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## M3Or1B-02: Development and performance qualification of two kinds of REBCO CICC for fusion

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Due to the high current carrying performance under high field and low temperature ( $<20$  K), REBCO tapes exhibit a strong potential of future fusion magnets application. The characteristics, such as anisotropic and multi-layered structure, the stress/strain sensitivity of critical current carrying performance, make them not easy for CICC development, which is very important to achieve practical application for fusion devices. In institute of Plasma Physics, Chinese Academy of Sciences, two kinds of CICC design concepts were proposed. The cable was twisted from sub-cable manufactured by winding the REBCO tapes around a stainless steel spiral tube. In addition, to increase the intensity of the cable, the sub-cable was assembled together with the Cu tube or Cu bar having machined slots outside. Research activities were carried out to find a solution for central solenoid (CS) coil for the next generation fusion device construction. Till now, processes including sub-cable winding, cable twisting, short length CICC assembly and compaction as well as joint termination soldering are being developed for design and performance qualification. CICC sections have been manufactured, totally 210 REBCO tapes were used for each kind of design. Tested critical currents of around 20 kA at 77 K, self-field indicate no obvious degradation happened during the CICC manufacturing processes. Two CICC sections with a length of around 2.7 m, one for each design concept, have been delivered to Sultan lab for performance qualification under a maximum background field of 10.8 T.

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