DVN-I
Automotive Interior

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Editorial

"Passenging" Pulls For New Technology

IMAGE: DREAMSTIME

Car makers are aggressively rebranding themselves as "mobility providers" while paradoxically, motoring media are focused more than ever on a thrill-of-driving approach, celebrating the fastest and most expressive sports cars.

The car manufacturers and their whole value chain of suppliers are making a paradigm shift to the user experience, while media are still hyperfocused on the extreme driving element of this experience! There's a realistic balance somewhere in between, where passengers are willing to get a driving experience which has to be far above what you get in any public transportation system, whatever it is a train, a plane or a boat.

The CASE megatrends are progressively transforming the driving experience into a "passenging" experience, and that's where interior and driving assistance technology are of increasing importance. That's where car interiors are becoming a new product differentiator, allowing occupants to have a complete new set of activities—relaxing,

working, phoning, reading, watching movies… the car becomes a mobile lounge, thanks to a wide range of new technologies.

Functional surfaces, interior air quality, interior materials, safety, HMI, displays, interior lighting, seating, and electronics are among the relevant topics to be addressed at the inaugural DVN-I Smart Interior Conference and Expo to be held online this coming 24 September, providing an ideal opportunity to go deeper into these topics. Sign up here, see the docket here, and find a video teaser here. We hope you will find this newsletter interesting, informative and useful. Have you not yet subscribed? Here's your link

Sincerely yours,

Philippe Aumont
General Editor, DVN-Interior

In Depth Interior Technology

IAQ Tech Continues Evolving

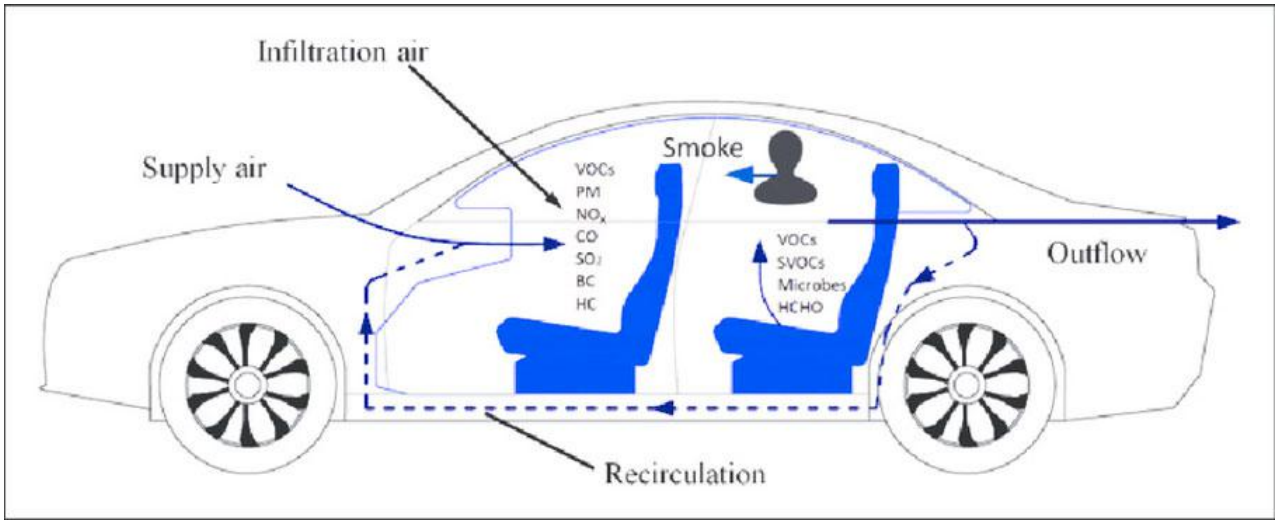


IMAGE: BIN XU

Interior air quality management continues to grow increasingly relevant in the automotive world, and growing consumer demand suggests IAQ is becoming a new area for innovation, and probably regulations.

As presented in DVN Interior on 27 March, road transport emissions are a major source of urban air pollution, with nitrogen oxides (NOx) and particulate matter (PM) coming from vehicle exhausts, plus non-exhaust emissions such as brake dust, tire dust, and road dust. Ever-smarter technology means ventilation options, efficacy and type of cabin filtering technology, time of day and route selection, and individual exposure in the interior can be monitored.

Corpus of Understanding Progresses

There's still a public misperception that once you go inside and close the door, you're protected from the exterior air pollution. That's not so, and researchers and data are confirming the importance of IAQ management, reinforced by degradation of exterior quality.

