

Advances in Overpressure Processing Bi-2212 Insert Coils in a New, Large Overpressure Furnace

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Abstract — The Overpressure (OP) processing Bi-2212 round wire increases J_c and J_e in long-length wire to values needed for practical applications in high-field magnets. In the past, OP processing of Bi-2212 coils was limited to small coils ~45 mm OD and ~25 cm long that could fit in the small, horizontal OP furnaces available at ASC and Fermi National Accelerator Laboratory. We worked with a furnace company to build a larger, vertical OP furnace to process larger coils designed to be insert coils in high-field, all superconducting magnets. The new furnace is designed with a working hot-zone that is 150 mm in diameter and 50 cm long, and for an OP pressure of 100 atm. The challenges and lessons learned bringing this large OP furnace on line and results from larger diameter Bi-2212 coils OP processed in it will be discussed.

Keywords (Index Terms) — Bi-2212 high-temperature superconductors, overpressure processing, high field magnets, insert coils.