



## **VALEO AT IAA TRANSPORTATION 2024**

From 16 to 22 september 2024

**Hall 19 - 20**

### **PRESS KIT**

From September 16 to 22, 2024, Valeo will be taking part in the 69th IAA Transportation show in Hanover. The event is a meeting place for commercial vehicles, and an opportunity to discover innovations for the future of mobility of goods and people, which is becoming cleaner, safer, more assisted, more connected and more diverse. Valeo is at the heart of these revolutions, which are characterized by the transformation of powertrains, the emergence of new forms of mobility and increased safety.

Valeo has anticipated these profound changes, investing massively each year in Research and Development and is supporting the changes in the transportation of goods and people with affordable and more sustainable technologies. Solutions for commercial vehicles generated a 100% increase in orders for Valeo compared to the last IAA Transportation show two years ago.

At IAA Transportation, Valeo will be showcasing its systems for vehicle electrification - both for propulsion and temperature management - driving assistance systems, lighting and comfort.



## Towards 100% electric mobility for goods and people

Road transport accounts for 18% of global CO2 emissions. Reducing these emissions means that the sector has to do its part, so mobility is gradually becoming electric. This is not a transition. It's a revolution that changes everything about vehicles. Valeo has been preparing for this upheaval for over ten years.

Valeo's innovations today bear witness to the Group's change of dimension, as it becomes a global player in mobility. Valeo's technologies are based on recognized expertise in equipment, software and artificial intelligence algorithms, and are also used in the transportation of goods and people. They can now be found in all vehicles, in all new forms of mobility.

Valeo has all the systems needed to develop electric propulsion, from low to high voltage. These range from small 100% electric urban vehicles for last-mile delivery in city centers, to heavy goods vehicles for long-distance freight, not forgetting passenger transport.

Valeo presents at IAA Transportation,

- 48V hybrid systems for vans and other compact utility vehicles, notably for last-mile delivery, with a 48V motor, its inverter and associated transmission systems [see the following chapter about Valeo's 48V technologies];
- an intelligent heat pump
- 45 cm<sup>3</sup> or 120 cm<sup>3</sup> electrically-driven compressors

Since there can be no high-performance electric vehicles without innovative thermal systems, Valeo is also exhibiting its battery cooling and coolant heating technologies for commercial vehicles.

Valeo is also showcasing organosheet structural parts for front fascias and battery protection areas.

### **New electric mobility: 48V electric propulsion systems for all types of vehicle**

Electrically-assisted bicycles, electric scooters and motorbikes, three and four wheeled vehicles have taken off all over the world, and Valeo is using its 48V technology to offer solutions for each of these forms of mobility.

In particular, Valeo Cyclee™ technology, a module installed at the heart of the pedals on ebikes, is particularly well suited to eCargo bicycles, tricycles and quadricycles for the efficient, economical and environmentally-friendly delivery of goods in city centres.

In order to address this new electric mobility market in the same way as golf carts, Valeo is optimizing the propulsion system to find the best compromise between performance and size.

Valeo will be presenting on its stand 3 partner vehicles, equipped with its technologies:



**The Goupil G4, a light commercial vehicle equipped with a 48V electric motor**



Valeo has incorporated more than 10 years of expertise in 48V technologies into this system. Its electric motor and inverter can power a light city vehicle or achieve fuel savings of up to 15% in hybrid configuration. Valeo is the first company to supply a 48V electric motor in a dual clutch transmission

Unlike other 48V electric motors in production, Valeo's eMotor platform is compatible with oil cooling. As a result, it can be integrated directly into a dual-clutch transmission. The power range of the eMotor goes from 15kW to 25kW in regeneration, max 23kW in engine peak, for an engine speed of 20,000 rpm maximum, with an efficiency of 92%. It extends the field of use of 48V technology to small urban BEVs, with the advantage of not having to manage the safety of high-voltage systems.

