



Heat Transfer Modeling of an Additive Manufactured Porous Structure of a Two-Phase Evaporator for Spacecraft Thermal Control.

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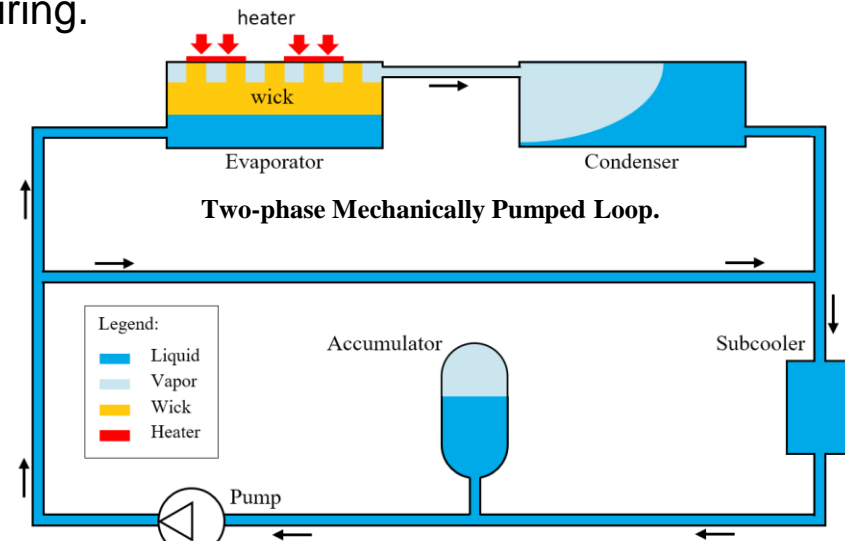
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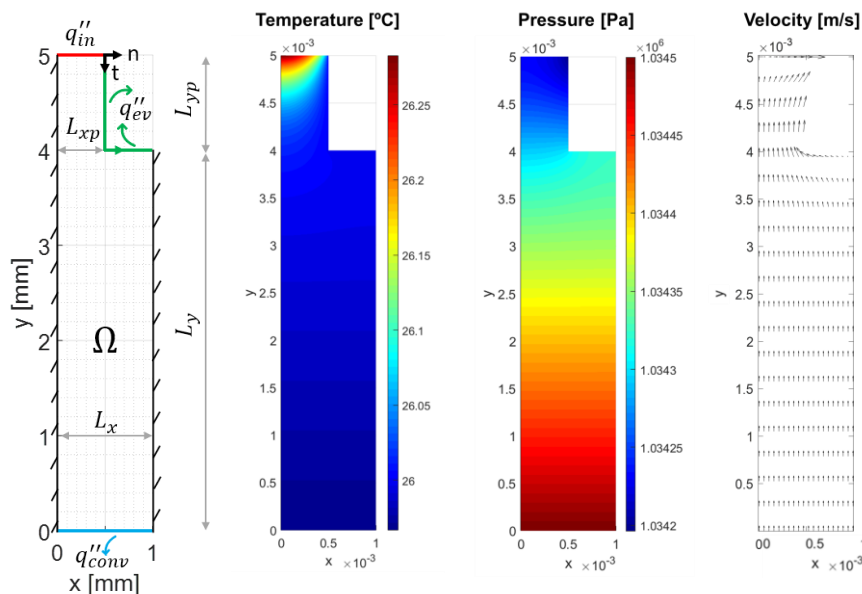
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The Two-Phase Mechanically Pumped Fluid Loop (2PMPL) for Spacecraft Thermal Control incorporates an innovative evaporator that uses a wick porous structure fabricated using additive manufacturing.

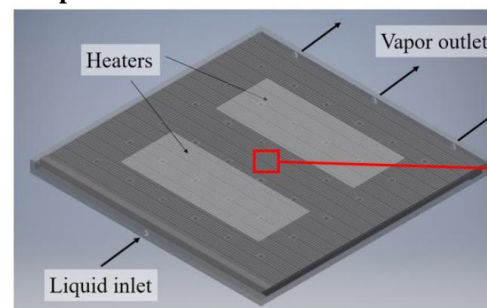
Objective: maximize the evaporative heat removal, reduce heat leaks to the liquid chamber and reduce overall mass of the evaporator.



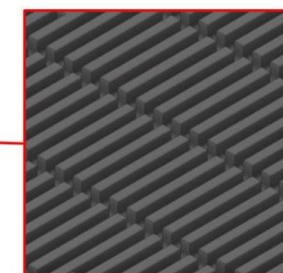
Heat and mass transfer in the wick due to evaporation.



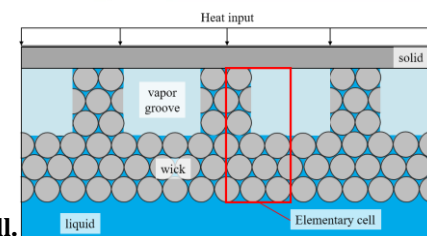
Evaporator.



Wick structure.



Selection of the appropriate wick properties such as pore size, porosity, permeability, effective thermal conductivity and geometry indicate the optimal configuration to improve the performance of the evaporator and of the entire 2PMPL.



Elementary cell.