

Detailed look at the electric car from the inside

- **Electric cars are becoming more popular on our streets, but how they work continues to raise questions**
- **Charging systems, safety and power are the biggest doubts users have**
- **The Mii electric has a combined cycle range of up to 260 km and its 61 kw of power enables it to accelerate from 0 to 50 km/h in 3.9 seconds**

Martorell, 26/03/2020. When Benjamin Franklin opened the way to an electric world in 1752, he probably never imagined that one day the energy that moved a key attached to the tail of a kite would drive a car. Today's vehicles can be charged from a household socket. They are more sustainable, have a lower cost per kilometer and deliver the same (or even better) performance. But do we know how electric cars work? We find out by taking a close look inside the Mii electric.

1. It all begins with electricity. Alternating current, direct current, combined... Electric vehicles can be charged using either a domestic electric network or at a fast charging station. The difference is that domestic current is alternating, while fast charging is direct current. Therefore, different connectors are needed. **“The Mii electric features a combined system that allows for both types of charging. The time needed at home will depend on the contracted power or whether wallboxes are used. When using fast chargers, the charging time can be more than 5 times lower”**, says Francesc Sabaté, the head of Energy System Development at SEAT.

2. High-voltage safety. If the car is being charged from a domestic AC network, the electricity first passes through the charger located under the engine, via the charging cable. As this is a high-voltage system, the entire circuit has high safety measures. **“The batteries of the Mii electric are continuously checking the parameters of the entire system. If a measurement does not meet the set levels during a check, the system automatically disconnects”**, ensures Francesc.

3. Converting the current. The charger ensures that only direct current reaches the battery, so it transforms the current supplied by the domestic network. If the vehicle is charged with direct current from a fast system, it does not go through this phase and goes directly to the battery.

4. The heart of the system. The current has now reached its destination, the battery. This is not a single unit, but is divided into modules, and these, in turn, into cells. The advantage of this system is that if one of the modules fails, it can be replaced independently without affecting the rest of the battery components. **“In contrast to fuel-burning cars, electric cars consume less in the city and recover energy when braking, which is why the Mii electric has a range of up to 260 km in combined cycle, and up to 360 km when only driven in the city”**, explains Santi Castellá, the head of Electromobility at SEAT.


5. On the go. The electric propulsion e-Motor can now be started. Technically, it converts the three-phase voltage into motive power. Once in operation, the same power is maintained over


almost the entire load level range. Unlike vehicles equipped with a combustion engine, electric cars deliver full power from the very first moment. On a practical level, and in the case of the Mii electric, it delivers 61 kW [83 hp] of power and 212 Nm of torque, enabling it to accelerate from 0 to 50 km/h in 3.9 seconds.


The batteries on the Mii electric

Today's new electric models adapt their design to the shape of the batteries, which occupy the lower part of the car. However, when converted to electric, the Mii did not undergo any changes in its structure or interior space, as batteries are manufactured specifically for this model:

 - Range of up to 260 km (combined cycle).

 - 61 kw of peak power.

 - Rechargeable lithium-ion.
- 14 module unit, each with 12 cells.
- Connected to the motor, charger, heating and climate control system compressor.

 - 80% fast charge in one hour (40 kW DC).
80% charge in four hours (7.2 kW AC).

SEAT is the only company that designs, develops, manufactures and markets cars in Spain. Member of the Volkswagen Group, the multinational has its headquarters in Martorell (Barcelona), exports 80% of its vehicles, and is present in 80 countries on all five continents. In 2019, SEAT sold 574,100 cars, the highest figure in the history of the company.

The SEAT Group employs over 15,000 professionals and has three production centres – Barcelona, El Prat de Llobregat and Martorell, where it manufactures the highly successful Ibiza, Arona and Leon. Additionally, the company produces the Ateca in the Czech Republic, the Tarraco in Germany, the Alhambra in Portugal and the Mii electric, SEAT's first 100% electric car, in Slovakia.

The multinational has a Technical Centre, which operates as a knowledge hub that brings together 1,000 engineers who are focused on developing innovation for Spain's largest industrial investor in R&D. SEAT already features the latest connectivity technology in its vehicle range and it is currently engaged in the company's global digitalisation process to promote the mobility of the future.

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