**The Cleanmotion EVIG**

EVIG is a future-proof, solar-powered droid designed and produced by Swedish EV pioneers Clean Motion for the clean cities of tomorrow. It features Valeo's efficient e-access powertrain and is the perfect example of an electric vehicle tailored for last-mile delivery. EVIG has been tailored for efficient deliveries in urban environments and can hold up to 350kg in a 2.5m<sup>3</sup> cargo space. Together with its connectivity services, it offers unique value for any company providing city services. The electric motor develops 9.7 kW of power, and the battery is 10 kWh, giving EVIG a range of 130 km.



**The VUF XXL Transporteur Poly, a unique solution for transporting large loads and volumes, with Valeo Cyclee™ electric assistance.**



The VUF XXL Transporteur Poly is a 'made in France' cargo bike specially designed for transporting large loads and volumes (up to 150 kg and 2 m<sup>3</sup>). Its large load area and electric assistance make it a safe and comfortable utility solution, thanks to its ergonomic design and reduced legroom for users between 1.5m and 2m tall. VUF Bikes' mission is to provide a carbon-free logistics solution for all city professionals. The VUF cargo bike is equipped with the Valeo Cyclee™ pedal motor. This motor is a combination of a 48V motor



and an integrated adaptive gearbox (7 speeds). The VUF can reach a speed of 25 km/h (according to e-bike standards) with a maximum torque of 130 Nm. The Transporter Poly box is a robust, watertight transport solution. Its structure, made up of polypropylene panels and aluminum profiles, makes it very light, 100% recyclable and UV-protected. The VUF XXL Transporter Poly has a rear door and a side door equipped with an RFID badge opening system for easy loading and unloading. Combined with a comprehensive range of services, a wide range of bodies, 10 years' experience and outstanding references, VUF Bikes is the leading manufacturer of three-wheeled cargo bikes in Europe.

### Valeo takes care of batteries for electrified vehicles

Many companies, particularly in the delivery and logistics sectors, are adopting electric vehicles (EVs). Advances in battery technology, particularly in terms of capacity and recharging time, are making electric commercial vehicles more viable. Lithium-ion batteries remain dominant as they offer better energy density.

#### Ultra flat plate coolers

Valeo has a long history in battery cooling technologies, including ultra-thin glycol plate coolers for optimal heat exchange.

Valeo not only has the industrial capacity to produce all sizes of coolers, but also to assemble battery packs. Semi-trailer battery packs in particular are often divided into smaller modules that can be assembled to form a complete pack. This allows greater flexibility in terms of capacity and adaptability to different vehicle configurations; operators choose the battery capacity that suits their specific needs



#### High-voltage heating



Optimum battery cooling is a guarantee of pack durability and safety; but in some very cold climates, battery pre-heating is necessary to protect the cells and speed up charging.

Covering a complete range from 3 to 10 kW, Valeo's high-voltage water heating module provides a flat, easy-to-integrate product that is also compatible with compact heat pump systems. Our product is the benchmark in terms of software safety, achieving ASIL D safety level.



### Battery pack protection reinforcements

The mechanical protection of batteries is just as important as their thermal protection. Valeo is developing side impact absorbers (the most vulnerable area of the battery pack). These resin-impregnated fibreglass structural elements reduce the weight of the side members by 30% and offer greater rigidity than metal structural parts thanks to Valeo's unique manufacturing process (pultrusion).



### Valeo's thermal systems for the comfort of drivers

In terms of thermal comfort, the challenge for an electric vehicle is to compensate for the lack of free heat provided by an internal combustion engine with electrical sources that do not excessively affect the car's range in extreme conditions. Electric vehicles are generally fitted with electric heating systems, which consume around 6 kW at -7°C on cold start-up, and electric compressors for air conditioning, which consume around 4.5 kW at 35°C. These draw on the energy stored in the batteries and can affect range by up to 40% in winter (-7°C) and 20% in summer (over 35°C), if the vehicle is not fitted with intelligent, energy-saving heating and air conditioning systems.

