Thu, 14 November 2024
Weekly Newsletter

DVN
Interior

NEWSLETTER #236

Editorial

Innovation Comes To Sun Visors, Too!

CARINMYLIFE IMAGE

Sun visors might be considered as the most common and simplest component of your vehicle interior. But they're indispensable to the usability and user experience of the car. They cut sun and bright-sky glare, making it safe and comfortable to drive in a wide range of conditions. They also bring added-value comfort to passenger and convenience with functions like inbuilt mirrors, ticket holders, and others. So this week's in-depth is a spotlight on sun visors.

There's lots of content on technology, too—holographic displays, driver anti-distraction displays, voice assistants, automated seat cover sewing, seat textiles with reused and recycled fibers. The future is technology-based, yet simple low-tech solutions can still have great value; the rear view mirror, for example. You'll see more details in this week's news.

If you haven't yet seen the DVN Torino workshop review, **it's here**, and in it you'll see that design and sustainability are now pivotal points—for sunvisors, too! And the spoken presentations are available **here**.

Sincerely yours,

Philippe Aumont
DVN-Interior General Editor

In Depth Interior Technology

Sun Visors' Turn to Take On Tech

2014 FIAT UNO (FIAT IMAGE)

Our report on Headliners and overhead systems covers a broad scope of overhead parts and functions, including sunvisors. Here, we zoom in on the visors.

AMAZON IMAGE

Sunvisors are said to have been introduced on the 1924 model T Ford. Sunvisors, at least one of them on the driver's side, soon came to be standard equipment in all cars. Many sunvisors have added-value features like mirrors, ticket holders, and extenders to allow coverage of the top of the view out the side window, or broaden the forward coverage wider than the visor. In the past, high-tech-of-the-day extra features included inbuilt programmable remote controls for electric garage door openers, and even cellular telephones built into sunvisors (video Crylsler).

The visor's flap or core is typically a pressed or thermoformed part with a piece of metal for its attachment onto a mounting bracket. Some are made of molded substrates or PP. The mounting bracket is often a metal rod with a slight bend in the middle and a bracket that attaches it with screws to the sheet metal above the headliner. The bend in the rod serves to hold the visor flap in the desired position. The flap is covered with material, most often to match the interior of the vehicle. Padding on the sun visors became popular in the 1950s, at first as an option promoted as providing protection to passengers (who were virtually all unbelted and would surely be thrown forward in a crash or panic stop).

The visor plays a vital role to maintain safety while driving by protecting the driver from glare. NHTSA reports thousands sunglare-related car accidents each year, and another study indicates the risk of a car crash is 16 per cent higher during bright sunlight than under less-glaring conditions.

An LCD visor is an option, which does the normal things a visor does, and also integrates a display to extend information/entertainment to passengers.

The automotive sunvisor market grew from USD $1.46bn in 2023 to $1.59bn in 2024. Research and Markets predicts it will carry on growing at a CAGR of 9.50 per cent, reaching $2.77bn by 2030.

The market is segmented by component type—conventional or LCD, for example—material type (fabric, vinyl); features (mirror, light, compass, extended glare protection, etc), and vehicle type (passenger cars, commercial vehicles).

Glare Protection

Glare from the sun can be much more than annoying, it’s dangerous. On the windshield or the driver’s side window, sun glare can dazzle or blind occupants. The visor's effectiveness against this is self-evident.

UV Protection

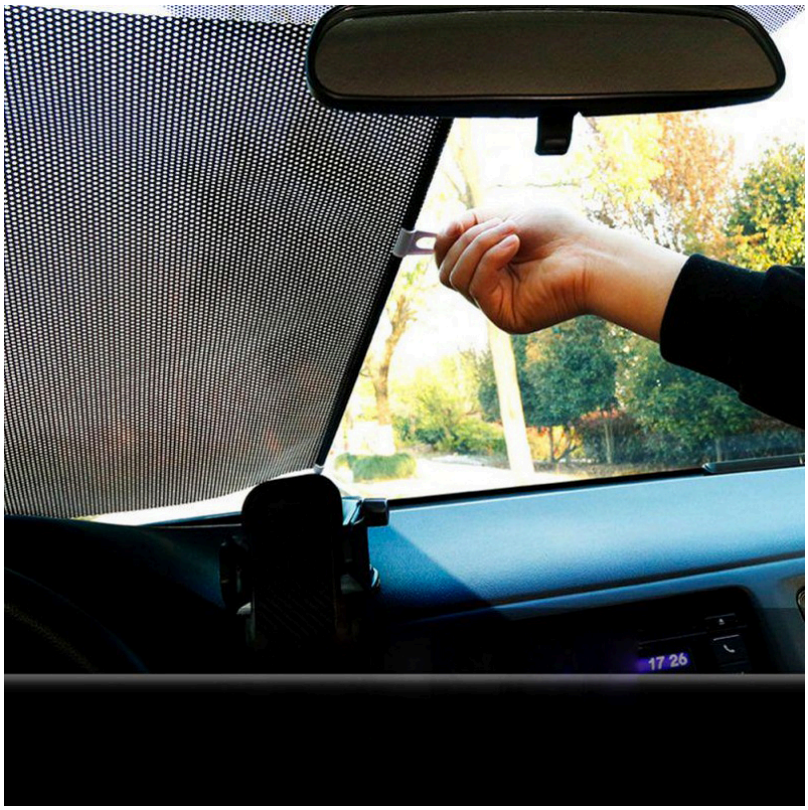
UVA rays penetrate the skin more deeply and are primarily responsible for premature aging and wrinkles. UVB rays are known to cause sunburn and are a significant contributor to skin cancer. Prolonged exposure to UV radiation, especially UVB, poses significant health risks, including skin cancer, cataracts, etc. And UV can also degrade auto interior materials.

