



Open Innovation Service

DOCUMENT CONTROL SHEET

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	Organization Name	Short Name	Country
1	TECHNICAL UNIVERSITY OF MUNICH	TUM	Germany
2	EOS GMBH ELECTRO OPTICAL SYSTEMS	EOS	Germany
3	OERLIKON AM EUROPE GMBH	Oerlikon AM	Germany
4	TECHNISCHE UNIVERSITEIT EINDHOVEN	TU/e	Netherlands
5	SILIOS TECHNOLOGIES SA	SILIOS	France
6	BEAMIT SPA	BEAMIT	Italy
7	AENIUM ENGINEERING SL	AENIUM	Spain
8	AMEXCI AB	AMEXCI AB	Sweden
9	BAVARIAN RESEARCH ALLIANCE	BAYFOR	Germany
10	TECHNION – ISRAEL INSTITUTE OF TECHNOLOGY	Technion	Israel
11	INSTITUTE OF METALS AND TECHNOLOGY	IMT	Slovenia



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1 The Project InShaPe – an Abstract

The **additive manufacturing (AM) process** powder bed fusion of metals uses a laser beam (**PBF-LB/M**) to melt and fuse metal powder together. Its importance is growing in industries that have high demands for **lightweight or individualized designs**. The InShaPe project will develop a novel PBF-LB/M process underpinned by **two technical innovations**:

- i) A first-of-a-kind **AI-enhanced optical beam shaping module** that enables the flexible adaptation of laser beam shapes tailored to the material and geometry of the printed parts.
- ii) A novel **multi-spectral imaging technique** for in-line process monitoring and control.

The application of these two innovations should disrupt the manufacturing industry by transforming PBF-LB/M into a **green manufacturing technology** that surpasses traditional techniques regarding **resource efficiency** and **precision of manufactured parts**. The project aims to boost the European PBF-LB/M manufacturing sector's global reputation as a leading supplier of advanced machinery and highly complex parts. The consortium is thereby targeting the **rapidly growing global metal fusion AM market**, which is estimated to be EUR 6.92 billion annually.

As a proof of concept, InShaPe will demonstrate the potential of the novel AM process by manufacturing four different industrial use cases in the sectors aerospace, energy, space, and consumer goods.

2 About the Open Innovation Service

We are thrilled to announce our open innovation service, inviting innovators across all industries to be part of the transformative future of manufacturing. We are aiming to develop Additive Manufacturing into a **commercially wide-ranging technology to outperform conventional manufacturing processes**, such as die casting, and would like to **increase the number of industrial use cases** taking advantage of our **knowledge and cutting-edge technology**.

This Open Innovation Service provides an opportunity to showcase real industrial parts to explore the possibilities and advantages of innovative beam shaping for Additive Manufacturing in terms of precision, quality, cost-per-part, and sustainability.

2.1 Why participate?

- **Shape the future:** Be at the forefront of innovative ideas with additive manufacturing and make an impact with your use case.
- **Explore novel metal applications:** Opportunity to motivate your team to create something new and to boost innovation in your company.
- **Competition and recognition:** The best idea will be printed and showcased to highlight your team and company as an innovator.
- **Create impact:** The beam shaping technology is more productive and sustainable, leading to products with better CO₂ footprint and better acceptance in the market.



2.2 Submission Requirements

Does your selected part fulfill the following requirements?

- **Material:** Metal (preferably Inconel or a Copper- or Aluminum-Alloy as process development is already ongoing for these materials)
- **Dimensions:** maximum 250 x 250 x 300 mm (to be suitable for our M 290 EOS machine)
- **Raw data and Construction:** CAD available and designed for additive manufacturing. Possible formats are (Conversion from other formats might be possible):
 - FormatsPro/ENGINEER (*.PRT.*)
 - SolidWorks (*.SLDPRT)
 - STEP (*.STEP/*.STP)
 - Rhino 3D (*.3DM)
- **Publication:** In case your part is selected for printing, you will agree to showcase the part in social media, magazines, and events (no secrecy of part design).
- **Confidentiality:** During the selection process all submission documents will be treated confidential and will only be distributed to the selection committee (InShaPe partners). If there is a need for an additional non-disclosure agreement, please contact us via inshape.lbam@ed.tum.de.

2.3 How to Apply

Please fill out the following boxes and submit your use case by sending the filled-out form with the stated attachments to the following e-mail address: inshape.lbam@ed.tum.de.

General information

Name of participant or team members:

Company:

Contact information:

Name of the part:

Area of application:



Short description of the part: application field, function of the part, material, size, volume, number of parts produced and number of parts, which should be printed in the future, needed post-processing steps

Please describe what you are hoping to archive by applying beam shaping technology: increased productivity, tailored properties, etc.

Checklist for submission

General information (text box)

Description of the part (text box)

Description of expectations (text box)

Images or photos of the part (mail attachment)

CAD file of the part (mail attachment)

We are looking forward to your application for our open innovation service to shape the future of AM together. Please send us the filled-out form and the stated attachments to the following e-mail address: inshape.lbam@ed.tum.de.

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