

# Analysis and Simulation on Thermal Behavior of Cryogenic Tank for Different Types of Internal Support Materials

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**Abstract:** *The cryogenic vessel is mainly a double-walled vessel which mainly consists inner vessel, outer vessel, and inner support. The Inner support is the main part designing of the cryogenic vessel for thermal and structural criteria. Inner support material for cryogenic vessels can be made of various materials depending on Net evaporation rate (NER) criteria and structural criteria (i.e. road transport, marine transport, space condition). Material for the Inner support structure has low thermal conductivity and high strength, low weight. To meet the design goal for very low thermal conductivity, high strength, and low weight the next-generation materials like carbon fibber and polymeric-based composites are being developed for cryogenic fuel tank applications. By using different materials like SS304, G-10, Inconel, Invar-36, High strength Carbon fibber, and polymer-based composites same support structure will be analysed in FEA software for Thermal and structural conditions and will compare for different load conditions to check structural integrity. Also will compare the impact of different materials on NER and holding day for cryogenic fluid*

**Keywords:** Cryogenic Vessel

## BIOGRAPHICAL NOTES



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