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Status of NbTi Strand Development and Production for ITER in WST

The ITER magnet coils are wound from Cable-In-Conduit Conductors (CICC) made up of superconducting and copper strands assembled into a multistage, rope-type cable inserted into a conduit of steel tubes. The conductors for the Toroidal Field (TF) and Central Solenoid (CS) coils require about 500 tons of Nb₃Sn strands while the Poloidal Field (PF) and Correction Coil (CC) conductors need around 250 tons of Nb-Ti strands. Western Superconducting Technologies Co., Ltd.(WST) will supply about 180 ton Nb-Ti strands which will be used for PF conductor and CC conductor.

Multi-filamentary Nb-Ti strands for ITER has been successfully fabricated by a conventional process at WST. All the performances of the Nb-Ti strands are able to meet the ITER specifications and with a high uniformity. Up to now, more than 50 tons of Nb-Ti strands has been registered and will be cabled, jacketed and integrated into PF234 and PF5 conductor. Before mass production for Nb-Ti strands started, Conductor Performance Qualification Samples(CPQSs) titled with PFCN1, PFCN2, CCCN2, MBCN1 and CBCN1 respectively, have been tested in SULTAN facility, located at CRPP, Switzerland and passed the test. There have reasonable agreement between SULTAN test results and extrapolated Nb-Ti strands performance.

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