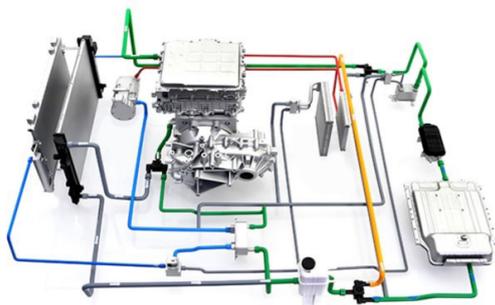


NRF TECHNICAL ARTICLE

BATTERY COOLING

Why the A/C system becoming more and more important in the modern Electric and Hybrid Vehicles?



Because the A/C system becomes the main cooler/heater of the EV's power components.



What are the operating temperatures of an EV battery?

Usually, the nominal operating temperature of the battery is around 20°C to 25°C

The lower limit of battery operating temperature is about -10°C to -5°C

The upper limit of battery operating temperature is usually around 40°C to 45°C



What happens if the battery does not operate at its optimal temperatures?

Electric car batteries are extremely sensitive to temperature changes, and temperatures that are too high or too low can have serious consequences for their performance, capacity and even safety.



*by Dave Talbot technical specialist

At extremely low temperatures, battery capacity can be significantly reduced, and at high temperatures, faster degradation of the battery system can occur, reducing its life and capacity in the future.

The battery system of an electric vehicle requires maintaining optimal temperature conditions in order to function reliably, efficiently and safely.

What happens if the battery overheats?



High temperatures can accelerate the degradation processes of electrode materials and electrolytes, leading to a reduction in battery capacity and life.

High temperatures can cause materials in the battery system to expand, which can cause mechanical stress and deformation.

This can lead to structural damage to the battery system and even physical damage such as electrolyte leakage, corrosion and deformation of the electrodes

Each battery is managed by a BMS module which, in addition to all its functions, also monitors the temperature of each battery pack and controls the path of the cooling/heating agent.

Who cares about optimal battery temperatures?



Heat pump - the new generation of cooling systems

The heat pump system is an innovative technological component that serves for efficient heating and cooling of the high voltage components of the EV's and Hybrids, providing optimal conditions for operation and maintenance of its life cycle. This system is an advanced form of thermoregulation that regulates the heat path as well as the refrigerant path.

