BIOGRAPHICAL SKETCH

Venkata Avinash Paruchuri was born in Juvvalapalem, Andhra Pradesh, India, on May 31, 1992. He entered Koneru Lakshmaiah University in August 2009 and received the degree of Bachelor of Technology in Mechanical Engineering in May 2013. The following August he attended Jawaharlal Nehru Technological University and received Master of Technology in Thermal Engineering in August 2015.

EDUCATION

B.Tech., Mechanical Engineering, Koneru Lakshmaiah University, India.	2013
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Ph.D., Mechanical Engineering, Tennessee Technological University, USA.	2019

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College of Engineering

TENNESSEE TECH

The Department of

Mechanical Engineering

Announces the Dissertation Defense

of

Venkata Avinash Paruchuri

In Partial Fulfillment of the Requirements

For the degree of

Doctor of Philosophy

Thursday, Oct. 31, 2019

9-11 a.m.

Held in

BRWN 241

Tennessee Tech University

FIELD OF STUDY

Mechanical Engineering

DISSERTATION TOPIC

Experimental and Finite Element Analysis of Typical Duct Systems

EXAMINING COMMITTEE

Stephen Idem, Ph.D.

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ABSTRACT

Unreinforced 12 in. × 23 in. (305 mm × 584 mm) galvanized steel flat oval ducts were tested to measure deformations when internal static gauge pressures were applied. Finite element models with discrete ring seams and an average wall thickness approach were utilized to represent the continuous spiral seam, and therein predict non-corrugated duct deflections at prescribed locations along the duct wall.

Deformation was measured as a function of internal static gauge pressure for galvanized steel spiral 12 in. × 43 in. (305 mm × 1092 mm) flat oval ducts. Both unreinforced and externally reinforced ducts were considered. Dial deflection gauges were used to measure the duct deformation at prescribed locations on the top and bottom surface of the test duct and compared to corresponding predictions generated using a non-linear finite element model that accounted for the self-weight of the duct walls. The effective wall thickness method was utilized to account for the presence of a continuous spiral seam.