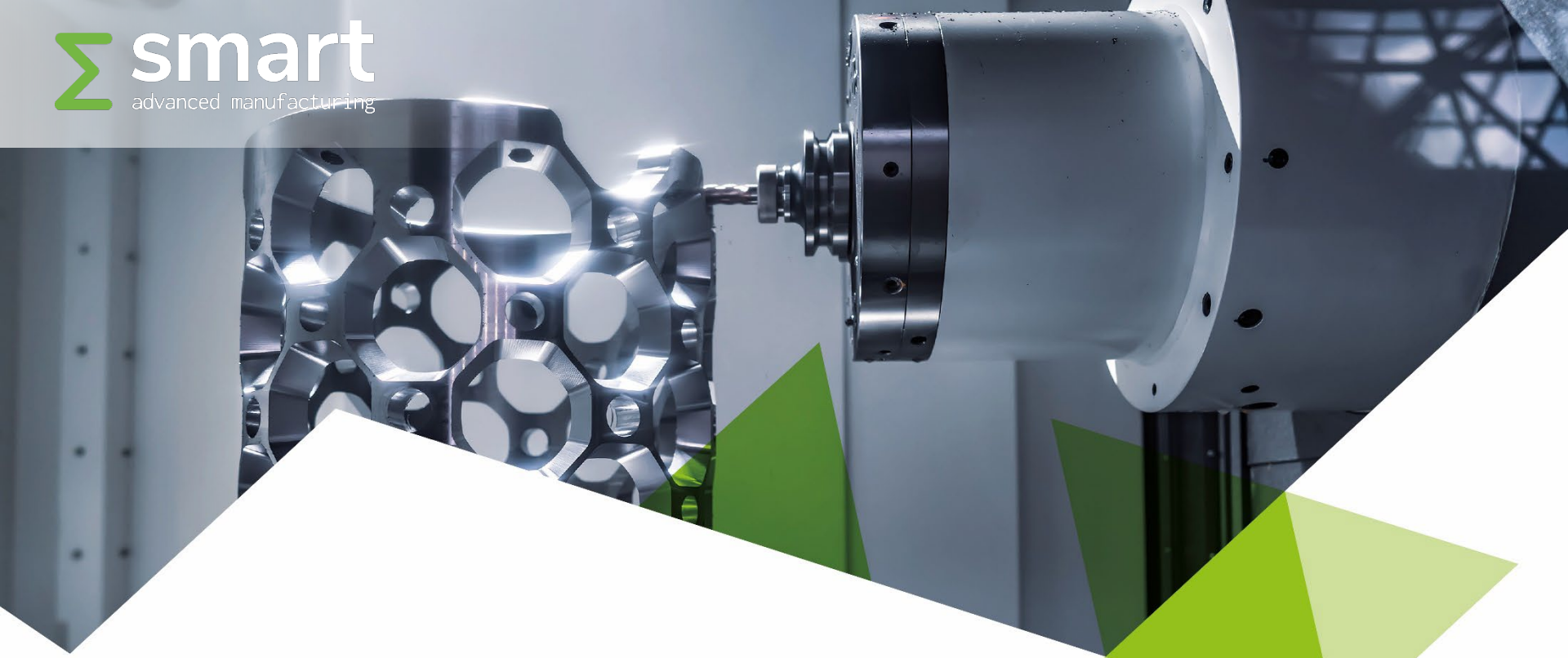


# Qualification Process for Non-Standard Powder Feedstock in PBF-LB (Q-PRO)

## Enhancing sustainability through the usage of a broader powder feedstock cut from the atomisation process within the supply chain on different additive manufacturing platforms.


