YBCO Coated Conductors by Continuous PVD Methods

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Continuous physical vapor deposition (PVD) method is one of many processes to fabricate long length coated conductor which is required for successful large-scale application of superconducting power devices. Three film deposition systems (pulsed laser deposition, sputtering, and evaporation) equipped with reel-to-reel metal tape moving apparatus were installed and used to deposit multi-layer oxide thin films. Both RABiTS and IBAD texture templates are used. IBAD template consists of CeO_2(PLD)/YSZ(IBAD) on SUS metal tape, and RABiTS template has the structure of CeO_2/YSZ/Y_2O_3 which was continuously deposited on Ni-alloy tape using R2R evaporation and reactive sputtering in a deposition system designed to do both processes. 0.4m-long coated conductor with Ic(77K) of 34A/cm was fabricated using RABiTS template. 0.5m and 1.1m-long coated conductor with Ic(77K) of 41A/cm and 26A/cm were fabricated using IBAD template. The details on multi-layer film deposition process and deposition systems will be presented together with on-going activities and near–future plan.

keywords : YBCO, coated conductor, PVD, RABiTS, IBAD, continuous deposition

Acknowledgement

This research was supported by a grant from Center for Applied Superconductivity Technology of the 21st Century Frontier R&D Program funded by the Ministry of Science and Technology, Republic of Korea.