

Innovation and Commercialization

UNIVERSITY OF TEXAS  ARLINGTON

Nozzle-Integrated Pre-Deposition and Post-Deposition Heating of Previously Deposited Layers in Polymer Extrusion Based Additive Manufacturing

Tech ID: UTA 19-20

INVENTOR: Ankur Jain, Hardikkumar Prajapati, Darshan Ravoori

TECHNOLOGY NEED

Additive Manufacturing (AM) has growing demand in the sectors of manufacturing and research to produce light weight and complex parts. Extrusion based AM is commonly used for economic reasons as compared with other AM techniques. Thermal and mechanical properties of the built parts in AM are directly related to the adhesion and merging of adjacent layers. High temperature plays a vital role in the process of adhesion and merging. Previously laser or infrared (IR) based mechanisms have been used, but these are complex, bulky and have high operating costs.

INVENTION DESCRIPTION/SOLUTION

The present invention proposes a simpler, less invasive and in situ mechanism for enhancing the adhesion between previously deposited newly deposited layers in extrusion based AM. A hot metal block is integrated with the nozzle that extrudes polymer during manufacturing of part. The hot metal block has a hole through which heat source cartridge is inserted. This block heats up the previously deposited layer which improves the adhesion between layers, thereby improving the mechanical and thermal properties of the built part.

APPLICATIONS

- Aerospace industry
- Automobile industry
- Research labs
- Biomedical industry

KEY BENEFITS

- Simplified design
- Improved adhesion between deposited layers
- Improves thermal and mechanical properties of build part

STAGE OF DEVELOPMENT

Component/subsystem validation in laboratory environment TRL=4

INTELLECTUAL PROPERTY STATUS

US Patent Pending



About the Inventors:

[Ankur Jain](#)

[Hardikkumar](#)

[Prajapati](#)

[Darshan Ravoori](#)

Contact information

For licensing, please contact
Justin Sierchio

(Licensing Associate)

justin.sierchio@uta.edu

innovation@uta.edu

P: 817.272.1132

Our mailing Address:

**Innovation and
Commercialization**

701 S Nedderman Drive,
Suite 350, Arlington, TX
76019

Connect with us:

