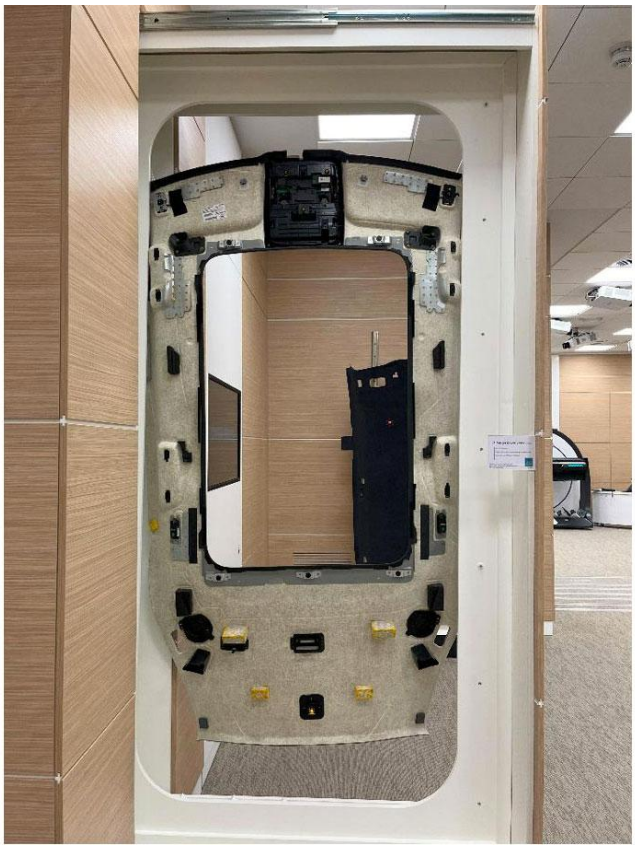
Thu, 21 December 2023
Weekly Newsletter

DVN-I
Automotive Interior

NEWSLETTER #192

Editorial

A Special Look At Antolin - Interview



ANTOLIN OVERHEAD SYSTEM (DVN IMAGE)

DVN Interior had the opportunity last week to visit Antolin's headquarters to talk and listen with this family-owned company, one of the world's leading automotive interior suppliers. This week's in-depth piece brings you a full interview and overview of their interior products, including headliners, doors and hard trim, instrument panels, center consoles, sunvisors, window regulators, trunk components, interior lighting, HMI and electronics…really, most of what makes an interior user-friendly, intelligent, integral, and sustainable.

We've also got plenty of news for you this week, about BYD, Changan, Polestar, Porsche, and Suzuki, with topics relevant to the whole industry: communication, interior lighting, extended displays, natural materials, and much more for you to enjoy.

The DVN Interior Newsletter will take a short hiatus over the holidays, and so today's issue will be the last of 2023. We'll see you next on Thursday, 4 January 2024.

Merry Christmas and Happy New Year from all of us to all of you! We're looking forward to seeing you all in Köln on 23-24 April at the **DVN Interior Workshop**.

Philippe Aumont
DVN-Interior General Editor

In Depth Interior Technology

DVN-Interior Interview: Antolin

ALFA ROMEO BACKLIGHTING DECORATION

Jorge Jurez, EVP Technology Solutions - Lighting, HMI & Electronics

DVN-Interior went to Burgos, Spain, to visit Antolin's headquarters and talk and listen with their Executive VP of Technology Solutions - Lighting, HMI, and Electronics, Jorge Juárez, and their marketing chief Rosalía Arribas, shown here near a photo—printed on a modern headliner! — of one of the company's workshops in the 1950s. We took most of the pictures in this article there at the Burgos headquarters, with its an impressive collection of mockups and demonstrators, made for customer applications and presented with immersive tools, along with the company's sustainability story, presented proudly in the company lobby.

RIGHT TO LEFT: ROSALIA ARRIBAS - ANTOLIN, JORGE JUÁREZ - ANTOLIN, PHILIPPE AUMONT – DVN INTERIOR – ALL ANTOLIN PICTURES

DVN-I: Can you summarize Antolin history and today key figures?

Antolin: Antolin is one of the leading interior manufacturers worldwide with over 130 plants in 25 countries, and a turnover of 4.05 b €. We are one of the few companies able to develop and produce most interior parts.

History in short, here are some of the highlights:

The story takes us to back to the nineteen fifties in Burgos, when the two founders (José and Avelino Antolin) ran a small car workshop. There they invented a rubber-metal steering joint that lengthened the life of the components, solving safety problems in vehicle steering.

In Burgos during the 60s and 70s started to produce the first trims for overhead systems and door panels.

In 1989, the internationalization phase began with the opening of sales offices in the major European decision-making centres (U.K., France, Germany, and the U.S.).

In 2012, they strategically advanced their position in the lighting industry through the acquisition of CML Innovative Technologies. The company continues its inorganic growth. In 2015, acquiring Magna Interiors in the biggest operation in its history. The new Grupo Antolin doubled its size.

The company launched the new Electronic Systems Business Unit back in 2020.

A transformation started this year with a new strategic plan and corporate image to consolidate the company as the key supplier to vehicle manufacturers in developing technology solutions for automobile interiors.

TATA HARRIER AND SAFARI SUV INTERIOR TOUCH CONTROL PANEL

DVN-I: The company defines itself as an interior supplier with the most complete and wide range of solutions, what does it mean?

Antolin: We are part of the very few companies, able to manage car interior trim, with all the technologies which are necessary today, such as Electronics, HMI... to become a technology solution provider to the industry. We have developed a strong industry presence through over seventy years of working with our customers to develop a complete cycle of component manufacturing, from their conception and design, through the development and validation stages, to their industrialization and sequenced delivery.

DVN-I: What do you see as the company's strengths and challenges?

