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C1Po2D-06: Mechanical and Process Design of the Interface to a 20,000 Liter Liquid Helium Dewar

Monday 10 July 2023 14:00 (2 hours)

A new 20,000 liter (20 KL) liquid helium dewar is being integrated in to the existing cryogenic system at the Facility for Rare Isotope Beams at Michigan State University (MSU-FRIB). This dewar will serve a new planned cold box system that supports the large experimental system superconducting magnets and the many legacy superconducting magnets in the downstream beamline. This dewar has a single large penetration, or "neck", that all the process lines and instrumentation pass through. On top of the "neck"is a vacuum insulated interface box, or "neck can", which houses all the connections between the dewar and the connecting distribution system transfer-line. Though not generally common, this design approach has been successfully implemented on 5 to 10 KL liquid helium dewars at the Spallation Neutron Source (SNS), Jefferson Lab (JLab), and also at FRIB. It has been found that this approach greatly simplifies the mechanical design, while allowing for multiple process and instrumentation interfaces and still permitting a low heat in-leak. This paper presents an overview of the mechanical and process design of this new neck can.

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