High-quality, high-speed EBM 3D printing by the integration of high-performance electron sources

Fact Sheet

Project Information

EBMPerform

Grant agreement ID: 666788

Project website

DOI
10.3030/666788

Project closed

EC signature date
18 April 2015

Start date
1 August 2015

End date
31 October 2019

Funded under
INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Nanotechnologies

Total cost
€ 2 494 400,00

EU contribution
€ 1 648 035,00

Coordinated by
ARCAM AB
Sweden

Objective

Background:
Production of high integrity components in Europe must use smart manufacturing methods to be efficient in use of scarce materials and other resources, and must ensure its environmental impact is minimised. Advanced manufacturing techniques, such as metal powder bed 3D printing, can ensure that production of aerospace parts is carried out with resource efficiency. However, such techniques are today

struggling with technical and reliability consistency for use in production. Arcam is a Swedish SME who uniquely design and supply electron beam additive manufacturing (EBM) machines.
Objective:
The aim of this work is to overcome key obstacles concerning future requirements for EBM 3D printing for production of aerospace parts through the integration of two enabling technologies. The work will develop and integrate a novel plasma cathode electron source with an EBM machine focusing on realising the enhanced capabilities of low maintenance, consistent manufacturing performance and higher productivity. Also, development and integration of an array probe device will provide quantified quality assurance of machine manufacturing readiness. The key research challenges will be the design of the electron source and optics and the development of new build procedures making best use of the new source.
Expected Results
The verified design of a plasma cathode electron source will enable high integrity 3D printing of metal parts. Arcam will supply equipment with this technology to large industrial companies for efficient production of parts. The equipment will enable the wider adoption of EBM leading to efficient use of materials – particularly strategic titanium alloys and nickel based super alloys at first. Increased equipment sales are expected to boost Arcam's growth over the next 5-10 years leading to faster adoption of 3D printing for large scale production. The results will be disseminated to existing and potential end-user clients in aerospace and other sectors.

Fields of science (EuroSciVoc)

natural sciences > computer and information sciences > **software**

engineering and technology > electrical engineering, electronic engineering, information engineering > electronic engineering > **control systems**

natural sciences > chemical sciences > inorganic chemistry > **transition metals**

engineering and technology > mechanical engineering > manufacturing engineering > **additive manufacturing**

medical and health sciences > medical biotechnology > **implants**

Programme(s)

H2020-EU.2.1.2. - INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Nanotechnologies MAIN PROGRAMME

H2020-EU.2.3.1. - Mainstreaming SME support, especially through a dedicated instrument

Topic(s)

NMP-25-2014 - Accelerating the uptake of nanotechnologies, advanced materials or advanced manufacturing and processing technologies by SMEs

Call for proposal

H2020-SMEInst-2014-2015

See other projects for this call

Sub call

H2020-SMEINST-2-2014

Funding Scheme

SME-2 - SME instrument phase 2

Coordinator

ARCAM AB

Net EU contribution

€ 1 648 035,00

Total cost

€ 2 494 400,00

Address

KROKSLATTS FABRIKER 27A
431 37 MOLNDAL
Sweden

SME

Yes

Region

Södra Sverige > Västsverige > Västra Götalands län

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Last update: 16 August 2022

Permalink: https://cordis.europa.eu/project/id/666788