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## Manufacturing and Qualification Test of ITER Busbar Joint

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The paper describes the result of the ITER feeder main busbar joint sample qualification test as confirmation of the requirement of busbar joint resistance;  $2 \text{ n}\Omega$  at 70 kA at zero background field, as well as those of joint performance in various magnetic fields to investigate stability and current distribution characteristics in feeder-type joint box. The results support the quality of the joint manufacturing process for ITER main busbar joint. The qualification sample design was prepared to be tested in SULTAN facility. The production of the full-scale sample was manufactured in ITER magnet workshop located at CEA with contribution from CEA collaborators. The SULTAN joint sample consists of joints to be qualified at the level of the peak field and upper terminations. In bottom joints, twin-box feeder-type paying hands configuration is applied. In upper terminations, one of them is made with solder-filled cable for optimum current distribution. The other takes the same length of the copper sole and contact with the busbar cable as those positioned in bottom of the sample. The performance of this leg is compared with the other leg consisting of both ends manufactured with two twin-box feeder-type joints, which could have a lowered Tcs if the current redistribution is an issue. The sample undergoes a test program including joint resistance measurement, AC losses and stability margin test. The outcome of the following test program are to be reported; DC joint resistance measurement by voltage taps and calorimetry at 0 - 70 kA and 0 - 3.8 T, AC loss measurement with AC field transverse to copper face, stability limit under single trapezoidal field pulse transverse to copper face, and joint degradation study under repulsive and attractive load applied to the joints.

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