Co-funded by the European Union

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)

Agreement number 2023-1-RO01-KA220-HED-000155412

European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

AMAZE

MULTIPLIER EVENT ME3

Yuriy Fedkovych Chernivtsi National University (Ukraine)

20 June 2024

Assoc. Prof. Dr. Eng. Băilă Diana-Irinel

National University of Science and Technology POLITEHNICA Bucharest, Romania

Faculty of **Industrial Engineering and Robotics**

Co-funded by the European Union

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)

Agreement number 2023-1-RO01-KA220-HED-000155412

European Network for Additive Manufacturing in Industrial Design for Ukrainian Context – Acronym AMAZE

Project Partners:

1- National University of Science and Technology Politehnica Bucharest (Romania) – Project Coordinator: Assoc.Prof. Diana Băilă

2- Yuriy Fedkovych Chernivtsi National University (Ukraine) – Mr. Dean Prof. Igor Fodchuk

3- Poznan University of Technology (Poland) – Project Responsible Mr. Prof. Remigiusz Labudzki

4- Edibon International S.A. (Spain) – Project Responsible Mrs Mirian Judit Bonilla

Project activities– www.amaze2023.eu

AMAZE kick-off meeting

Bucharest
27-29 Nov 2023

Flyer
Agenda
Minutes
Dissemination

1st Multiplier Event

Madrid, Spain
25 Apr 2024

Flyer
Agenda
Minutes
Report

Staff training session

Madrid, Spain
7 - 10 May 2024

Flyer
Agenda
Minutes
Report

Transnational Kick-off meeting Report

1st Multiplier Event Report - Madrid, Spain, 25 Apr 2024

Staff training session Report - Madrid, Spain - 7..10 May 2024

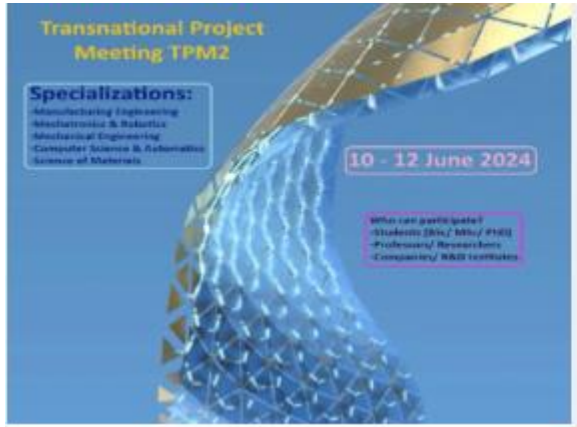
Co-funded by the European Union

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)

Agreement number 2023-1-RO01-KA220-HED-000155412

European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

Project activities– www.amaze2023.eu



To come ...

2nd Transnational Project Meeting

Poznan, Poland
10 -12 Jun 2024

Flyer

Agenda

To come ...

2nd Multiplier Event

Bucharest, Romania
18 Jun 2024

Flyer

Agenda

To come ...

3rd Multiplier Event

Chernivtsi, Ukraine
20 Jun 2024

Flyer

To come ...

Summer School

Bucharest, Romania
8 - 17 Jul 2024

Flyer

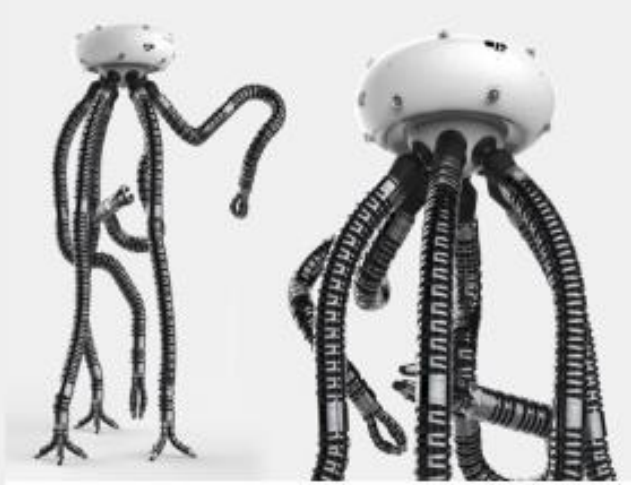
Project activities– www.amaze2023.eu

To come ...

3rd Transnational Project Meeting

Madrid, Spain
4 - 6 Sep 2024

Flyer



To come...

4th Multiplier Event

Poznan, Poland
4 Nov 2024

Flyer

MULTIPLIER EVENT ME3 ON 20 June 2024 – Hosted by Yuriy Fedkovych Chernivtsi National University (Ukraine)

https://www.chnu.edu.ua/novyny/aktualni-novyny/zustrich-u-ramkakh-proiektu-european-network-for-additive-manufacturing-in-industrial-design-for-ukrainian-context/

Новини > Актуальні новини > Зустріч у рамках проекту «European Network for Additive Manufacturing in Ind...

П'ятниця, 14 червня 2024 р. Актуальні новини

20 червня 2024року, **відбудеться багатосторонні зустріч у рамках міжнародного проекту «European Network for Additive Manufacturing in Industrial Design for Ukrainian Context – Європейська мережа адитивного виробництва у промисловому дизайні в українському контексті»**, який реалізується за програмою ЄС «ERASMUS+ KA220-HED-2023» відповідно до грантової угоди між Національним університетом науки та технологій «Бухарестська Політехніка» (м. Бухарест, Румунія), Познанською Політехнікою (м. Познань, Польща), компанією EDIBON International, S.A. (Мадрид, Іспанія) та Чернівецьким національним університетом імені Юрія Федьковича.

До участі у зустрічі запрошені представники різних компаній міста Чернівці, пов'язаних з архітектурою, будівництвом, інформаційними технологіями та технологіями медичної реабілітації. Захід почнеться о 9:00 у 8а корпусі ЧНУ, 206 аудиторія.

З цієї нагоди ми запрошуємо викладачів, науковців, студентів нашого університету та інших закладів взяти участь фізично або онлайн у цьому заході. Для тих, хто зацікавлений, контактна адреса М.Чернівці, вул.Рівненська, 14.

