

European Project JOSPEL develops low energy passenger comfort systems based on the Joule and Peltier effects

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Abstract

Electric vehicles require specific thermal management solutions because their motors and batteries do not create heat in the same way as internal combustion engines. Up to 25% of the potential electric vehicle's range is reduced due to the use of current HVAC (heating, ventilation, and air conditioning) technologies. The main objective is the reduction of at least 50% of energy used for passenger comfort (<1,250 W) and at least 30% for component cooling in extreme conditions with reference to electric vehicles currently on the market.

Joule heating is the process by which the passage of an electric current through a conductor releases heat. The amount of heat release is proportional to the square of the current. Heating fabrics and panels are being developed aiming to achieve an efficient heating in the cabin. Heating is achieved with low energy consumptions. Latest results will be presented in the workshop.

Figures



- Voltaje range: **5 volts** to **220 volts** AC or DC
- Power range: Up to **2000 Watts/m²**
- Temperature range: Up to **100°C**
- Temperature increase: ~50°C (in less than one minute)

Figure 1: Heating fabric performance

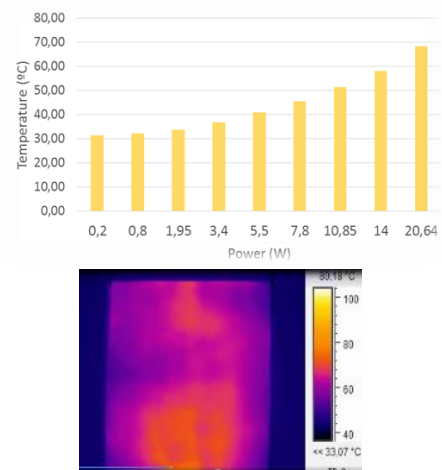


Figure 2: Heating panel performance