

Abstract Submitted  
for the DFD08 Meeting of  
The American Physical Society

**Modeling and Numerical Simulation of Multi-Species Flows in Fiberglass Reinforced Plastic (FRP) Boat Manufacture** ROHAN WAN-CHOO, URMILA GHIA, University of Cincinnati, KARMAN GHIA, University of Cincinnati — This study investigates styrene exposure to human beings working in a FRP boat-manufacturing plant. A recent survey in one such plant indicated that styrene concentrations were higher than the recommended exposure limits. Exposure to styrene causes health problems to human beings including cancer. Adopting suitable ventilation systems is one way to reduce this exposure. For the present study, styrene concentrations in this plant were determined for the ventilation system currently in place. Flow over one of the six boats in the plant was simulated by solving unsteady Navier Stokes, species conservation and energy equations. An initial 2D study was carried and the results suggested that a ventilation system should include an exhaust close to the ground to remove much of the styrene accumulated. For the subsequent 3D analysis, flow over the 3D boat model, with specified dimensions, was simulated and the results obtained will be shown in the final presentation. The results include flow pattern inside the plant, variation of styrene concentration with time at fixed points and contours of styrene and temperature along constant x, y and z planes.

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Date submitted: 06 Aug 2008

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