Not much of the sun's UV radiation gets through windshields, which block virtually all UVA and UVB. Side glass, however, is much less protective, blocking as little as 44 per cent of UV. It's thought to be why skin cancer and cataract rates are elevated on the outboard side among people who drive (i.e., the left side in countries with RH traffic and LH-drive cars, and vice-versa).

Therefore, UV rays through car windows is a pertinent concern and sunvisors are an apt countermeasure. While the automotive sun visor industry is commonly associated with glare reduction and visibility improvement, its role in UV protection is equally important, contributing to the overall safety and health of drivers and passengers.

UV-blocking coatings, polarized visors, adjustability, and coverage help in enhancing UV protection through automotive sun visors. UV-blocking coatings on visors effectively reduce UV radiation penetration, shielding occupants from potential skin and eye damage.

Sunshades



ITWPERFORMANCEPOLYMERS.COM IMAGE

Sunshades have a job related to that of the sunvisor, but they aren't the same. A sunshade is meant for use when the car is parked. They are positioned on the windshield to prevent internal overheating and protect the vehicle's interior components from sun damage.

Automation is possible; when the vehicle is parked, a motorized and/or automatic shade could be lowered to fully cover the windshield, keeping the interior cooler. Autoshades might also be made of transition-like material that can darken or lighten as necessary.

Automatic Sunvisors

Automatic visor systems use a sensor to detect the eye position of the driver or front passenger and the degree of light hitting their face. A motor deploys the visor into the best position by rotating it downward on a track hidden in the ceiling of the vehicle. Automatic visors can be more like sunglasses, in that they're made of tinted, transparent material. They block sun without blocking the ability to see.

An automatic visor is especially effective when a setting or rising sun is entering the windshield just over the dash, or at an extremely low angle. It will also sense and block a dazzling blinding reflection off a bumper or rear window of a car that might be stopped ahead, either in a traffic jam or at a stop light.

Suppliers

In Europe, the most important supplier are Antolin and Daimay, a Chinese company which took over from Motus (Atlas Holdings), themselves having acquired the headliner and sun visor business of Johnson Controls. Other notable suppliers are: Gentex, Knauf, Kasai Kogyo, Martur Fompak, Irvin, Howa, Hayashi Telempu, along with an abundance of Chinese companies serving the aftermarket.

Antolin

ANTOLIN IMAGE

Antolin has all the technologies adapted to each market to meet the most varied requirements for weight, safety, and customization.

Antolin has made several innovations in this product, such as SOR—Slide On Rod (lateral slide), retractable sunvisors, reduced thickness sunvisors, integration of multi-function mirrors, bio-materials, new design covers. They integrate lighting solutions that increase product functionality, from anti-glare halo lighting to custom backlit logos.

