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## Conductor Performance of Nb<sub>3</sub>Sn Sample for CFETR CSMC coil

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The Central Solenoid Model Coil (CSMC) of China Fusion Engineering Testing Reactor (CFETR) is designed to operate max current is 47.65kA and get the highest magnetic field 12 T, the maximum magnetic field rate is designed 1.5 T/s. The CSMC consists of 5 independent coils, the Nb<sub>3</sub>Sn Inner and Outer coils, the Upper, Middle and Lower NbTi coils. The Nb<sub>3</sub>Sn conductor for the CSMC was manufactured in China and was tested in the SULTAN facility. The cabling was done following the short twist pitch sequence of the ITER CS conductor. The Jacket material is chosen of 316 LN for left leg and JA2LB for right leg. The Tcs test results show that both legs of the Nb<sub>3</sub>Sn conductor CSMC have high Tcs performance. Using the electrical method, the Tcs was 6.645 K for the left leg and 6.57 K for the right leg at 45.1 kA /10.85 T in the first test and 6.89 K for left leg and 6.85K for right leg after 9950 electromagnetic load cycles and two times warm up and cool down. Based on the Nb<sub>3</sub>Sn conductor sample test results at 47.65 kA and at different fields, the Tcs was extrapolated to the peak field B<sub>peak</sub>= 12 T and current equal to 47.65 kA. The extrapolated Tcs is 6.538 K for left leg and 6.484K for right leg after 9950 electromagnetic load cycles and two times warm up and cool down. According to the SULTAN test result, the Nb<sub>3</sub>Sn conductor for the CSMC is fit the design requirement.

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