

MAESTRO

Modular laser-based additive manufacturing platform for
large scale industrial application

Factory of the Future Project - Grant 723826



MAESTRO contest template for demonstrator proposal

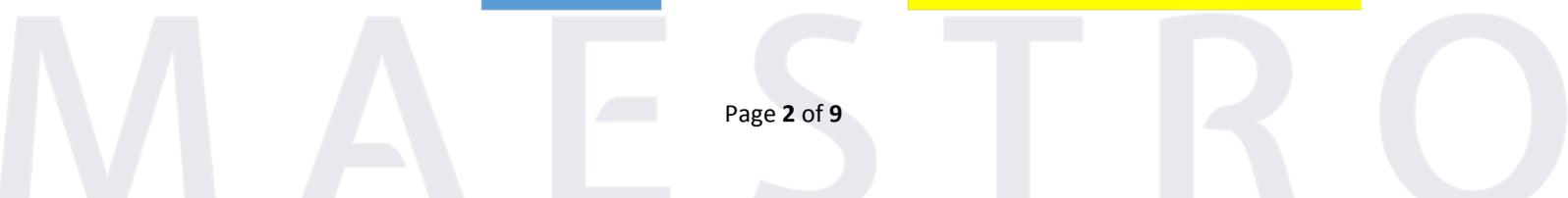
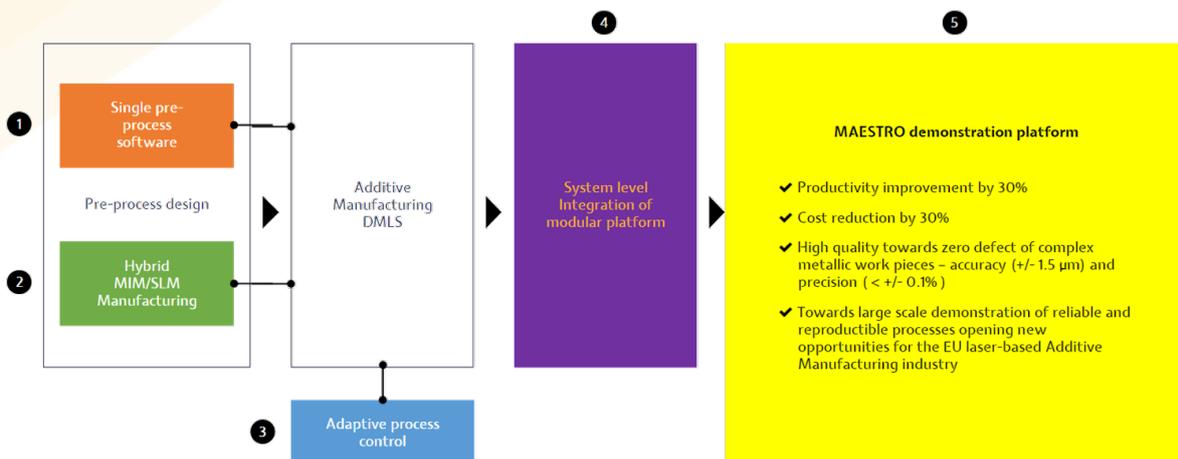


1. Contest introduction

The laser-based Additive Manufacturing (AM) of metal parts made a significant progress in the last two decades, especially in laser-based powder-bed technology (also called DMLS – Direct Metal Laser Sintering), broadening the range of materials available for them and also in developing the necessary data pre-processing tool. The AM technology has matured to reach a level where it can be considered as a viable alternative for producing net shape metal components for relatively small markets, predominantly for prototyping and small batch manufacture. This means only for low-scale applications where one material is used, the accuracy is not too high and surface integrity is achieved in one single AM processing step. Now it is necessary to improve productivity, cost and speed to bring this technology to a larger scale, towards mass market applications.

