

Abstract Submitted
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Further progresses in the development of large MgB₂ Superconducting Coils for the Ignitor Experiment* A. TUMINO, G. GRASSO, Columbus Superconductors, B. COPPI, MIT — Intermediate temperature superconducting cables have been adopted for the fabrication of the largest poloidal field coils of the Ignitor experiment. This is an important step toward achieving better duty cycles in Ignitor-like machines with innovative magnet technologies compared to traditional superconductors. The commercially available MgB₂ strands manufactured by Columbus Superconductors can achieve the target specifications for the considered coils, about 5 meters of outer diameter and maximum field on the conductor below 5 T. These cables are also compatible with the Ignitor cryogenic system, which is designed to cool the machine at about 30 K, although MgB₂ may use colder gas at 10 K. The preliminary cable design includes about 300 MgB₂ multifilamentary strands of 1 mm in diameter and a copper tube for the He-gas flow in the center. Recently we have succeeded in the development of MgB₂ strands with a further improvement in design and electrical properties for cable application. Reaching of a higher critical current density and better current sharing properties between the different strands is allowed by the newest design. The implementation of this progress in wire performance and its impact on the coil design will be discussed. *US DOE partly sponsored.

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