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Bi-2212 wire development at CNR-SPIN: GDG process as valid Over Pressure alternative for future high field applications

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The Over Pressure (OP) process led to the realization of Bi-2212 wires with J_c performance well beyond the minimum application requirements. While several efforts are under way to demonstrate that it is possible to apply such a process to real coils, researchers at CNR-SPIN are developing a process based on mechanical deformation (the GDG process) to realize denser Bi-2212 wires with superconducting properties satisfying application requirements through an easily industrially scalable process. Initial evidence of the effectiveness of the process has already been reported, but a demonstration on longer wires is needed. Here we present a comparison between the J_e results obtained for short and long samples wound on different barrels. We also report a detailed analysis of the evolution of microstructural properties during the partial-melt process to obtain insights to support J_c improvement. Finally, we address the question of whether the OP process is actually needed.

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