



**INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS**

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Programme of Study	:	Ph.D.
Thesis Title: Design, development and testing of solar air heater for drying applications		
Name of Thesis Supervisor(s)	:	Prof. P. Muthukumar and Prof. Senthilmurugan Subbiah
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SHORT ABSTRACT

The study focuses on the arc rib embedded SAH configuration, which has shown promising thermo-hydraulic performance. Analytical analysis and experimental investigations reveals a decline in heat transfer rate and thermal efficiency along the SAH duct.

To address these issues, a novel varied arc rib embedded SAH was developed and tested. It outperforms other configurations in thermal efficiency, offering a potential solution for efficient agricultural product drying.

A 2-meter prototype of the varied arc rib embedded SAH was fabricated and tested at the Indian Institute of Technology, Guwahati, achieving a maximum thermal efficiency (57%) and hot air outlet temperature (68.5°C) respectively.

In summary, this research addresses the urgent need for energy-efficient drying solutions in Northeastern India by harnessing the region's abundant solar energy potential. The innovative approach of varied arc rib embedded SAH holds promise for enhancing thermal efficiency in agricultural product drying, aligning with the shift towards sustainable and renewable energy sources.