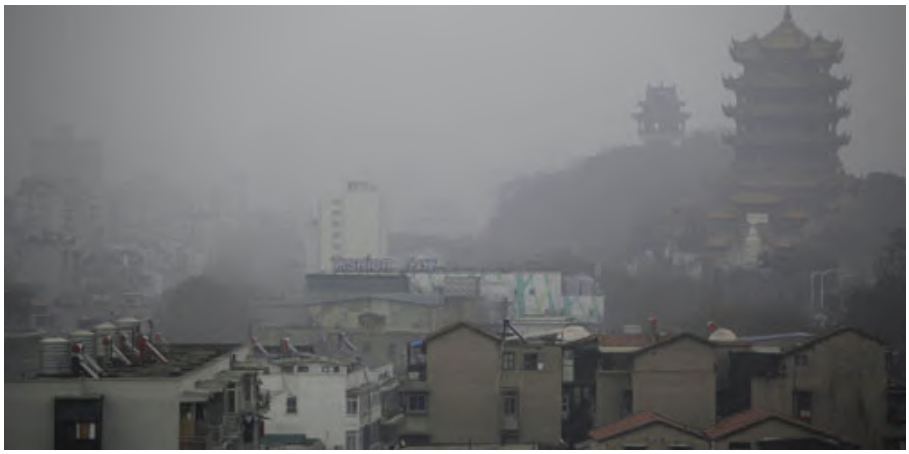
According to Emissions Analytics, the worst filtration systems are 60% effective and the best are 99%, but even at these levels of efficiency in-cabin pollutant concentrations can be anywhere between 80% lower and four times higher than at the roadside. And it's not necessarily correlated with vehicle price.

A study carried out by Airlabs, which develops tools to measure, map and mitigate air pollution, showed vehicles driving in central London during working hours were averaging a 72 µg/m^3 concentration of NO_2 within the cabin—almost twice the 40 µg/m^3 World Health Organization guideline, and 70% higher than at the roadside.

As published recently in Atmospheric Environment Journal, scientists at the University of Birmingham have found that if vehicle ventilation is set correctly, drivers and passengers are exposed to up to 49% less PM2.5 and 34% less nitrogen dioxide (NO_2) than the on-road levels. The lowest exposure to particles and gases is when the windows are closed with recirculation and air conditioning switched on, though of course recirculation means the air will grow stale.

NAQTS (National Air Quality Testing Services in the UK) says the company's tests show 80% of fine particle emissions can be kept out by switching air-conditioning to recirculation mode. But this comes with a downside; CO_2 concentrations from occupants' exhalations can quickly reach 1,000 ppm—more than double the background level. This can affect cognitive functions—decision-making and concentration—and in the context of driving a car, that becomes very important. With two people in a car for 30 minutes with recirculation mode on, you would typically see concentrations getting to above 5,000 ppm, so more than 10 times background levels.

China considers IAQ regulation



POLLUTED AIR IN WUHAN, CHINA

Right now, there's no legal requirement to pass incoming air through any form of filter. But China is considering mandatory in-car air quality regulations to protect the health of occupants, in a move that could put its industry ahead of the world competition. New vehicles will be required to clear an in-car environment test after their doors have been shut for hours, most likely measuring level of contaminants including formaldehyde and benzene. New in-car air quality rules in the world's biggest auto market will also push auto interior parts suppliers to develop new products to meet these new requirements.

In 2011, China's environment and quality watchdogs published a guideline for passenger vehicles in-air quality but stated the standards were just recommended and not compulsory.

In 2019, it accelerated an independently designed strict emissions standard for gasoline cars after using European-like emissions rules for years, leading to a technology acceleration. The same effect is expected if China regulates IAQ, Global automakers and suppliers will need the technology to sell in China, and then to the world.

In the same logic of occupant health, officials there also want to test electromagnetic radiation levels as electric vehicles and combustion-engine cars use more electronic devices.

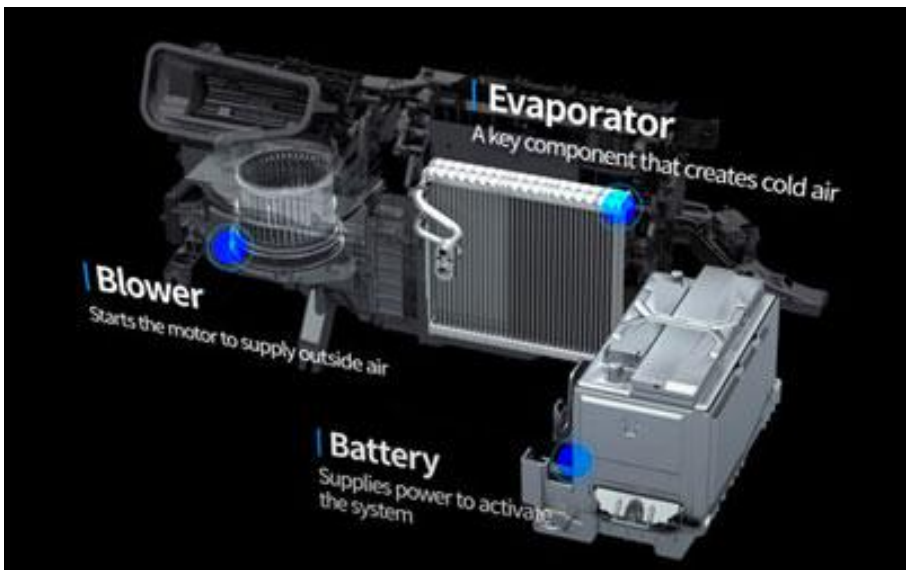
Volatile Organic Compounds (VOC)

Interior components and materials release VOCs that affect IAQ. Rubber, leather (surface coatings), vinyl, and urethane-based foams are examples of some materials that outgas and negatively affect IAQ.

