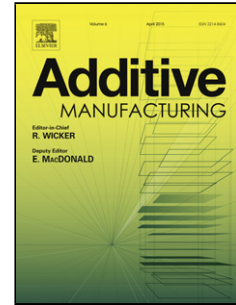


Accepted Manuscript

Title: The development of a strategy for direct part reuse using additive and subtractive manufacturing technologies

Authors: Van Thao Le, Henri Paris, Guillaume Mandil

PII: S2214-8604(17)30181-1
DOI: <https://doi.org/10.1016/j.addma.2018.06.026>
Reference: ADDMA 440



To appear in:

Received date: 27-4-2017
Revised date: 30-6-2018
Accepted date: 30-6-2018

Please cite this article as: Le VT, Paris H, Mandil G, The development of a strategy for direct part reuse using additive and subtractive manufacturing technologies, *Additive Manufacturing* (2018), <https://doi.org/10.1016/j.addma.2018.06.026>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

The development of a strategy for direct part reuse using additive and subtractive manufacturing technologies

Van Thao Le^{1, 2}, Henri Paris^{3, *}, Guillaume Mandil³

¹*Institute of Research and Development, Duy Tan University, Da Nang 550000, Vietnam.*

²*Advanced Technology Center, Le Quy Don Technical University, Hanoi, Vietnam*

³*Univ. Grenoble Alpes, CNRS, Grenoble INP, G-SCOP, F-38000 Grenoble, France*

** Corresponding author. E-mail address: henri.paris@univ-grenoble-alpes.fr*

Abstract

In recent years, combining additive and subtractive manufacturing technologies has attracted much attention from both industrial and academic sectors. Due to consolidated benefits of individual techniques, this combination provides new possibilities to manufacture products, and develop new strategies for recovering products at their end-of-life stage. This paper aims to develop a direct material reuse strategy based on such technique combination. The principle of the strategy is to manufacture new parts (or final parts) directly from end-of-life parts (or existing parts) without involving the material recycling phase. In this paper, a systematic methodology is proposed to develop the strategy. Firstly, the good mechanical characteristics of parts obtained by the strategy are confirmed. Thereafter, the design of process planning for combining additive and subtractive manufacturing processes is focused. This allows achieving the geometry and quality of final part from the existing part. The methodology for process planning design is developed in two major steps using the manufacturing feature concept, the knowledge of manufacturing processes, technological requirements, and available resources. In the first step, manufacturing features (i.e. machining and additive manufacturing features) are extracted from the information of the existing and final parts. In the second step, the process planning is generated from extracted features by respecting the relationships of features and the manufacturing precedence constraints. Finally, a case study is used to illustrate the proposed methodology.

Keywords: Additive manufacturing; Process planning; Feature; Remanufacturing; Life cycle.

Download English Version:

<https://daneshyari.com/en/article/7205803>

Download Persian Version:

<https://daneshyari.com/article/7205803>

[Daneshyari.com](https://daneshyari.com)