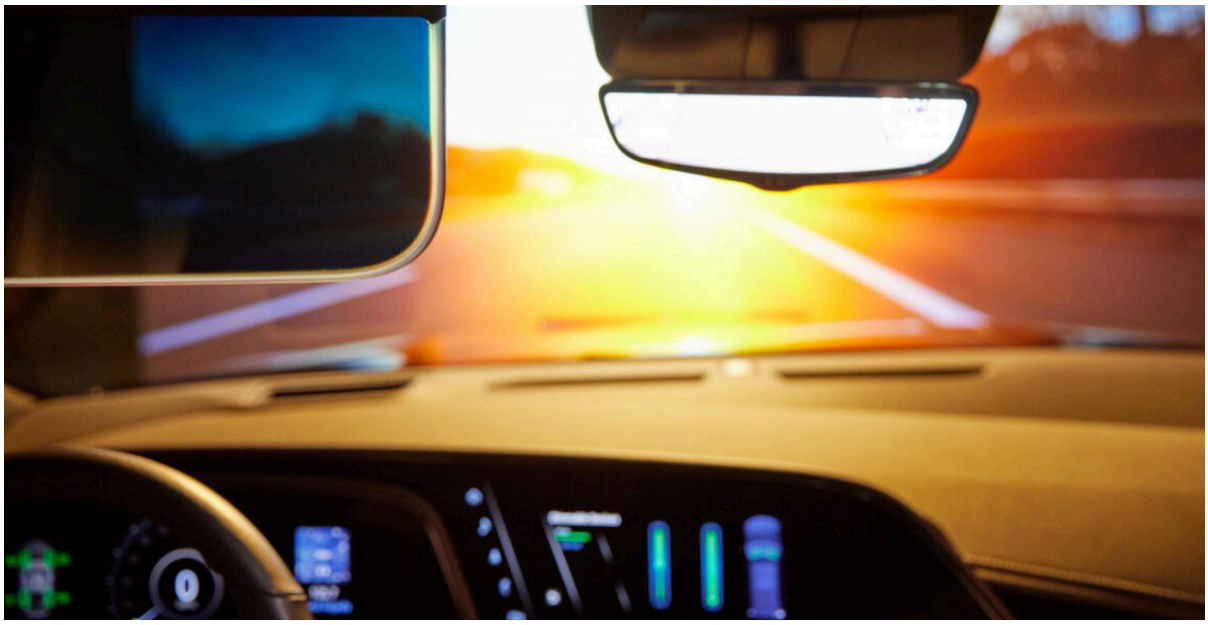
Bosch

BOSCH IMAGE

Bosch's innovative Virtual Visor (see **DVN-I coverage** and promotional video) uses a transparent LCD panel and 'AI' facial detection to block sun glare without obstructing the driver's view. This improves driver safety and comfort by addressing the issue of temporary blindness caused by sun glare. It was presented at CES 2020, but not seen in any vehicle since.

In 2021, Bosch and Zeiss collaborated to integrate Zeiss's expertise in optics and coatings with Bosch's automotive technology. The partnership aimed to develop advanced sun visors with polarized lenses and UV-blocking coatings. These visors offer enhanced glare reduction and UV protection, improving driver visibility and passenger comfort.

Gentex



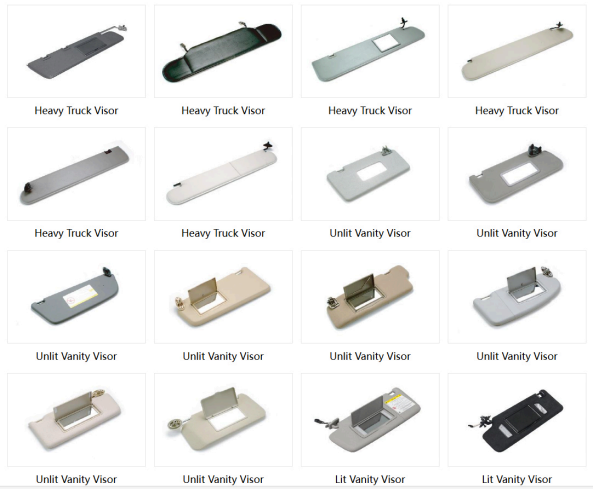
GENTEX IMAGE

Gentex dimmable-glass technology uses electrochromic glass with what the supplier says is the greatest opacity range, the highest optical clarity, and the greatest durability in the market.

New to their product line are dimmable sunvisors. They fold down like a regular visor but include a clear panel that can variably darken as desired by the driver or passenger, thus cutting glare while still allowing forward vision. The darkening can be automatically or manually controlled.

Gentex and Toyota collaborated in 2022, and Gentex auto-dimming mirrors and smart glass technologies contributed to the development of Toyota sun visors with adjustable tint levels and integrated UV-blocking capabilities. These visors provide customizable coverage and UV protection, optimizing comfort and safety for vehicle occupants.

Daimay



Shanghai Daimay Automotive Interior Co., Ltd., mainly engaged in R & D, production and sales of passenger car components, is a professional auto parts supplier with integrated capabilities of design, development, manufacture, sales and service. Production part portfolio include sun visors, seats and headrests, steering wheels and roof consoles. Daimay holds a leading position in the global sun visor supply segment.

Daimay's plant at Creutzwald, France (formerly JCI/Motus) produces 35,000 sunvisors per day.

