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Latest progresses of cold test facilities development for fusion SC magnet technology at ASIPP

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Supported by the national project CRAFT, which aims to explore and master fusion DEMO level key technologies and establish testing facilities for key material, components and system for CFETR, serials cold test facility for SC material, conductor and magnet are under construction and planned to be completed this year. The SC material testing facility has already been accomplished, mainly consists of a self-developed superconducting background magnets with field of 19T and aperture of 70mm, and multifunctional sample holders. The conductor test facility (Super-X), aims to evaluate the reliability of engineering technology and safe operation for CICC in operation environment, mainly consists of a 15T split solenoid background DC magnet, a 100kA superconducting transformer, and auxiliary system. For the fusion magnet testing, two large-scale facilities will be used. The one with dimension of $\phi 7.7\text{m} \times H 11\text{m}$, current capacity of 60kA and refrigerator of 1000W@4.5K, has already been used for the CFETR CSMC coil test in 2024. The current of CSMC reached to the design parameter 48kA. The other with dimension of $25\text{m} \times 15.5\text{m} \times 10\text{m}$ has two pairs of current leads with capacity of 100 kA and 60 kA respectively, will be used for CFETR TF and BEST TF magnets tests. Up to 4 BEST TF magnets can be tested at once using this facility.

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