

Electric vehicles: Shorter charging times thanks to high-pressure heat exchanger from BENTELER

- **BENTELER's high pressure heat exchanger provides high-capacity battery cooling during charging.**
- **Use of steel allows a more compact design and higher power density: 60 bar pressure and 12 KW power output.**
- **Climate-friendly, completely enclosed CO₂-based cooling system.**

Salzburg/Paderborn, January 28, 2021. Together with range, battery charging time is one of the key issues in electromobility. "Car owners don't like the fact that the charging process currently still takes a relatively long time. They feel that this restricts their mobility and flexibility," explains Dr. Rainer Lübbers, Executive Vice President of the responsible business unit at BENTELER Automotive. Shorter charging times are therefore a factor in promoting the politically desirable broad acceptance of electric vehicles. Up to now, however, the large amount of heat generated during charging at fast charging stations has proven to be an obstacle. With its high-pressure heat exchanger, BENTELER now offers an innovative solution for particularly effective and fast cooling.

Innovative, compact and powerful

"Keeping the battery as cool as possible during the charging process is crucial for reducing charging time," explains Jens-Eike Jesau, the developer responsible: "Our system makes this possible and thereby accelerates charging." The BENTELER high-pressure heat exchanger is installed in the air conditioning circuit. "Coupling battery cooling and air conditioning in this way increases the cooling power available during charging. This shortens the battery charging time," says Jesau. Another plus: On the one hand, the battery and car interior can be optimally cooled while, on the other, the battery heat can be used to heat the passenger compartment when necessary. The high-pressure heat exchanger also scores with a high 12KW output. At the same time, its design is very compact – the BENTELER high-pressure heat exchanger is about the size of a cigarette pack thereby simplifying its integration in the vehicle.

BENTELER's high-pressure heat exchanger uses CO₂ (R744 refrigerant) as the cooling medium. The system pressure is ten times higher than in conventional heat exchangers, which significantly increases the cooling capacity: 60 bar in the heat pump system liquefies the CO₂ before it enters the cooler. There it evaporates and absorbs the waste heat from the battery charging process. Thanks to the completely sealed system, no CO₂ can escape.

System competence in e-mobility

"We are proud to be able to offer this new solution to our e-mobility customers," says Lübbers. "It's backed up by our systems expertise as one of the leading global partners to the automotive

industry. We have a deep understanding of the electric vehicle platform and derived subsystems. Plus, there's our proven expertise in thermal management and the design of safety-relevant high-pressure components, which we use for ground-breaking developments." As a result, the high-pressure heat exchanger benefits from BENTELER's extensive expertise in the development and production of exhaust gas recirculation coolers and high-pressure fuel rails.

Photos and captions:

high-pressure heat exchanger.jpg: BENTELER's climate-friendly high-pressure heat exchanger delivers high cooling capacity for batteries during charging.

BENTELER_metal_processing_specialist.jpg: As a global metal processing specialist BENTELER offers its customers first-class engineering competence, innovative material and process technologies as well as expertise in metal forming and processing. (symbolic picture: production at a BENTELER Automotive plant)

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BENTELER Automotive is the development partner for the world's leading automobile manufacturers. With around 26,000 employees and more than 70 plants in about 25 countries we develop tailored solutions for our customers. Our products include components and modules in the areas of chassis, body, engine and exhaust systems, as well as solutions for electric vehicles.

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