Knauf Automotive

KNAUF IMAGE

Knauf Group is a family-owned company based in Iphofen, Germany. They make sunvisors for cars and trucks, using high-quality expanded polypropylene (EPP). Their innovative double-action foam molding technique ensures precision and quality.

They focus on combining functional excellence with aesthetic appeal, offering sun visors with various surface structures to perfect the tactile and visual experience.

Martur Fompak

Martur Fompack, based in Istanbul, Turkey, makes seating systems, interior parts, and textiles. Their multi-technology approach enables products to integrate into the supply chains of customers on a global scale. Production technologies are sandwich, shell, EPP, or EPP & sandwich with manual sewing. They use high-frequency cutting, and different types of printing technologies such as digital printing, hot stamping, serigraph printing and pad printing (tampography).

Sustainability

Sunvisors, like all interior plastic-based components, will have to include progressively natural and recycled materials and sustainable practices in manufacturing to comply with regulations and to reduce environmental impact.

Interior News

Adient Partner With Paslin for Automated Sewing

INTERIOR NEWS

ADIENT IMAGE

Adient has entered into a joint-development agreement with machine integrator and automation company Paslin. The purpose is to develop new and innovative automation solutions for Adient's current traditional sewing operations.

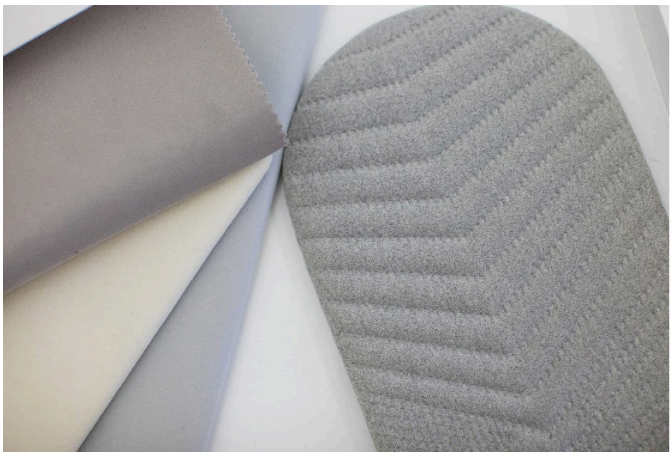
It will focus on creating automated sewing cells with integrated robotics to enhance pattern joining accuracy and automated assembly processes for non-traditional trim development and manufacturing. The initiative is expected to drive improved business performance through increased efficiency and product quality.

Founded in 1937 in Michigan, Paslin provides sophisticated customized automation systems.

Automation of sewing has been a target for all the seat/cover industry since decades, without a lot of success, unless it’s a 2D sewing line.

Lear ReNewKnit Nabs Eco-Award

INTERIOR NEWS



LEAR IMAGES

Lear Corporation, based near Detroit, makes automotive seating and electrical parts and systems. Their seating activity includes body cloth capabilities, headliners, and specialty applications. Their ReNewKnit product range recently received a Creativity in Implementing Sustainable Practices award from Suppliers Partnership for the Environment.

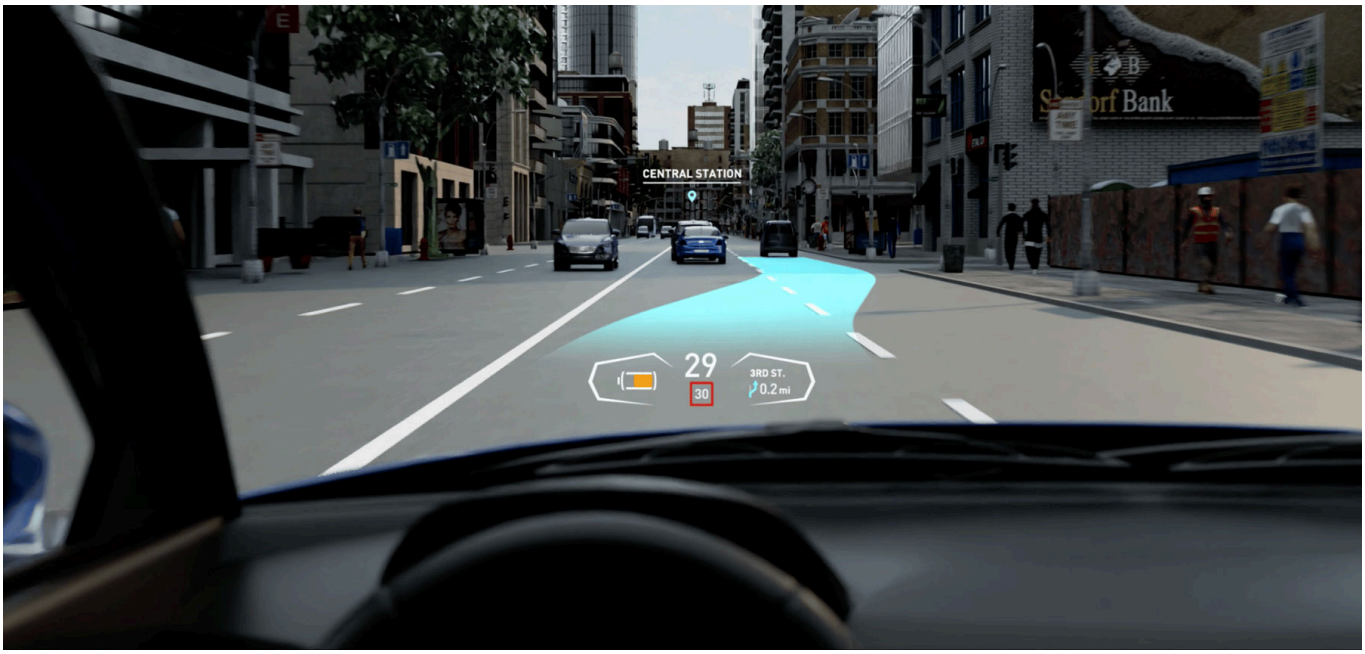
Developed by Lear's Guilford Performance Textile, ReNewKnit is a premium sueded material with a buttery-soft handfeel and improved functionality that meets automaker standards while being fully recyclable.