Antolin: With Electrification and Digitalization, Car Interior became even more relevant. End users expect technology, especially in interior, and the company strength relies on these many technologies we manage to answer OEM and end-user expectations. Our permanent challenge is to select the right technology which will succeed, and not to overinvest in the ones which will quickly disappear, and not to underinvest for the ones which will last in our vehicles.

The interior of the future will become that third living area in which we can do things in addition to the ones we do at home and in the workplace, that opens up great opportunities for Antolin. The challenge is to anticipate the major market trends with differential responses.

MERCEDES G CLASS INTERIOR

DVN-I: Innovation is present everywhere in what you state, what does it represent for the company?

Antolin: Innovation is really part of our DNA, and innovation is what allows us to always stay one or two years ahead of our competitors. Our innovation is not rocket science, it is what is applicable quickly in OEM programs. It is also the ability to scale up, as we did to be a competitive headliner partner in China. Innovation includes sustainability, smart surfaces, sensors, interior lighting, and even lighting synchronized with music in a Zeekr model. Our global presence helps us to transfer what has been invented in a region in all the other regions. That's the story of our headliner success in China, for instance.

DVN-I: What do you invest in advanced development, and in program development?

Antolin: Our target is to get 80% of our predevelopment in customer programs. We approach customer with new ideas, then we engage together in what is named **expert phas**e, and then it goes into the RFQ (Request for Quotation), where we have a good chance to succeed. We also handle internal innovation, like process innovations, our fundamentals, to improve our own efficiency. Last year, investment in R&D+i accounted for 2,66% of Antolin's turnover.

DVN-I: How are you organized around the planet?

Antolin: In the past, innovation was essentially managed from our corporate development & validation center we have here, in Burgos. Now, we innovate in our main markets such as Germany, China, India and US with the aim of better adapting to our customers' need…

Last year, the company opened its new Global Design and Business Services office in Pune (India) to support OEMs with a full service from product design and simulation to logistics.

DVN-I: What is your innovation development process?

Antolin: First, it is our ability to understand all the signals we receive from the market (auto-shows, OEMs, conferences, market research). We make these information's available to all the Antolin employees, including our 1700 engineers, which then triggers new ideas from anyone in the company. We also look beyond automotive to mobility, furniture, etc. That's how we entered disinfection during Covid.

In summary, Antolin's innovation process is divided into projects at four levels (technological surveillance, innovation ideas, innovation programs development, and innovation to the market).

BMW 1 SERIES

DVN-I: Are you working directly with all OEMs, when and how?

Antolin: We are working directly with OEMs, all of them, meaning 100 brands, thanks to our global teams. In 2022, our products are present in almost 600 models and in about 40% of electric cars.

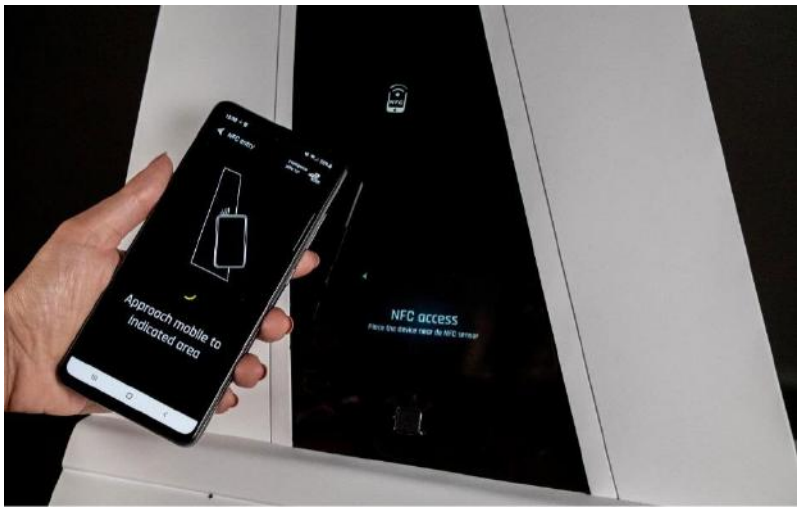
DVN-I: What is the role of concept interiors, physical, digital?

Antolin: It is two different steps. First, a digital mock-up is an easy way to get to the OEMs, the Covid period gave it a boost. It is also very flexible, as it allows easy customization per OEM or per region. In a second step, if there's interest, we go into physical, including a mix of ready-for-production innovations, with longer term new products.

DVN-I: How do you get and develop expertise in your domains?

Antolin: Expertise is key, and we have accumulated a lot since our 70 years of history. From a HR perspective, we build teams of experienced people and newcomers, to keep internal knowledge with any employee of the "Antolin family".

New technology and expertise enter as well through collaboration with Universities, Technical Centers, and Startups.



VEHICLE ACCESS SYSTEM PASSIVE KEYLESS

DVN-I: As technology is more and more complex, how to do you handle new technologies, in-house development, partnership, M&A?

Antolin: It is a combination. We mentioned our 2012 acquisition of CML in Besançon, France, for Interior Lighting. Or the strategic partnership with AED Vantage for electronics that we have developed progressively since 2020. We devised, for instance, our CES awarded keyless access system that way, a partnership with Biometric Vox. Another key partner is **Via Optronics** for Integrated Display Systems or Cipia for DMS. I would also like to add the new In-Mold-Electronics (IME) Alliance that we are about to announce with our strategic partner **WalterPack** and **e$_2$ip** to develop in mold electronics technology.

DVN-I: Do you think the market (OEMs) relies more and more on Tier #1 suppliers, and why?

Antolin: As one of the leading interior suppliers, we are working with many OEMs, and our knowledge of User Experience extends to all those OEMs we work with. For example, in the case of BMW, they know perfectly well their customers who drive their vehicles, but not as well as we know what the customers of the rest of their competitors want, so we can offer them innovative proposals by covering the needs of all of them.

And in case of Japanese and Korean, we are more open than their Keiretsu suppliers. And we can answer any OEM need, whether it is a complete module or what we name cherry picking for components. Traditional OEMs are more cherry picking as they have an available workforce to pre-assemble modules. Newcomers (as US EV makers) and Chinese OEMs are more going the module way, as we bring expertise directly into their operation.