smart
advanced manufacturing

# ORGANISATION PROFILE

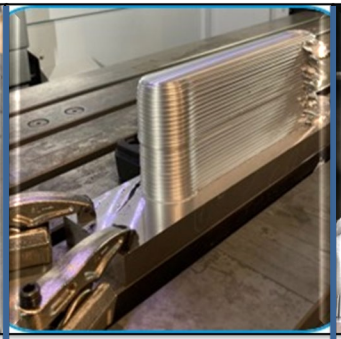
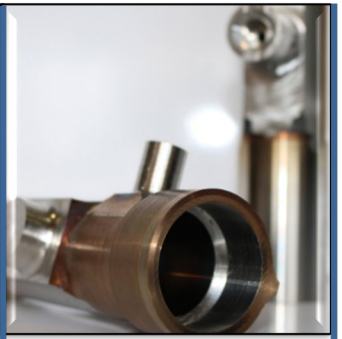
Established in 2001 as a collaboration between Boeing & University of Sheffield, the University of Sheffield Advanced Manufacturing Research Centre (AMRC) helps manufacturers of any size to become more competitive by introducing advanced techniques, technologies and processes.


**Personnel**: 600+ skilled researchers and engineers.
**Expertise**: Additive manufacturing, advanced manufacturing technologies, digital and sustainable manufacturing.
**Role in Project**: AMRC will act as the test bed, responsible for generating qualification data for the powder feedstock, optimizing the process parameters for PBF-LB, and overseeing the development of the qualification framework.

Additive Manufacturing Grants:

- DISTOPIA - (SMART Call 6)
- COMPADDITIVE - (SMART Call 7)
- E-SAM - (SMART Call 7)
- DIAMETER - (EU Horizon Europe)
- ECO-SUITE - (ATI)

# ORGANISATION PROFILE

|  |  |  |  |
|---|---|---|---|
| Directed Energy Deposition | Solid-state Non-fusion | Powder Bed Fusion | Hybrid Manufacturing |
| WAAM3D, Gefertec, Optomec LENS | MELD | Renishaw AM500Q<br>Renishaw AM500QF<br>Renishaw AM250<br>Renishaw AM400HT | DMG Lasertech 65 |

# PROPOSAL INTRODUCTION (I)

**Vision**:
The project's vision is to create a robust qualification framework for non-standard PBF-LB powder feedstock (outside of the 15-63 µm range), currently considered unusable, enabling it to enter the additive manufacturing (AM) supply chain without compromising end-part performance. By introducing this feedstock through a validated process, the project will help industries, such as aerospace and consumer goods, adopt more sustainable and cost-efficient manufacturing methods.

**Motivation**:
The AM industry generates significant quantities of unused powders, which are typically discarded due to undesirable size. As powder prices and material costs increase, and sustainability becomes a driving factor, it is crucial to find ways to recycle these materials. This project addresses the need to increase material efficiency and cut costs for industries like aerospace, which depend on high-performance, certified materials.

**Content**:
Establishment of a qualification framework for non-standard powder feedstock in PBF-LB. Optimisation of powder parameters and testing of mechanical properties such as fatigue, strength, and corrosion resistance. Creation of a digital toolset to model the feasibility of usage of powder feedstock (from different atomisation processes) on different manufacturing platforms and ensure compliance. End-user testing and validation in real-world applications for aerospace and consumer goods.

# PROPOSAL INTRODUCTION (II)

**Expected outcome:** The project will deliver a validated process for qualifying non-standard powder feedstock for PBF-LB, allowing industries to use greater yields from the atomisation process without compromising on end product performance. The expected outcomes include: A cost-competitive alternative to virgin powder feedstock. Industry adoption of sustainable manufacturing methods in sectors like aerospace and consumer goods. Digital toolset to model the feasibility for the usage of varying powder feedstock on different PBF-LB platforms.

**Impacts**:
This project will have significant impacts, including:
Environmental: Greater use of powder atomisation yield and therefore lower carbon footprint.
Economic: Cost savings for manufacturers by utilising cheaper, non-standard powders without sacrificing quality, leading to greater competitiveness in the market. The digital model will allow quicker time to market for different particle size distribution feedstock ranges and materials on different build platforms.
Sustainability: Providing industries with an alternative, more sustainable approach to producing high-quality parts using powder feedstocks that would otherwise be wasted.