Made out of recycled plastic bottles, ReNewKnit fibers are spun from recycled polyester yarn and finished with a foam-free, recycled fleece backing that further reduces water and energy consumption in the manufacturing process.

Manufactured solely with recycled materials at facilities using 100 per cent renewable electricity, this automotive interior fabric is fully recyclable at its end of life.

Zeiss-Mobis Holographic Display Pact

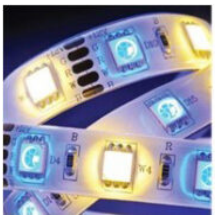
INTERIOR NEWS

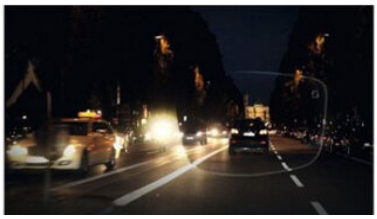


MOBIS IMAGES

Zeiss has signed a strategic partnership with Hyundai Mobis for holographic displays in transparent vehicle surfaces. By integrating Zeiss' transparent and functionalized film, key information will be displayed in the transparent in-plane displays in the lower area of the windshield, improving driving safety by enabling the driver to view information at once without taking their eyes off the road.

Zeiss Microoptics' vision is to bring its multifunctional smart glass technology into every vehicle. They aim to “entrench premium transparent holographic display in the automotive market” and set “new standards in automotive UX” by replacing traditional in-vehicle displays.






An advantage to transparent displays in the windshield is that they will usher in a new design of vehicle cabins by eliminating the need for different displays. The transparent film and its display functionality will offer added comfort, with entertainment content projected into the passenger’s field of vision without obstructing the view outside.

Zeiss and Hyundai Mobis have developed a transparent windshield display prototype and presented it this month at a demonstration for automakers.

The Holographic HUD market is projected to grow significantly, with forecasts estimating around 7 million units by 2030, positioning this technology as a new trend in automotive displays.

Lancia's SoundHound 'AI' Voice Assistant

INTERIOR NEWS

STELLANTIS IMAGE

SoundHound has integrated their Chat AI voice assistant into Lancia Ypsilon vehicles across the main European countries.

Lancia's SALA (Sound, Air, Light, and Augmentation—and 'sala' means 'room' in Italian) infotainment system now features SoundHound Chat AI. By saying "Hey Sala" or pressing a button, drivers can engage with the voice assistant, which responds with dynamic audio and visual information.

The SALA system operates on a fully customizable widget-based environment. It features two standard HD screens, with the home page serving as a centralized control panel for sound, air and light. This configuration allows for effortless customization of the car's atmosphere. Reveal of this new Ypsilon happens through the exclusive Lancia Ypsilon Cassina Limited Edition (of 1,906 units) EV.

Lancia customers will be able to enjoy generative AI responses in addition to in-car voice assistant features including calls, navigation and real-time information like weather and sports scores. The technology effortlessly detects natural human speech and uses generative 'AI' to facilitate "enjoyable, informative conversations", SoundHound says. Users can ask a range of follow-up questions that draw on complementary real-time domains for optimal responses that are relevant and useful while they're on the road.

