
Evaluation of heat transfer from steam/air and water under the influence of ultrasound waves

RAMASWAMY H. (1), BASTAKOTI M. (1), BASUMATARY R. (1)

1 McGill University, Montreal, Canada

This study is aimed at evaluating the combined influence of ultrasound on the associated heat transfer from steam, steam/air and water media. Ultrasound has been effectively used with water, but has not been explored with steam or steam/air mixtures. Presence of air has been traditionally accepted to degrade the condensation heat transfer from steam. Heat transfer from steam, steam/air and water as influenced by ultrasound variables were evaluated using high thermal conductivity materials (steel, aluminum) using regularly shaped metal transducers as used successfully in earlier steam/air studies. Such high thermal conductivity materials are necessary (for maintaining low Biot number conditions) for accurate determination of surface heat transfer coefficients associated with steam. Results clearly showed differences in heat transfer rates with a significant reduction in heat transfer in the presence of air and the necessity to use ultrasound to remove the surface barrier for short term heating (5-15 seconds) vegetables for surface microbial decontamination.