Лінк для онлайн під'єднання TYT:
Meeting ID: 333 246 032 048
Passcode: XNVBY5

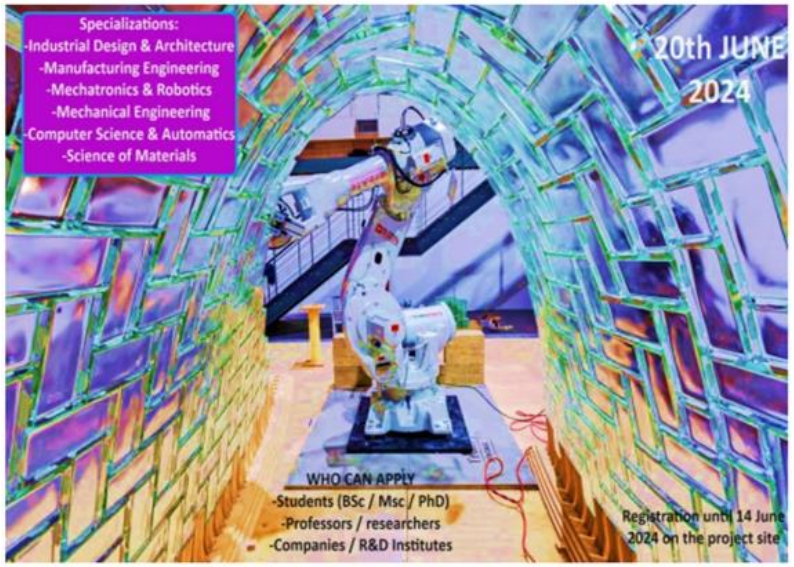
MULTIPLIER EVENT ME3 ON 20 June 2024 – Hosted by Yuriy Fedkovych Chernivtsi National University (Ukraine)

Co-funded by the European Union

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)
Agreement number 2023-1-RO01-KA220-HED-000155412
European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

AMAZE Multiplier Event 3 (ME 3) on:

Applied Research Methods for Additive Manufacturing in Architectural Design



Organized by Yuriy Fedkovych Chernivtsi National University (Ukraine)
in cooperation with the AMAZE project consortium partners

Co-funded by the European Union

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)
Agreement number 2023-1-RO01-KA220-HED-000155412
European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

MULTIPLIER EVENT OF APPLIED RESEARCH METHODS FOR ADDITIVE MANUFACTURING IN ARCHITECTURAL DESIGN

Organized by Yuriy Fedkovych Chernivtsi National University (Ukraine)
in cooperation with the AMAZE project consortium partners

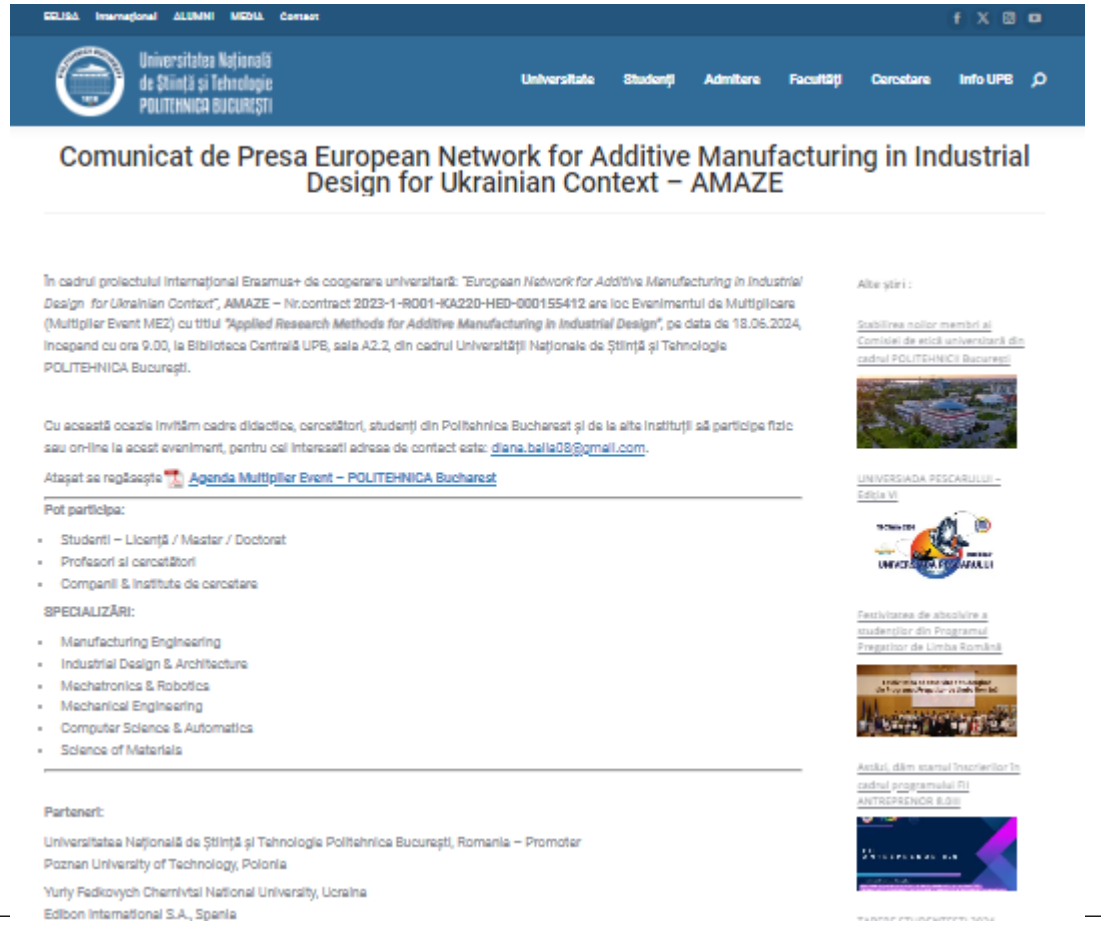
Agenda Schedule

Date: 20.06.2024, between 9.00-16.00, Yuriy Fedkovych Chernivtsi National University (Ukraine), starting at 9:00, Chernivtsi, Ukraine

Hour	Activity
9:00	Registration of participants to the Multiplier Event ME3
9:15	Opening and Welcome ceremony - Yuriy Fedkovych Chernivtsi National University (Ukraine), Dean Prof. Igor Fodchuk
9:30	AMAZE project and Erasmus+ KA Programme – Serhii Lukaniuk, Head of the Department of International Relations, Yuriy Fedkovych Chernivtsi National University (Ukraine)
9:40	AMAZE project overall presentation – progress, actions, KPIs, perspectives / results and details about the event – Additive Manufacturing & Sensors and Electronics Assoc. Prof. Diana Băilă (National University of Science and Technology Politehnica Bucharest, Romania)
10:10	AMAZE – Applied research methods for Additive Manufacturing in Architectural and Industrial Design/ Smart (Intelligent) Materials – e-book and e-toolkit - Yuriy Fedkovych Chernivtsi National University, Ukraine Mr. Dean Prof. Igor Fodchuk/ Mrs. Prof. Mariana Borcha
10:30	AMAZE – Applied research methods for Additive Manufacturing in Architectural and Industrial Design/ CAD/CAM /CAE– e-book and e-toolkit - Yuriy Fedkovych Chernivtsi National University, Ukraine / Mrs. Prof. Natalia Vatamaniuk
10:50	AMAZE – Applied research methods for Additive Manufacturing in Architectural and Industrial Design/ Reverse Engineering/ Smart (Intelligent Materials) – e-toolkit – Poznan University of Technology, Poznan, Poland Mr. Prof. Remigiusz Łabudzki/ Mrs. As. Prof. Natalia Wierzbicka
11:10	AMAZE – Applied research methods for Virtual Reality/Augmented Reality/ Computer Programming – e-toolkit – EDIBON International S.A., Madrid, Spain Mr. Fernando Martinez & Mr. Sergio Vizcaino
11:30	Coffee Break
12:00	Modern technologies in Architectural and Building design – Mr. Yaroslav Boyko, Head of the Ukrainian National Union of Architects in the Chernivtsi region, Chernivtsi, Ukraine
13:00	3D construction in rehabilitation measures of civilian and military patients – Prof. Petro Kovalchuk, Head of the Traumatology and Orthopedics Department in Bukovinian State Medical University, Chernivtsi, Ukraine
13:30	The life cycle management of the development project – Mr. Igor Zhytar, Head of the planning and financial department of Vodogray LLC, Chernivtsi, Ukraine
14:00	Visit to the laboratories of the Faculty of Architecture, Construction and Applied Arts the Department of Information Technology and Computer Physics
15:00	Q&A with partners comments and discussions on the possibility of joining different projects / EU consortium / Horizon Europe open calls Networks Closing words / ending of Multiplier Event
16.00	Light lunch