In parallel, SoundHound published a survey of US vehicle owners, finding that the majority of drivers are likely to use a voice assistant with generative 'AI' capabilities.

Of those surveyed, 76 per cent have access to an in-vehicle voice assistant, 86 per cent of whom report using it weekly. These assistants have mostly been used for in-vehicle controls, navigation, and calls. However, SoundHound says the research reveals that US drivers are ready for "supercharged assistants with new 'AI'-powered capabilities that promise to bring a whole new world of functionality to drivers with natural conversation".

These new functionalities include being able to place food orders and complete other transactions hands-free from the car dashboard, using the assistant instead of operating car features.

In the study, 74 per cent of US respondents said they'd be willing to pay a fee or be served ads to get access, and 81 per cent of US car owners who stated they were planning on purchasing or leasing a car in the next 12 months said they would prefer a car with 'AI' features—setting up a potential discussion, perhaps, with consumers who **say** the mere mention of 'AI' makes them less likely to buy.

The report also found that nearly 40 per cent of US drivers currently find car features too complicated, with half finding common applications like GPS navigation difficult and frustrating.

A Little Extra Mirror for Safer Car Exits

INTERIOR NEWS

GUANG YANG IMAGE

This small mirror attached to the rear door of a car provides safer exit for rear passenger. With no sensors and no energy consumption, this thoughtful addition lets rear seat passengers check for traffic—like bikes or pedestrians—before opening the door, thus helping to avoid dooring accidents and facilitate bicycle and pedestrian participation in vehicle-dominated traffic.

Rain Technology to Cut Driver Distraction

INTERIOR NEWS

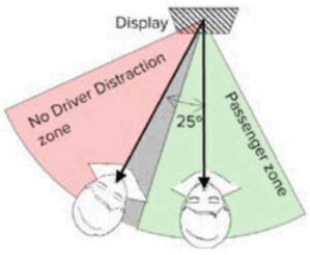
RAIN TECHNOLOGY IMAGE

Rain Technology, a developer of advanced directional display technologies, announced earlier this year that their partner Tianma Microelectronics showed their Passenger Infotainment Display (PID) innovations, combining No-Driver-Distraction and Display Screen Branding.

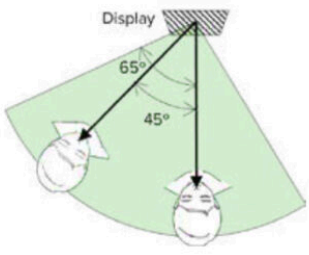
According to NHTSA, distracted driving claimed 3,308 lives and injured an estimated 289,310 people in 2022 in the U.S. The U.S. Department of Transportation has taken note and is currently driving the adoption of guidelines which would disable the use of many electronic capabilities while the vehicle is in motion, unless they are intended for use by the passenger and cannot reasonably be accessed or seen by the driver. Similar regulations are under consideration in the European Union as well.

No-Driver-Distraction is a switchable display solution for automotive safety. Passengers want to enjoy infotainment on the larger display screens of modern vehicles, while safety and regulatory requirements dictate minimizing screen distraction for the driver.

Rain Technology Switchable Privacy™ Solution Delivers



No-Driver-Distraction mode: Quantifiably high performance at a 25° angle



Share mode: High performance viewing for driver and passenger when regulations allow

In an automotive setting, Rain Technology's embedded screen technology electronically switches between:

- No-Driver-Distraction mode, in which the light output from the display is precision engineered to provide infotainment to the passenger but is not viewable by the driver.
- Share mode, in which both driver and passenger can enjoy the display when the vehicle is stationary, displaying map data, or in an approved self-driving mode.
- Rain Technology delivers these asymmetric requirements across the wide range of light levels experienced in a vehicle cabin

Poor HMI Design to Affect Euro NCAP Safety Ratings

INTERIOR NEWS

STAR.GLOBAL IMAGE

Large touchscreen LCD user interfaces are common in most new vehicles. They permit automotive engineers to create sleek dashboard layouts, seamlessly incorporating them into the vehicle's front console. Over time, these displays have continued to evolve to combine navigation, infotainment and vehicle controls. Increasingly, this has led to a decline in the number of individual buttons, which benefits motor manufacturers by reducing bill of material costs, labor and wiring loom costs.

But recent research by the U.S. NHTSA and the German Insurers Accident Research (UDV) points to them distracting drivers, as repeatedly found in practical studies (such as **this one reported on** in DVN-I).

In a recent interview with EE Times Europe, Ilse Harms, chair of the HMI & Human Factors Working Group at Euro NCAP said that outfit is reviewing this research and considering changes to their General Vehicle Controls protocol, a crucial part of the vehicle rating program. This protocol targets driver controls of speed assistance, lane support systems, in-vehicle infotainment systems and comfort controls.