Valeo is a world leader in air conditioning systems. The Group designs and produces all the components that go to make them up: electric compressors, evaporator-condensers, internal condensers, water-cooled condensers and high-voltage heaters, but also has expertise in controlling complex heat pump systems.

### Intelligent heat pump



Valeo has developed the entire heat pump system (including the electric compressor) with its control software to equip the electric platform of a leading European carmaker in China and Europe. Production started in 2019 in 3 Valeo plants.

On motorways, in stabilised mode, the intelligent heat pump can even recover the heat dissipated by the battery to heat the passenger compartment, offering a minimum consumption of 1 kW compared with the 3 kW required with resistive heating alone (outside temperature at -7°C and heating set at 21°C).

Valeo has also introduced to the market a low carbon/GWP R-744 refrigerant air conditioning system: a world first rewarded by the PACE in 2017 (on the premium segment of a German customer), as well as R-744 heat pump components for maximum range in winter which became standard in 2019 on the largest EV platform in the world.

To meet the challenge of balancing interior comfort and range in electric vehicles, Valeo is offering an

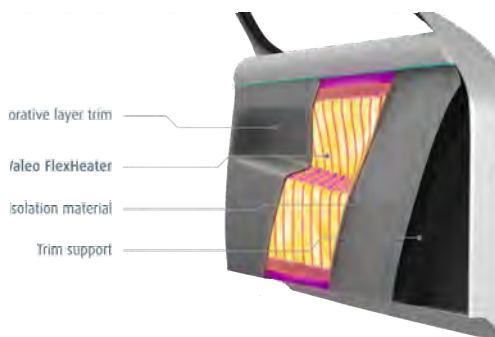


all-in-one heat pump that integrates the refrigeration and cooling loops into a single module, which can be easily connected to the HVAC, EDC, high-voltage coolant heater, battery pack and front-end cooling module. Valeo was the first to introduce this product and has been in series production since 2023.

The intelligent heat pump offers long-term savings thanks to its energy efficiency, making it an economical choice (possibility of reducing energy consumption and cutting greenhouse gas emissions).

### FlexHeater heating panels

Valeo has also developed a unique low-energy cabin heating solution based on the intelligent distribution of energy between the air and the interior surfaces. This system comprises a flexible, compact and innovative surface heating technology (FlexHeater) integrated into the cabin trim (door panel, centre console, cockpit, rear seat, etc.), combined with intelligent control of the heating, ventilation and air conditioning (HVAC) module. In very cold weather, this radiant electric heater provides immediate, silent comfort, as close as possible to the passengers, while the HVAC takes over. The system offers a spectacular 50% reduction in energy consumption when the temperature rises to  $-7^{\circ}\text{C}$  with a single driver (bearing in mind that the average occupancy rate of a vehicle is less than 2) and up to 25% when the vehicle is fully occupied.



### Range of electric compressors from 45cc to 120cc



The 45cc electric compressor is designed in 800 V for very high cooling requirements.

This electric compressor is lightweight, weighing less than 7 kg, and its packaging is very competitive, with a length of less than 235 mm. It achieves a cooling capacity of 12 kW at a high COP of over 2.0, making it ideal for ultra-fast charging.

At the same time, it is the quietest in its class, whether in cooling mode or in fast charging mode.

The 120cc electric compressor is the answer to market demand for e-Bus applications. Its operating range is compatible with the needs of AC/HP/battery cooling systems. Its low weight and high efficiency mean that it has a low carbon footprint when in use.



## Reducing the carbon footprint of electrified vehicles and bio-sourced materials

In 2018, Valeo introduced for the first time lightweight composite materials for automotive mass production, replacing aluminum structural parts in particular, which have very high emissivity. The organosheet cross member replaces metal parts and offers even greater crashworthiness. Thanks to its leadership in the field of thermoformed recyclable composites, Valeo can offer up to 30% weight reduction with this technology, making it possible to increase the range of electric vehicles and promote carbon neutrality.