Multiplier Event ME2 – hosted by Politehnica Bucharest, 18 JUNE 2024

https://upb.ro/comunicat-de-presa-european-network-for-additive-manufacturing-in-industrial-design-for-ukrainian-context-amaze/



Universitatea Națională de Știință și Tehnologie POLITEHNICA București

Universitate | Studenți | Admitere | Facultăți | Cercetare | Info UPB

Comunicat de Presa European Network for Additive Manufacturing in Industrial Design for Ukrainian Context – AMAZE

În cadrul proiectului internațional Erasmus+ de cooperare universitară: *"European Network for Additive Manufacturing in Industrial Design for Ukrainian Context"*, AMAZE – Nr.contract 2023-1-RO01-KA220-HED-000155412 are loc Evenimentul de Multiplicare (Multiplier Event ME2) cu titlul *"Applied Research Methods for Additive Manufacturing in Industrial Design"*, pe data de 18.06.2024, începând cu ora 9.00, la Biblioteca Centrală UPB, sala A2.2, din cadrul Universității Naționale de Știință și Tehnologie POLITEHNICA București.

Cu această ocazie invităm cadre didactice, cercetători, studenți din Politehnica Bucharest și de la alte instituții să participe fizic sau on-line la acest eveniment, pentru cei interesați adresa de contact este: diana.bella08@gmail.com.

Atașat se regăsește: Agenda Multiplier Event – POLITEHNICA Bucharest

Pot participa:

- Studenți – Licență / Master / Doctorat
- Profesori și cercetători
- Companii & institute de cercetare

SPECIALIZĂRI:

- Manufacturing Engineering
- Industrial Design & Architecture
- Mechatronics & Robotics
- Mechanical Engineering
- Computer Science & Automatics
- Science of Materials

Partenerii:

Universitatea Națională de Știință și Tehnologie Politehnica București, Romania – Promotor
Poznan University of Technology, Polonia
Yuriy Fedkovych Chernivtsi National University, Ucraina
Edibon International S.A., Spania

Alte știri:

Stabilirea noilor membri ai Comisiei de etică universitară din cadrul POLITEHNICII București

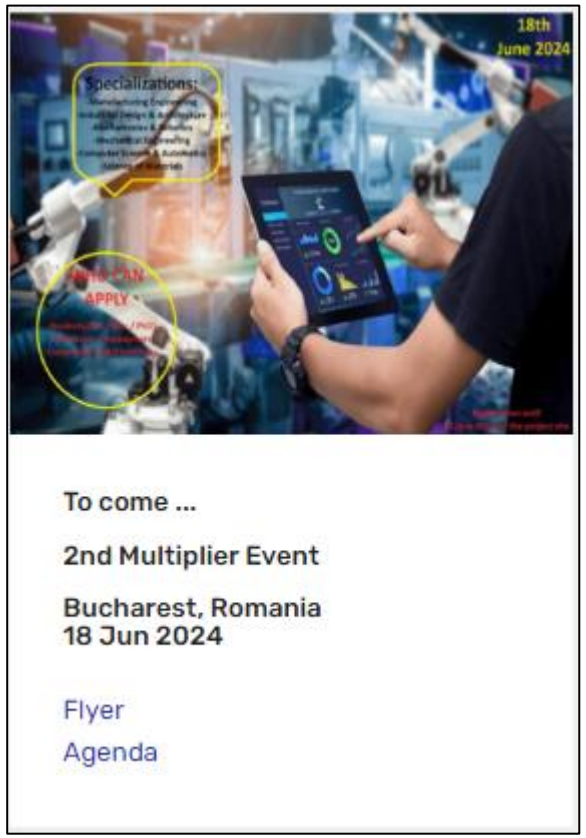
UNIVERSIADA PESCARUȘULUI – Ediția VI

Festivitatea de absolvire a studenților din Programul Pregătitor de Limba Română

Astăzi, dăm startul înscrierilor în cadrul programului ITI ANTREPRENOR 8.0!!!

Collection of activity reporting by the coordinator: organization and calendar (timesheets, deadlines/milestones)

Multiplier Event ME2 – POLITEHNICA Bucharest, Romania, on 18 June 2024



Co-funded by the European Union

AMAZE

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)
Agreement number 2023-1-RO01-KA220-HED-000155412
European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

MULTIPLIER EVENT OF APPLIED RESEARCH METHODS FOR ADDITIVE MANUFACTURING IN INDUSTRIAL DESIGN

Organized by National University of Science and Technology
POLITEHNICA Bucharest, Romania
in cooperation with the AMAZE project consortium partners

Agenda Schedule

Date: 18.06.2024, between 9.00-16.00, Central Library - UNSTPB, sala 2.2, starting at 9:00, Bucharest, Romania

