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COMPOSITE WHEEL WITH INTEGRATED HUB MOTOR

The automotive industry places high demands on quality and design. This applies also to car wheels, which in addition must ensure the highest level of safety and comfort. However, the idea of weight saving is relevant for this component as well.

Due to their high specific strength and stiffness, the use of fibre reinforced plastics offers the advantages of a light weight design, increased structural damping and improved damage tolerance. Another important point is the potential integration of additional functions.

The presented ultra-light CFRP wheel with integrated electric wheel hub motor was developed by Fraunhofer LBF during the corporate project "Fraunhofer Systemforschung für Elektromobilität".

The wheel hub motor consists of a rotor with coils and a permanent-magnet stator. It is connected to the wheel via its own CFRP-casing.

Through the use of high modulus fibers in fibre reinforced plastics, an increased eigenfrequency with improved damping behavior is achievable compared to the use of metal. Higher modulus fibers would allow still further reduction of mass and noise emissions.

The presented ultra-light CFRP-wheel is characterized by it´s unique design and low weight. Next, component tests will determine the structural durability.

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