TARGET SECTORS

AM3-CIRCULAR equips companies with the tools to enhance the sustainability of their products, from design through production, recycling, and reuse. Primarily developed and tested for the biomedical, motorcycle, and mechatronics sectors, key pillars of the manufacturing industry in the Emilia-Romagna region, these adaptable solutions can be used by both large enterprises and medium and small businesses.

Other sectors where AM3-CIRCULAR innovations could provide opportunities include smart and green mobility, nautical, hydraulic, hydrodynamic, agricultural machinery, tools and automation, robotics, electromechanics, and precision mechanics.

BIOMEDICAL SECTOR

MOTORCYCLE SECTOR

MECHATRONICS SECTOR

Partners

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cifla Centro per l'innovazione tecnologica e sociale

COESIONE ITALIA 21-27 EMILIA-ROMAGNA | Cofinanziato dall'Unione europea | Regione Emilia-Romagna

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Contact: eco@ecoinnovazione.it

www.am3circular.it

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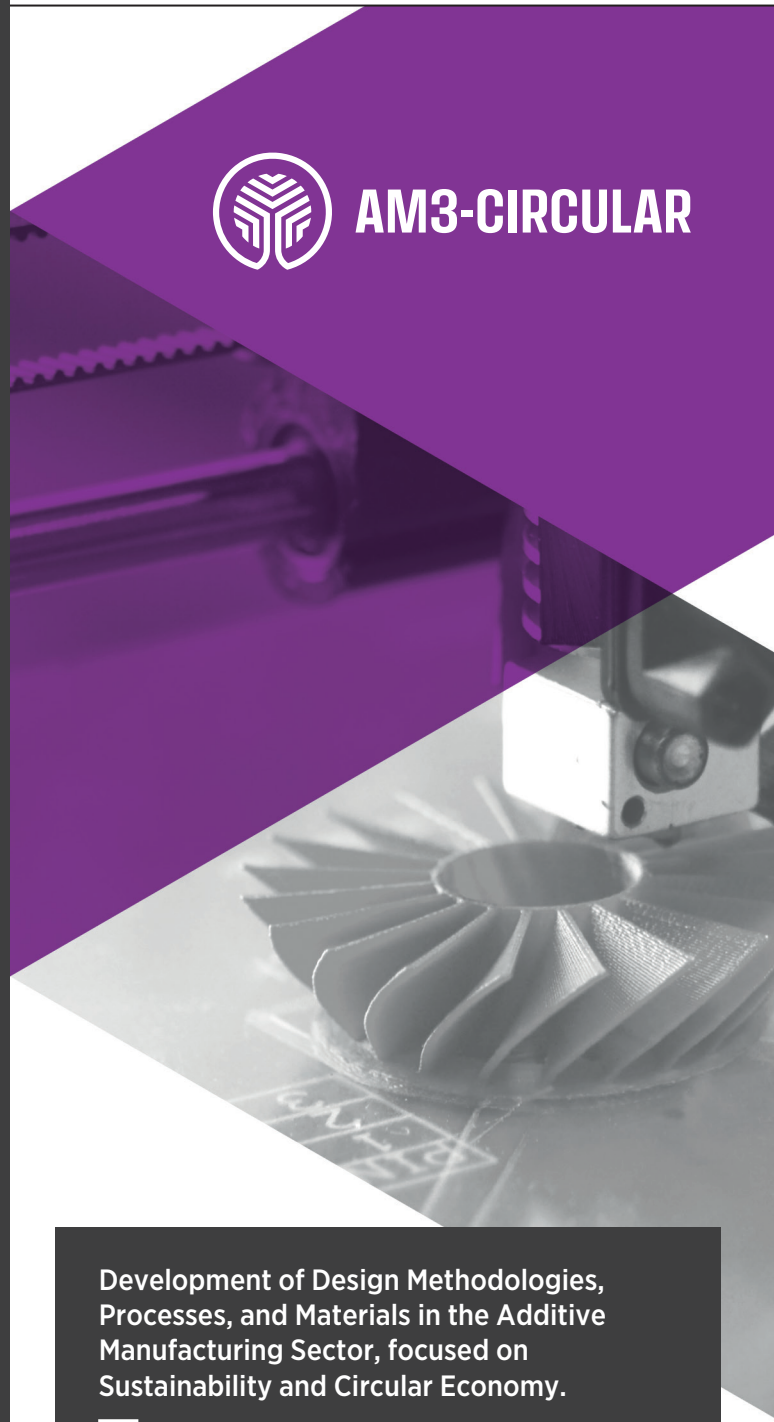
AM3-CIRCULAR



Development of Design Methodologies, Processes, and Materials in the Additive Manufacturing Sector, focused on Sustainability and Circular Economy.

PROJECT

AM3-CIRCULAR is a research project that proposes new solutions in Additive Manufacturing (AM) to enhance efficiency and reduce environmental impact in the motorcycle and biomedical sectors. It aims to replace traditional methods for the small-series production of metallic and polymer components.

Sustainability: a new growth tool for businesses

Combining the flexibility of "on-demand" production with "by design" sustainability, understood as a new form of competitiveness, AM3-CIRCULAR aims to make environmental impact assessment a critical factor in business decisions, alongside technical and economic considerations. To achieve this, a prototype system for assessing environmental sustainability will be developed. This system will use Life Cycle Analysis (LCA), Life Cycle Costing (LCC), and circularity evaluations of materials, facilitating business decisions for small-series production and promoting the adoption of hybrid manufacturing systems.

STRENGTHS

The tool for calculating the environmental footprint of AM-generated products, introduced by AM3-CIRCULAR, will aid businesses involved in AM processes by enhancing their competitive advantages. This tool has several tangible strengths compared to current sustainability assessment systems:

- **ABILITY TO PROVIDE AN "EX ANTE" SUSTAINABILITY ASSESSMENT DURING THE DESIGN PHASE**
- **EASE OF USE AND VERSATILITY, ALLOWING APPLICATION ACROSS VARIOUS COMMODITY SECTORS**
- **FULL COMPLIANCE WITH CURRENT REGULATIONS**
- **POTENTIAL FOR USE IN COMPANIES DEVELOPING HYBRID MANUFACTURING SYSTEMS, INTEGRATING AM WITH TRADITIONAL MANUFACTURING METHODS**

OBJECTIVES AND EXPECTED RESULTS

AM3-CIRCULAR is a 24-month project involving partners dedicated to achieving the following objectives:

01 Enhance design methodologies and topological optimization to meet the needs of Additive Manufacturing (AM) and requirements for environmental sustainability and circular economy.

02 Improve the recycling processes of AM materials to reduce reliance on virgin raw materials and promote a circular approach to the product life cycle.

03 Develop a prototype tool for calculating the environmental impact of AM products to support business decisions regarding sustainability and circularity.

04 Create a database of the most suitable materials for specific sectors such as biomedical and motorcycle industries.