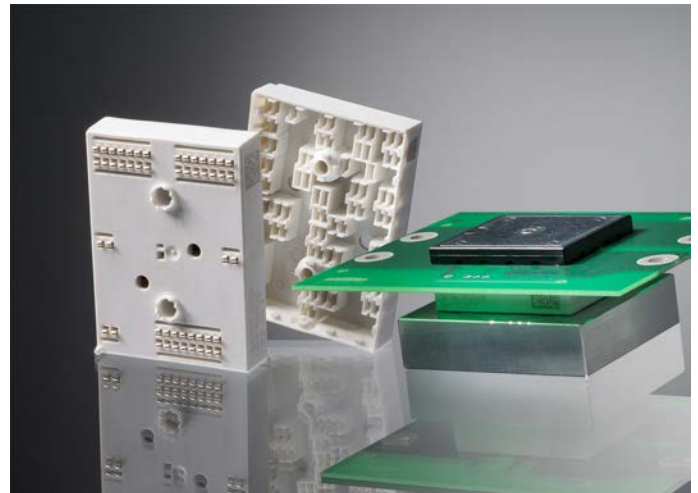


Energized: SEMIKRON manufactures power semiconductor modules from BASF's Ultradur®

Case Study

Since the beginning of 2015, the flame-retardant polybutylene terephthalate (PBT) Ultradur® B4450 G5 from BASF has been used in the mass production of the MiniSKiiP Dual power semiconductor modules from the company SEMIKRON. The flame retardant system used in the PBT contains no halogen and complies with the Restriction of Hazardous Substances Directive (RoHS). Application examples of power semiconductor modules (or DC/AC converters) are in industrial drive technology, solar inverters, or in the powertrain of electric vehicles. Developing heat is dissipated from the modules by metallic heat sinks. This prevents any rise in temperature and helps to ensure an optimum operating temperature. The power semiconductors are protected from external influences such as moisture, dirt, and fluctuations in temperature by a housing made from the thermo-plastic Ultradur®.

The material is classified as V-0 under UL 94 from a wall thickness of 1.5 millimeters and in combination with an excellent temperature performance (RTI = 140 °C) it is therefore particularly well suited to applications in electric power modules which are subject to a high amount of heat generation. The thermo-plastic also has good mechanical properties and can be light-colored. With a CTI value of 600, the material offers a very sound choice thanks to its exceptionally good electrical insulation capacity and therefore offers great freedom of design even for small and detailed components such as the MiniSKiiP Dual. Ultradur® B4450 G5 is reinforced with 25 percent glass fibers, which gives the components additional stability.



Ultradur® B4450 G5 is noted for the fact that it is very effective in helping to prevent electrolytic corrosion: metal contacts which are installed are only affected to a minimal extent even under highly humid and warm conditions. This means that short-circuits and the damage resulting from this can be avoided. Previously SEMIKRON and BASF have successfully worked together in the area of characterizing electrolytic corrosion. This resulted in a new kind of test method which can be used to test BASF's thermo-plastics for their resistance to electrolytic corrosion.