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EMT 2540: PRACTICAL REPORT I

ADDITIVE MANUFACTURING

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Contents

List of Figures

List of Tables

Chapter 1

Introduction

1.1 Additive Manufacturing

Additive Manufacturing (AM) is a manufacturing technology that uses the additive approach in the fabrication of parts. AM significantly simplifies the process of producing complex 3D objects directly from CAD data .

3D Printing has become the most commonly used wording to describe AM technologies. This term alludes to the use of a 2D process (printing) and extending them into the third dimension. Significant improvements in accuracy and material properties have seen 3D printing technology become useful in other applications other than prototyping. These applications are: testing, tooling, manufacturing, etc.

3D printing is a rapid and seamless process. It also reduces the amount of resources and processes required significantly. With the addition of some supporting technologies like silicone-rubber molding, drills, polishers, grinders, etc. AM can be possible to manufacture a vast range of different parts with different characteristics. Workshops which adopt AM technology can be much cleaner, more streamlined, and more versatile than before.

1.2 Objectives

1. To design a CAD model of a complex 3D part.

2. To fabricate the complex 3D part using an Additive Manufacturing technique (3D Printing)

Chapter 2

Literature Review

2.1 Additive Manufacturing

Additive manufacturing, referred to in short as AM, is the basic principle of generating a model using a three-dimensional Computer-Aided Design (3D CAD) system and fabricating it directly without the need for process planning. In contrast to other manufacturing processes, AM needs only some basic dimensional details and a small amount of knowledge on how the AM machine works and the materials that are used to build the part.

The basic working principle for AM works is that parts are made by adding material in layers, each layer being a thin cross-section of the part derived from the original CAD data. Layer thickness will affect the final output: the thinner each layer is, the closer the final part will be to the original.

Additive Manufacturing, commonly referred as 3D printing is a computer-based technology. Like many other manufacturing technologies, improvements in computing power and reduction in mass storage costs paved the way for processing the large amounts of data typical of modern 3D Computer-Aided Design (CAD) models within reasonable time frames. AM takes full advantage of many of the important features of computer technol-

ogy, both directly (in the AM machines themselves) and indirectly (within the supporting technology).

2.2 Technologies Associated with AM

The most common input method for AM technology is to accept a file converted into the STL file format originally built within a conventional 3D CAD system. There are, however, other ways in which the STL files can be generated and other technologies that can be used in conjunction with AM technology. These are:

2.2.1 Reverse Engineering Technology

2.2.2 Computer Aided Engineering

2.2.3 Heptic Based CAD

Chapter 3

Methodology

This is

Chapter 4

Results

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