

## **Biocycle between design and additive manufacturing**

C. Scognamiglio<sup>1,a\*</sup>, S. Capece<sup>1,b</sup>, M. Buono<sup>1,c</sup>.

*University of Campania Luigi Vanvitelli, Engineering Department, Via Roma 29 - 81031 Aversa – Italy*

*<sup>a</sup>ciro.scognamiglio@unicampania.it, <sup>b</sup>sonia.capece@unicampania.it, <sup>c</sup>mario.buono@unicampania.it*

*\*corresponding author*

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### **Abstract.**

The paper describes the experience of research and experimentation conducted for the configuration of a new "Biocycle" bike conceived through eco-friendly design methods and bioinspiration and with the support of Additive Manufacturing (AM) techniques oriented to customized and flexible production with high performance.

The AM outlines a change in the design-production methodology allowing the realization of unibody objects characterized by extreme formal complexity and increasing the level of customization of products. In this logic it is necessary to think of AM as a valid support to innovation and growth of many sectors in which design, creativity and design capacity play a strategic role for the success of the product.

Biocycle's design and experimentation path is characterized by a multidisciplinary approach to research; a collaboration between institutions, companies, laboratories and universities, which has enabled the development of a new bike according to Eco/Bio-design criteria, using recycled materials such as PET and integrating environmental factors into the design throughout the entire product life cycle, merging traditional production methods with additive printing to optimize performance, reduce the overall weight, costs and production time of the frame.

This has enabled Biocycle to design further innovative production developments and digital technologies for virtual environment product customization. The principles of flexibility and customization have been defined and characterized in relation to the discipline of industrial design within the AM and through the relationship between the design of the industrial product and the problems related to specific production needs.