

STATUS OF MANUFACTURE AND TESTING OF THE KSTAR MAGNETS¹

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The KSTAR device is under construction using all superconducting (SC) coils for a steady-state-capable operation. The KSTAR SC magnet system consists of 16 D-shaped toroidal field (TF) coils, 7 pairs of poloidal field (PF) coils, and magnet supporting structures. The TF coil system provides a field of 3.5 T at the plasma center and the PF coil system generates plasma current up to 2 MA, and plasma shaping. All the SC coils are fabricated by the continuous winding scheme using internally-cooled cable-in-conduit conductor (CICC). Two pairs of largest PF coils, which are named as PF 6 and 7 coils and were made of NbTi superconductor, have been completed in fabrication and assembled temporarily at the location of the KSTAR device. Eleven TF coils, which were made of Nb₃Sn superconductor, have been completed in fabrication and three coils of them were ready for assembly after being encased in the magnet structure by the April of 2005. All the TF coils and structures could be completed in fabrication and assembling on site by the 1st quarter of 2006. Several PF coils made of Nb₃Sn superconductor are under fabrication. To verify the operational feasibility of the KSTAR coils, cool-down and current charging test have been accomplished with a real-sized prototype TF coil and a pair of CS model coil. In this paper, the status of the manufacture and the test of the KSTAR SC coils are presented.

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