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Fabricación Aditiva

BOLETÍN DE VIGILANCIA TECNOLÓGICA.
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NOTICIAS

28/01/2021

Machine Learning Makes Light Work of AM Aerospace Alloys

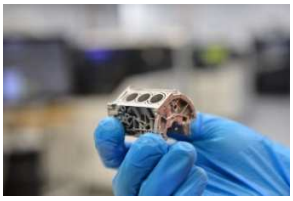
Project MEDAL aims to accelerate the product development lifecycle of aerospace components by using a machine learning model to optimize additive manufacturing (AM) processing parameters for new metal alloys at a lower cost and faster rate.

https://www.aerodefensetech.com/component/content/article/adt/insiders/amm/stories/38429?utm_source=SAE_Aero_News&utm_medium=email&utm_campaign=20210128&oly_enc_id=3803F6443578G7X

11/03/2021

ExOne Achieves Scientific Breakthrough: Automotive Industry-First Binder Jet Aluminum 3D Printing and High-Density Sintering

New patent-pending process developed by ExOne and Ford Motor Co. for binder jetting 6061 aluminum, one of the most commonly used aluminum alloys in the world, delivers final parts with 99% density and material properties comparable to traditional manufacturing. Sintering precision parts in aluminum can unlock new benefits in manufacturing, such as new lightweight part designs that improve system design and performance. This rapid and reliable process for future production of aluminum parts is much faster than other 3D printing methods and capable of scaling to the volumes needed for automotive use. Ford and ExOne are actively working on designs to use the new material and process



https://www.businesswire.com/news/home/20210311006007/en/4937076/ExOne-Achieves-Scientific-Breakthrough-Automotive-Industry-First-Binder-Jet-Aluminum-3D-Printing-and-High-Density-Sintering

30/03/2021

Saab flies 3D-printed battlefield repair part on Gripen fighter

Saab has successfully test-flown a 3D-printed replacement fuselage part on a Gripen D.

https://www.flightglobal.com/defence/saab-flies-3d-printed-battlefield-repair-part-on-gripen-fighter/143108.article

PUBLICACIONES CIENTÍFICAS

Febrero/2021

Hybrid metal additive manufacturing: A state–of–the-art review

J.P.M. Pragana, R.F.V. Sampaio, I.M.F. Bragança, C.M.A. Silva, P.A.F. Martins

This paper starts from the early developments and working principles of the additive manufacturing of polymers, continues with a glimpse on the extension to metals with identification and characterization of the two most widespread technologies, and ends with an overview of the recent developments in hybrid metal additive manufacturing.

Earlier classifications of hybrid manufacturing with roots on the utilization of primarily processed raw materials in the form of ingots, sheets, rods, tubes, profiles, powders and pellets are revisited in the light of the emergence of a new type of hybridization resulting from the combination of additive manufacturing with traditional manufacturing processes.

Special emphasis is given to the combination of additive manufacturing with forming processes with the twofold objective of (i) increasing the applicability domain of metal additive manufacturing and overcoming its limitations related to low productivity, metallurgical defects, rough surface quality and lack of dimensional precision, and (ii) adding flexibility and fostering new applications of traditional forming processes.

https://www.sciencedirect.com/science/article/pii/S2666912921000027

Marzo/2021

An investigation on wear characteristics of additive manufacturing materials

Aditya Kumar, Abhishek Choudhary, Abhishek Tiwari, Christopher James, Harish Kumar, Pawan Kumar Arora, Shahroz Akhtar Khan

Wear, heat and friction generate problems in working mechanisms of a machine because of the high and repeated use of machines. A huge cost on machines would be saved if the wear rate on machines is taken into consideration as wear reduces lifespan of material. Every mechanism on a machine has a surface which is in

relative motion with another part of the machine (e.g., sliding, rolling etc). The main focus is to control the high wear rate of a material. The characteristics of the different materials differ due to their quantum differences. The present work is an investigation covering wear characteristics of additively printed specimen with materials like steel, nickel, aluminium, acrylonitrile butadiene styrene (ABS), polylactic acid (PLA), etc. The availability of a variety of wear testing methods helps to conduct the detailed research of microstructure and composition of touching surfaces. The recent work on wear not only helps to understand the mechanism of contact and rigorousness transfer during sliding but also helps in better understanding of properties like critical angle for maximum wear rate by particle.

https://www.sciencedirect.com/science/article/pii/S2214785321003527

Marzo/2021

Conventional or additive manufacturing for spare parts management: An extensive comparison for Poisson demand

Fabio Sgarbossa, Mirco Peron, Francesco Lolli, Elia Balugani

Due to the main peculiarities of spare parts, i.e. intermittent demands, long procurement lead times and high downtime costs when the parts are not available on time, it is often difficult to find the optimal inventory level. Recently, Additive Manufacturing (AM) has emerged as a promising technique to improve spare parts inventory management thanks to a 'print on demand' approach.

So far, however, the impact of AM on spare parts inventory management has been little considered, and it is not yet clear when the use of AM for spare parts inventory management would provide benefits over Conventional Manufacturing (CM) techniques.

With this paper we thus aim to contribute to the field of AM spare parts inventory management by developing decision trees that can be of support to managers and practitioners.

To this aim, we considered a Poisson-based inventory management system and we carried out a parametrical analysis considering different part sizes and complexity, backorder costs and part consumption. Moreover, we evaluated scenarios where the order-up-to level is limited to resemble applications with a limited storage capacity.

For the first time, the analysis was not limited to just one AM and one CM technique, but several AM and CM techniques were considered, also combined with different post-process treatments, for a total of nine different sourcing alternatives. In addition, the economic and technical performance of the different sourcing options

were obtained thanks to an interdisciplinary approach, where experts from production economics and material science were brought together.

https://www.sciencedirect.com/science/article/pii/S092552732030342X