- 30% lighter than reference hybrid steel
- 37% stronger than basic hybrid steel
- Corrosion-resistant
- Plastic overmolding for easy integration of functions
- Introduction of bio-sourced composite materials (replacement of glass fibres by hemp fibres)

## Valeo and technologies for more assisted transport

Valeo is the world leader in advanced driver assistance systems, (ADAS). The Group has been innovating for the safety of road users for more than 30 years. It all began with the information given to the driver, with the ultrasonic sensor that warns of an obstacle. Valeo then assisted the driver with systems that triggered emergency braking or lane keeping on their own. Today, Valeo's technologies make it possible to delegate driving to a vehicle.

Valeo masters the entire system. The Group is world leader in equipment, with the most advanced and comprehensive sensor portfolio in the world, and in the central electronic control units that merge information and translate it into digital data that can be used by the software functions.

Valeo has been developing software for over 30 years and is now a major player in the field of Software Defined Vehicles (SDV), the Group has a software offer that is one of the largest offers in the market, including embedded software for powertrain, thermal management, driver assistance systems or smart lighting and Valeo anSWer, its solutions for software as a product and as a service.



### Valeo's SCALA™ 3 Lidar: the cornerstone of the autonomous vehicle



As an example of Valeo's unique expertise in combining cutting-edge equipment, high-performance perception software based on artificial intelligence and industrial production capacity, Valeo's LiDAR is the world's first mass-produced 3D laser scanner, fitted on vehicles that are already on the market, enabling level 3 autonomy and meeting the automotive industry's stringent specifications, particularly in terms of reliability. Presented at the

IAA Transportation show as a key component of driver assistance systems designed to enhance road safety, it sees what the human eye, cameras and radar cannot.

Protected by over 700 patents, Valeo's third-generation LiDAR - SCALA™ 3 - senses the vehicle's environment as a point cloud, a very accurate 3D distance measurement, with a resolution unmatched to date on an automotive LiDAR system.

With a resolution of 12.5 million pixels per second (nearly 50 times more than Valeo SCALA™ 2) and a detection up to 300m for a truck or a car for low reflectivity objects (10%), it makes automated driving possible on motorways (up to 130 km/h) and in urban areas.

Valeo SCALA™ 3 is energy-efficient, consuming less than 15 watts. Its compact design allows it to be integrated either in the bumper or on the roof of the vehicle.

In addition to its outstanding physical and material properties, Valeo SCALA™ 3 is equipped with a suite of AI-based software modules enabling advanced LiDAR perception and functionality, such as object, lane, landmark, blockage, rain and spray detection, online calibration, misalignment detection or service calibration. These software modules can be integrated into any SoC (system-on-chip), running on both domain controllers or dedicated ECUs.

Its wide horizontal (120°) and vertical (26°) field of view makes it the ideal lidar for ADAS and driverless vehicles.

Thanks to 3 generations of Valeo SCALA™, and multiple series L3 programs with leading OEM in all major markets, Valeo SCALA™ technology is fully ready to support ADAS on commercial vehicles

### Range of touch screens for transport vehicles

By integrating the instrument cluster and central screen into a curved, 4K product measuring over 21", Valeo is setting new standards in quality and user experience for the driver of a goods or passenger vehicle. Valeo has







designed this screen with cold-formed glass with a radius of 3 metres to enhance the perception of quality inside the vehicle.

Thanks to the technologies implemented, the user can enjoy vivid colours, sharp contrasts and wide viewing angles for an immersive visual experience. The screen is compatible with locally dimmable backlighting. What's more, the floating appearance of the screen on the dashboard adds a touch of originality.



Visitors to IAA Transportation will also have the chance to discover a range of high-definition displays, including centre displays and instrument clusters for use in transport vehicles. Valeo offers a range of display sizes, from 7' to over 20', ensuring a perfect fit for all vehicles. ASIL A and B compliant, they guarantee the highest safety standards.

