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Assembly of the LIPAc SRF LINAC cryomodule

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In complement to the development activities for fusion reactors (JT-60SA & ITER), Fusion for Energy contributes to the R&D for material characterisation facilities. The LIPAc, technical demonstrator for the production and acceleration of a D+ beam, will be used for neutron production by nuclear stripping reaction on a liquid Li target. Since its first beam in 2014, the LIPAc construction and commissioning continues and will be concluded with the cryomodule installation aiming for beam validation at nominal power. The cryomodule assembly, started in March 2019, was paused for two and half years, devoted to improve the pumping, repair, cold tests and high pressure rinse the solenoids. In August 2022, the cleanroom activities resumed with the cavity/coupler assembly but had to be paused again to fix a leaking bellows on a solenoid. In September 2024, the beam line left the cleanroom to start the cold mass assembly phase which was concluded in January 2025 with the cold mass insertion. In March 2025, the cryomodule was transported to the accelerator vault for the last assembly steps before its integration. The team is working on the connection of the super-conducting solenoids. The final leak tests of the cryomodule, conclusion of its assembly, are expected in the second half of 2025. This paper presents the technical challenges encountered and their solutions, highlighting continuous progress in overcoming complex integration issues across a synergic international collaboration.

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Footnotes

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