Ford, with Lear, uses soybean-based bio-foam for the seat cushions of all vehicles sold in North America for almost a decade now, claiming a 67% reduction in VOC emissions versus petroleum-based foam. They also recently patented a system that would enable autonomous vehicles to find warm environments and open their windows to vent VOCs if detected levels inside the car are too high.

VOCs have a smell, and odor specification is mostly driven by Chinese consumers, who definitely do *not* go for what some Western markets favorably perceive as "that new-car smell". China is also the dominant country with legislative restrictions for interior VOCs. Decreasing the VOC levels in a vehicle interior results in not just a healthier experience for the driver and passengers, but also a more pleasant one.

New Developments: Hyundai Motor Group



Hyundai Motor has developed an "After-Blow" system as well as other new IAQ management strategies they're calling Multi-Air Mode and Fine Dust Indicator. These will initially be introduced on selected models in Korea and then expanded to upcoming Kia, Hyundai and Genesis platforms worldwide. The automaker has put up a **video** describing the new systems.

The After-Blow system dries the condensate on the AC system evaporator, which the company says suppresses mold growth in the air-conditioning system and prevents development of damp odors in humid climates. After a vehicle's engine is turned off and the condensate on the evaporator drains naturally for around 30 minutes, the system activates for 10 minutes to dry the evaporator and any condensate left over in the air passages. The air-conditioning system automatically allows influx of outside air during this time to prevent humidity building up.

The system uses an intelligent battery sensor (IBS) to monitor the battery and stops the system when the battery is low, soothing any concerns about battery discharge. It also deactivates when the air-conditioning system is not in

use for a certain length of time, or when the outside temperature is low.

The Multi-Air Mode uses multiple vents for air-conditioning and heating to regulate airflow around the cabin. Hyundai says that when this system is activated, air is dispersed to multiple slots in the driver's and passenger seats in addition to the normal air vents. The result, it says, is that overall wind volume remains the same, but the dispersion of the air currents reduces direct air contact with the occupants.

And the Fine Dust Indicator system measures air quality inside the vehicle in real time and delivers this information to the driver. An indicator displays the concentration and pollution level of ultrafine particles (PM2.5) inside the vehicle using integer numbers and colors, which the company says provides better visibility to the user: blue for 0-15 $\mu g/m^3$, green for 16-35 $\mu g/m^3$, orange for 36-75 $\mu g/m^3$ and red for 76 $\mu g/m^3$ or higher.

If the level of ultrafine particles exceeds 36 $\mu g/m^3$ while the function is active, an air-cleaning mode will run automatically to purify the air in the vehicle.

Existing systems

Volvo introduced a multifilter system in 2014, claiming a 70% efficiency rate and intakes that close automatically when outside air quality is poor.

TESLA LAUNCH OF ITS HEPA AIR FILTRATION WITH BIOWEAPON DEFENSE MODE AS AN AFTERMARKET FOR MODEL S AND X

Tesla equips its largest models with a large HEPA filter, which it says can almost eradicate even the highest concentrations of ultra-fine particles from incoming air

New Development: Tata, BreezoMeter In-Cabin Air Quality

Tata Motors, together with Tata Motors European Technical Centre (TMETC) and Tata Elksi (Computer software company) have joined forces with air quality data specialist BreezoMeter, based in Haifa, Israel, to provide in-cabin pollution management. Tata Motors is India's largest automaker, offering an extensive range of integrated, smart and e-mobility solutions. TMETC, meanwhile, is a subsidiary of Tata Motors, launched in 2005 as a UK-based center of excellence for automotive design and engineering.

The move will further enhance the goal of all organizations to help strengthen the future of in-cabin air quality and management.

The goal will be to allow drivers to see real-time information about air quality in their vicinity on dashboard, enabling them to make better health decisions based on the air pollution levels and individual sensitivities. Alerts will make the driver aware when they enter an area with poor air quality.

BreezoMeter is the first location-specific, real-time global air pollution, pollen and active fires data provider, and provides an air quality map that highlights the best, and worst, parts of any city, helping drivers plan the most non-polluted route. It can also be used to automatically activate the windows, sunroof, A/C and filtration systems to keep the vehicle clear of pollutants. BreezoMeter is accurate to 5 m, is updated hourly, has global coverage and provides a four-day forecast.

Studies reveal that average drivers spend around three years of their life on the road in a setting where both vehicle and passengers are regularly exposed to environmental hazards. A recent increase in awareness concerning personal health and car safety, during a time of heightened environmental challenges, requires smarter and safer cabins.

The Tata Group provides tech-enabled innovative products to anticipate and provide vehicles and connected mobility solutions for global customers. It is with this mission in mind that the company joined BreezoMeter.

Interior News

Pininfarina Battista EV Hypercar Sound Design with Naim

INTERIOR NEWS

Automobili Pininfarina has a new partnership with Naim Audio, the British hi-fi manufacturer, to create a new level of sonic experiences to prospective owners of the most powerful Italian sports car of all time. News of the partnership was revealed as Automobili Pininfarina prepared a small batch of prototype Battista hypercars for the final stages of a rigorous test program earlier this month.

