrification and software.

Aimotive is based in Budapest, Hungary, with over 200 employees worldwide, including engineers with advanced AI and AD expertise. Now, according to the agreement, they will operate as a subsidiary of Stellantis, maintaining their operational independence and startup culture. Founder László Kishonti will remain as CEO, and they will carry on selling three areas of their current technology product portfolio.

Stellantis will establish a board of directors to oversee Aimotive while preserving the startup mindset of rapid innovation.

Ampere is New Renault Brand for Electromobility

GENERAL NEWS

RENAULT ALPINE A110

In addition to their planned partnership with Google, the Renault Group has announced the next stage of their electric strategy: After the first two 'Renaulution' phases—Resurrection and Renovation—now comes the Revolution stage.

Under the Ampere brand, all-electric passenger cars are to be developed, produced and sold using software-defined vehicle technology. According to Renault CEO Luca de Meo's plans, Ampere is to become "a fully-fledged OEM with around 10,000 employees." Half of the 3,500 engineers will specialize in software, he said.

By 2030, the Ampere brand will include six electric models: the Renault 5 Electric and Renault 4 Electric, the Megane E-Tech Electric, the Scenic Electric and two more models to be revealed later.

Ampere is to produce around one million electric vehicles for the Renault brand in 2031, according to the plan. Renault is relying on its "ElectriCity" production network in Douai, northern France and its battery partners to provide a total of 80 gigawatt hours by 2030, it said.

In addition to the Ampere plans, the company also announced further details on its strategy: Renault's Alpine sports car brand, for example, is to offer only electric cars from 2026. Currently, the brand has only announced an e-car study with the Alpine A110 E-ternité.