### Steering wheel-mounted controls for trucks



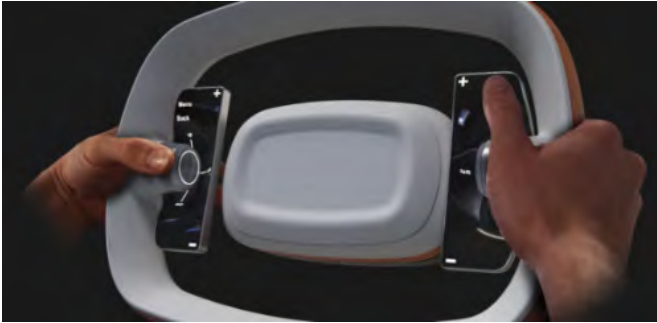
The truck switch combo is the ultimate electrical control solution for drivers of all commercial vehicles, on and off road. As a market leader with decades of experience, Valeo offers a standard solution unmatched in reliability and performance.

These combination switches feature state-of-the-art contact and non-contact technologies, guaranteeing the durability and precision of each function. They seamlessly integrate essential controls such as indicators, lights, wiper and gearbox control, providing a complete and intuitive driving experience.

Designed to withstand harsh conditions, these switches offer a resistance to use of up to 250 N (depending on customer design) and robust IP5K2 protection. For enhanced visibility and safety, optional backlighting is available on the levers.



### Steering wheel-mounted controls for trucks



Valeo's steering wheel switches are designed to enhance driving control and comfort. These advanced switches make it possible to manage all assistance, automated driving and infotainment functions without taking your hands off the wheel or your eyes off the road.

### Driver Monitoring system

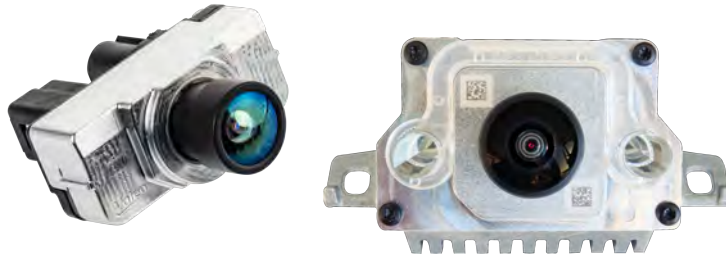


Studies show that drivers underestimate the risk of drowsiness, just as they overestimate their vigilance and driving ability. This is why it is important to detect driver drowsiness and distraction in order to avoid potentially fatal accidents. Valeo focuses on the driver and helps them maintain their attention on the road. By understanding driver behaviour, the system enables the vehicle to make better decisions and take appropriate action. This improvement will help to reduce accidents linked to fatigue, distraction and telephone use. Telephone use at the wheel has increased considerably in recent years, becoming one of the main causes of road accidents.

Valeo's driver monitoring system is destined to become an indispensable element in improving safety.

### Camera cabin surveillance system

Valeo presents its occupant monitoring system, a revolutionary solution designed to improve driver and passenger comfort and safety. The system integrates a high-resolution interior camera and a powerful electronic control unit (ECU) to provide a range of advanced functions.



The camera, with a resolution of 2.5 to 5 megapixels and a fisheye field of view of 190° to 200°, captures every detail of the passenger compartment. Equipped with an RGB and IR imaging system and LED lighting, it guarantees optimum visibility whatever the lighting conditions.

The system's capabilities include

- Cab monitoring: Provides a complete view of the interior, enhancing safety and surveillance.
- Vital signs detection: Monitors driver health parameters in real time, adding an extra layer of safety.

### HMI for electric bikes - PixelRide

Valeo has designed a unique aesthetic HMI through the selection of durable materials, combining the needs of cyclists: connectivity and adaptability. Existing products are designed specifically for city or mountain use. In addition, electric bikes are increasingly being targeted by thieves due to their growing value.

Valeo introduces an elegant new Human Machine Interface (HMI) solution and a secure, easy-to-use locking system tailored to the needs of electric cyclists.



