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Wed-Af-Po.04-01: Study on the universality of copper bonding joints on different REBCO copper-plated tapes

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Joint technology is one of the key technologies for the application of second-generation high-temperature superconducting (2G HTS) tapes. The simplicity of the joint fabrication method and the excellence of the electrical and mechanical properties of the joints significantly impact the performance of REBCO in large-scale applications. Copper bonding joint technology, a new type of solder-free, low-resistance joint created using warm welding method, is suitable for REBCO copper-plated tapes. In this paper, we further investigate the performance of copper bonding joints in bonding various copper-plated tapes. In this research, tapes produced by SST, SuperOx, and Theva were used to make copper bonding joints, validating the strong universality of the copper bonding joint technique. The joints were made under various bonding temperatures, pressures, and bonding time, and their electrical and mechanical properties were tested. The results indicate that factors such as the copper plating process, the thickness of the copper stabilizer, and the thickness of the tape substrate all influence the difficulty of producing well-bonded copper bonding joints.

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