



ADMIRE - THE FUTURE IS NOW: **EUROPEAN METAL AM ENGINEER MSC**

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of the European Union



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Welcome

This Booklet provides information for **Students** and **Universities** towards the **First European Metal AM Engineer MSc**

Table of CONTENTS

The need for a new European Metal Additive Manufacturing Engineer Master Degree 3

European Metal AM Engineer Master Degree

Features of the Metal AM Engineer Masters Degree 4

Related Professional Profiles at the Engineering level 5

How to turn your Master Degrees into a European Master Degrees? 14

Advantages of enrolling in the European Metal AM Engineer MSc 15

ADMIRE AM Hub/Platform

Purposes of the Platform 16

Who can access to it? 17

What are the advantages of creating an Account? 18

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The need for a new European Metal Additive Manufacturing Engineer Master Degree

ADMIRE was a three-years project funded by Erasmus+ Programme, under Knowledge Skills Alliance, that gathered 8 Partners from five EU countries (Belgium, France, Portugal, Germany and United Kingdom) belonging to Additive Manufacturing (AM) Industry, Research Centers and Universities to reply to the urgent need for a highly qualified workforce in AM.

As result, **four Metal AM Professional Profiles** were developed to be implemented in the scope of the **European Metal AM Engineer Master Degree (AM MSc)** by Universities in EU, and an innovative **AM Hub/Platform** was created to provide AM Companies, Universities and Students in Europe the opportunity to connect, thus closing a long lasting gap between AM Industry and Education.

This Guide aims to present those Professional Profiles and the AM Hub/Platform created, and to explain Universities and Students:

- How to implement and access, respectively, to the new European Metal AM Engineer Master Degree;
- How they can use the AM Hub/Platform to access to the map of European resources in AM.

GUIDELINES

OF ADMIRE PRODUCTS.

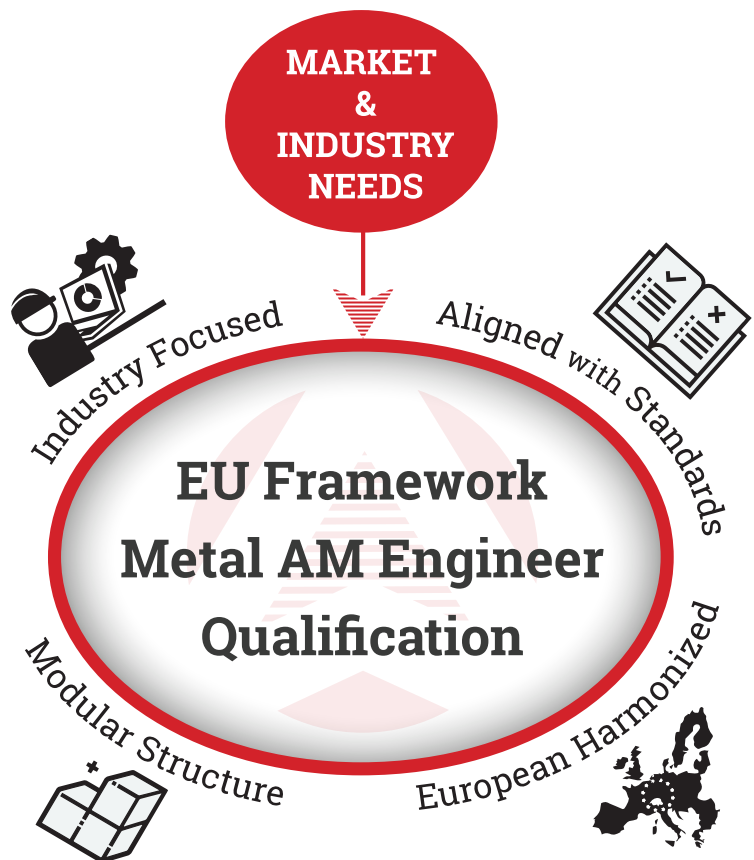
European Metal AM

ENGINEER MASTERS DEGREE

Features of the **Metal AM Engineer** Master Degree

The first European Master for Metal AM Engineer with innovative features:

- Multidisciplinary Scientific Scope
- A Modular Approach based on soft skills
- Learning Outcomes Approach
- Learner centered, self directed by students, enabling flexible pathways
- Work Based Learning Approach
- Problem Based Learning Assignments, based on industrial problems





European Metal AM

ENGINEER MASTER'S DEGREE

Related **Professional Profiles** at the **Engineering level**

ADMIRE Metal AM Engineer MSc & Professional Profiles

According to AM Industry's feedback (including ISO - International Organization for Standardization) collected by ADMIRE partners, there is a need for specific Professional Profiles that allow this field to maintain its growth among the Key Enabling Technologies in Europe.

