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M1Or1A-03 [Invited]: Present Directions for 2G HTS Wire Development at SuperOx

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Recently, in response to the growing demand on 2G HTS wire, both internal and external, the SuperOx group of companies has increased its production capacity, bringing it in 2018 to 120 km of 12 mm wide wire per year. Another incremental increase is planned in 2019.

As the fabrication technologies of 2G HTS wire have become more mature over the few last years, the key product development directions are focused now on better satisfying the demands of specific wire applications and addressing common issues, for instance, improving reproducibility and mechanical strength.

Key wire development directions at SuperOx are: (1) to increase the wire critical current at liquid nitrogen temperature in self-field for application in FCL and cables; the particular target is to go beyond the Ic of 800 A/12 mm at 77 K, and (2) to increase the engineering current density at low temperature in high magnetic field for application in magnets; the particular target is to go beyond the Je of 700 A/mm2 at 20 K, 20 T.

We adopt into production the approaches successfully demonstrated at lab-scale, such as: to increase the HTS layer thickness with minimum degradation of Jc, to modify the HTS layer composition for enhanced pinning, to use thinner substrate for higher Je, and to use laser slitting instead of mechanical slitting for better reproducibility and mechanical properties of narrow wire strips.

We will report the results of these activities and give examples of specific HTS device projects and associated wire requirements that drive the progress.

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