

**Interreg**  
**Sudoe**



EUROPEAN UNION

**ADDISPACE**

European Regional Development Fund

**“Metal Additive Manufacturing  
in Aerospace” Pilot Scheme**  
**- *Open Call for SMEs* -**

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## 1. Introduction

ADDISPACE project aims at the dissemination and transfer of Metal Additive Manufacturing (MAM) technologies, as advanced manufacturing technologies essential to the manufacture of components by companies, especially SMEs, from the aerospace sector in the SUDOE area. ADDISPACE project is co-financed by the European regional Development Fund (ERDF) in the framework of Interreg Sudoe programme. Further information on [www.addispace.eu](http://www.addispace.eu) and [www.interreg-sudoe.eu](http://www.interreg-sudoe.eu)

As part of the transfer strategy carried out by the project, ADDISPACE consortium is implementing 4 Pilots leading to the development and demonstration of MAM technologies for the production of mid-size aerospace sectors, opposed to their manufacturing by conventional production means.

The 4 Pilots, described in following section consist of 2 phases:

- Industrial Development Phase, carried out by the research centers and companies of ADDISPACE project with the aim of developing and testing MAM technologies and process all along the MAM chain for the manufacturing of an aerospace metal part or component;
- Viability Phase, aimed at the transfer of the methods and learning from the previous Phase to SMEs, by the means of conducting viability analysis for the transfer of tested methods into specific SMEs.

The present document defines the Terms of Reference of the open call aimed at SMES from SUDOE area, that will lead to the selection of the 4 SMEs that will benefit from the Viability Phase of the Pilots.

The contents of the Terms of Reference are the following:

- Introduction to the Call.
- Description of Industrial Development Phase of Pilots.
- Description of Viability Phase of Pilots, including the scope of the viability stage from which will be benefitting selected SMEs and the implementation calendar of the planned activities.
- Eligibility criteria for SMEs to take part on the Call.
- Minimis regulation applicable to the aid delivered to selected SMEs.
- Call procedure: timetable, procedure for SMEs to apply, selection criteria and agreement.

As an Annex you will find information on the Application Form for SMEs willing to apply to the Call.

## 2. ADDISPACE Pilots: Industrial Development Phase

This phase is aimed at developing, testing and demonstrating the viability of MAM technologies for the manufacturing of aerospace metal components and parts with results equal or comparable to those manufactures through conventional means.

To that end, 4 different Pilots are being implemented, addressing different aerospace components and parts in size and complexity, different MAM technologies and processes and materials. This Phase is implemented in the laboratory and research facilities of ADDISPACE partners.

The 4 Pilots are summed up in following tables:

<b>Pilot 1</b>	
<b>Title</b>	<b>SLMilling</b>
<b>Organisations involved</b>	FADA-CATEC (Spain) IPLeiria (Portugal) MICRONORMA (Portugal)
<b>Target component</b>	Aerospace fitting
<b>Target MAM technologies</b>	SLM (Selective Laser Melting)
<b>Target materials</b>	Titanium Ti6Al4V
<b>Technical goals</b>	
<ul style="list-style-type: none"> <li>• Fabrication of a component with SLM in Titanium 64</li> <li>• Manufacturing strategy taking into account that it is going to be machined.</li> <li>• Cover all the value chain of the manufacturing till final part machining.</li> </ul>	

<b>Pilot 2</b>	
<b>Title</b>	<b>LMD-powder</b>
<b>Organisations involved</b>	IPLeiria (Portugal) ESTIA (France) ADIRA (Portugal) GNC Laser (Spain)
<b>Target component</b>	Elbow tube of large dimensions (more than 300mm) with 2 functions to add (fins)
<b>Target MAM technologies</b>	LMD-powder (Laser Metal Deposition) TLM (Tiled Laser Melting)

**Target materials** Inconel  
Stainless steel

**Technical goals**

- Development of fabrication chain for LMD-powder technology, topologic optimization and design for LMD/P process.
- Quality control, dimensional control, NDT (tomography, ultrasounds, etc) and metallographic analysis.
- Comparison between TLM-ADIRA, LMD-powder from ESTIA Laser Powder Deposition from GNC Laser and conventional.