Hour	Activity
9:00	Registration of participants to the Multiplier Event
9:15	Opening and Welcome ceremony– National University of Science and Technology POLITEHNICA Bucharest – Head of Department: Mr. Prof. Ionescu Nicolae Project Coordinator: Mrs. Assoc.Prof. Băilă Diana
9:40	AMAZE project overall presentation – progress, actions, KPIs, perspectives / details about the event Assoc. Prof. Diana Băilă (National University of Science and Technology Politehnica Bucharest, Romania)
10:00	AMAZE – Applied research methods for Additive Manufacturing in Industrial Design – e-toolkit - Yuriy Fedkovych Chernivtsi National University, Ukraine Mr. Dean Prof. Igor Fodchuk/ Mrs. Prof. Mariana Borcha
10:20	AMAZE – Applied research methods for Additive Manufacturing in Industrial Design – e-toolkit – Poznan University of Technology, Poznan, Poland Mr. Prof. Remigiusz Labudzki/ Mrs. As. Prof. Natalia Wierzbicka
10:50	AMAZE – Applied research methods for Additive Manufacturing in Industrial Design – e-toolkit – EDIBON International S.A., Madrid, Spain Mrs. Mirian Bonilla
11:30	Coffee Break
12:00	LEYKOM Company Bucharest - presentation (Additive manufacturing and different 3D parts: SLM, SLA, SLS, etc) – Mr. Dragoș Voineag
13:00	ADMASYS Company Târgu Mureș, Romania – presentation – Mr. Molnár Endre
14.00	NUTechnologies Company Timișoara, Romania – presentation – Mr. Cristi Floral
15.00	Industrial Design – Vector for Product Meaning Prof. Andrei Dumitrescu (National University of Science and Technology Politehnica Bucharest)
15:30	Q&A with partners comments and discussions on the possibility of joining different projects / EU consortium / Horizon Europe open calls Networks Closing words / ending of Multiplier Event / Press Conference
16.00	Light lunch

Three companies participated to this event: LEYKOM Bucharest, ADMASYS Târgu Mureș and NUTechnologies Timișoara

Multiplier Event ME2 – POLITEHNICA Bucharest, Romania, on 18 June 2024

Three companies participated to this event: LEYKOM Bucharest, ADMASYS Târgu Mureș and NUTechnologies Timișoara

Multiplier Event ME2 – POLITEHNICA Bucharest, Romania, on 18 June 2024

Co-funded by the European Union

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)

Agreement number 2023-1-RO01-KA220-HED-000155412

European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

Collection of activity reporting by the coordinator: organization and calendar (timesheets, deadlines/milestones)

Multiplier Event ME1 – EDIBON International S.A., Spain, on 25 April 2024

Co-funded by the European Union

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)
Agreement number 2023-1-RO01-KA220-HED-000155412
European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

MULTIPLIER EVENT OF RESEARCH BASE LEARNING METHOD FOR TEACHING IN ADDITIVE MANUFACTURING FOR INDUSTRIAL DESIGN

Organized by EDIBON International S.A., Madrid, Spain
in cooperation with the AMAZE project consortium partners

Agenda Schedule

Date: 25.04.2024, between 9.00-16.00, c/ Julio Cervera 10, Móstoles Technological Park, 28935, Madrid (Spain)

Hour	Activity
9:00	Registration of participants to the Multiplier Event
9:15	Opening and Welcome ceremony– EDIBON International S.A. company, Madrid, Spain Mrs. Director Mirian Bonilla
9:40	AMAZE Project Presentation Assoc. Prof. Diana Băilă (National University of Science and Technology Politehnica Bucharest, Romania)
10:00	Case Study – Specific Elements in AMAZE Project Assoc. Prof. Diana Băilă (National University of Science and Technology Politehnica Bucharest, Romania)
10:20	Intelligent (Smart) Materials used in Industrial Design - Yuriy Fedkovych Chernivtsi National University, Ukraine Mr. Dean Prof. Igor Fodchuk/ Mrs. Prof. Mariana Borcha
10:50	Applied research teaching methods for additive manufacturing in industrial design, Poznan University of Technology, Poland Prof. Remigiusz Labudzki
11:30	Coffee Break
12:00	Visiting of International EDIBON S.A. company
13:00	Intelligent (Smart) Materials used in Additive Manufacturing Prof. Zaharia Cătălin (National University of Science and Technology Politehnica Bucharest)
13:35	Robotics used in Industry 4.0 - Prof. Filippo Sanfilippo (University of Agder, Norway)
14:00	LEYKOM Company, Bucharest, Romania – Presentation (Additive manufacturing and different 3D parts: SLM, SLA, SLS, etc)
14:30	Industrial Design – Vector for Product Meaning Prof. Andrei Dumitrescu (National University of Science and Technology Politehnica Bucharest)
15:00	Q&A with partners comments and discussions on the possibility of joining different projects / EU consortium / Horizon Europe open calls Networks Closing words / ending of Multiplier Event / Press Conference
16.00	Light lunch

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)
Agreement number 2023-1-RO01-KA220-HED-000155412
European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

AMAZE Multiplier Event 1 (ME 1) on:

Research base learning method for teaching in Additive Manufacturing for Industrial Design

Organized by EDIBON INTERNATIONAL S.A., Madrid, Spain
in cooperation with the AMAZE project consortium partners

Co-funded by the European Union

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)

Agreement number 2023-1-RO01-KA220-HED-000155412

European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

Multiplier Event ME1 – EDIBON International S.A., Spain, on 25 April 2024

Staff Training– EDIBON International S.A., Spain, on 7-10 May 2024

Co-funded by the Erasmus+ Programme of the European Union

AMAZE

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)
Project No: 2023-1-RO01-KA220-HED-000155412
Project title: European Network for Additive Manufacturing in Industrial Design for Ukrainian Context
Acronym: AMAZE

Agenda for Staff training in VR and AR programming EDIBON INTERNATIONAL S.A. Company, Madrid, Spain 7-10.5.2024

Date and time period	7.05.2024	8.05.2024	9.05.2024	10.05.2024
8.30 - 8.45 AM	Registration of the participants	EDIBON International S.A. visit (manufacturing and assembling rooms / facilities)	EDIBON INTERNATIONAL S.A. Company (manufacturing of AR / VR rooms and testing of the facilities in the rooms)	AMAZE platform (basic concept, vision, organizing into different rooms) - lecture
8.45 - 9.00 AM	Introduction – welcome words+ presentation of training scope			
9.00 - 9.45 AM	Additive manufacturing used in industrial design of complex parts (Assoc.Prof. Băilă Diana – Politehnica Bucharest)			Research realized concerning materials used in industry (Prof. Adam Patalas, Prof. Pawel Zawadzki – PUT)
9.45 - 10.30 AM	AR/VR software presentation (EDIBON)	VR presentation (basic concepts) – lecture (EDIBON)	AR presentation (basic concepts) – lecture (EDIBON)	AMAZE application – laboratory – uploading the rooms / VR & AR apps on the virtual platform
10.30 - 11.00 AM	Coffee break	Coffee break	Coffee break	Coffee break
11.00 - 12.15 PM	AR/VR applications – laboratory work	Reverse Engineering (As.Prof. Natalia Wierzbicka, Prof. Remigiusz Labudzki – PUT)	Exploring Polymeric Materials: Innovations and Uses in 3D Printing (Prof. Zaharia Cătălin-Politehnica Bucharest)	AMAZE application – laboratory – releasing of the draft variant of AMAZE platform on the AMAZE website
12.15 - 13.00 PM	New materials used in Industrial Design. Sensors and electronics. (Assoc.Prof. Băilă Diana – Politehnica Bucharest)	Design Methods (Prof. Dumitrescu Andrei – Politehnica Bucharest)	New materials and properties used in architectural design (YFCNU Ukraine)	Testing of AMAZE platform and final feedbacks related to the functionality and content of the platform, next steps about what has to be improved
13.00 – 14.00 PM	Precision and dimensional control used in industry (Prof. Ionescu Nicolae – Politehnica Bucharest)	Architectural design CAD in industrial products (YFCNU Ukraine)	Conclusions, feedbacks and interim evaluation of progress work	Closing words, releasing of the certificates, final conclusions related to realizing training and future work and closing ceremony
14.00 – 15.00 PM	Lunch break	Lunch break	Lunch break	Lunch break