The 4 main objectives of the MAESTRO project will be, compared to the existing procedures in laser-based additive manufacturing:

- To improve the productivity by 30%** compared to the existing laser-based Additive Manufacturing procedures, owing to: (i) hybrid monitoring which will optimize the whole process by focusing DMLS only on complex parts that require high accuracy and precision; whereas the rest of the operation on rougher parts will be achieved using MIM, thereby saving time and speed of processing, (ii) an adaptive process control that will minimize the failure rate by providing in-line thermal and mechanical monitoring throughout the process chain
- To reduce the cost by 30%** compared to the existing procedures by developing: (i) adaptive process control that will limit the scrap rate, thereby increasing the production efficiency leading to savings in raw material consumption and hence the costs, (ii) a single pre-process software that reduces the time to market by merging all numerical pre-processing steps into a unique one
- To produce high quality complex metallic objects with high accuracy ($\pm 1.5 \mu\text{m}$) and precision ($\leq \pm 0.1\%$)** while maintaining the cost and productivity benefits, leading towards zero defect production by: (i) developing an adaptive process control that will minimize the fault rate and (ii) system level integration ensuring pre and post-processing enhancement and thus improving the design to piece reliability
- To integrate all modules in a platform that will be hosted by IPC and will validate the MAESTRO robustness and reproducibility in R&D development. With the help of five demonstrators (4 from consortium end-users, one from external company winning the MAESTRO contest), MAESTRO will reinforce the industrial leadership in the consortium, as well as companies that will benefit from the project’s results. As a leader in AM, EOS will benefit from MAESTRO’s results to develop afterwards the innovation towards the end users through product shipment.





In order to demonstrate the MAESTRO platform capabilities on a 5th demonstrator, companies are invited to propose case studies for future products to be manufactured by the MAESTRO technologies. The proposals will be evaluated (vs. economical, technical and societal criteria) and ranked by the project partners. For the best proposal, the fabrication process will be characterised with respect to industrialisation, i.e. throughput, throughput time, process parameter control, yield, cost. Free prototyping of the products will be proposed to the winner of the contest.

2. Contest rules and regulations

MAESTRO EU Project Partners “the Organizing Party” are organising a free contest “the MAESTRO Contest” to test metal additive manufacturing through the MAESTRO platform from October 24th, 2018 to February 28th 2019 PM;

The quality of “winner” is subject to the validity of the participant's participation (hereinafter the "Participant"). Participation in the Contest implies the unconditional acceptance of these rules and regulation (hereinafter the "Rules"), rules of professional conduct in force on the Internet, as well as laws, regulations (including tax) and other applicable laws in Belgium. The Rules therefore apply to any Participant who participates in the Contest. Participants acknowledge that in case of violation of any of its provisions, the Organizing Party will have the opportunity to consider the participation and / or the awarding of the prize as void.

1. Participation rules

The participation in the Contest is reserved for companies or group of companies (1) which are allowed to participate to European project and (2) having manufacturing facilities selling products in the EU market.

If the circumstances so require, the Organizing Party reserves the right to postpone, extend or cancel the Contest. In no event shall his responsibility be incurred.

Participation in the Contest is subject to

- having filled a participation file available at <https://www.maestro-project.eu/downloads/public-documents/>
 - the sending of the application form completed at maestro.contest@ct-ipc.com before February 28th 2019, 5 PM
2. The Participant must return only one participation file for the same company/group of companies; It is entitled to participate for only one demonstrator project.

The Contest is proposing an award to the winner consisting of the manufacturing of a demonstrator prototype in Steels or Aluminum, which sized must fit into DMLS machine 250*250*300 mm³.

The awarding Participant will not be able to claim the counter-value of the demonstrator in cash. The winner can only win one demonstrator prototype.

3. Awarding rules

The winning project will be determined according to the criteria filled in the demonstrator proposal as detailed in paragraph 4 – Demonstrator Proposal.

Each criterion is marked with 1 point if this latter is fulfilled. If not, it is marked as 0 point.

A weight is also assigned for each criterion. The project that obtains the higher score will be the winner. In the case 2 Participants have the same score, the winner will be the one who sent first by email its completed contest form.

The Participant will be informed of the contest result before April 2, 2019 by email.



The prototype will be manufactured according to data provided by the Winner (3D file, Drawings, post treatment data, etc) and will be delivered to the winner on the MAESTRO workshop day, in July 2019.

The Participant agrees to modify the shapes, the scale, the raw material, etc of the Demonstrator Prototype on simple request of the Organizing Party in order to be compliant with manufacturing constraints.

The Participant authorizes the Organizing Party any verification of its company identity, business activity and place of business. Any falsified, fraudulent, false, misleading, incorrect or inaccurate identification or address shall result in the elimination of the Participant.