**Pilot 3**

**Title** Large structural part by wire deposition + Hybridization with LMD/Powder

**Organisations involved** ESTIA (France)  
IK4-LORTEK (Spain)  
VLM (France)

**Target component** Large structural part originally machined from a forged titanium block

**Target MAM technologies** WAAM (Wire & Arc Additive Manufacturing) with CMT (Cold Metal Transfer)  
LMD-powder (Laser Metal Deposition)

**Target materials** Ti6Al4V

**Technical goals**

- Fabrication of a big structural aeronautic part in Ti64.
- Fabrication of a big structural aeronautic part.
- Fabrication with a robotic cell.
- Comparison of time, mechanical properties between different CMT technologies and machining.
- Hybridization with LMD/Powder.
- Control in process with a sample of the part (geometrical inspection).
- Machine Ti64 with a robot arm.

**Pilot 4**

**Title** SLM Opti-lattice

**Organisations involved** IK4-LORTEK (Spain)  
FADA-CATEC (Spain)  
ADIRA (Portugal)

**Target component** Aerspatial connection system support

**Target MAM technologies** SLM (Selective Laser Melting)

#### Target materials

AlSi10Mg  
Scalmalloy®  
Stainless steel

#### Technical goals

- Combination of topologic optimisation with lattice structures and study of the difference for two different materials.
- Demonstration in SLM built part the possibility of combining lattice and massive zones (select the most appropriate lattice structures, transition, range of density, etc.).
- Increase of the number of applications of SLM technology. Also the potential of topological optimization by SLM in multiphysic problems (mechanical and thermal) or the reduction as much as possible weights.

Implementation of the Pilots is carried out from September 2017 to September 2018. Preliminary and final findings from the 4 Pilots will be disseminated in the framework of ADDISPACE conferences and workshops.

### 3. ADDISPACE Pilots: Viability Phase

The aim of this Phase is to assess the viability of the MAM technologies and processes tested in the previous Phase, on real life settings, in the framework of SMEs interested to shift or integrate MAM technologies capabilities into their production processes.

Following a selection process resulting from the implementation of the current Call for SMEs, a total of 4 SMEs from SUDOUE area will be selected and will be the beneficiary of a Viability Assessment, conducted by ADDISPACE partners.

#### Scope of the Viability Assessment

As a result of this phase, each of the beneficiary SMEs will receive a complete Viability Assessment Report with the following information:

1. Technical Proposal for the deployment or integration of target MAM technologies on the SME production process:
  - Description of equipment and inputs to be created or integrated, with indication of the current inputs that can be re-used or adapted: equipment, ancillary materials, software, human resources, etc.
  - Description of the redesign production process, integrating if necessary conventional means of manufacturing or machining.
2. Economic Proposal: Estimated budget for the investment necessary for implementing the Technical Proposal.
3. Impact Assessment: Description of the estimated impact of the proposed technical proposal in economic and environmental terms:
  - Reduction on the use of materials,
  - Reduction on the part weight.
  - Reduction of stockage needs.
  - Personalisation capabilities in response to tailored demands for providers.

#### Method

In order to carry out the viability assessment, the beneficiary SME will be communicated about the ADDISPACE partner in charge of its assessment. This ADDISPACE partner will be the main interlocutor with the beneficiary SME centralising any kind of queries or technical support that might be needed from other ADDISPACE partners.

Method for the development of the assessment will be a combination of tools:

- Interviews with beneficiary SMEs management and production responsables in order to get accurate information about the manufacturing process.
- Analysis of data and information disclosed from beneficiary SME on regards to the company production process, results and performance. In order to

preserve the SMEs private information a Non-Disclosure clause will be included in the Agreement to be signed between the beneficiary SME and the ADDISPACE partner in charge.

- Laboratory and market research by ADDISPACE partner in order to make the Technical Proposal with new equipment and process needs.