Every Battista will be hand-crafted by Pininfarina in Cambiano near Turin, Italy, with deliveries to clients worldwide beginning early in 2021. No more than 150 of them will be created, each specified with a bespoke in-car sound system by the award-winning Naim Audio.

The Battista is a hyper-fast (400km/h, 0-100 km/h in 1.9s) fully electric vehicle. Pininfarina and Naim Engineers took the opportunity to create a real new sound experience, which fits with the design of the car and its EV specific characteristics. The newly developed audio system delivers 1.3 kilowatts(!) of sonic power through 10 speakers arranged inside the cabin, featuring a Dual Voice Coil Subwoofer located between driver and passenger seats, with super-tweeters amplifying higher frequencies situated behind the seats and in the panels of the Battista's butterfly doors.

Naim Audio has drawn on the expertise of its fellow French VerVent Audio brand Focal to optimize all speakers for their unique environment, while Naim Audio masters have tuned the hypercar's amplification and built-in Digital Signal Processing (DSP) system to deliver exceptional in-car audio, with a truly immersive listening experience. Tuning is optimized for both driver and passenger: a symmetrical speaker layout creates an auditorium-like studio effect, with a realism and ambience that will make it seem as if musicians are playing right there inside the car.

FlexEnable OLCD Technology for Curved Displays

INTERIOR NEWS

FlexEnable, based in Cambridge, England, has a new glass-free OLCD (organic liquid crystal display) technology to address the need for conformed and shaped displays inside cars. It delivers high-brightness, long lifetime flexible displays that are low cost and scalable to large areas, while also being thin, lightweight and shatterproof.

Most cars today feature glass displays and they are often the only flat surface in the entire vehicle. More and bigger displays mean a need for them to be curved to conform to the contours of the interior. These curved displays will have a function that is more important than just bringing design aesthetic. They will play an important role in improving the user safety and experience too.

For example, for safety, a curved display on the A-pillar of the car can show the driver what is behind the pillar when combined with external cameras and sensors.

For user experience, HMI has always been driver-centric, and as we gradually transition to more and more vehicle autonomy, we are likely to see the HMI spread out, with a more democratized control of the vehicle across multiple occupants. It will help create smart surfaces around each occupant. This creates as well an opportunity to provide customizable and downloadable elements of HMI. In the future, shared mobility vehicles can be configured and

personalized - each passenger will be able to feel like they are using their own vehicle, in the same way people can select their mobile device screen background.

It will also allow car designers to design the cockpit of the car without constraints and deliver automotive HMIs of the future. Non-flat and non-rectangular displays present both new system design challenges and opportunities.

Covestro's Material Portfolio for Tomorrow's Interiors

INTERIOR NEWS

Within the context of new mobility solutions, with new architecture, always connected, and compliant with weight and environment specifications, a new range of materials is needed in car interiors. That's what material suppliers are developing, such as Covestro, with high-end materials such as polycarbonates composites and polyurethanes; coatings, adhesives and specialty films; and 3D-printable materials.

Covestro's concept car interior shows off the maker's abilities: it's got polycarbonates and carbon-reinforced composites, compact polyurethane foam claddings on the seat surfaces, and Insqin®, waterborne polyurethane synthetic materials designed especially for shared mobility. It's very robust, with a premium feel, and it can be illuminated with LEDs from its underside to create different mood experiences.

Polycarbonate allows to create complex curves and geometries not possible with conventional materials such as glass.

The concept interior integrated display and projection areas to allow individuals to adapt the experience for flexible infotainment and communication on PC films.

The privacy dome seen on the concept adapts to individual passenger requirements and creates a personalized experience. The privacy dome also demonstrates the advantages of polyurethane foam for acoustic management in an electric car.

The floor integrates illuminated marble, built on material combinations with a digital-print surface film, and opportunity to use any natural material, such as marble, granite and other stones.

Low mass is also a key criterion for material selection. Covestro uses 3D-printed polycarbonates to create lightweight dashboard structures. The table is made of carbon-fiber reinforced Maezio®, to achieve its ultra-slim, ultra-light and super-stiff structure.

Covestro will be presenting at the upcoming online DVN Interior Conference & Expo on 24 September.

Škoda Enyaq's Roomy Interior

INTERIOR NEWS

Škoda will be the first Volkswagen Group brand to unveil a battery-powered SUV—the Enyaq—based on the automaker's modular e-drive (MEB) platform.

The Enyaq is to be shown on 1 September in Prague, three weeks ahead of the presentation of VW's ID4 SUV. Škoda will start production of the SUV later this year at their plant in Mlada Bolesav, Czechia, and they're planning a market launch at the beginning of 2021. Production of the ID4 will also begin this year at VW's Zwickau plant in Germany.

The cabin of Enyaq has been designed to reflect modern living environments. The dashboard is dominated by a large 13" display, which controls many of the vehicle's functions. There's another display for the driver's instrument cluster, positioned left of the main screen.

