

5 T Class RE Magnet with Simplified Cooling System

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REBCO coated conductor has several superior characteristics to the other superconductors. Its critical temperature is above the boiling point of liquid nitrogen, and its critical current is quite high even in the environment of high magnetic field. Therefore, REBCO coated conductor can raise the operation temperature of superconductor applications. Higher operation temperature means lower energy consumption of the magnet cooling system. In the case of maglev application, it also means downsizing of the on-board power source and leads to saving of the overall weight of the vehicle. We fabricated a trial RE magnet that can generate 5 T. The magnet demonstrates that magnetic flux density of 5 T is achievable at 45 K and the cooling system including the cryocooler and the thermal insulation structure can be simplified because of its high operation temperature.