Thus, SMEs willing to take part on the Call must comply with the following obligations:

- Management and Production responsible must meet at least three times with the ADDISPACE partner in order to carry out the assessment. The 3 planned meeting will take place on a 4-5 month time period with the following goals:
  - ✓ Meeting 1: Introduction of the scope of the Viability Phase, compilation of data and information on company and production process.
  - ✓ Meeting 2: Presentation of a preliminary technical proposal and work with the company on the assessment of different technology alternatives or doubts.
  - ✓ Meeting 3: Presentation, discussion and validation of the final Viability Assessment Report.
- Agreement to disclose a minimum relevant information about the production process is needed from the company, for the assessment to have relevant results.
- Agreement on ADDISPACE project to make public the name of the company as a beneficiary of the Call, and to disseminate anonymised and non-confidential information in the results of the Viability with dissemination purposed on communication activities of the project.

## Timetable

The Viability Phase will be carried out on a 4-5 months' time.

Following the selection of the SMEs, these will be contacted in order to agree on a Work Meeting schedule that will be integrated into the **Collaboration Agreement** to be signed between the beneficiary SME and the ADDISPACE responsible partner.



#### 4. SMEs eligibility

The Call for the selection of SMEs sets up the following general eligibility criteria:

- The company must be an SME following the definition included on Article 2 on Annex 1 of the Commission (EU) Regulation nº 651/2014.
- The company must have its official address located in the eligible area of SUDOE programme:
  - ✓ SPAIN: ES11 Galicia, ES12 Principado de Asturias, ES13 Cantabria, ES21 País Vasco, ES22 Comunidad Foral de Navarra ES23 La Rioja, ES24 Aragón, ES30 Comunidad de Madrid, ES41 Castilla y León, ES42 Castilla - La Mancha, ES43 Extremadura, ES51 Cataluña, ES52 Comunidad Valenciana, ES53 Islas Baleares, ES61 Andalucía, ES62 Región de Murcia, ES63 Ciudad Autónoma de Ceuta, ES64 Ciudad Autónoma de Melilla.
  - ✓ FRANCE: Nouvelle-Aquitaine (FR53 Poitou-Charentes, FR61 Aquitaine, FR63 Limousin), Occitanie (FR62 Midi-Pyrénées FR81 –Languedoc-Roussillon), FR72 Auvergne.
  - ✓ PORTUGAL: PT11 Norte, PT15 Algarve, PT16 Centro (PT), PT17 Lisboa, PT18 Alentejo.
- The company must have available minimis equivalent to the estimated aid set up in next section, at the time of the signature of the Collaboration Agreement.

Besides, specific technical eligibility criteria are set up for each of the Pilots:

<b>Pilot 1</b>	
<b>Target SME</b>	1.- Aerospace company producing metal components through conventional technologies.  2.- Aerospace company producing metal components through basic MAM technologies
<b>Technology requirements</b>	Conventional manufacturing capabilities (CNC) and/or MAM technologies if it is target SME no. 2.

<b>Pilot 2</b>	
<b>Target SME</b>	Aerospace company producing metal components through conventional technologies.  Aerospace company producing metal components through basic MAM technologies  MAM company producing metal components from other industries other than the aerospace
<b>Technology</b>	No technology requirements

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## requirements

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### Pilot 3

#### Target SME

Choice n°1: Aerospace company producing metal components through conventional technologies.

If not, Choice n°2: Aerospace company producing metal components through basic MAM technologies

#### Technology requirements

No technology requirements

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### Pilot 4

#### Target SME

Aerospace company producing metal components through conventional technologies.

Aerospace company producing metal components through basic MAM technologies

MAM company producing metal components from other industries other than the aerospace

#### Technology requirements

No technology requirements

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## **5. Minimis regulation**

ADDISPACE makes known through in the Terms of Reference that the aid provided in the framework for this call fall under the minimis regulation set up in Article 2 on Annex 1 of the Commission (EU) Regulation n° 651/2014.