One of the main categories of Euro NCAP's safety rating scheme is Safe Driving. Harms explained that a car with a poor interaction design cannot obtain the maximum category points. New HMI criteria are in development and, in 2029, will likely be further enhanced to put greater emphasis on interaction design.

Distraction contributes to traffic accidents. Euro NCAP recognizes that poor interaction design can contribute to unnecessary long glances off the road while performing a driving or non-driving-related task. As part of its 2026 rating scheme and to facilitate safe driving practices, Euro NCAP plans to introduce its first assessment protocol for General Vehicle Controls. This will involve evaluating the design of vehicle controls, how they are operated (e.g., by inputting through a button, stalk, switch or touch display) and their ease of use. It will consider controls used for various functions, such as the media player, climate control, rear fog lights and hazard warning lights. According to Euro NCAP, car manufacturers will be encouraged to implement good interaction design practices to prevent distraction by design through this updated protocol. It has indicated that a poor result in the new General Vehicle Controls assessment will not directly prevent a vehicle from achieving a five-star rating but will make it more challenging.

The Design Lounge

Audi Sub-Brand in China: Four letters Replace the 4 Rings

THE DESIGN LOUNGE

AUDI IMAGES

Audi has partnered with SAIC on a new Chinese sub-brand to better serve the world's largest car market. The name is AUDI, called out in all uppercase letters—and with no rings.

The first model from was previewed at the introduction. The Audi E, also named the Purple Project, is a near-production electric concept that closely previews what will be launched next year. The E is a "sportback", meaning somewhere between an estate/wagon and a shooting brake.

Its dimensions are: 4,870mm long, 1,990mm in width and 1,460mm in height, with a wheelbase of 2,950mm. Its electric powertrain includes two electric motors, with a total of 570 KW of power and four-wheel drive, which Audil claims will give an acceleration of 0-100 km/h in 3.6 seconds.

Its exterior look focuses on a minimalist design. It has smoothed-off wheel arches and wraparound lights, while the elongated roofline improves space inside for passengers.

Inside, the interior features a curved full-width 4K digital touch display that runs the length of the dashboard. Meanwhile, the door mirrors are also camera displays that are incorporated into the screens, too. The door cards feature illuminated wood, microfiber and three-dimensional design to create a sustainable yet modern look.

The Audi OS operating system powers many of functions, including the Audi Assistant, an app ecosystem, media playback and more. On the center console, which offers storage for two phones, there's the Audi Control, a touch sensitive bar that can be used to navigate any content on the large screen and adapt contextually to any function being interacted with. The E is just a concept for now, so pricing and further specifications are expected to come alongside the reveal of a production-ready model. Plus, this new branding will be for the Chinese market only, with no plans to bring it to European buyers.

News Mobility

Here's What's Really Working In Robotaxis

NEWS MOBILITY

Elon Musk's 'We, Robot' **song-and-dance event** last month focused on robotaxi services, showed more about Musk's fantasies than about actual, working hardware. A recent review listed what's really happening in the autonomous people-moving space, i.e. robotaxis and roboshuttles.

Waymo, the undisputed leader in the robotaxi space in North America, just announced on Instagram that they are logging 150,000 robotaxi trips per week, up from 100,000 trips per week a couple of months ago. Their most recent safety data shows that 84 per cent fewer airbag-deployment crashes are occurring compared to human drivers in similar situations.

With a lean staff of only 280 people, **May Mobility** operates driverless-intent shuttle buses on fixed routes. Their deployment in Sun City, Arizona has already transitioned to driver-out, while operations at other sites rely on a safety driver for the time being. The company said that another operations area will transition to driver-out by the end of this year, with more in early 2025.

In total, May Mobility has stood up nine deployments in the U.S. over recent years. The company reports that deployments will rise to sixteen "soon." Several of these will be in Japan, where May is partnered with NTT's mobility group to start services there next year. Toyota e-Palette vehicles will be operating using May Mobility's hardware and software. Application in Japan is still a question mark, May Mobility is actively collaborating with their Japanese partners to find suitable use cases.

But Japan is another story. There, Toyota has deployed their e-Palette vehicle.

While Tesla is making dubious assertions about a profitable robotaxi operation run by "shepherds" who own an handful of CyberCabs, May Mobility is much further down this road. The company tells that some of May's deployments are already running with a positive margin.

“At 20 cents revenue per mile, I expect Tesla will need 300,000 miles to break even,” said CEO and Founder Dr. Edwin Olsen in a recent interview. But he stressed that Tesla relying on their huge trove of camera-based driving data to create their robot driver is fundamentally flawed. “A situation will arise which the car has never seen before, despite millions of miles of training data. So direct sensing and perception needed,” said Dr. Olsen.