The Organizing Party does not have to answer any Participants' requests regarding the Contest's mechanism, the interpretation or application of these rules, the winner (regardless of the method of delivery), even after the closing date of the Contest.

The Participant authorizes the Organizing Party to use the demonstrator prototype as a public demonstrator (all design and manufacturing steps) for the dissemination and in the public deliverable of the MAESTRO project. The Participant will not be authorized to refuse the public communication around its demonstrator.

4. Image rights

The Participant hereby authorizes, without any compensation of any kind, the Organizing Party, as well as any and all sponsors of the Contests to, on any and all media platforms and through any and all communication channels and networks existing or yet to be invented, throughout the world for a duration of 10 years from the beginning of the Contest:

(i) film, record and photograph his image, voice, performance and/or other likeness (including but not limited to his verbally expressed words), as well as its prototype demonstrator, including all design and manufacturing steps (design optimization and modification, additive manufacturing process and finishing), (hereinafter referred to as the "Image"), during Contest which will take place from October 2018 to July 2019.

(ii) copy, edit, reproduce and distribute any and all of his Image's video and audio footage and photographs recorded or taken during the Contest (hereinafter the « Recordings »), on any and all media platforms and through any and all communication channels and networks existing or yet to be invented, for promotional, advertising and commercial purposes, throughout the world.

The Participant understands and agrees that the Recordings may be reproduced, in whole or in part, on any and all media platforms existing or yet to be invented, including but not limited to on any and all:

- digital and/or printed magazines, books and newspapers,
- catalogues and brochures,
- digital formats, including but not limited to CD's DVD's, Blue-Rays, digital copies,
- audiovisual format, including but not limited to live or delayed broadcast, TV shows, documentaries, videoclips, podcats,
- websites and smartphones/tables applications, including but not limited to <https://www.maestro-project.eu>
- social media pages/accounts (including but not limited to facebook and twitter) of the Organizing Party and any and all of the Sponsors.

The Participant understands and agrees that the Recordings may be distributed to the public, in whole or in part, through any and all communication channels and networks existing or yet to be invented, including by not limited to any and all electronic and digital networks, including but not limited to internet, mobile networks (including but not limited to 3G and 4G), mobile TV networks, wired and wireless networks, to any and all fixed and/or mobile devices.

The Recordings, made and freely selected, shall be exclusively reproduced and distributed as indicated above.



The Participant understands and agrees that the production, editing and/or distribution of the Recordings (including abstracts of the Recordings) shall be carried out at the sole discretion of the Organizing Party.

This authorization includes the right for the Organizing Party, the right to reproduce and distribute the Images and Recordings, to edit and/or modify (including but not limited to any addition or deletion) the Images and Recordings as they deem necessary.

5. Personal Data

Any personal data provided to the Organizing Party during the Contest shall be processed pursuant to Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. Such data shall be processed solely for the purposes of the performance, management and monitoring of the Contest by the Organizing Party acting as data controller without prejudice to possible transmission to the bodies charged with monitoring or inspection task in application of Union law.

The Participant shall have the right of access to his personal data and the right to rectify any such data. Should the Participant have any queries concerning the processing of his personal data, he shall address them to the entity acting as data controller at maestro.contest@ct-ipc.com.

The Participant shall have right of recourse at any time to the European Data Protection Supervisor. Where the Contest requires the processing of personal data by the Organizing Party, the Organizing Party may act according to the data regulations in particular with regard to the purposes of the processing, the categories of data which may be processed, the recipients of the data, and the means by which the data subject may exercise his rights. The Organizing Party shall limit access to the data to the staff strictly necessary for the performance, management and monitoring of the Contest.

The Organizing Party undertakes to adopt appropriate technical and organisational security measures having regard to the risks inherent in the processing and to the nature of the personal data concerned in order to:

- a) prevent any unauthorised person from having access to computer systems processing personal data, and especially:
 - 1) unauthorized reading, copying, alteration or removal of storage media;
 - 2) unauthorized data input as well as any unauthorised disclosure, alteration or erasure of stored personal data;
 - 3) unauthorized using of data-processing systems by means of data transmission facilities;
- b) ensure that authorized users of a data-processing system can access only the personal data to which their access right refers;
- c) record which personal data have been communicated, when and to whom;
- d) ensure that personal data being processed on behalf of third parties can be processed only in the manner prescribed by the contracting institution or body;
- e) ensure that, during communication of personal data and transport of storage media, the data cannot be read, copied or erased without authorization;
- f) design its organizational structure in such a way that it meets data protection requirements