The Viability Assessment carried out by ADDISPACE on behalf of beneficiary SME is estimated in 20.000 €, following the workload and the knowledge and technology transfer nature of the activities planned.

This implies that after the selection of the SME, this will have to provide a Minimis Declaration stating the amount of minimis aid from which the company benefits in the previous 2 fiscal years and on the current year, prior to the signature of the Collaboration Agreement between the SME and ADDISPACE.

The signature of the Collaboration Agreement will only take place once ADDISPACE have checked up that the reported minimis by the company plus the estimated aid of ADDISPACE does not goes beyond the 200.000 € limit set up by the applicable regulation.

By the means of this disclaimer, beneficiary SMEs are notified about the minimis aid regulation applicable to the granted aid, fact that will also be re-stated into the Collaboration Agreement and the Viability Assessment Report.

## 6. Call Procedure

### Timetable

Activity	Time
Launch of Call	February 21, 2018
Closure of Call	April 30, 2018
Notification to selected SMEs	May 31, 2018
Delivery of minimis declaration by selected SMEs	June 7, 2018
Signature of Collaboration Agreement	June 20, 2018
Implementation of Viability Assessment	October 1, 2018
Delivery of Viability Assessment Report	January 31, 2019

### Application process

Interested SMEs can apply to be the beneficiary of the Viability Assessment Phase by filing in and submitting the online application form before the deadline of **April 30, 2018**.

Application must be submitted online through the following webform: <https://goo.gl/forms/41cXAsrrpn92e4z13>

You can find the Application Form fields in Annex 1.

SMEs can only apply to be the beneficiaries of 1 Pilot. In case that SMEs apply for more than one, ADDISPACE will only take into consideration the first application received.

### Selection process

Upon the reception of the applications, ADDISPACE will assess them according to the following criteria, coming up with a ranking of SMEs by Pilot.

#### 1. Company size: Up to 5 points.

- Less than 10 workers: 5 points.
- From 14 to 49 workers: 4 points.
- From 50 to 249 workers: 3 points.

#### 2. Company category: Up to 5 points.

- Company of aerospace sector without MAM experience: 3 points.
- Company of aerospace sector with MAM experience: 2 points.
- Company with MAM experience but without aerospace experience: 1 point.
- 1 additional point for transnational companies, with offices in more than 1 SUDOE territory.

- 1 additional point for companies members of aerospace or MAM clusters of associations.

3. Impact Assessment: Up to 20 points:

- Redefinition of production process.
- Company's turnover.
- Access to new clients and markets.
- Interest to invest on new equipment.
- Employment of new staff.

The SME placed in first position by Pilot strand, will be notified of its provisional selection. The selection will not be final, until the SME accepts by writing the aid and delivers the Minimis Declaration allowing to check the compliance to the 200.000 € limit.

ADDISPACE will make public the names of the 4 SMEs beneficiaries of the Call and notify by writing to all applicants about the result of the Call.

### **Collaboration Agreement**

Following the publication of the selection of beneficiaries, a Collaboration Agreement will be signed between the beneficiary SME and the ADDISPACE partners appointed as interlocutor.

Collaboration Agreement will include:

- Work plan for the viability assessment, including work meetings timetable.
- Obligations for ADDISPACE in terms of quality of the deliverable.
- Obligations for beneficiary SME in terms of disclosure of minimum necessary information to deliver the Viability Assessment.
- Non-disclosure agreement.
- Notification of aid for Minimis regulation purposes.

### **Queries**

If you have any information requirement in regards to the Call you can address your queries to the following Contact Points:

SPAIN:           LORTEK  
Lexuri Vazquez: [lvazquez@lortek.es](mailto:lvazquez@lortek.es)

FRANCE:        ESTIA  
Pierre Díaz: [p.diaz@estia.fr](mailto:p.diaz@estia.fr)

PORTUGAL:    IP LEIRIA  
Artur Mateus: [artur.mateus@ipleiria.pt](mailto:artur.mateus@ipleiria.pt)

## **Annex 1: Application Form**

Link to application form: <https://goo.gl/forms/41cXAsrrpn92e4z13>

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