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Thu-Mo-Po4.05-03 [33]: Mechanical and Electrical Testing of A Novel Enhanced Bi2212 Round Wire

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Abstract-High temperature superconducting material Bi 2212 has outstanding conductor-carrying capacity at 4.2 K in magnetic field and it is the only high temperature superconducting material that can be made into isotropic round wire (RW). Therefore, it's considered to be one potential material for CICC (Cable-in-Conduit Conductor) in high magnetic field application, especially when magnetic field is over 15T. However, Bi2212 phase is a ceramic structure, which is sensitive to strain. And Bi2212 round wire has low mechanical properties because its sheath whose composite materials are Ag and Ag Mg alloy is soft. In the process of operating CICC, strong Lorentz force will cause the deformation of superconducting wires in CICC and, therefore, cause the degradation of superconducting performance of the wires. In this paper, a novel enhanced structure of Bi2212 round wire is presented in order to improve its mechanical performance. Mechanical and electrical tests of this novel enhanced Bi2212 round wire were operated to validate the structure. And relevant results will be also reported in the paper.

Index Terms-high-temperature superconductor, enhanced Bi 2212, mechanical and electrical tests

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