DVN-I: How do you understand consumer/user wishes?

Antolin: Our marketing radars are getting many signals from market research, clinics, auto-shows, engagement with OEMs, tech-shows, partnership eco-system, etc. We are benchmarking product from competition. Working with China EV makers is now the way to get into the vehicle of the future, as competition is pushing them to introduce innovation all the time. For example, that is where we develop most of the new ideas in door and headliner modules, the domain where we are world leaders.

DVN-I: What is your vision for car interior? As the car is getting to more and more digital technologies, what are the new perspective you see in car interiors?

Antolin: Autonomous vehicles are creating a lot of opportunities for Interiors. In this sense, we conceive the interior as a living space and our mission is to seamlessly integrate all the functions to make the interior feel and look like this living space. The OEMs and therefore Antolin are moving away from the idea of seeing the interior as a spaceship to make the interior comfortable and have technology-on-demand. And example is what we call hide-and-seek technology, this kind of “shy tech” is invisible, unless you need it, and you trigger it with buttons or gesture; for instance, you have no display, and suddenly, a rollable display appears. Interior lighting is growing very quickly, from a simple reading lamp in the headliner, to now, ambient, and dynamic lighting, mood lighting, with LED and ISELED technologies, micro controllers, etc. You can manage colors, alerts, like for safety, battery level, heating/cooling. We’ll better understand the driver behavior and mood, to adjust temperature, music, fragrance, cleaner air, etc.

Last, but not least, the future must be sustainable. From a material perspective, sustainability, like recyclability, non-fossil origin, etc must be certified by an independent or NGO organization, like **Seaqual** for a 100% post-consumer recycled polyester yarn for upholstery and trim, obtained from recycled ocean plastics.

GEELY OVERHEAD LIGHTING CONSOLES

DVN-I: What is your vision for car interior lighting?

Antolin: Interior Lighting represented 1 or 2% of the interior cost. Now, Interior in an HMI system, with ECUs, Body Controllers, and Electronics, it could go up to 50%! And, it has the highest growth potential, with display, decoration, back-lighting of capacitive switches, in instrument panel, console, doors, trims, etc. This growth is even more important, as the market volume is decreasing, even in China!

Key is seamless integration of light. Interior Lighting facilitates personalization, face lift, also from a cost standpoint as development amortization is getting trickier because of lower production batches.

Personalization and differentiation will increase, thanks to technology. Decorative parts can be made unique, changing surface design post-process with laser.

Interior Lighting has also an important role for Safety, it is used for alerts and warning, An example is the lighting of the BMW iX, which, being strategically located in the door waist, serves as an element of communication with the interior and exterior. In this case, we also introduced ISELED technology inside the car for the very first time. Lighting also makes driving safer; we have a research project, **NightSight Assist** together with the University of Valladolid and the IOBA Applied Ophthalmology Institute, both in Spain, where specific light and frequency is exciting eye pupil helping the driver to have a clearer view.

Now clients are taking a step further and asking us for emotional lighting. In this way, we can assess driver mood (with DMS), and use light a way to stimulate positive mood.

DVN-I: What is your strategy in Electronics?

Antolin: Electronics has many players, we are combining electronics with interior, and with interior features. That's what we name the "last mile" electronics. We are not into the overall architecture, we go up to the local ECU, dedicated to the interior application. Personalization and updates are done at that level.

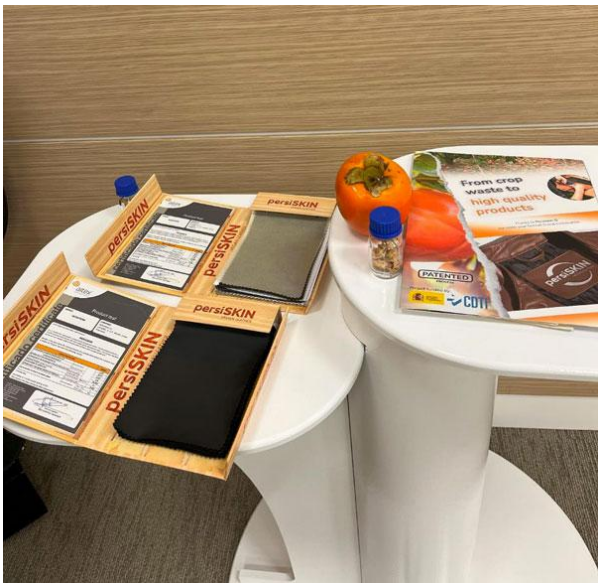
NATURAL MATERIAL (MYCELIUM) BASED SUN VISOR

DVN-I: How do you handle sustainability and carbon neutrality?

Antolin: ESG is very important for us. We want to reduce the CO2 emissions by 75% in 2028, and to be carbon neutral in 2040, and having our supply chain carbon neutral in 2050.

We are now integrating sustainability into innovation, that's how we develop new materials, mostly natural based, for interior surfaces, but anywhere else, like PCBs, to be more lightweight and more sustainable. Natural material could be important, if OEMs are engaging, or public authorities are subsidizing. It is always a bit more expensive at the beginning, so we need support. We have a first headliner substrate on the market produced from urban waste, post-consumer plastic waste and tires at the end of their useful life. This headliner has recently won various innovation awards.

There are also synergies between plastic materials and electronics that we integrate as IME, In Mold Electronics. Using the product's existing structure and material (e.g., a door panel) to incorporate functional electronics within the structural surface reduces the eco-footprint of the component.



PersiSKIN, a Valencian partner startup that creates a plant-based material as an alternative to animal leather and synthetic leather.

DVN-I: To summarize our conversation, what would you say?

Antolin is positioned as a leading Full-Service Supplier to the automotive interior market. Our innovation is developing the interior of the future to support our customer and make their dreams come true! We are a family-driven company, and we work with the complete eco-system, including the customers.

