

## **MultiPlas Parameter Calibration for Geometrically Simplified HEMS Cables**

In electromobility, cables with cross-sections between 35mm<sup>2</sup> and 90mm<sup>2</sup> are used for power distribution in the high-voltage area. This applies to the connections from the charging inlet to the battery, between battery cell modules and the connections in the powertrain. As the cross-section increases, the flexibility of these cables decreases. Thus, they have a significant mechanical influence on connecting elements, like e.g. connectors, during assembly or vibration.

For the simulative validation of fastening and stiffening elements for cables or in the connectors, considering the mechanical behavior of the associated cable is essential. On the one hand, it is important to map the obviously orthotropic-plastic behavior of the cable, which consists of differently stranded conductors, insulation layers and shielding. On the other hand, it is necessary to reduce the geometric complexity of the cable to a core and an insulation volume, and to use a "smeared" material law.

This article discusses how the cable material model of the MultiPlas library can be parameterized based on laboratory results and be used in simulation practice.

**Dr.-Ing. Ralf Gollee, TE Connectivity Germany GmbH**