The solution is a 3-component system: an intelligent docking station, a 2' touch screen and a remote control with a rotary throttle.

This HMI moves seamlessly from the city to the mountains, thanks to several mounting positions and a removable screen. The 'Phone-as-a-Key' system of Valeo's intelligent docking station automatically locks the electric bike when the user moves 2 metres away from it.

Valeo offers an upgradeable product: entry-level pack with the smart docking station and remote control, the Premium pack with the 2' touch screen.



## Valeo is the world leader in visibility systems, making mobility safer, smarter and more attractive

As vehicles become increasingly electrified and autonomous, lighting will become even more important in the years to come, and even ubiquitous - both around and inside the vehicle.

The architecture of electric vehicles reduces the need for air intakes, freeing up space and allowing designers to assert their style and brand through lighting.

Lighting will also be an essential lever when increasingly autonomous vehicles need to communicate with their external environment and offer passengers a cabin that feels 'just like home'.

Clear, real-time information can be shared with other road users thanks to intelligent pixelated display surfaces. These can be used, for example, to inform users of the vehicle's charge level or, in the future, to provide information on traffic conditions. This information will be relayed inside the vehicle to alert drivers to emergency situations by means of light signals.

The new lighting solutions also offer consumers a host of creative ways of personalising the passenger compartment, the front of the vehicle and the area around the vehicle by projecting light onto the ground.

Valeo is also developing AI systems to define and visualise holistic designs in real time by combining style, functionality and materials. These advanced systems will accelerate the virtual development of lighting solutions: prototypes can be designed at the most advanced stage possible, reducing development costs.

Finally, these new lighting systems provide a solution to the problem of hardware obsolescence, thanks to the development of software that allows lighting style options to be updated throughout the life of the vehicle.

### **A more efficient and personalised lighting**

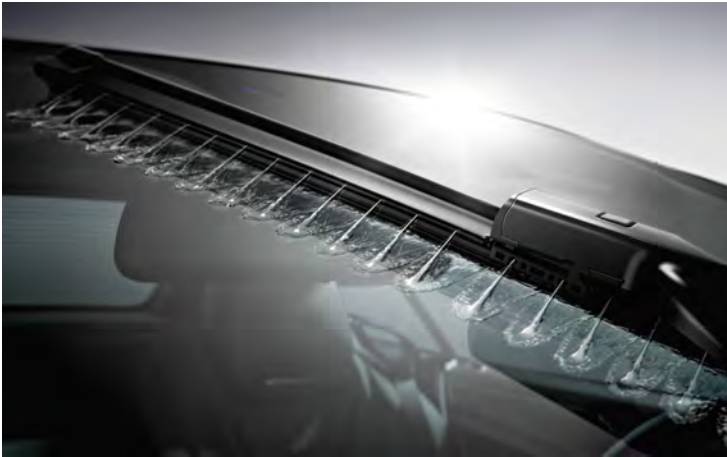
On its stand, Valeo is presenting an innovative front-end, equipped with 15 mm high Valeo Thinbilite bifunction lighting modules and two pixelated display panels made up of more than 1,700 LEDs. This front-end offers users the possibility of communicating with other road users via lighting, using near-field projection. The front fascia, mounted on Zeekr 007, also features a strong brand identity, with an illuminated central logo incorporating an ADAS sensor.





### **Wiping system for curved windscreens**

The Curved Screen Wiping System is specially designed to ensure perfect wiping quality for new truck cabs. These cabs have a bubble-shaped windscreen due to new environmental regulations, making it impossible to wipe the corner of the windscreen with the standard arm and blade system.



Valeo has developed and patented a wiper arm that allows the blade to rotate to wipe the pillar.

Combined with Valeo Aquablade™ and Valeo's electronic motor in a single system, it achieves perfect wipe quality and vision through a specific wiping pattern while reducing wash consumption and enabling a full range of software and other end-user focused functions (debug/de-ice).