MODULAR OVERHEAD SYSTEM IN THE SHOW ROOM

Most of the pictures were taken by DVN during the Antolin show room tour at the Burgos headquarters. It is an impressive collection of mock-ups and demonstrators, made for customer applications, presented with immersive tools,

Sustainability story, presented in the company lobby.

Volvo C40 Recharge Headliner (center) substrate made of PU using recycled polyol and panoramic plastic frame from end-of-life tires (left). House door (right) with chipboard core made of waste and cut-offs of the headlines.

Interior News

Inova Semiconductors Leadership Change

INTERIOR NEWS

Leadership and management of Inova Semiconductors is being taken on by Robert Isele and chief technology officer and Inova cofounder Roland Neumann. Their appointment was unanimously approved at the shareholder meeting on 30 November. Following the unexpected death of Robert Kraus in September, Hans Weilnhammer took over as interim CEO/CFO to lead the company through this difficult period. The dual leadership will now come into effect as a permanent successor to Kraus.

Robert Isele has been working for the BMW Group since the early '90s, supervising and contributing to the application and development of APIX and ISELED. In his executive capacity in the display, instrumentation, interior lighting, and ultimately semiconductor management fields, he musters extensive experience in semiconductor developments and supply chain processes.

Inova is enjoying strong growth, and their products—including APIX, ISELED/ILaS, and ADXpress—demonstrate their ability to innovate for advanced display and lighting applications and high-speed automotive data transmission.

Neumann welcomed Isele: "This dual leadership with Robert Isele offers the best way to continue the success of Inova Semiconductors. He embodies many years of professional experience, profound expertise, and unflagging commitment, all contributing in the years to come to the continued consolidation and expansion of the company’s strategy in a highly dynamic business environment".

For his part, Isele says, "I am very proud and honored to lead a company with which I feel so closely connected and to whose success I can now make a decisive contribution. Inova Semiconductors is an extraordinarily innovative semiconductor company".

Suzuki Swift: New Design, Advanced Safety

INTERIOR NEWS

SUZUKI IMAGE

Suzuki's new fourth-generation Swift offers a spacious and comfortable cabin with ergonomic features to elevate the driving experience.

The cockpit features a center cluster and controls subtly angled toward the driver for ease of use. The wraparound, dual-tone black and light-grey dashboard and front door trim, with satin plating and satin dark silver paint accents, give the cabin a 'sporty, dynamic look', the auto maker says.

A 9-inch HD capacitive touchscreen delivers quick and accurate response, and features Apple CarPlay and Android Auto through Wi-Fi and USB; voice recognition, Bluetooth music playback, and also displays information about the vehicle’s status.

Millimeter-wave radar and a monocular camera detect vehicles, bicycles, and pedestrians in front of the vehicle and help mitigate frontal, diagonal, and lateral collisions. If a collision seems likely, audio and visual warnings are issued to alert the driver. If the driver brakes with insufficient force, brake assist automatically engages to help slow the vehicle.

There is a camera built into the instrument panel which monitors the driver’s eyes and face (DMS). If the system detects the driver is drowsy, falling asleep, or looking away from the road, it sounds a warning alarm and displays an alert message on the information display.

MicroCloud Hologram to Provide CMS for BYD

INTERIOR NEWS

HOLO IMAGE

MicroCloud Hologram is a provider of hologram 'digital twin' technology, and their subsidiary is providing CMS—content management systems—for BYD, China's largest NEV company. By dint of the agreement, the two companies say, they expect to usher in a 'breakthrough in the new energy vehicle business'.

MicroCloud Hologram offers services such as lidar solutions and 3D holographic technology. The CMS agreement outlines several key aspects of collaboration between MicroCloud Hologram and BYD, to provide a design and development program for a common streaming media control system applicable to various vehicle models. This encompasses hardware and software solutions for the camera, controller, and display modules. Data and system analysis solutions, optical analysis, platform-based analysis, and imaging analysis will be offered, to enhance the functionality of the streaming media control system.

MicroCloud Hologram is also required to cooperate with the vehicle company for any changes in the conditions of the new energy vehicle models and deliver expandable AI functions in the streaming media control system.

MicroCloud Hologram's integrated holographic vision software and hardware solutions are also designed to support the development of ADAS for new energy vehicles.

Porsche Macan EV Has ARHUD, Up to Three Screens

INTERIOR NEWS

PORSCHE IMAGES

The electric Porsche Macan is slated for release early next year. Now the interior has been shown, and we've learned it will contain up to three screens, plus an augmented-reality HUD (ARHUD) turning the windshield into a fourth screen to display features like navigation arrows and distances to vehicles in front. Looking through the glass, the projected images appear to encompass a space reaching over 30 feet in front, stretching 87 inches. Porsche says it's one the largest head-up displays available.

There's a 12.6-inch curved digital display for the driver; the HD central infotainment screen is 10.9 inches, and an optional passenger display also measures 10.9 inches. The optional screen allows the passenger to operate several vehicle systems that would otherwise require the driver to stop, such as certain navigation features or video streaming.

In addition to LED ambient illumination, the cabin features what Porsche calls a Communication Light that stretches across the dashboard and will be used to call attention to driver alerts and other functions.

It also offers virtual camera-based replacements for the mirrors (in countries where they're permitted; i.e., not the USA), with interior video displays mounted inside at both doors and in place of a conventional rearview mirror.

There's plenty to play around with. The Macan's system is Android-based and can be updated through the Porsche App Centre with programs like Spotify, YouTube, and WebEx. There are also games, the Home Assistant smartphone app, and monthly map updates. Android Auto and Apple CarPlay are also still available. The Macan will even add Apple's or Google's map to the driver display as part of the integration.