The Enyaq iV benefits from the MEB platform's long wheelbase, which—in relation to the body dimensions—offers an exceptionally spacious interior. Because of no tunnel, the flat floor opens the cabin, and designers have created a feeling of open space.

Škoda will introduce a range of seat materials to offer buyers new options. Some of the trims use sustainable materials; one of them, for example, relies on seats made of 40 percent new wool and bear the Woolmark Company's seal, while the remaining portion is polyester from recycled PET bottles.

JLR's "Feel Good Score" to Cut Carsickness

INTERIOR NEWS

Motion sickness is a difficulty that autonomous driving will face. It usually takes place when passengers look inside the vehicle and thus see a fixed environment, while their bodies feel movement. Reading or interacting with a smartphone, for example, while riding in a car can cause motion sickness. Nevertheless, it is important that passengers in an autonomous car can go about their business without worrying about the road. Automated driving should therefore be careful not to worsen this sensation for those subject to it, or even, if possible, to reduce its intensity. Jaguar Land Rover is working on it.

JLR first established a "feel-good score" to assess the level of motion sickness that a given drive might or might not cause, using biometric sensors that record physiological signals. This score had already been used by JLR, in particular to adapt the interiors of their cars to minimize the risk of motion sickness.

Engineers then assessed the feel-good score over 32,000 km of real and virtually simulated driving. Through a machine learning process, the system would allow an autonomous car to adapt its driving based on the data collected.

The technology can be used to teach each Jaguar and Land Rover vehicle to steer independently, while retaining the unique characteristics of each model.

As with all other cars and in order to control body movements in three dimensions, autonomous cars will also have to present an effective suspension and damping system to ensure a good level of comfort while limiting motion sickness. On this point, Jaguar Land Rover highlights their Adaptive Dynamics system which adjusts the continuously controlled suspensions to control roll and pitch.

IMSE – Injection Molded Structural Electronics with Lighting

INTERIOR NEWS

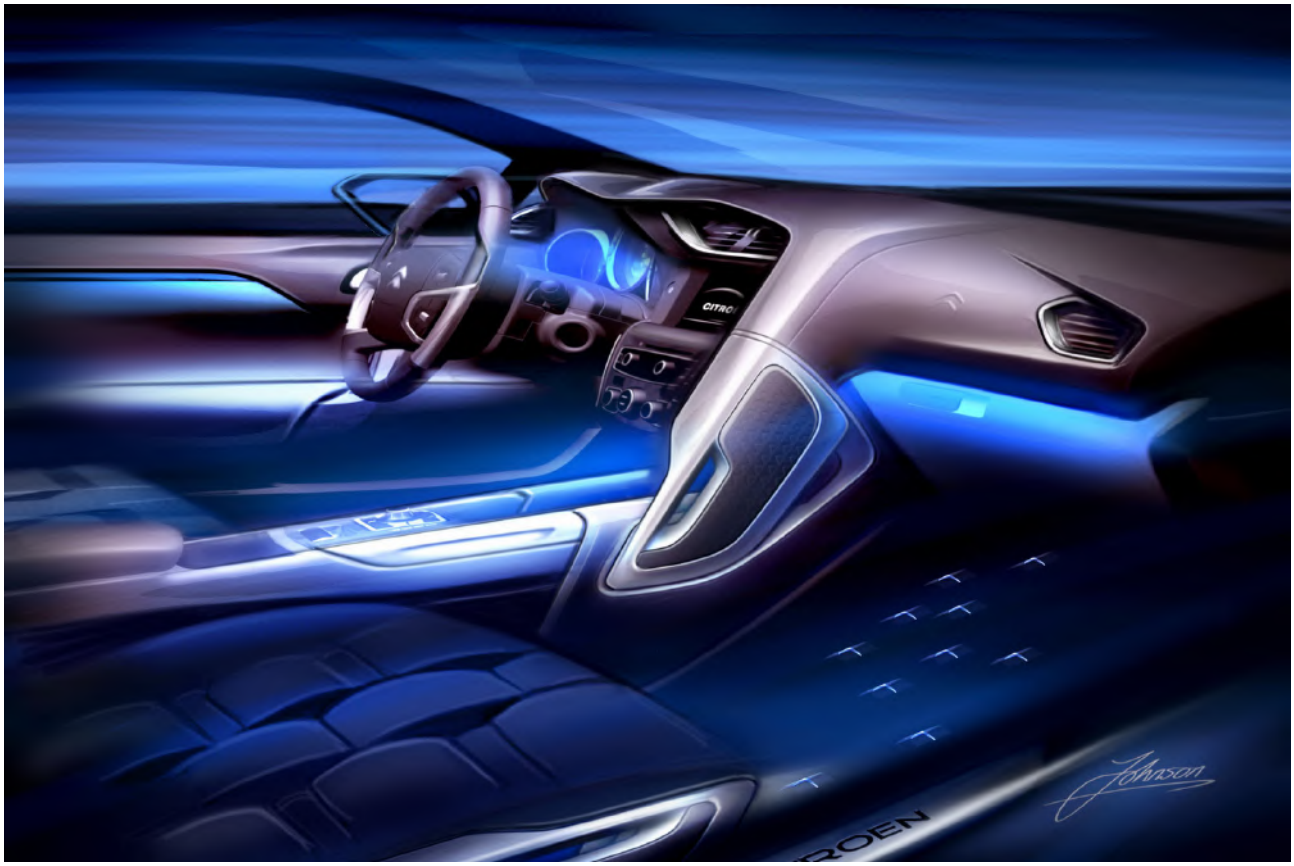


IMAGE: TACTOTEK

IMSE integrates printed circuitry and discrete electronic components inside plastics with a seamless structure and high design freedom.

