Contribution ID: **946** Type: **Poster Presentation of 1h45m**

Strong, round and rectangular HTS wires based on the Bi2212 superconductor

Wednesday, 30 August 2017 13:15 (1h 45m)

Reinforced round and rectangular, Bi2212 -based, high temperature superconducting wires are being developed for use in transposed cables, coils and magnets that are problematic with wide HTS tapes, and that need to operate beyond the limits of low temperature superconductors. These wires exhibit in excess of 500 MPa stress tolerances and current densities (Jc's) that exceed 2000 A/mm2 at > 16T field and 4.2 K, making them suitable for use in transposed cables, coils and magnets that are problematic with wide HTS tapes, and that need to operate beyond the limits of low temperature superconductors. This paper describes advances in the bonding of very high modulus strips to portions of the 2212/Ag wire surfaces so as to greatly improve their strength while also still enabling the subsequent coil winding and reaction formation of high Jc 2212 inside the multifilament 2212/Ag wire cores. Our program has recently established long length production capability for the rectangular form of this wire and the round wire form is now at an advanced stage of architecture and process development. Strong rectangular wires have been produced and tested with reinforcement levels for 300, 400 and 500 MPa stress tolerance levels, in straight, coiled and cabled forms, with the results validating that usefully high operating current densities and target levels of strengthening are achieved with low cost materials, scalable processes, and now, with a simple reaction step that produces high Jc 2212 in gas at 1 atm pressure instead of in gas at 50 atm overpressure conditions previously employed. Considerable progress has also been achieved on the development of technologies for the practical application of these wires to both wind-and-react and react-and-wind usage regimes.

Submitters Country

USA

Author: Dr OTTO, Alexander (Solid Material Solutions, LLC)

Presenter: Dr OTTO, Alexander (Solid Material Solutions, LLC)

Session Classification: Wed-Af-Po3.09

Track Classification: F2 - High-Tc Wires and Cables