

# HBM hotnote



New eDrive testing solution: **T12** and **Genesis HighSpeed**

## Seven misconceptions about the testing of electric motors

The time has come to rethink the testing of electric motor power output. Restrictions limiting the speed of data acquisition and the quality of measurement data are not inevitable. We reveal to you the seven major misconceptions about eDrive testing – and how you can enhance your testing of electric motors and make it more reliable.



### HBM's eDrive testing solution

#### Your benefits:

- + Continuous storage of all raw data
- + Synchronous data acquisition
- + Storage of all data in a standardized system
- + Power calculation per half cycle
- + Real-time visualization of results



*HBM test and measurement equipment in a test bench for combustion engines and electric motors at Technische Universität Darmstadt, Institute for Internal Combustion Engines and Powertrain Systems (Institut für Verbrennungskraftmaschinen und Fahrzeugantriebe)*

GEN2i data recorder and  
T12 torque transducer



### **Misconception no. 1: "Further development of battery technology will be the solution"**

Some modern electric cars have a range of max. 100 km. Extending the range through further development of battery technology is limited by chemical conditions. Alternative methods need to be found to extend the range of electric cars, for example, the use of lighter materials or increases in motor efficiency through higher energy yield.

### **Misconception no. 2: "Electric motors do not have any efficiency reserves"**

Today's electric motors used in the automotive sector have an energy conversion efficiency of only 50 to 60 %. Nearly half of the energy input is not converted to propulsion but wasted as heat. Power tests on the drive train of electrically driven vehicles help make motors and other components more efficient and increase efficiency.

### **Misconception no. 3: "Power tests performed on electric motors are identical to tests on combustion engines"**

While power tests on combustion engines primarily record mechanical signals, the testing of electric motors also involves measurement of the electrical signals between inverter and motor. The challenge to be met in the test setup: There must not be any phase delay when recording the different signals, otherwise the analyses will be worthless.

### **Misconception no. 4: "Power tests do not provide any raw data"**

Users need raw data for verifying in detail the measurement results and power data. Power meters used up to now, however, provide only computed power data. HBM's new eDrive testing solution gives users full access to the raw data.

### **Misconception no. 5: "Test and measurement equipment requires high investment"**

Incorrect! The right test setup enables cost savings to be achieved when configuring the test bench. It is more cost-efficient to use, for example, Genesis HighSpeed and Perception than to fit a test bench with a multichannel power meter.

### **Misconception no. 6: "Test data processing takes hours"**

Power meters require relatively long data processing times. This is why valuable details of highly dynamic motor tests are often not identified. HBM's Perception software allows extremely fast data processing and computation of the power data per electrical ,half cycle'.

### **Misconception no. 7: "There is no alternative to power meters"**

Full access to raw data, synchronous data acquisition of mechanical and electrical signals – there is indeed an alternative to conventional power testing on electric motors:

- HBM's T12 digital torque transducer ensures reliable and highly precise acquisition of torque and rotational speed.
- The Genesis HighSpeed data acquisition system synchronously records the electrical signal of inverter and motor as well as the digital signals from the torque transducer.
- Users of Perception software have direct access to their raw data for convenient analysis.

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