National Conference on Multidisciplinary Design, Analysis and Optimization 2021

Autodesk Design Contest

Design of heat exchanger for solar still application:

A solar still is used to heat water to inactivate microbial pathogens. The application requires that the water is at the least heated to 70 degrees or above for a minimum duration of 10 minutes. The solar still has a footprint of 1m by 1m with a charcoal bed 6 inches thick and the charcoal bed reaches an average temperature of 75 degrees on a bright sunny day. The inlet water is at ambient temperature with a pressure head of 10 ft and the outlet is discharged at atmospheric pressure.

Conceive a conceptual design of the heat exchanger and create a parametric design, analysis and Optimization workflow using Autodesk® suite of software such as Fusion 360 and Generative Design among others.

Create a multi-disciplinary simulation workflow for analysing the performance of the heat exchanger. Formulate an optimum design problem. State your assumptions, objectives, design variables and constraints. Create a multi-disciplinary / multi-objective optimisation workflow driven by simulations and demonstrate the exercise.

Reference Links:

Solar still on Wikipedia:

https://en.wikipedia.org/wiki/Solar_still

Related article on Autodesk:

https://www.autodesk.com/autodesk-university/class/Generative-Design-Build-Optimum-Model-Autodesk-CFD-Heat-Sink-Modeling-2019

Autodesk student license (need college email ID):

https://www.autodesk.com/education/edu-software/overview?sorting=featured&page=1