Therefore, the European Metal AM MSc includes four Professional Profiles:

- European Process Engineer Directed Energy Deposition (DED)-Arc
- European Process Engineer Directed Energy Deposition- Laser Beam (DED-LB)
- European Process Engineer Powder Bed Fusion -Laser Beam (PBF-LB)
- European Metal AM Coordinator

European Master
DEGREES



Process Engineer

Directed Energy Deposition–Arc (DED–Arc)

Description

DED–Arc Engineers are the professionals with the specific knowledge, skills, autonomy and responsibility to manage Metal Additive Manufacturing using DED–Arc Process

His/Her main tasks are to:

- Develop and execute DED–Arc plans including validation of design, implementation, pre and post processing operations, assurance of parts conformity and identification of the causes and the corrective actions of technical production problems;
- Coordinate the tasks distribution between the operators according to the workplan as well as manage the link between them and the management.

Benefits

- Up-to-date knowledge, skills and competences regarding the DED–Arc AM process;
- Understanding of technical requirements to be applied for solving complex problems and proving quality in requested conditions;
- Broad awareness of DED–Arc Additive Manufacturing coordination, both from the perspective of decision making and professional development.

Process Engineer

Directed Energy Deposition-Arc (DED-Arc)

COMPETENCE UNITS	E/IE DED-ARC RECOMMENDED WORKLOAD
CU 00: Additive manufacturing Process Overview	14
CU 01: DED-ARC Process	84
CU 08: DED-LB Process	70
CU 15: PBF-LB Process	70
CU 25: POST Processing	28
CU 34: Process Selection	56
CU 35: Metal AM Integration	42
CU 36: Coordination Activities	14
CU 37: Production of DED-Arc parts	56
CU 38: Conformity of DED-Arc parts	84
CU 39: Conformity of facilities featuring DED-Arc	28
TOTAL	532
Optional CUs	
CU 26: Introduction to materials	28
TOTAL	560
Materials CUs***	
CU 27: AM with steels feedstock (excluding Stainless Steel)	42
CU 28: AM with Stainless Steel feedstock	28
CU 29: AM with Aluminium feedstock	14
CU 30: AM with Nickel feedstock	14
CU 31: AM with Titanium feedstock	28
CU 32: AM with Tungsten feedstock	7
CU 33: Biomedical metallic materials	14

***A minimum of 2 CUs shall be selected from the list Materials CUs in order to successfully complete the qualification



Process Engineer

Directed Energy Deposition- Laser Beam (DED-LB)

Description

DED-LB Engineers are the professionals with the specific knowledge, skills, autonomy and responsibility to operate Metal Additive Manufacturing machines using DED-LB Process.

His/Her main tasks are to:

- Develop and execute DED-LB plans including validation of design, implementation, pre and post processing operations, assurance of parts conformity and identification of the causes and the corrective actions of technical production problems;
- Coordinate the tasks distribution between the operators according to the workplan as well as manage the link between them and the management.

Benefits

- State-of-the-art knowledge, skills and competences regarding the DED-LB Additive Manufacturing process;
- Ability to understand technical requirements when solving complex problems and proving quality in requested conditions;
- Full picture of DED-LB Additive Manufacturing coordination, both from the perspective of decision making and professional development.

Process Engineer

Directed Energy Deposition- Laser Beam (DED-LB)

COMPETENCE UNITS	E/IE DED-LB RECOMMENDED WORKLOAD
CU 00: Additive manufacturing Process Overview	14
CU 01: DED-ARC Process	84
CU 08: DED-LB Process	70
CU 15: PBF-LB Process	70
CU 25: POST Processing	28
CU 34: Process Selection	56
CU 35: Metal AM Integration	42
CU 36: Coordination Activities	14
CU 40: Production of DED-Arc parts	42
CU 41: Conformity of DED-Arc parts	70
CU 42: Conformity of facilities featuring DED-Arc	28
TOTAL	518
Optional CUs	
CU 26: Introduction to materials	28
TOTAL	546
Materials CUs***	
CU 27: AM with steels feedstock (excluding Stainless Steel)	42
CU 28: AM with Stainless Steel feedstock	28
CU 29: AM with Aluminium feedstock	14
CU 30: AM with Nickel feedstock	14
CU 31: AM with Titanium feedstock	28
CU 32: AM with Tungsten feedstock	7
CU 33: Biomedical metallic materials	14