Changan VIIA Concept: Clever Use of Lighting

INTERIOR NEWS

CHANGAN IMAGES

Changan is a Chinese automaker based in Chongqing, with a European design department based in Torino, Italy. Their design activities are galloping along, and now they're showcasing some aspects of their much-anticipated concept car, the VIIA, in a **video.**

Originally teased at the end of 2022 and shown later at the 2023 Shanghai auto show, the VIIA blends a traditional coupe silhouette with a high-tech interior. Light beams are a central theme to the project.

The interior is tech-forward, and amplifies the excitement of driving a car. The seats provide the same kind of support offered by a racing bucket seat, but are designed in a way that would not look out of place on a spacecraft.

The steering wheel is small and light, like a race car's, but is shaped more like a videogame controller. There is very little distraction from gadgets, dials and controls throughout the cabin—no cupholders and no center console. It is clearly designed for the task of driving, and at the same time, a pillar-to-pillar digital display brings it into the future. The concept is full of these contrasting themes.

There is a clear emphasis on lighting, both inside and out. The design team drew inspiration from the idea of “light beams” and this can be seen not only on the exterior but also with the icy blue glow that wraps around the doorcards and IP and floods the footwells.

Changan says the relationship between car and driver continues to evolve, and part of the idea behind the VIIA concept was to imagine a vehicle that offers different driving modes. Beyond sport, comfort or efficiency mode, the VIIA offers driving mode, gaming mode and drone mode.

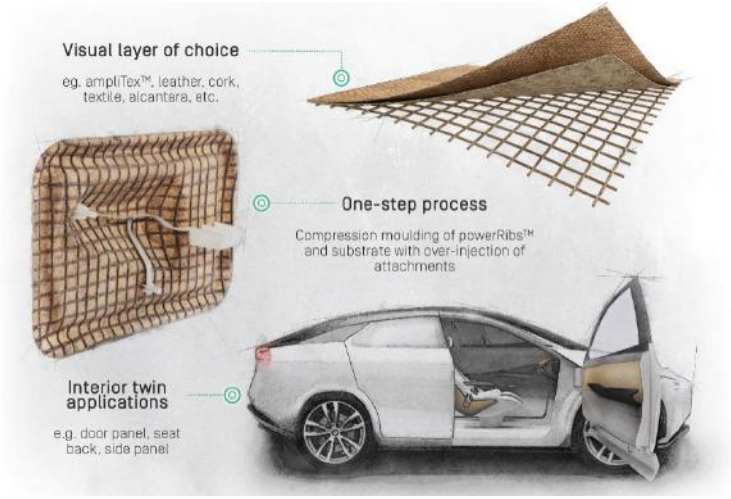
Changan representatives say, "We need a drone because it acts as an extra pair of eyes, leading us to appreciate more unseen scenery. We love gaming because of our boundless imagination and our desire to explore an unlimited spiritual world. The VIIA cockpit showcases a blend of virtual and perceived design".

Polestar Day, With Bcomp Sustainable Interior Solutions

INTERIOR NEWS

At the historic Barker Hangar in Santa Monica, California, Polestar spoke with guests and the media to celebrate their passion for design, innovation, sustainability, and performance—and showcasing what comes next for the brand.

Swiss-based Bcomp played a central role in the event, which included an address by Chief Revenue Officer Per Mårtensson, who explained the history of the partnership, the potential of flax as an alternative to conventional engineering materials, Bcomp's race-to-road evolution, and how they are industrializing Bcomp technologies for premium road cars.



BCOMP IMAGE

Bcomp has a unique approach to apply the latest composites knowledge to natural fibers, with their proprietary reinforcement solution PowerRibs™ and AmpliTex™ technical fabrics. Bcomp's solutions for sustainable lightweighting with thermoplastic PowerRibs can cut weight by up to half, and reduce plastic by up to 70 per cent in interior panels.

Four zones occupied the hangar, each associated with a different aspect of Polestar's vision and aligned with one of its vehicles. Bcomp was present in the Polestar 3 zone, highlighting their natural-fibre performance

composites which are seeing increasing adoption in automotive applications.

Polestar's Head of Design Maximilian Missoni said, "We understood the huge potential of this material and, finally, after years of development together with our suppliers—and Bcomp—we've found the key to applying it in high volume production. Our own signature weave brings a luxurious and technical finish to this natural fibre composite, which means it can now be used as a functional and visual material.

"As you saw in Precept, we will proudly show this off in our cars. Taking the step into volume production means we have now unlocked the potential for more natural fibre composites in our cars. It leads to less than half of the fossil-based content compared to traditional premium solutions used in automotive interiors, and it reduces the CO_2 emissions of these components by over 50 per cent".

And Bcomp's Chief Revenue Officer Per Mårtensson said, "A heartfelt thank you to Thomas Ingenlath and the entire Polestar team for an incredible event. We are honored to contribute to Polestar's successful journey towards sustainable mobility. This close partnership reflects our shared commitment to sustainability, quality, and performance.

"Our joint efforts in satisfying demanding safety requirements, meeting Polestar customer expectations, and achieving scalable production solutions has been a masterclass in collaboration. Together, we've achieved a premium, modern, and elegant aesthetic for the Polestar signature weave, setting a new standard for excellence and a unique expression of sustainable modern luxury".

The Design Lounge

Ad Astradome Per Aspera

THE DESIGN LOUNGE

COFFEE CORNER
DVN
Interior

By Daniel Stern

1960 CHRYSLER ASTRADOME INSTRUMENT PANEL (JC AUTO RESTORATION IMAGE)

Address: 8400 Kirby Drive, Location: Houston, Texas, US

The Astrodome is in Houston, Texas, USA. Once called the 'eighth wonder of the world', it is the world's first multipurpose domed sports arena. It was built between March 1963 and November 1964, it served over the years as home to the Houston Astros of (baseball), the Houston Oilers (football), the Houston Rockets (basketball), and the Houston Livestock Show and Rodeo. It was the first major sports venue to install artificial turf—a Monsanto product patented in 1965 and originally sold under the name ChemGrass, but rebranded as AstroTurf after its well-publicized first large-scale use at the Astrodome in 1966. The Astrodome featured the Astrolite, the first animated scoreboard. In 2005, it was pressed into service as a shelter for New Orleans residents affected by Hurricane Katrina. In 2014, it was added to the U.S. National Register of Historic Places.