**Schedule**: start and end dates for the project. (Target budget £1.5 million)
Start Date: May 2026
End Date: May 2028
Duration: 2 years

# PARTNERS

**Current Consortium:**

AMRC (UK): Lead partner and test bed for qualification framework development. Atherton Bikes (UK): End-user from the consumer goods sector focusing on high-performance bike parts. Leonardo UK (Aerospace): End-user focusing on aerospace applications. Sandvik (Sweden): Powder feedstock supplier providing non-standard materials for qualification.

**Partner search**:
We are looking for partners from the following areas:
Industry: Aerospace and automotive sectors to test the wider application of qualified powders.
Research Centres: Specialising in materials testing, qualification standards, and certification to help develop a comprehensive framework.
Countries of Origin: Primarily seeking partners from European countries such as Belgium, France, and Netherlands to collaborate on certification and standardisation efforts.

# CONTACT INFO

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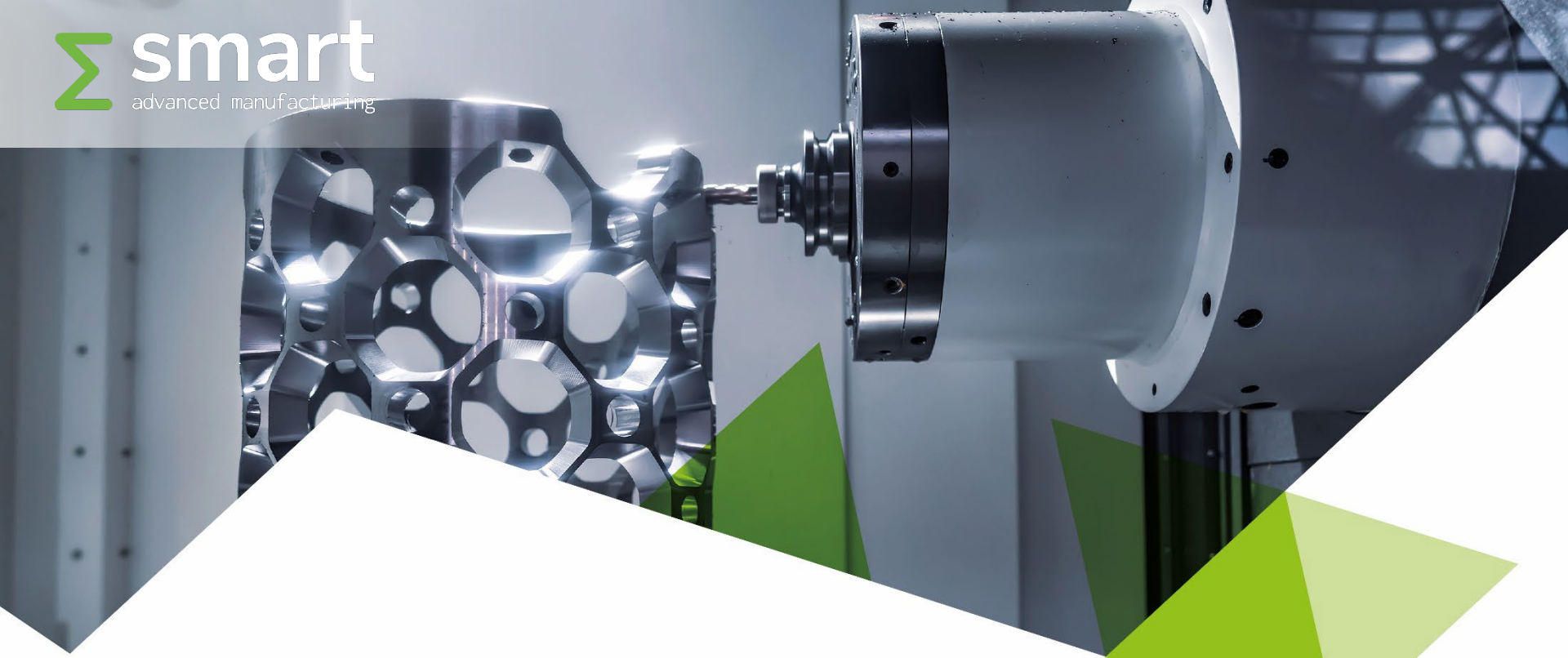

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