***A minimum of 2 CUs shall be selected from the list Materials CUs in order to successfully complete the qualification



Process Engineer Powder Bed Fusion– Laser Beam (PBF–LB)

Description

PBF–LB Engineers are the professionals with the specific knowledge, skills, autonomy and responsibility to coordinate Metal Additive Manufacturing using PBF–LB Process.

His/Her main tasks are to:

- Develop and execute PBF–LB plans including validation of design, implementation, pre and post processing operations, assurance of parts conformity and identification of the causes and the corrective actions of technical production problems;
- Coordinate the tasks distribution between the operators according to the workplan as well as manage the link between them and the management.

Benefits

- Up-to-date knowledge, skills and competences regarding the PBF–LB Additive Manufacturing process
- Understanding of technical requirements to be applied for solving complex problems and proving quality in requested conditions
- Offering the full picture of PBF–LB Additive Manufacturing coordination, both from the perspective of decision making and professional development

Process Engineer Powder Bed Fusion- Laser Beam (PBF-LB)

COMPETENCE UNITS	E/IE PBF-LB RECOMMENDED WORKLOAD
CU 00: Additive manufacturing Process Overview	14
CU 01: DED-ARC Process	84
CU 08: DED-LB Process	70
CU 15: PBF-LB Process	70
CU 25: POST Processing	28
CU 34: Process Selection	56
CU 35: Metal AM Integration	42
CU 36: Coordination Activities	14
CU 43: Production of PBF-LB parts	42
CU 44: Conformity of PBF-LB parts	70
CU 45: Conformity of facilities featuring PBF-LB	28
TOTAL	518
Optional CUs	
CU 26: Introduction to materials	28
TOTAL	546
Materials CUs***	
CU 27: AM with steels feedstock (excluding Stainless Steel)	42
CU 28: AM with Stainless Steel feedstock	28
CU 29: AM with Aluminium feedstock	14
CU 30: AM with Nickel feedstock	14
CU 31: AM with Titanium feedstock	28
CU 32: AM with Tungsten feedstock	7
CU 33: Biomedical metallic materials	14

***A minimum of 2 CUs shall be selected from the list Materials CUs in order to successfully complete the qualification



METAL AM COORDINATOR

Description

As an **European/International Metal Additive Manufacturing Coordinator** you are expected to detain skills in operational aspects of the different AM technologies, such as:

- Evaluate manufacturing suitability for customers' requests defining which processes are fit for the request, using cost models.
- Coordinate the tasks distribution between the operators according to the workplan as well as manage the link between them and the management.

Benefits

- Up-to-date knowledge, skills and competences regarding Additive Manufacturing processes;
- Understanding of technical requirements to be applied for solving complex problems and proving quality in requested conditions.