Co-funded by the European Union

AMAZE

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)
Agreement number 2023-1-RO01-KA220-HED-000155412
European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

AMAZE Staff Training on:

VR and AR programming

Organized by EDIBON INTERNATIONAL S.A., Madrid, Spain

Staff Training– EDIBON International S.A., Spain, on 7-10 May 2024

TPM 1 – Kick off meeting – hosted by POLITEHNICA Bucharest – 27- 29 nov 2023

TPM 2 – hosted by Poznań University of Technology, Poland – 10- 12 June 2024

Project management

-important aspect related to the interim report submission

- The Interim Report was submitted.

Raluca Stefania Boldan
From: raluca.boldan@anpcdefp.ro
To: Diana Baila

Buna ziua

Am verificat si termenul de depunere a raportului intermediar este 13.07.2024.
Cand credeti ca ati terminat raportul va rog sa ma anuntati sa il verific inainte de a da submit. Scurtam astfel din timpul de evaluare.

O zi buna
Raluca Boldan

EXPERT - DEPARTAMENT PROIECTE ÎNVA?AMÂNT UNIVERSITAR
Agentia Nationala pentru Programe Comunitare in Domeniul Educatiei si Formarii Profesionale
t: (+4) 021 201 0749
f: (+4) 021 312 1682
w: Erasmus+, ANPCDEFP
a: Splaiul Independentei 313, Bibl. Centrala a
UPB, Corp A, Etaj 1 Bucuresti, S6, 060042,
Romania

Raluca Stefania Boldan
From: raluca.boldan@anpcdefp.ro
To: Diana Baila

Mon, May 20 at 10:36 AM

Buna ziua

Raportul pare ok. Il puteti incarca pe platforma. Va trebui sa descarcati si sa semnati declaratia de onoare.

Nu uitati sa completati si descrierile din fiecare pachet de lucru.

O zi buna

Raluca Boldan

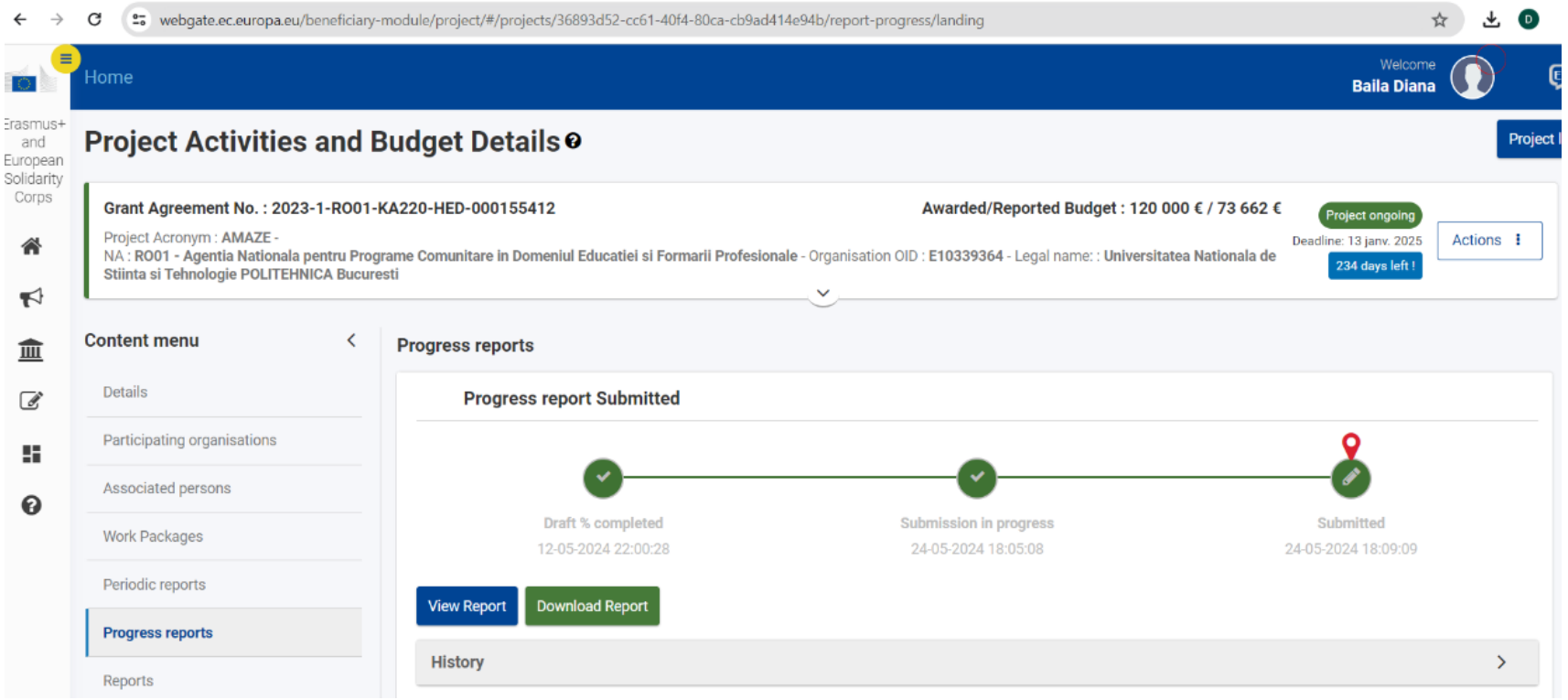
EXPERT - DEPARTAMENT PROIECTE ÎNVA?AMÂNT UNIVERSITAR
Agentia Nationala pentru Programe Comunitare in Domeniul Educatiei si Formarii Profesionale
t: (+4) 021 201 0749
f: (+4) 021 312 1682
w: Erasmus+, ANPCDEFP
a: Splaiul Independentei 313, Bibl. Centrala a
UPB, Corp A, Etaj 1 Bucuresti, S6, 060042,
Romania

Project management
-important aspect related to the interim report submission

- **The Interim Report** was submitted.

