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3D Printing Technology for Thermal Application: A Brief Review

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ABSTRACT

3D printing is an emerging technology to construct complex geometry by adapting layer-by-layer addition technique from a 3-dimensional CAD model. Mass customization, freedom of design, and wastage minimization are the main advantages of Additive Manufacturing (AM) based 3D printing. 3D printing is currently used in many sectors worldwide, such as automotive, aerospace, agriculture, medical, electronics, and other household products. However, the usage of the AM technique is limited in large production sectors due to the limitation of the materials and properties of the produced parts. In this review, the different methods of 3D printing, the materials used in different processes, various fields of applications, and the properties of the different approaches are discussed. Also, the effect of process parameters such as layer thickness, nozzle temperature, platform temperature, printing speed, extruding rate, and layer height in 3d printing was reviewed. This will be helpful for further development of 3D printed product quality and applications in various sectors.

1. Introduction

3D printing, one of the methods in Additive Manufacturing (AM), is a process of constructing materials with complex geometry using a layer-by-layer technique from 3-dimensional CAD data [1]. In 1986, Charles Hull developed the initial AM process named stereolithography (SLA) and further enhanced it to various other technologies such as powder bed fusion (PBF), fused deposition modeling (FDM), and contour crafting (CC). The increasing demands for the cost-efficient project, lightweight products, and polymer-based composites materials upsurge the use, research, and technology development of 3D printing. These days, 3D printing is used in many sectors like aerospace, medical, electronics, construction, and other housed hold products [1]. 3D printing is a truly revolutionary technology that has evolved as a multifaceted process step. It opens new possibilities for businesses trying to maximize production productivity and offers hope for many

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