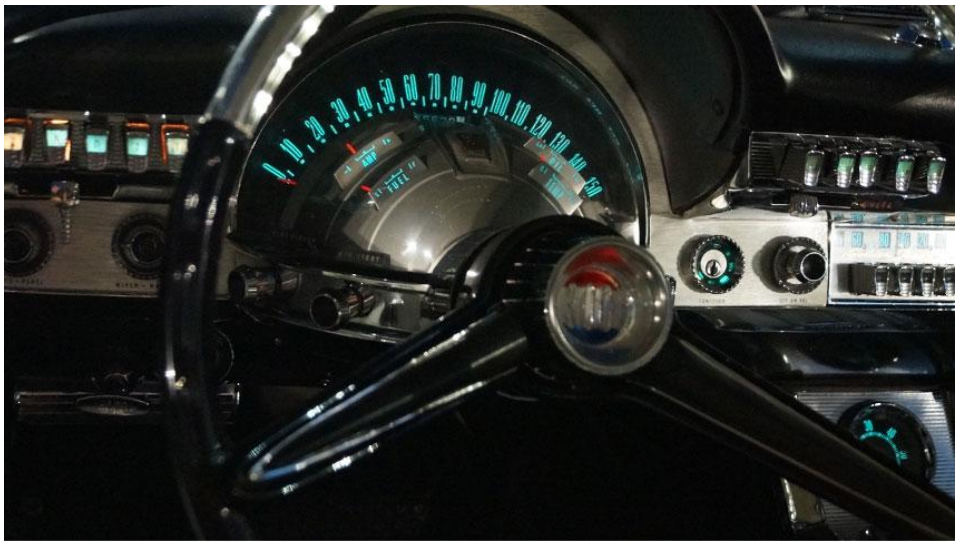
But before the Astrodome came the **Astradome**, and aside from sharing a general dome theme, it was utterly different. It was much smaller, and much more mobile, for it was the instrument cluster in 1960 through 1962 Chryslers—from the entry-level Newport through the Windsor, Saratoga, New Yorker, and top-of-the-line 300F, 300G, and 300H. It was a unique, futuristic instrument cluster with all elements positioned in three dimensions, under one single transparent dome.

At the time, Virgil Exner was in charge of design at the Chrysler Corporation. Chryslers of that era were known for oustanding engineering (plus) and daring design (plus and minus, depending on model and observer), and indifferent build quality (minus). Exner had scooped the industry and wowed the public with his "Forward Look" styling, which started in 1955 and peaked in 1957 to 1960, but his styling of the company's 1961 and

1962 cars, together with an ill-advised (and **ahead of its time**) downsizing of the standard-sized models, did not find favor with buyers. However, Chryslers of that period are known not just for their exterior design, but also for some of the most remarkable interiors in automotive history.

The Astradome might well have drawn inspiration from a previous company design, used in 1949-'53 Chryslers—a concentric design with all gauges integral, as shown here.

But the Astradome had a far more dramatic, space-ageappearance. In contrast to the earlier design's near-planar flatness, the Astradome was highly three-dimensional—so much so that it's fun to wonder what Virgil Exner's design brief might have been. Perhaps something like, "design an instrument cluster all the way out to the steering wheel". Or maybe he just asked his designers "What happens when the steering column becomes the instrument cluster?" Either way, the Astradome set Chrysler apart from any other maker, and from other vehicles made by Chrysler—the Valiant, Plymouth, Dodge, DeSoto, and Imperial models. Extremely interesting, classy and futuristic, it remains one of the most beautiful instrument panels ever made in the history of American automobiles.



Within its clear plastic bubble, there are four gauges: an ammeter, gasoline gauge, engine temperature gauge, and oil pressure gauge, as well as the great big speedometer. Just beneath, on the lower part of the steering column are round knobs for the dome light, the power antenna, the rear window defogger, and the map light. The automatic transmission pushbuttons are horizontally arrayed to the left of the dome, with an unusual monostable turn signal switch below them—nudge it left to put on the left blinkers, or right to put on the right ones—the Astradome left no room for a conventional steering column turn signal stalk—with HVAC pushbuttons on the right, symmetrical with the transmission buttons.

Besides the beauty of the cluster during daytime, Chrysler gave a particular attention to the nighttime appearance. The Astradome used electroluminescent lighting, an expensive and complex but spectacular high-voltage system which made a blue-green light, eerily homogenous for the time, radiate from all elements of the cluster. The night effect is amplified by the translucent sections of the steering wheel that further augment and diffuse the high-tech light. At the time, it was decidedly above all standards. Maybe it even compensated for some of Chrysler's exteriors, which were not as well appreciated at the time.

For 1963, Exner and his space-age design sense were out. Along with his swoopy exteriors, the Astradome was swept away and replaced by a much more conventional, much more conservative design with separate gauges on a flat plane (though the squircular steering wheel did hang on through 1963).

Every time I see UX graphics arranged in a semicircular manner, I think of the Astradome as its direct physical analogy. There is something magic to it that we have not yet captured with our efforts in designing modern interfaces. It's not about the reflections, shadows and highlights or other CGI effects that aim to replicate the physical world. Maybe it's to do with a different learning and cognitive experience that separates physical from digital. Amazingly enough, collectors and Chrysler aficionados say the entire Astradome cluster and its components are designed so they can be assembled only in the correct way, to avoid errors. These days, that is called *poka-yoke* (a Japanese term for mistake-avoidant design). What could be the digital equivalent of the assembly perception and its extension to the driving experience?