ELECTRONIC FUNCTIONS WITH AMBIENT LIGHTING IN 3D OVERHEAD CONSOLE (IMAGE: TACTOTEK)

The core business of TactoTek, headquartered in Oulu, Finland, is design & manufacturing of 3D smart in-mold electronics. The pictured overhead console is a single-part construction with one electromechanical interface with electronic and lighting functions in 3D contours.

DESIGN AND FUNCTIONAL VARIANTS ARE EASILY CREATED BY CHANGING THE SURFACE MATERIAL (IMAGE: TACTOTEK)

With a single toolset design and functional variants can be created by changing the surface material or printing. IMSE structures can also feature surface materials like wood and leather.

The IMSE technology turns plastic into smart surfaces by integrating flexible printed circuitry and electronic components like LEDs into 3D injection molded 1- or multifilm structures.

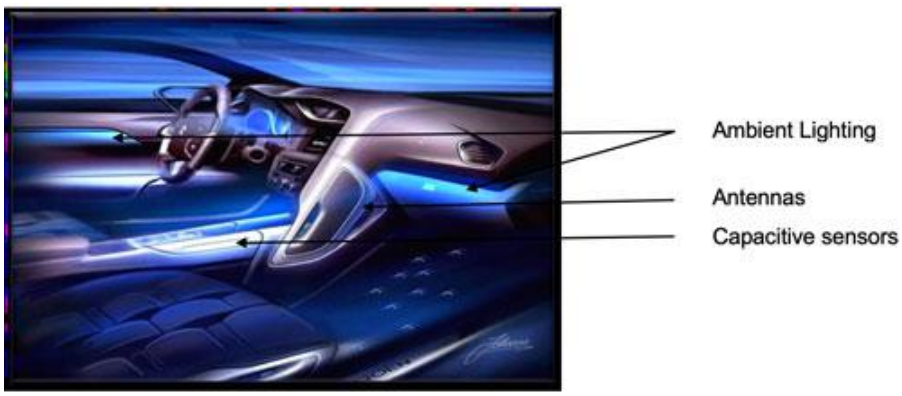
IMSE process:

1. Printing decoration, wiring, touch controls and antennas
2. Mounting components on flat film
3. Forming 3D shape with components
4. Injection molding final single, seamless part

IMSE part structure for A surface:

1. Decorative A Surface: IML film or natural materials
2. Surface electronics: conductive and dielectric inks, SMT electronics
3. Injection molding resin on bottom

With IMSE technology blocks can be built with touch and proximity sensors, small and large area illumination, Wi-Fi -, BT- or NFC connect and different surface materials and finishing.



IMSE IN CARS (IMAGE: TACTOTEK)

Lyriq: Cadillac's First Electric Crossover

INTERIOR NEWS

Cadillac, GM's luxury brand, will launch its first electric crossover, the Lyriq, to start sales in 2023. It will come behind GMC, which is getting the 2022 Hummer EV SUT, an electric pickup that goes into production in the fall of 2021, and which will be followed later by an SUV. The Lyriq concept was presented earlier this month, and gave some hints about what the production vehicle might look like.

The Lyriq is based on the crossover version of the platform known as BEV3. It's a five-seat, two-row midsize SUV, with batteries located in the floor, under the seats. The batteries are GM's own Ultium cells, co-developed with LG Chem to allow for vertical or horizontal stacking to enhance packaging options.

Inside is a 34"(!!), seamless curved LED screen stretching from one side of the dashboard to the other, a feature that will be coming to other future Cadillacs as well. There are still physical controls for those who don't want to rely only on touchscreen inputs. A large crystal rotary knob controls all screen functions.

The Lyriq's user interface screen has three sections, despite being a single piece of curved glass. The area farthest to the left has the controls for the lighting and heads-up display. A digital instrument cluster occupies the next area to the right, and then there's a wide infotainment display. The system can also show a single, unified image when the Caddilac is stopped or charging.

With no tunnel, the Lyriq's interior feels open and roomy. The center stack has two sets of drawers and the center console is a giant storage bin. Each door has burled wood trim that goes into a light pattern, and even the design of the speaker that ends to the armrest adds to the overall flow of the materials in the door. Rear passengers face screens mounted to the front seats, as well as a third screen in the center console with controls that are easy to reach while reclining in the massaging (!) seat.

The Lyriq crossover and the Celestiq sedan suggest more names to come ending in "iq".

