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Wed-Af-Po3.15-13 [17]: Preliminary research on Soldered Stack ReBCO Cable

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ReBCO is the second generation of high temperature superconducting (HTS) materials with potential for high-field applications and low mass quality applications. The fabrication process and performance of superconducting cables are a key issue for superconducting magnets operating at high-field or large sizes. This study describes a process of a soldered stacked conductor using a 4 mm wide ReBCO tape with copper stabilizing layer. The development of this kind of conductor is the preliminary research for more complicated cable modus, such as twisted stacked conductors and aluminum stabilized superconducting cables. The electrical and mechanical properties of the ReBCO soldered stacked conductor samples, including critical current, minimum bending radius, and axial maximum stress, were tested and analyzed. A simple multi-turned single-pancake coil using the above conductors was fabricated, tested, and compared to a similar coil using single ReBCO tape. In the future work, the development route of aluminum-stabilized superconducting cables for large-aperture magnet applications is stated.

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