News Mobility

Kardome's Accurate In-Car Voice Interaction

NEWS MOBILITY

Kardome Mobility isolates the desired speech, reduces background noise and echo, and correctly identifies the person speaking. Their 'Spatial Hearing' technology simultaneously enhances speech signals from multiple speakers in real time, isolating the target speech with unsurpassed accuracy. Kardome says they know who is talking, where they're located, and what they're saying. The company was established in 2019 by a team of enthusiastic and researchers with expertise in algorithms and acoustics, dedicated to making voice-controlled devices usable in all environments.

Kardome's innovations include spot-forming, a multidimensional soundscape analysis method which decodes spatial cues such as echoes in a space by extracting the relative locations between each sound source in the environment and the microphone array. Wakeup word identification accuracy is more than 95 per cent, response accuracy is above 90 per cent, and voice identification accuracy is more than 95 per cent —making it applicable to any in-car communication.

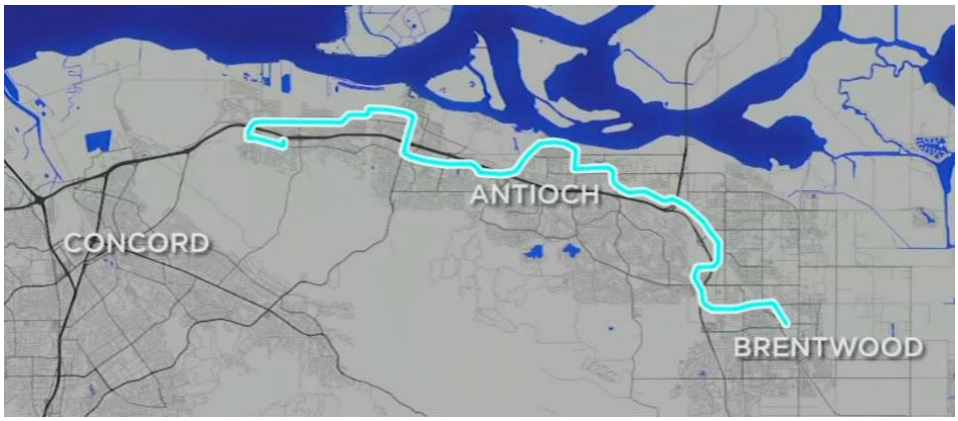
It works the other way around, too: Kardome can locate where speakers are sitting in the cabin, providing a customized audio experience for every passenger. Spot-forming's 3D model uses reverberations to separate sound (speech) from different locations. The AFE includes the following functionalities: multichannel acoustic echo cancellation, noise reduction, source (speakers) separation, and speech localization.

Glydcars, Contra Costa Micro Mobility

NEWS MOBILITY

GLYDWAYS IMAGES

For the past few years, the Contra Costa Transportation Authority in California has been working on what they call the Dynamic Personal Micro Transit (DPMT) system. It is 28 miles that will connect Pittsburg, Antioch, Brentwood, and Oakley with autonomous vehicles, known as Glydcars.



Tim Haile is Executive Director of the CCTA. He says, "First and last mile is one of our biggest challenges here in Contra Costa County. We don't want people to have to drive to the BART station," referring to the Bay Area Rapid Transit system. "The vehicle is small, it is only five feet wide. And that reduces a lot of the infrastructure and operational costs, as well as operational costs. And [it is] electric, sustainable, zero emissions".

All the pickup and dropoff points are still to be determined, but the idea is set: using an app, users would show up at an access point—similar to a bus stop or BART station—get in, and head off to their destination. "It takes you from, say, Pittsburg directly to a BART station or downtown community center or to a university or school (…) all those really important points of interest to the community," Haile said.

Eastern Contra Costa County has a population of close to 300,000 people, and that figure is growing. The county estimates 79 per cent of those people commute to work in other parts of the Bay Area, ,and one goal of this new system is to reduce traffic by using a closed-circuit roadway, to help California meet its zero carbon emission goals.

It is a public-private partnership which includes Glydways, the company providing the technology and the vehicles. Plenary Americas and Flatiron are also involved. Testing is being done at GoMentum station in Concord.

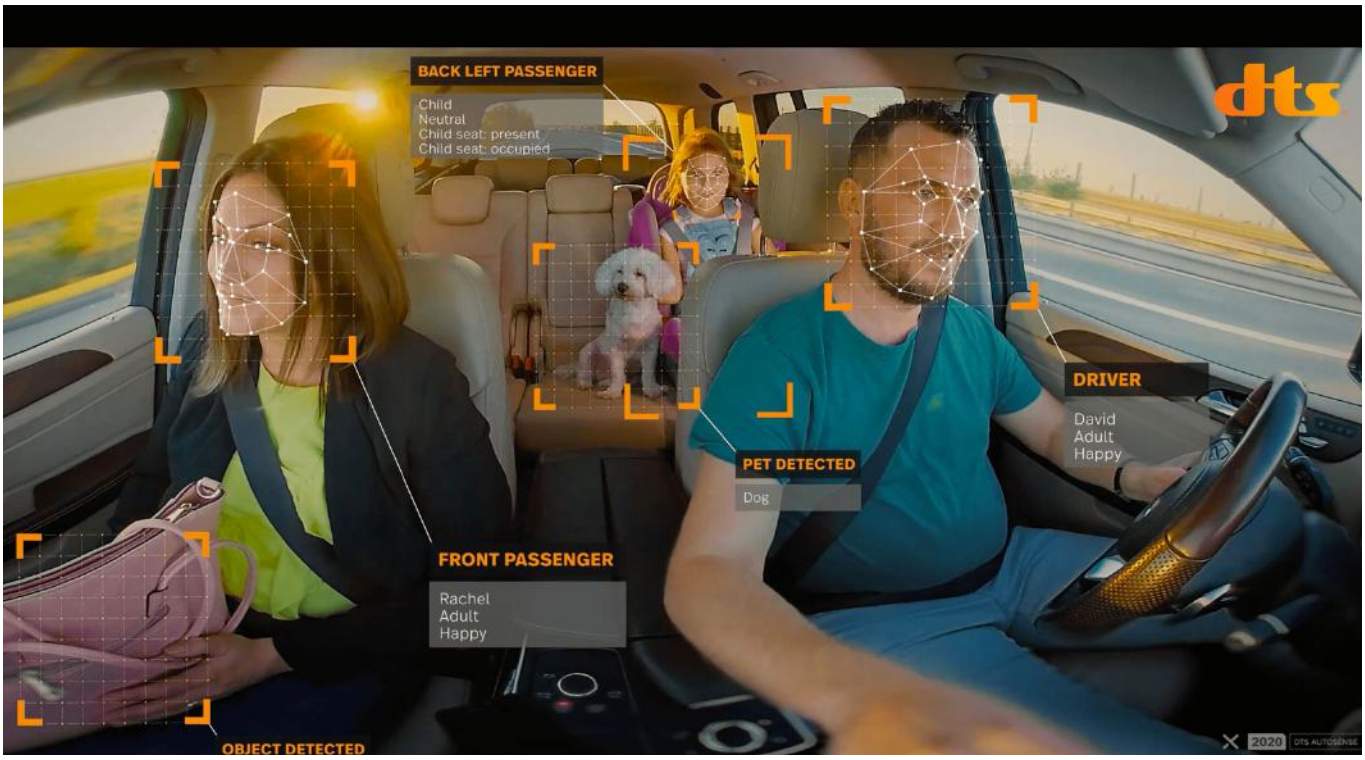
"A ride that takes you 25 minutes, will now take you, predictably, all the time, six to seven minutes," says Glydways CEO Gokul Hemmady.