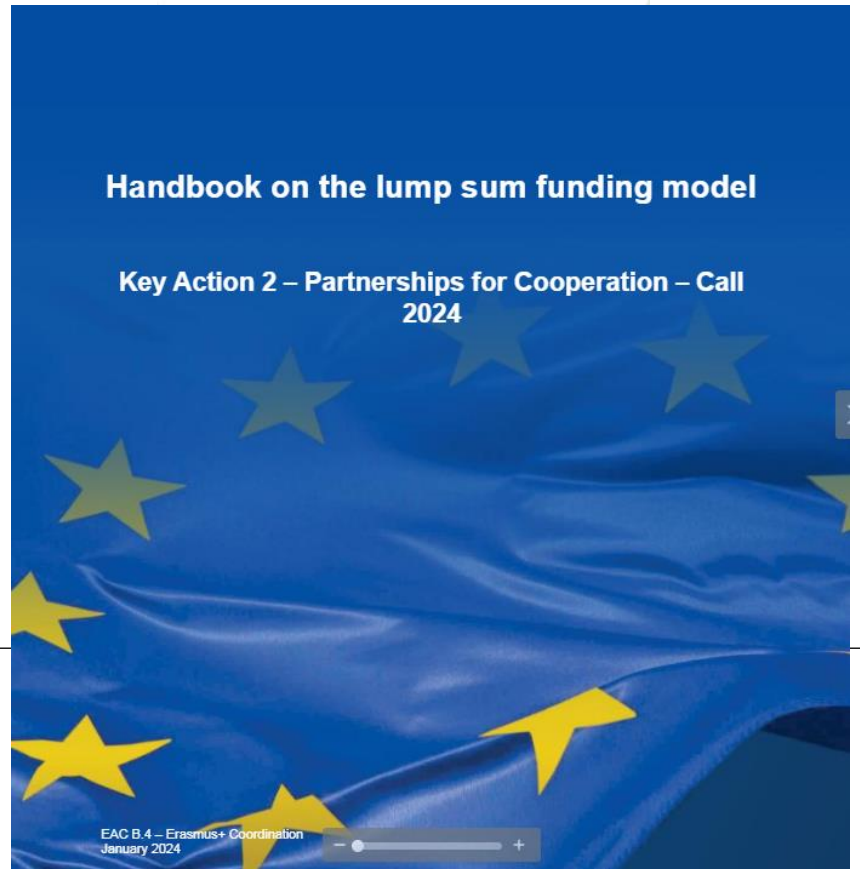
Activities presented – Kick off meeting Politehnica Bucharest (TPM1),
ME1 Edibon International S.A.
And STTE Edibon International S.A.
And Intellectual Output IO1 – e-book

- Final Report Deadline: 13 janv 2025



Impact, quality and reporting in the new KA220-HED projects, Bucharest, Romania

Thanks for submitting your contact info!



SALTO Education and Training

onpcdefp

IMPACT, QUALITY AND REPORTING IN THE NEW KA220-HED PROJECTS

20 - 21 June 2024 / Bucharest

19th June	Arrival
19:00 – 21:00	Welcome dinner at Pullman Hotel, Bucharest
20th June	
09:00 – 09:30	Registration
09:30 – 11:00	Welcome and introduction! Exploring KA2 examples: achievements, challenges, solutions
11:00 – 11:30	Coffee break
11:30 – 13:00	Particularities of the KA220 HED reporting phase Result – Effects – Impact
13:00 – 14:00	Lunch
14:30 – 16:00	Defining the reporting methodology The 'Lump sums' approach
16:00 – 16:30	Coffee break
16:30 – 18:00	The Final report and additional resources Conclusions and preparation for the next day
21st June	
09:30 – 11:00	Reconnecting with Day 1 Additional resources in drafting the Final report
11:00 – 11:30	Coffee break
11:30 – 13:00	Drafting the final methodology on monitoring and reporting for KA220 HED projects Conclusions and additional recommendations
13:00 – 14:00	Lunch

Kick off Meeting – Transnational Project Meeting TPM1 – UNSTPB Bucharest, 27-29 nov 2023

Project Results:

Results: What project results and other outcomes do you expect your project to have?

The project will achieve the following results: IO1 – AMAZE e-book for developing of complex design industrial parts, IO2 – AMAZE e-toolkit manual for digital learning in producing of complex design industrial parts, IO3 – AMAZE e-learning VR/AR platform, IO4 – AMAZE e-case studies.

-1 open acces book

-1 open acces toolkit manual

-2 academic papers (in journals with high visibility, open-acces) and 2 papers in International Conference open-acces and 1 patent submitting application.

Co-funded by the European Union

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)

Agreement number 2023-1-RO01-KA220-HED-000155412

European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

AMAZE eBook

1. Additive Manufacturing
2. Smart (Intelligent) Materials
3. CAD CAM CAE Design
4. Reverse Engineering
5. Computer Programming
6. Sensors and Electronics
7. Virtual Reality (VR) and Augmented Reality (AR)

13th International Conference on Materials Science & Engineering - Brasov - 13-16 March 2024

Collection of results of Intellectual Outputs and status of delivery

Project activities– www.amaze2023.eu

E-book – published with e- ISBN – Publishing House Printech Bucharest and update on AMAZE site

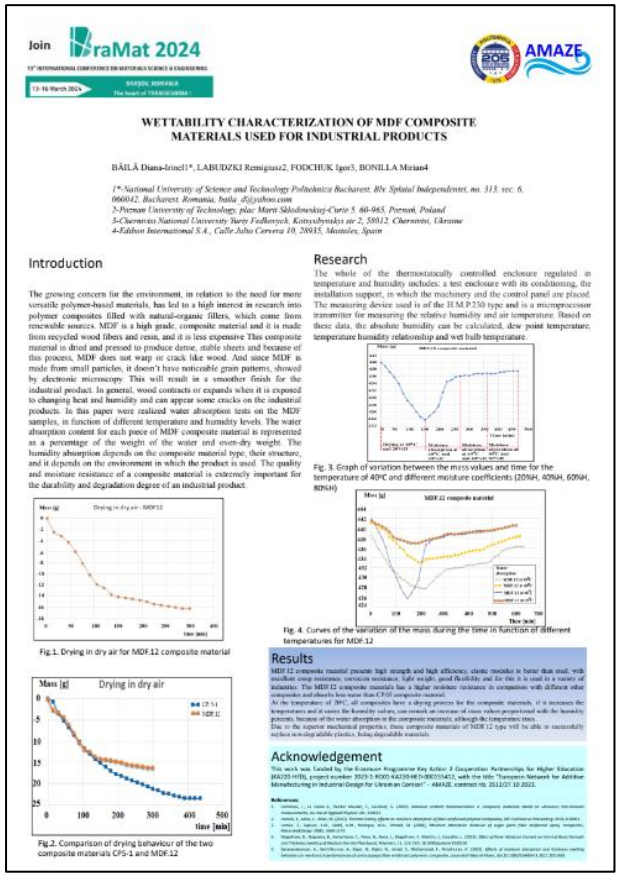
Co-funded by the European Union

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)

