



Cryogenics Operations 2018

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Overcoming challenges while building cryogenic infrastructure

Superconducting magnets must be cryogenically cooled. The magnet cold mass is immersed in a pressurized bath of superfluid helium and operated at very low temperatures (approximately 1.9 K). The distribution of helium at pressures above atmospheric pressure is a significant engineering challenge. The secret lies in the use of reliable and efficient cryogenic infrastructure like for instance multiple helium transfer lines, cryostat, valve boxes and others.

An efficient cryogenic system has to overcome design challenges (i.e., heat load of various origins within the system, pressure drop, mechanical stability, space constraints etc.), manufacturing challenges (i.e., correct sequence of building up the equipment, testing inside out, material traceability and components certificates), logistic challenges (i.e., procurement of valves, raw materials, temperature, pressure and flow sensors) and installation challenges (i.e., special tools for placing the hardware and confined spaces for performing welding and testing activities). The key goals are to reaffirm and refine the reference solutions from previous cryogenic projects. Demaco has designed, manufactured, tested and installed cryogenic infrastructure over the last thirty years.

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