



Product and Technology Communications

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Innovative aerodynamics concept of the Audi e-tron S models

- **Top aerodynamic drag figure of 0.26 for the e-tron S Sportback prototype**
- **Wheel arch trims with air flow-through as new Audi patent, plus fully enclosed floor pan and controllable cool-air inlet**
- **Virtual exterior mirrors with OLED displays in the interior**

Ingolstadt, June 17, 2020 – Aerodynamics is a key factor in range particularly with all-electric automobiles. Thanks to smart technology innovations, Audi’s sporty SUV coupé achieves a remarkably low drag coefficient figure of 0.26. The sophisticated aerodynamics concept features many innovative detailed solutions.

The electrically powered S models reveal their power through sporty details on the exterior – the wheel arch trims, for instance, are 23 millimeters (*0.9 in*) wider on both sides than on the basic version. The striking design takes its cue from aerodynamics based firmly on new technologies. The SUV coupé’s quickly downward-sloping roof line further improves the drag coefficient compared with the sister model. And in particular a spoiler edge on its trunk lid improves the airflow direction at the rear.

Optimized airflow through the front wheels: air curtains and airflow through wheel arch trims

The controlled airflow at the front wheels is fundamental to the aerodynamics concept. The side air inlets in the front – the air curtains – route the air over a channel in the wheel houses to optimize the airflow to the wheels and the vehicle flank. The airflow through the wheel arch trims serves the same purpose: Narrow horizontal bars in the recesses formed by the widened trims in the front channel the airstream to surround and encapsulate disruptive swirl in the wheel houses. The upshot is “cleaner” airflow along the vehicle flank with reduced flow losses. The design of the 20-inch wheels as well as the tread and the pattern on the sidewalls of the tires have also been optimized accordingly.

The airflow through the wheel arch trims helps Audi resolve the conflict of objectives between outstanding aerodynamics and sporty looks. For the first time, the brand with the Four Rings is bringing this innovative, patented solution to high-volume automobile production. The future Audi e-tron S Sportback will achieve a drag coefficient figure of 0.26 – the Audi e-tron S 0.28.



Virtual exterior mirrors with OLED displays in the interior

Compared with standard mirrors, the sleek virtual exterior mirrors further reduce aerodynamic drag. They help improve aerodynamics by around the same amount as the airflow through the wheel arches and increase range by around three kilometers (*1.9 mi*) in the WLTP cycle. The virtual exterior mirrors were another world first from the Four Rings that already went into volume production in the Audi e-tron quattro (combined electric power consumption in kWh/100 km (*62.1 mi*)*: 26.6 – 22.4 (WLTP); 24.3 – 21.0 (NEDC); combined CO₂ emissions in g/km: 0). Each of their flat supports integrates a small camera at the ends. The captured images appear in the interior on high-contrast OLED displays located in the transition between door and instrument panel. Whether driving on the highway, turning or parking, the field of view adjusts to each driving situation.

The sophisticated aerodynamics concept of the future e-tron S models continues under the vehicle floor. Here underfloor paneling with spoiler elements cleanly routes the air around the vehicle. The underfloor together with the aluminum cover plate for the high-voltage battery is enclosed. The bolting points come with bowl-shaped indentations, similar to the dimples on a golf ball. They make the air flow much better than a totally flat surface. The standard adaptive air suspension – the air suspension with controlled damping – further helps improve the aerodynamic drag: At high speeds, it lowers the body up to 26 millimeters (*1.0 in*) below the standard height in two stages.

Part of thermal management: the controllable cool-air inlet

The controllable cool-air inlet is an important component, which also acts as the thermal management control center. It comprises a frame behind the Singleframe with two electrically operated louvers. At speeds between 48 and 160 km/h (*29.8 and 99.4 mph*) these are usually closed so that the air flows over the hood with virtually no swirl. If the air conditioning system or the drive components require more cooling air, the louvers open gradually. If the hydraulic wheel brakes are subjected to extremely high loads in exceptional circumstances, the controllable cool-air inlet releases two channels that route air to the front wheel arches. If necessary, the cooling fan is turned on.