Agreement number 2023-1-RO01-KA220-HED-000155412

European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

AMAZE Project Results



Join BraMat 2024

AMAZE

WETTABILITY CHARACTERIZATION OF MDF COMPOSITE MATERIALS USED FOR INDUSTRIAL PRODUCTS

BĂILĂ Diana-Irinel1*, LABUDZKI Remigiusz2, FODCHUK Igor3, BONILLA Mrian4

1-National University of Science and Technology Politehnica Bucharest, Blv. Splaiul Independenței, no. 313, sec. 6, 060042, Bucharest, Romania, băila_d@yahoo.com*
2-Poznan University of Technology, plac Marii Skłodowskiej-Curie 5, 60-965, Poznań, Poland
3-Chernivtsi National University Yuriy Fedkovych, Kotsyubynskyi str 2, 58012, Chernivtsi, Ukraine
4-Edibon International S.A., Calle Julio Cervera 10, 28935, Mostoles, Spain

Introduction

The growing concern for the environment, in relation to the need for more versatile polymer-based materials, has led to a high interest in research into polymer composites filled with natural-organic fillers, which come from renewable sources. MDF is a high grade, composite material and it is made from recycled wood fibers and resin, and it is less expensive This composite material is dried and pressed to produce dense, stable sheets and because of this process, MDF does not warp or crack like wood. And since MDF is made from small particles, it doesn't have noticeable grain patterns, showed by electronic microscopy. This will result in a smoother finish for the industrial product. In general, wood contracts or expands when it is exposed to changing heat and humidity and can appear some cracks on the industrial products. In this paper were realized water absorption tests on the MDF samples, in function of different temperature and humidity levels. The water absorption content for each piece of MDF composite material is represented as a percentage of the weight of the water and oven-dry weight. The humidity absorption depends on the composite material type, their structure, and it depends on the environment in which the product is used. The quality and moisture resistance of a composite material is extremely important for the durability and degradation degree of an industrial product.

Research

The whole of the thermostatically controlled enclosure regulated in temperature and humidity includes: a test enclosure with its conditioning, the installation support, in which the machinery and the control panel are placed. The measuring device used is of the H M P 230 type and is a microprocessor transmitter for measuring the relative humidity and air temperature. Based on these data, the absolute humidity can be calculated, dew point temperature, temperature humidity relationship and wet bulb temperature.

Fig. 3. Graph of variation between the mass values and time for the temperature of 40°C and different moisture coefficients (20%H, 40%H, 60%H, 80%H)

Fig.1. Drying in dry air for MDF.12 composite material

Fig. 4. Curves of the variation of the mass during the time in function of different temperatures for MDF.12

Fig.2. Comparison of drying behaviour of the two composite materials CPS-1 and MDF.12

Results

Acknowledgement

Project Results: 2 articles accepted for publishing in International Conferences
– BRAMAT 2024, Brasov, Romania, 13-16 March 2024
- KreativEU 2024, Targoviste, Romania, 16-17 may 2024

Acceptance Notification

Diana Irinel Băilă
Igor Fodchuk
Remigiusz Łabudzki
Myrian Bonilla

ACCURACY OF SLA AND MATERIAL MORPHOLOGY USED IN ARCHITECTURE

Summer School –will be hosted by POLITEHNICA Bucharest, during 8-17 July 2024 (participants students and staff from AMAZE consortium)

To come ...

Summer School

Bucharest, Romania
8 - 17 Jul 2024

Flyer

Agenda for Summer School on "Virtual e-learning platform for Additive Manufacturing in Industrial Design", hosted by National University of Science and Technology POLITEHNICA Bucharest, Romania, 8-17 July 2024

h	Monday 8.07.2024	Tuesday 9.07.2024	Wednesday 10.07.2024	Thursday 11.07.2024	Friday 12.07.2024	Saturday 13.07.2024	Sunday 14.07.2024	Monday 15.07.2024	Tuesday 16.07.2024	Wednesday 17.07.2024
10	Opening ceremony and project presentation	CAD – Lecture (UPB+YFCNU)	Smart (Intelligent) Materials used in architecture (YFCNU)	CAE – lecture (YFCNU)	Enterprise dynamics (workshop)	Progress report (preparing of the interim report for Monday - working on smaller groups)	Progress report (preparing of the interim report for Monday - working on smaller groups)	General progress of W1 and W2	Finalizing progress report, preparing final presentation	Presentations made by students for companies involved in the summer school - evaluation and feedback on behalf of the companies, defining of common ideas of future diploma projects
11	Participants' presentation and program guidelines for summer school	Industrial Design (UPB)	Reverse Engineering (PUT)	Developing of VR/AR applications (EDIBON)	Presentation of Leykom Bucharest and Admasys Targu Mures companies from Romania			Presentation of NUTechnologies company from Timisoara, Romania	Final test, final questionnaires and feedbacks	
12	Lunch & free time	Lunch & free time	Lunch & free time	Lunch & free time	Lunch & free time	Lunch & free time	Lunch & free time	Lunch & free time	Lunch & free time	Lunch & free time
13	Introduction in Additive Manufacturing (UPB)	Workshop 3D / Launching of case studies	Sensors and Electronics (UPB)	Precision and control used for industrial parts	Trip at Bran Castle/ Sinaia Castle	Trip at Black Sea	Trip at Black Sea	Workshop Additive Manufacturing	Finalizing work on assembly, preparing final presentation	Closing and awarding ceremony, future perspectives of AMAZE project
14	Visiting UPB laboratories	Smart (Intelligent) Materials used for industrial products (PUT)	Workshop 3D CAD	Workshop 3D CAE					Final student presentations, live demonstrations, test corrections	
15	Visiting CAMPUS laboratories	Computer Programming (EDIBON)						Case studies particularities and specific tests for the industrial parts		Free time, sightseeing
	Week 1							Week 2		

SUMMER SCHOOL – POLITEHNICA Bucharest,

8-17 July 2024, www.upb.ro

Participants: EDIBON International S.A. – Spain – 2 persons

From PUT - Poland

- 1. Teachers
- - Prof. Natalia WIERZBICKA
- - Prof. Remigiusz LABUDZKI
-

- 2. Students
- - Ms Iryna KACHURA-ZHECHYTSKA.
- - Ms Klaudia Jańczak
- - Ms Emilia Smolarek
- - Mr Jakub Gapsa
- - Mr Sebastian But

From YFCNU - Ukraine

1. Teachers
- Dean. Igor FODCHUK
- Prof. Mariana BORCHA

2. Students
- Ms. Auryte Anastasiia
- Ms. Bazyniak Vita
- Ms. Kolodrivska Sofiia
- Ms. Pauk Volodymyra
- Ms. Panivnyk Nataliia

Co-funded by the European Union

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)

