

Fabrication of 250 m Class Bi-2223/Ag HTS Tapes

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Multifilamentary Bi-2223 HTS tapes for superconducting power applications were studied through the fabrication of 250 m length tapes by the PIT (powder in tube) process. To fabricate continuous long wire, drawing machine, two-drum bull block and rolled tape winding machine were developed. Especially, 250 m tapes were heat treated with pancake coil to reduce the heat affect zone and to achieve the high critical current. Engineering critical current density was improved through both the enhancements of critical current density by control of thermal process and the increase of filling factor by use thin Ag alloy sheath tubes less than 1.5 mm thickness. We have made successfully 250 m length 37 filamentary tapes with high filling factor up to 31 % employing the modified drawing and rolling technique. The critical current of 250 m tapes with pancake coil type was measured by transport method at self-field up to 250 gauss of center field. The results, based on transport critical current at self-field, I_c -B characteristics and magnetic field analysis, are 34 A of I_c and 4.0 kA/cm² of J_e at 250 m, 77 K, 0 T. We also have achieved the 56 A of I_c and 7.0 kA/cm² of J_e in short tapes at 77K, self-field, and 1^W/cm.

keywords : Bi-2223, tapes, PIT, critical current(I_c), engineering critical current density(J_e)