Up to 973 Nm (*717.6 lb-ft*) of torque: innovative drive concept with three electric motors

The future e-tron S models will stand out thanks to their extraordinary performance in addition to their outstanding aerodynamic characteristics. The two new flagship models in the Audi e-tron model line use three electric motors, two of which work at the rear axle. Together they produce 370 kW boost output and up to 973 Nm (*717.6 lb-ft*) of torque. The S models each sprint from a standstill to 100 km/h (*62.1 mph*) in 4.5 seconds. Their intelligent drive control raises vehicle safety, and dynamic handling in particular, to a new level. In addition to the electric all-wheel drive, there is the electric torque vectoring with active and fully variable torque distribution on the rear axle.

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** Information on fuel/electric power consumption and CO₂ emission figures given in ranges depend on the equipment selected for the vehicle*



Fuel consumption of the models named above:

(Information on fuel/electric power consumption and CO₂ emission figures given in ranges depend on the equipment selected for the vehicle)

Audi e-tron 55 quattro

Combined electric power consumption in kWh/100 km (62.1 mi): 26.4 - 22.4 (WLTP); 23.1 - 21.0 (NEDC)

Combined CO₂ emissions in g/km: 0

Audi e-tron 50 quattro

Combined electric power consumption in kWh/100 km (62.1 mi): 26.6 - 22.4 (WLTP); 24.3 - 21.9 (NEDC)

Combined CO₂ emissions in g/km: 0

The specified fuel consumption and emission data have been determined according to the measurement procedures prescribed by law. Since September 1, 2017, certain new vehicles are already being type-approved according to the Worldwide Harmonized Light Vehicles Test Procedure (WLTP), a more realistic test procedure for measuring fuel consumption and CO₂ emissions. Starting on September 1, 2018, the New European Driving Cycle (NEDC) will be replaced by the WLTP in stages. Owing to the more realistic test conditions, the fuel consumption and CO₂ emissions measured according to the WLTP will, in many cases, be higher than those measured according to the NEDC. For further information on the differences between the WLTP and NEDC, please visit www.audi.de/wltp.

We are currently still required by law to state the NEDC figures. In the case of new vehicles which have been type-approved according to the WLTP, the NEDC figures are derived from the WLTP data. It is possible to specify the WLTP figures voluntarily in addition until such time as this is required by law. In cases where the NEDC figures are specified as value ranges, these do not refer to a particular individual vehicle and do not constitute part of the sales offering. They are intended exclusively as a means of comparison between different vehicle types. Additional equipment and accessories (e.g. add-on parts, different tire formats, etc.) may change the relevant vehicle parameters, such as weight, rolling resistance and aerodynamics, and, in conjunction with weather and traffic conditions and individual driving style, may affect fuel consumption, electrical power consumption, CO₂ emissions and the performance figures for the vehicle.

Fuel consumption and CO₂ emissions figures given in ranges depend on the tires/wheels used and chosen equipment level. Further information on official fuel consumption figures and the official specific CO₂ emissions of new passenger cars can be found in the "Guide on the fuel economy, CO₂ emissions and power consumption of all new passenger car models," which is available free of charge at all sales dealerships and from DAT Deutsche Automobil Treuhand GmbH, Hellmuth-Hirth-Str. 1, 73760 Ostfildern, Germany, or under www.dat.de.

The Audi Group, with its brands Audi, Ducati and Lamborghini, is one of the most successful manufacturers of automobiles and motorcycles in the premium segment. It is present in more than 100 markets worldwide and produces at 16 locations in 11 countries. 100 percent subsidiaries of AUDI AG include Audi Sport GmbH (Neckarsulm, Germany), Automobili Lamborghini S.p.A. (Sant'Agata Bolognese, Italy) and Ducati Motor Holding S.p.A. (Bologna, Italy).

In 2019, the Audi Group delivered to customers about 1.846 million automobiles of the Audi brand, 8,205 sports cars of the Lamborghini brand and 53,183 motorcycles of the Ducati brand. In the 2019 fiscal year, AUDI AG achieved total revenue of €55.7 billion and an operating profit of €4.5 billion. At present, 90,000 people work for the company all over the world, 60,000 of them in Germany. Audi focuses on sustainable products and technologies for the future of mobility.