News Mobility

_ Trajectories, our mobile signature

NEWS MOBILITY

IMAGE: BEN LAWSON_LONGBORDING

(a designer's look at our mobility-centric culture)

5. Urban invaders

Following the demographic paradox and the industrial miracle of the 19th Century, the automobile became the prodigy of 20th and the badge of every social and economic narrative. The complexity of mobile trajectories by the mid-1920s was such that a new phenomenon could be identified. The art of circulating was a term often interpreted by numbers in an attempt to measure and tame the unpredictable. Statistic representations described accumulated trajectories as flow of a thermodynamic type and regulations put in place accordingly with often experimental character. Changing the sense, speed, and in times frequency of accumulated trajectories, generated all types of kaleidoscopic patterns in roundabouts and crossroads.

The world was rolling on wheels of all types, sizes and diameters that were scanning, reproducing, sharpening and reinventing linear trajectories on any dedicated alley for four or two-wheelers. The trend for speed and faster lines naturally built up, multiplied and finally overtook other motorized trends. Top speed became this one magic digit that said all about the vehicle and its owner. Gradually "fast straight line" took over tortured urban or rural paths and thus planners optimized journeys at the name of speed until sometime later we could observe straight long avenues congested with slow cars.

After decades of mastering and domesticating the art of automobile and just before the 80's, new trajectory trends appeared. Was it because humans could not rely anymore at this diluted and congested, over the years, spatial expression of mobility and wanted to reinvent motion? Arguably so, at the peak of mechanized mobility led by cars, we witnessed and experienced the invasion of a mobility new wave. The moment that all bicycle traces looked alike, BMX appeared. A stripped-down two-wheeler with nothing special but its choreography, was conquering everyday wider urban envelopes. Moving in peculiar ways, enhancing jumps, reverses, wheelies on front or rear wheel, the

new urban invader was sketching exotic figures in the street stage. It became an object of desire bringing along something magic. Before too long, small-wheeled alien creatures landed on the urban territory, *(skate)* boards of all types claiming their part of new moves. A new urban tribe arise, highly determined to put beautiful traces on urban ground. Linear big sweep-slightly drifting *(longboard)*, fishtailing while accelerating *(wave)*, pivoting donuts *(skate)*, jumping and walking, while running *(blade)* variable mirror slaloming *(street)* etc. Literally, along these lines, multitudes of mobile objects are dancing next to car-congested roads. A new definition of 'freedom to move' was building up its legacy, escorted by its own surrounding graffiti art and music sounds. Accelerating, sliding, leaning, turning, breaking, colliding are built-in elements of our mobile self, while on shoes or on wheels.

Fragmented mobile trajectories were perceived as choreographic performances and the new urban phenomena were represented by *scratching* DJs improvising the speed of music rhythmed in breakdance moves.

_to be continued…

*INDUSTRIOUS*_____

BMW eDrive Zones Geofencing Technology in the UK

NEWS MOBILITY

BMW's new technology automates the process of switching to electric-only power when a BMW plug-in hybrid vehicle enters a defined area of a city. In the UK, it will initially cover the TfL Congestion Charge/ULEZ zone in London and the planned Clean Air Zone in Birmingham, due to be implemented in 2021. But it will be expanded in additional cities across the UK and Ireland in the future as required. And within Europe the technology will cover more than 80 cities.

The technology will make the most of BMW's plug-in hybrid model electric-only ranges of up to 54 miles. It also automatically ensures that the electric power is conserved for use during the part of the journey within the low emission zone, if the journey destination is entered into the vehicle's navigation system.

Drivers will be encouraged to make use of the functionality in future through BMW Points, receiving points for emission-free journeys as part of a loyalty program, which can be exchanged for rewards.

Said to be a UK-first among carmakers, it's included in every new BMW 3 Series, BMW 5 Series, BMW 7 Series and BMW X5 plug-in hybrid model, with additional compatible models launching in the future. It's also available via a free over-the-air. Sounds like a very clever system to use EV capability of a Hybrid vehicle when it's really needed! and to foster plug-in hybrid sales.

Michigan Explores Autonomous Vehicle Corridor

NEWS MOBILITY

Michigan's leaders intend to place connected and autonomous vehicles in the fast lane toward the future.

With an eye toward embracing industry R&D efforts, the state said Thursday it has embarked on efforts to sketch a corridor between Detroit and Ann Arbor (43 miles) with a dedicated infrastructure that can speed deployment and enables safer movement of these vehicles.

Cavnue, a subsidiary of Sidewalk Infrastructure Partners—itself a division of Alphabet, Google's parent company—will run the exploratory project along with Google subsidiary Sidewalk Labs, the company's urban digitalization platform.

Renderings of the project, which will explore the viability of building such a corridor, depict the creation of dedicated lanes reserved for connected and autonomous vehicles that are separated from human traffic by barriers that "ensure safety and efficiency," according to Cavnue.

There's no public timeline yet for determining when a decision would be made on whether to proceed with an actual project.

Roads tailor-made for autonomous vehicles, with extra attention paid to lane markings, a kind of platooning system, the creation of high-definition maps and ubiquitous connectivity would be the solution to have Level 5 vehicles embedded together with normal traffic.

The Design Lounge

The Design Lounge is on Summer Holiday, returning in two weeks.

General News

A Magna-Steyr Fisker Deal for EV SUVs?