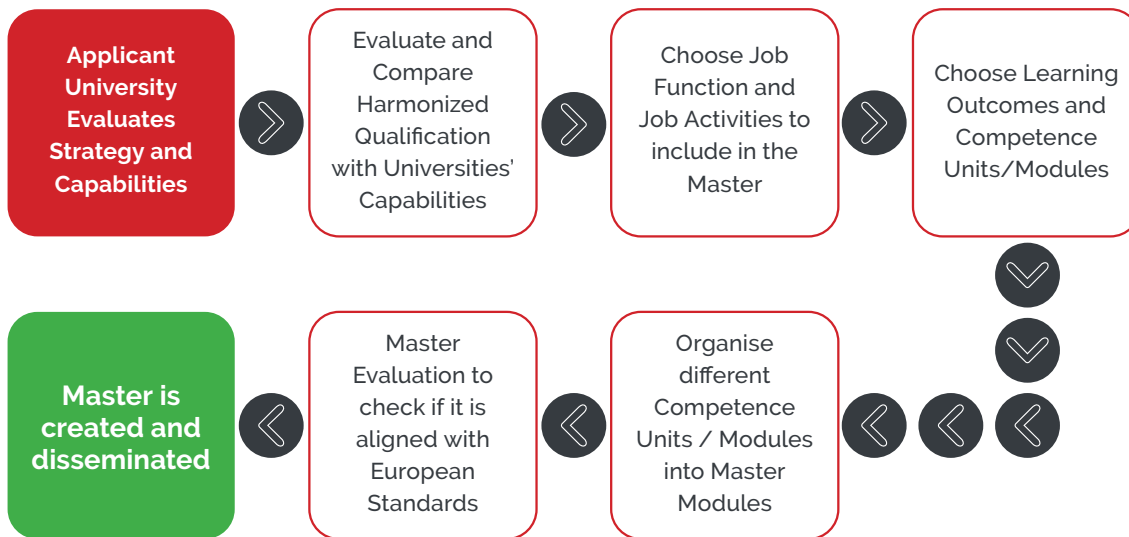
METAL AM COORDINATOR

COMPETENCE UNITS	E/IE MAM C RECOMMENDED WORKLOAD
CU 00: Additive manufacturing Process Overview	14
CU 01: DED-ARC Process	84
CU 08: DED-LB Process	70
CU 15: PBF-LB Process	70
CU 25: POST Processing	28
CU 34: Process Selection	56
CU 35: Metal AM Integration	42
CU 36: Coordination Activities	14
TOTAL	378

UNIVERSITIES

How to turn your **Master Degrees** into **European Master Degrees?**

ADMIRE project offers a set of Competence Units (CUs) organized in a Modular framework that can be used by different European Universities which, based on their own resources, can implement the entire European Metal AM Engineer qualification, or a specialization rooted on four different Professional Profiles/Qualifications and their respective CUs: **Metal AM Process Engineer for DED-Arc, for DED-LB and PBF-LB, and Metal AM Coordinator**. To do so, these are the steps Universities must follow:



This allows different Universities, with complementary resources, to work closely towards a specific Qualification and/or to work with Industry for technological support, if needed.

Be part of **ADMIRE European AM Network** to answer to AM Industry's needs and to prepare the workforce of the future!

The European Metal AM Engineer MSc and its specializations must comply with the International Additive Manufacturing Qualification System (IAMQS) requirements, its rules and operating procedures, managed by EWF. For more information, please contact ewf@ewf.be



STUDENTS

Advantages of enrolling in the **European Metal AM Engineer MSc**

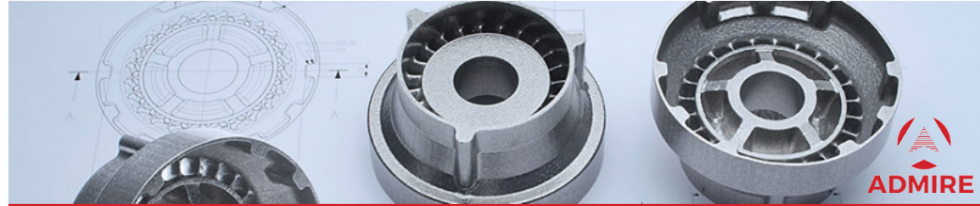
- Modular structure with contents organized in Competence Units individually assessed and validated;
- Competence Units with learning outcomes defined in terms of knowledge, skills, autonomy and responsibility
- Advantages:
 - Facilitates lifelong learning;
 - Avoids repetition of previously acquired knowledge;
 - Allows learners to choose to attend specific individual competence Units
 - Flexible learning pathways;

ADMIRE AM Hub/Platform

Purposes of the Platform

An innovative online Hub/Platform that encompasses the following main purposes:

- To develop a Problem-Based Learning environment and mindset, rooted on ADMIRE learner-centered approach.
- To tackle the gap between Industry/Labour market and Universities, at European level.
- To connect Universities with Students.
- To map European Training/Education resources on AM.



