

7 - 19 HIAF Superconducting Linac Cryogenic System Progress

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The cryogenic system provides superfluid helium cooling power for the superconducting linac, which is a necessary condition for its operation. In 2022, significant progress has been made with the cryogenic system.

10 kW/4.5 K(2 kW /2 K) refrigerator is being integrated at Air Liquide, with the total progress of 50% readiness before its delivery to HIAF site, as seen in Figs. 1 and 2. The arrival and transportation plan for the refrigerator have been basically determined. It is planned that all the equipment will arrive at HIAF site in November 2023. The optimized design for cryogenic distribution system has been completed, as seen in Fig. 3. Cryogenic valves, pressure transmitters, temperature sensors and other purchased parts began to arrive. We have started processing of valve box, multi-channel transmission pipes. Engineering drawing design of room temperature pipeline and equipment integration are completed, and material procurement is started, as seen in Fig. 4. Recycling and purification equipment, helium storage tanks and other equipment are being produced at the factory. We have completed the factory test of the first set of QWR007 and HWR015 cryomodules, as shown in Figs. 5 and 6. The cryogenic horizontal test will be conducted in the second half year of 2023. It is expected that by the end of 2023 all sub-system equipment will be delivered to the HIAF site for integration.



Fig. 1 (color online) Picture of the cold box top half.



Fig. 2 (color online) Picture of the cold box bottom half.

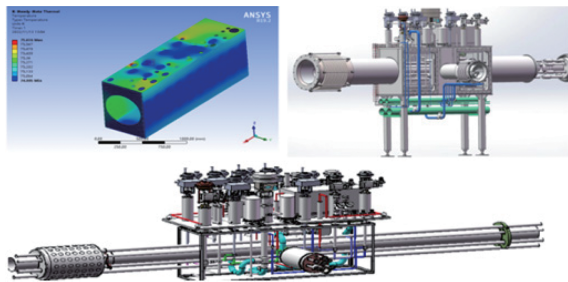


Fig. 3 (color online) Valve box optimized design.

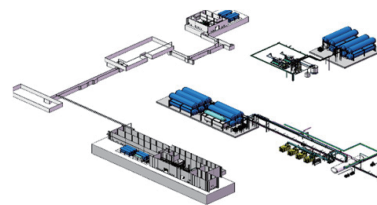


Fig. 4 (color online) Picture of the cold box bottom half.

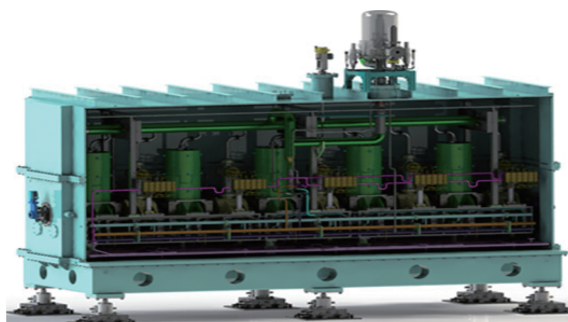


Fig. 5 (color online) 3D structure of cryomodule.



Fig. 6 (color online) Picture of cryomodule factory test.