Biodegradable magnesium stents: A new manufacturing methodology

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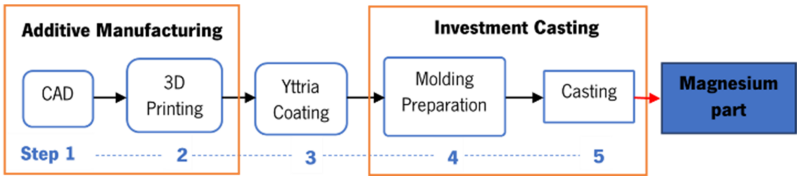
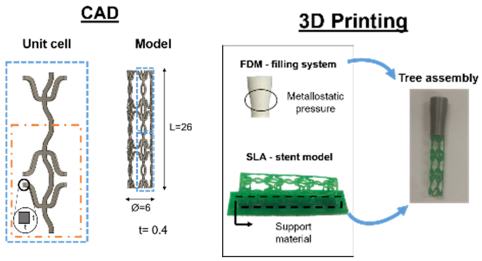
Nanotechnologies

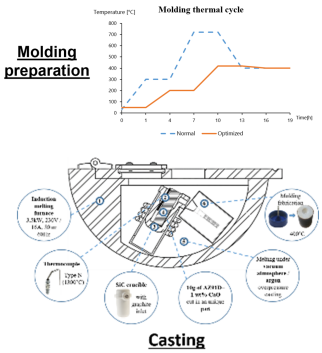
Introduction

- It is the objective of this study to demonstrate the fabrication of magnesium alloy stents by combining additive manufacturing with investment casting in plaster molding.
- Compared to other existing processes, the proposed hybrid process (schematic below) is capable of reducing processing steps and costs significantly, especially for thin-walled applications.



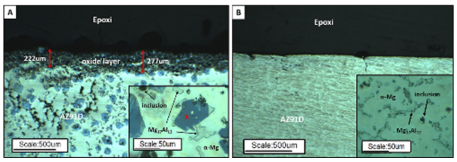
Proposed Methodology





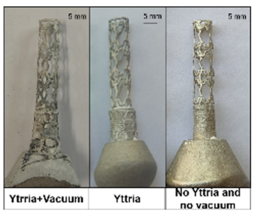
Yttria coating

As a refractory coating on the initial models (image B), Yttria effectively prevented mold-metal reactions in the investment casting of AZ91-Eco Mg alloy.



Results

There must be a compromise between the use of Yttria (Y_2O_3) and vacuum in order to achieve better results.



Conclusions

- It is demonstrated that the proposed methodology is effective for the investment casting of Mg applications.
- As a result, a more realistic assessment of the potential for this process in the industrial sector can be made.

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