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Technology Development for React and Wind Common Coil Magnets*

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High field common coil magnets using brittle Nb3Sn or HTS Rutherford cables provide new challenges with respect to the design and manufacturing of coils. At the Superconducting Magnet Division of Brookhaven National Lab (BNL), we are developing the techniques required for the production of low cost, scaleable common coil magnets. By utilizing a rapid turnaround short coil program, it is possible to quickly develop and test the new design and manufacturing concepts required to handle the brittle conductors. The rapid turnaround program required the development of a standard coil cassette, allowing coils to be used as building blocks for testing different magnet configurations. Careful attention is given to the design of the coil structure: the inner bobbin the wire is wound on, the coil winding process, insulation integrity, epoxy vacuum impregnation, and final assembly into a test magnet. This paper will discuss the manufacturing techniques and design rules learned from the rapid turnaround program, how they are being applied to the development of the common coil at BNL, and test results to date.

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