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3D AND 4D PRINTING IN INDUSTRY 4.0: TRENDS, CHALLENGES AND OPPORTUNITIES

S. Deepak Kumar[1,*], Shailesh Dewangan[1], Sanjay Kumar Jha[1], S. K. Parida[2], Ajit Behera[3]

[1]Department of Production Engineering, Birla Institute of Technology Mesra, Ranchi - 835215, Jharkhand, India
[2]Department of Manufacturing Engineering, National Institute of Foundry & Forge Technology-Ranchi-834003, Jharkhand, India
[3]Department of Metallurgical and Materials Engineering, National Institute of Technology Rourkela-769008, Odisha, India.

* Corresponding author

ABSTRACT

The manufacturing industry across the globe is accelerating at a rapid pace and 3D & 4D printing is the emerging technology in Industry 4.0 for automobile, aerospace and Biomedical products. Recent advances in Additive Manufacturing, commonly known as three-dimensional (3D)-printing, have allowed researchers to create complex shapes previously impossible using traditional fabrication methods. A research branch that originated from 3D-printing called four-dimensional (4D)-printing involves printing with smart materials that can respond to external stimuli. This paper provides a basic understanding of this upcoming paradigm of 3D/4D printing materials, technologies, and applications.

Objective: The main objective of this chapter is to provide the current trends and innovations in the field of Additive Manufacturing and its potential in Industry 4.0.

Key Challenges: The challenges in 3D and 4D printing of emerging materials is addressed with practical solutions in meeting the needs of Industry 4.0

Keywords: Additive Manufacturing, 3D/4D Printing, Rapid Prototyping, Industry 4.0