The estimated cost of this transit system is USD $450m—considerably less than the billions needed to expand BART. The next phase includes design and environmental reviews. If the timeline holds, Haile says the first Glydcars could be operating within three to four years.

General News

Tobii Buys AutoSense from Xperi

GENERAL NEWS



XPERI IMAGE

Tobii has agreed to buy the AutoSense business fromXperi Inc. for a minimum consideration of €41m. This transaction accelerates Tobii's path to leadership in the automotive interior sensing market by assimilating Tobii's technological capabilities (as **previously reported** in DVN-I).

The new Tobii Autosense business segment has significant design wins with seven automakers who represent more than 15 per cent of global annual automobile production. It is expected to generate €45m worth of revenue in 2028, and to reach cashflow break-even in 2026. To finance the operational expenses needed in 2024 and 2025, Tobii intends to raise €27m through a rights issue during the first quarter of 2024.

Transaction in brief

- Tobii acquires FotoNation from Xperi, which includes AutoSense, a business delivering DMS-OMS solutions.
- In addition to the automotive related technologies Tobii is also receiving technology and patents related to image processing and computer vision.
- The Transaction is of a transformational character for Tobii, with the creation of a new business segment named Tobii Autosense which features one of the strongest product offerings in the Automotive Interior Sensing market.
- FotoNation has approximately 250 full-time employees.

Global Trends in Automotive Interior Market by 2028

GENERAL NEWS

R&M CEO CLIFF SHERIDAN (MARKETSANDMARKETS IMAGE)

According to a research report, the global automotive interior market, is estimated to be worth USD $157.4bn in 2023, and is projected to reach $194.8bn by 2028, at a CAGR of 4.4 per cent from 2023 to 2028. The report, called "Automotive Interior Market by Component (HUD, Door Panel, Dome Module, Seat, Headliner, Center Console, Center Stack & Others), - Global Forecast to 2028", says:

- The growth of the automotive interior market is influenced by various factors such as increasing customer preference for convenience, premium features, and advanced safety features, integration of smartphone connectivity, use of variety of sustainable, lightweight & advanced materials and innovative finish.
- Economic cars are projected to hold the largest market share in 2023. As technology becomes more accessible and affordable, economic cars are incorporating basic infotainment systems, Bluetooth connectivity, and other convenient tech features. OEMs provide aesthetically pleasing elements at a lower cost as a result of material advancements and technological developments in electrical components. The floating infotainment display system, the semi-digital instrument cluster, and the cabin's significantly more upscale appearance and feel are among of the interior's standout features. Such development will drive the segment growth in the forecast period.
- The market seat segment is expanding as a result of rising vehicle production and rising consumer demand for comfort and luxury. The world's largest market for vehicle production, Asia Pacific dominates the market for seats. The small/economy car segment, which dominates the market in Asia Pacific, is responsible for the region's higher adoption of conventional car seats. The mid- and luxury-car segments are what drive the markets in North America and Europe. In these areas, consumers are particularly interested in high-tech seats and comfort solutions. As a result, there is a growing prevalence of powered and heated, heated and ventilated, heated, ventilated, and memory, and heated, ventilated, memory, and massage seats.
- The European automotive interior market during the forecast period is expected to be shaped by dynamic trends such as continuous innovation in materials, a focus on connected and smart interiors integrating advanced technology, an increasing emphasis on customization and personalization options for consumers, and a growing commitment to sustainability with eco-friendly materials. The rise of autonomous and electric vehicles is influencing interior design, leading to a focus on creating comfortable and functional spaces tailored to the unique needs of electric vehicle drivers. Advanced seating systems, compliance with stringent safety and environmental regulations, and a broader shift towards holistic user experiences will likely play pivotal roles in shaping the evolving landscape of automotive interiors in Europe.

Brose-Hasco China JV Renewed

GENERAL NEWS

Brose and Hasco have renewed the contract for their joint venture Shanghai Brose Automotive Components for another 25 years.

In 1999, Brose and Hasco subsidiary STEC established a joint venture to set up Brose's first production bases. Since then, the company has produced 90 million products for domestic and international car manufacturers.

Around 320 employees develop and manufacture door modules, window regulators, seat structures, cooling fan modules and latches.

Brose and Hasco will continue with the original shareholding of 60 and 40 per cent, respectively.

The company plans to boost product development capability for power liftgates and cooling fan modules.