GENERAL NEWS

Electric carmaker Fisker, which recently announced plans to go public through a merger with a "blank-check company", is saying they have a tentative deal for Canadian auto supplier Magna International to build the Fisker Ocean electric SUV.

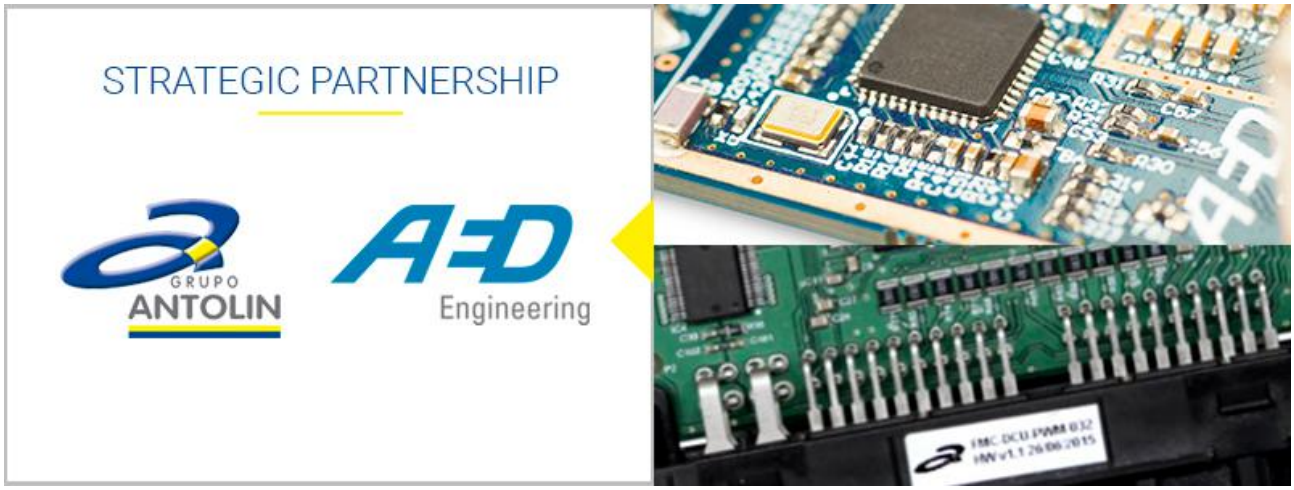
Henrik Fisker said in a statement that he expects to reach a definitive agreement in the next few months to have the Fisker Ocean in production at Magna Steyr's plant in Graz, Austria as early as the fourth quarter of 2022. A Magna spokesman confirmed the memorandum of understanding, but declined further comment.

Fisker added the companies are also evaluating manufacturing options for the United States and China.

Spartan Energy Acquisition, backed by alternative investment manager Apollo Global Management, announced a deal last month to take Fisker public through a merger that valued the EV startup at $2.9bn. The deal is expected to close in the fourth quarter.

Antolin, AED in Electronics Partnership

GENERAL NEWS



Smart Interiors need Electronics for functional surfaces, occupant monitoring, displays, and the like. Now Spain-based Grupo Antolin is moving in that direction; they've announced an agreement strengthening Antolin's new Electronic Systems Business Unit by dint of strategic partnership with integrated electronics provider AED Engineering. With this pact, Grupo Antolin will improve their electronic capabilities, which are vital in the transformation process it is undertaking to consolidate the company as a global provider of technological solutions for the automotive interior.

AED Engineering, based in Germany, will continue with their expansion plans and the development of an advanced engineering hub in Murcia, Spain, the aim of which is to establish an industry benchmark in the country.

AED Engineering has more than 140 highly specialized engineers at its advanced engineering centers in Munich (Germany) and Murcia (Spain).

The German company has already teamed up with the Polytechnic University of Cartagena to create the AED-UPCT Chair in order to develop automotive research projects, while training young engineers. Antolin is also working with the Galician Automotive Technology Center (CTAG) in Vigo, Spain, in the development of new advanced electronics solutions.

Motional is Hyundai's JV with Aptiv for L4 Autonomy

GENERAL NEWS

Hyundai has partnered with sensor manufacturer Aptiv to develop L^4 autonomobiles in a JV called Motional. It is based in Boston, with teams in Pittsburgh, Las Vegas, Santa Monica, Singapore, and Seoul. The newest office, Seoul, will serve as a key technology hub and testing location.

Motional

Motional effectively got its start last September when Hyundai, in a deal worth $4bn, announced they would invest in R&D and other resources to develop driverless technologies with Dublin-based Aptiv. For a 50% stake in the venture, Aptiv pledged technology, intellectual property, and approximately 700 employees focused on the development of scalable autonomous driving solutions.

Motional says they'll be able to begin testing fully driverless systems this year, and that their driverless systems and supporting technology will be available for robo-taxi providers and fleet operators by 2022. Motional's team includes autonomous pioneers including those involved with the first fully-autonomous cross-country drive in the US, the launch of the world's first robo-taxi pilot in Singapore, 2016, and the operation of the world's most-established public robo-taxi fleet in 2018 in Las Vegas.