Although Mr. Musk touts the sufficiency of today’s camera-only sensing, Dr. Olsen disagrees. “Theoretically, camera-only can be sufficient for self-driving, but the technology and training data is not yet up to the task. This could be possible by end decade,” he said.

Amazon-owned **Zoox** plans to deploy a small fleet of their robotaxis in San Francisco and Las Vegas “in the coming weeks,” co-founder and CTO Jesse Levinson announced last week. But Zoox is taking “a measured approach,” according to Levinson, with this phase of deployment only being open to company employees.

Similar to the e-Palette, the Zoox vehicle is also optimized for people-moving and does not have traditional driver controls.

Cruise Automation is poised to transition to driverless operations for the public early next year.

General News

Aunde Boshoku to the future of TB Kawashima

GENERAL NEWS

AUNDE IMAGE

Aunde Achter & Ebels concluded on November 1st the investment in TB Kawashima Co, based in Shiga, Japan and a subsidiary of Toyota Boshoku. TB Kawashima changed its company name to Aunde Boshoku.

Founded 1899 as Achter & Ebels in Mönchengladbach, the company began to specialize in the production of textile for the automotive industry from 1920 onwards. The cooperation currently has 116 sites in 28 countries, and 24,100 specialists working there.

Aunde Group has grown internationally while retaining a focus on ecological and social sustainability along the entire value chain. With the brands Aunde, Isringhausen, and Fehrer, the group companies Technofibres, GMA and Reinert, and joint ventures Aundebader and Munda, the portfolio ranges from yarn production to the production of textile surfaces, the cutting and sewing of covers and the individual production of seats, to interior components and composite components.

TB Kawashima, established in December 2009 for manufacturing fabrics for transportation equipment mainly for automobiles, already has a collaborative relationship with Aunde in India and so on. By developing business jointly together with Aunde as controlling and major shareholder, which has a business base with European and American automakers, TB Kawashima will strengthen its competitiveness.

TB Kawashima has been also expanding the relationship with Aunde such as production outsourcing in the North American region, and a global business partnership agreement. This time by further strengthening the collaboration, TB Kawashima will evolve into a true global supplier and will enhance new product development capabilities in seat fabric and cover.

Young People Still Want Status Symbol of Car: Continental

GENERAL NEWS

CONTINENTAL IMAGE

Continental survey reveals young drivers are not planning to give up their cars anytime soon, contrary to intuitive predictions of a future decline in car ownership among young people, based on falling rates and rising ages at which young people apply for a driver's license.

That's one of the highlights of the latest Continental Mobility Study that reveals 54 per cent of young drivers between 18 and 34 years old in Germany, for example, view owning a car as a positive indication of social status.

The study, conducted in August by market research institute INFAS (the Institute for Applied Social Science in Bonn, Germany), gathered opinions of more than 5,000 motorists in key auto markets of Germany, China, France, Japan and the U.S.

Overall, 84 per cent of car owners in Germany, regardless of age, believe it is important to own a car.

The majority of young people in all markets are particularly enthusiastic about technological advances in cars. In Germany 51 per cent of 25- to 34-year-olds look forward to the benefits of self-driving cars freeing up time to be able to read, play video games or work. This group also welcomes the advance of AI in the use of in-cabin voice assistants.

In China, 90 per cent view the relevant technologies as a useful development, while in Japan, 72 per cent share this sentiment. There are also positive attitudes to the technology with 60 per cent approval in France, and 56 per cent in the U.S.

An AI-powered virtual travel companion is particularly popular in China, where 91 per cent say they would like to have such a service. In the U.S. it's 66 per cent and Japan 63 per cent expressing this desire, while in France 58 per cent and in Germany 57 per cent would be happy to have the technology.

Just 39 per cent of respondents who do not yet own a BEV believe their next car will be fully electric. By contrast, hybrid drives are highly popular across all countries.

In Germany 48 per cent and in the U.S. 47 per cent who do not own a BEV can imagine their next vehicle being a gas-electric hybrid and in China, that figure rises to 86 per cent.

However, 68 pe rcent of drivers between 25 and 34 in Germany are particularly interested in BEVs compared with their international peers.

Philipp von Hirschheydt, Continental executive board member responsible for automotive, says: "Younger people have changing expectations of cars. These are closely linked to pioneering technologies such as automated driving, which deliver new user experiences. The response to new technologies in cars varies greatly between generations and between countries. That's why we aim to provide customized solutions – market-specific, tailor-made and modular."