[Home Page](#)

[Admire project Platform.](#)

Welcome to ADMIRE Platform. Please Log In or create a user account, to start working on/creating Industrial Challenges. Log in to solve Additive Manufacturing Problem Based Learning Assignments



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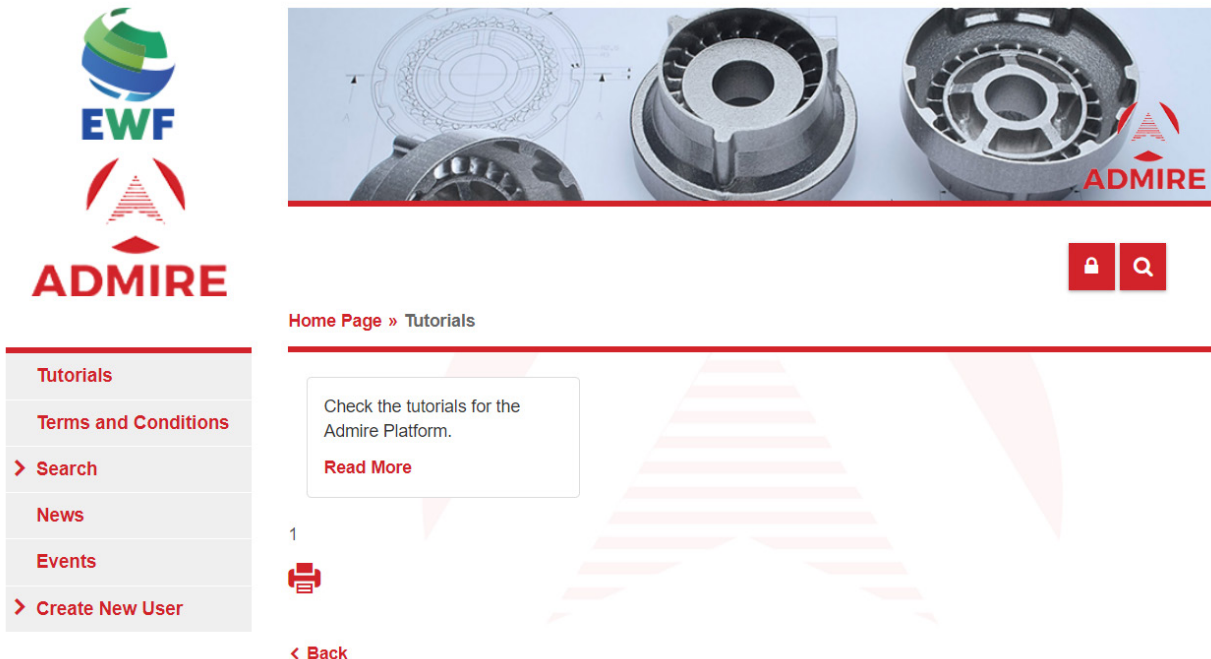
ADMIRE AM Hub/Platform

Who can access to it?

ADMIRE AM Hub/Platform was created for:

- Companies belonging to AM supply chain,
- Universities/Teachers,
- Students.

All visitors are able to create their own account on ADMIRE AM Hub/Platform by following the indications provided on a visual Tutorial produced to assist them. Please access at: www.ewf.be/admire



The screenshot shows the ADMIRE AM Hub/Platform website. On the left, there is a navigation menu with the following items: Tutorials, Terms and Conditions, Search, News, Events, and Create New User. The main content area features a large image of a turbine component with the ADMIRE logo overlaid. Below the image, there is a text box that reads: "Check the tutorials for the Admire Platform. [Read More](#)". The page also includes a search bar, a lock icon, and a "Back" button.

UNIVERSITIES

ADMIRE AM Hub/Platform

What are the advantages of creating an Account?

By creating an account on **ADMIRE AM Hub/Platform**, you can:

- Network with other Universities, AM Companies and Students.
- Have access to up to date AM industrial problem-solving assignments.
- Be part of a Problem-Based Learning environment and mindset, rooted on ADMIRE learner-centered approach;
- Have access to news and events about AM.



Access the Platform: www.ewf.be/admire

STUDENTS

ADMIRE AM Hub/Platform

What are the advantages of creating an Account?

By creating an account on **ADMIRE AM Hub/Platform**, you can:

- Access to a network of European Universities delivering training in AM.
- Network with Universities, AM Companies and other Students.
- Contribute to the solution of real AM industrial problems.
- Access and/or reply to job vacancies published by Companies.
- Access to news and events about AM.



Access the Platform: www.ewf.be/admire



THE FUTURE IS NOW: EUROPEAN METAL AM ENGINEER MSC

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Or access the **ADMIRE Project Website**:

W : www.admireproject.eu