6. Disclaimer

The demonstrator that will be developed through the MAESTRO contest, is delivered on an “as is” basis. The Organizing Party makes no warranty of any kind, either expressed or implied, as to any matter including but not limited to, warranty of fitness for particular purpose, merchantability, accuracy, nor shall the Organizing Party be liable to the Participant for direct, indirect, special, or consequential damages including in connection with inability to use, use properly or use without errors, said demonstrator or any applications and derivation thereof. The Organizing Party makes no warranties of any kind with respect to freedom from patent or copyright infringement, informational content, accuracy, integration or theft of trade secrets and does not



assume any liability hereunder for any infringement of any patent or copyright arising from the use of the demonstrator or rights granted or provided by it hereunder. The Participant agrees that it will not make any warranty on behalf of the Organizing Party, expressed or implied, to any person concerning the application of, accuracy of, or the results to be obtained with the demonstrator, or with respect to any other matter.

The Participant will defend, indemnify and hold the Organizing Party harmless from any claim, suit, loss, cost, damage, liability or expense arising out of Organizing Party's manufacturing the demonstrator's for the purpose of the Contest, as well as of the Participant's use of the demonstrator, whether commercially or not, Organizing Party's use of resources provided by the Participant for the purposes provided by the Participant, and/or claims by or relating to employees or agents of the Participant. The Participant warrants that the demonstrator is free of claims of infringement of patent rights, designs rights of any third party.

The demonstrator that will be developed through the MAESTRO contest, is delivered on an "as is" basis. The Organizing Party makes no warranty of any kind, either expressed or implied, as to any matter including but not limited to, warranty of fitness for particular purpose, merchantability, accuracy, nor shall the Organizing Party be liable to the Participant for direct, indirect, special, or consequential damages including in connection with inability to use, use properly or use without errors, said demonstrator or any applications and derivation thereof. The Organizing Party makes no warranties of any kind with respect to freedom from patent or copyright infringement, informational content, accuracy, integration or theft of trade secrets and does not assume any liability hereunder for any infringement of any patent or copyright arising from the use of the demonstrator or rights granted or provided by it hereunder. The Participant agrees that it will not make any warranty on behalf of the Organizing Party, expressed or implied, to any person concerning the application of, accuracy of, or the results to be obtained with the demonstrator, or with respect to any other matter.

The Participant will defend, indemnify and hold the Organizing Party harmless from any claim, suit, loss, cost, damage, liability or expense arising out of Organizing Party's manufacturing the demonstrator's for the purpose of the contest, as well as of the Participant's use of the demonstrator, whether commercially or not, Organizing Party's use of resources provided by the Participant for the purposes provided by the Participant, and/or claims by or relating to employees or agents of the Participant. The Participant warrants that the demonstrator is free of claims of infringement of patent rights, designs rights of any third party.

7. Law and jurisdiction

The present rules and regulations are governed by Belgium Law ; Prior to any litigation, the Parties undertake to meet in an effort to amicably settle their possible disputes by means of a registered letter with acknowledgement of receipt sent to the other Parties and that describes the disputed point.

Any claim regarding the contest shall be submitted to the Organizing Party by registered letter with acknowledgement of receipt within a maximum of 60 (sixty) days from the deadline for participation.

In the absence of amicable settlement within one month of the notification by registered mail, any difficulty will be brought before the competent courts of Brussels.





3. Contest planning





4. Demonstrator proposal

Name of the demonstrator:	
Company:	
PIC number of the Company	
Company size: Small / Medium / Large	
Description of the part:	
Illustration: picture, schematic view, CAD file	
Innovation: new product, new function, new market, lead time, cost, ...	
Main objectives: cost reduction, mass saving, lead time reduction, ...	
Production of the part (large scale application): number of products / month, / year, ...	
Customisation possibilities: variation of the design	



Advantages of metal AM	
Matching with MAESTRO project: optimized design for AM, hybrid manufacturing, monitoring needs, post-processing,	
Contact details (name of the representant, principal place of business and address, country)	
<input type="checkbox"/> By ticking this box, you, as a Participant, expressly agree to the use of your personal data by the MAESTRO Organizing Partners for the provision of information on 3D printing	