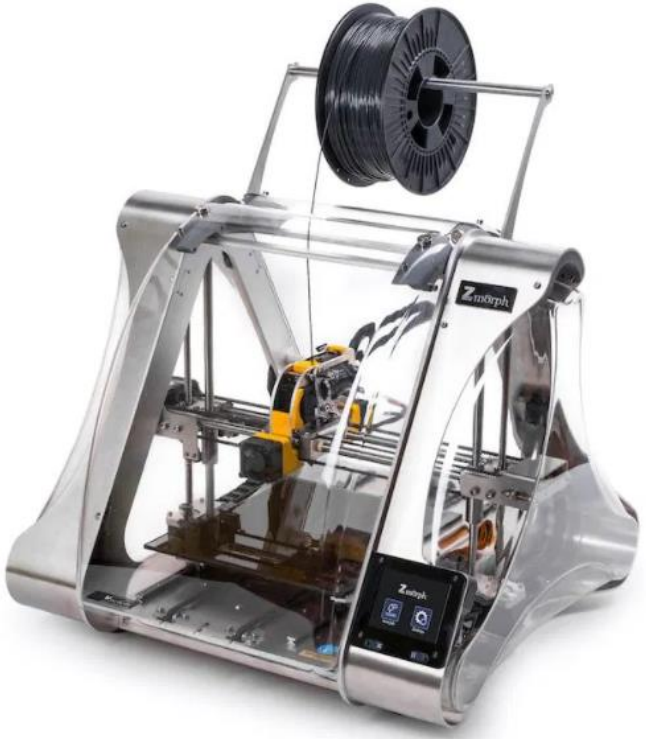
Agreement number 2023-1-RO01-KA220-HED-000155412

European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

AMAZE

3D Printers that will be used in AMAZE Project - University POLITEHNICA of Bucharest

E-case studies – 3D MODELS for design and 3D Printing



Hybrid 3D Printer Zmorph 2.0 SX Full SET
- FDM (Fused Deposition Modeling)

Photocentric Liquid Crystal
- DLP (Digital Light Processing)

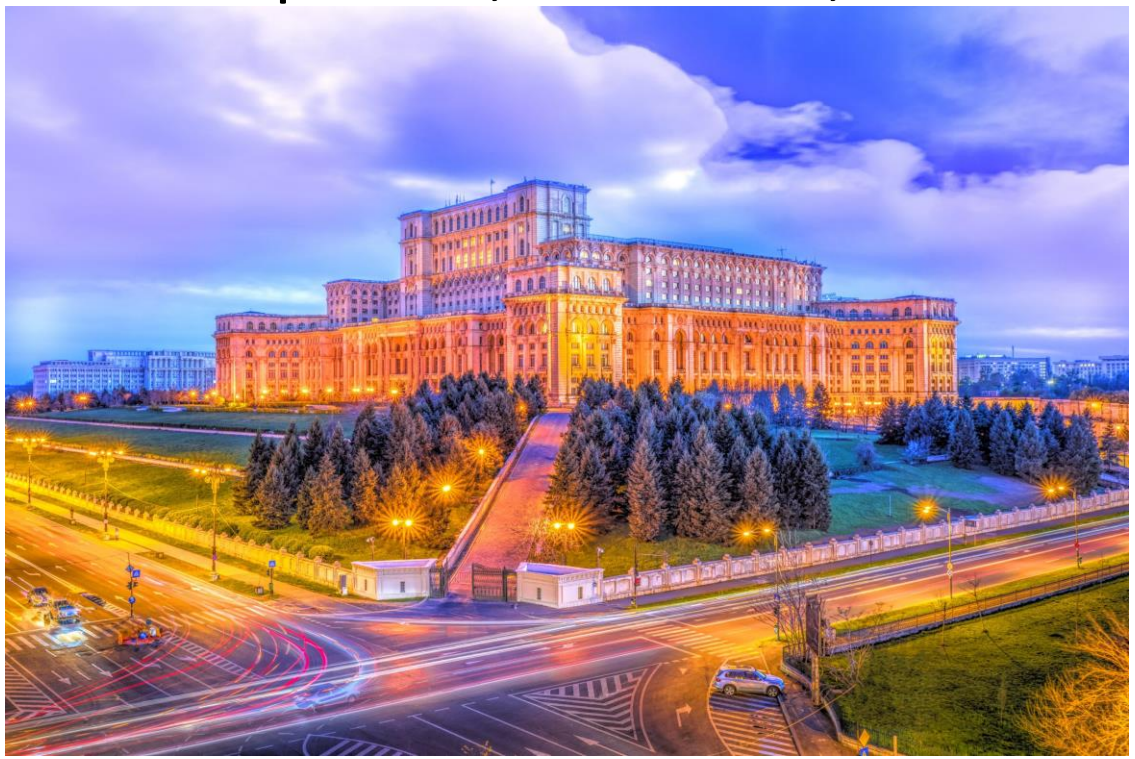
Phenix Systems – PXS&PXM
- DMLS (Direct Metal Laser Sintering) – collaborating company)

Summer School – Bucharest- **8-17 July 2024**

Peleș Castle – Sinaia, Romania

Summer School – Bucharest- **8-17 July 2024**

Casa Poporului, Bucharest, Romania



Castelul Kretulescu, Bucharest, Romania

Summer School –

Bucharest- **8-17 July 2024**

Black Sea

Summer School – Bucharest- **8-17 July 2024**

Dracula Castle – Bran, Romania

Project Budget

Expenditure	Grant (Euro)
1, Project management and implementation	23978
2. Short term transnational mobility activities of ind	40382
3 Intelectual outputs	43040.00
4, Multiplier events	12600
5. Special needs	0
6, Exceptional costs	0
Total requested from EEA Grants 2014-2021	120000.00

Kick off Meeting – Transnational Project Meeting TPM1 – UNSTPB Bucharest, 27-29 nov 2023

Project workpackages:

IO1 - AMAZE e-book for developing of complex design industrial parts (15.11.2023 – 14.03.2024) – Leading organisation - UNSTPB

IO2 - AMAZE e-toolkit manual for digital learning in producing complex design industrial parts (15.03.2024 – 14.06.2024) – Leading organisation CHNU

IO3 - AMAZE e-learning VR/AR platform for virtual laboratory (15.06.2024 – 14.09.2024) - Leading organisation Edibon International S.A.

IO4 – AMAZE e-case studies for project-based learning method used in developing, testing and manufacturing of customized industrial parts by Additive Manufacturing technologies (some 3D models, cases of design or architectural models) (15.09.2024-14.11.2024) – Leading organisation PUT

Project Management and Dissemination Results (15.11.2023 – 14.11.2024)

Kick off Meeting – Transnational Project Meeting TPM1 – UNSTPB Bucharest, 27-29 nov 2023

Project workpackages:

IO1 - AMAZE e-book for developing of complex design industrial parts (15.11.2023 – 14.03.2024) – Leading organisation – UNSTPB
comprising the next module courses:
1-Additive Manufacturing (UPB); - UPB
2-Smart (Intelligent) Materials (YFCNU+PUT); - YFCNU
3-CAD/CAM/CAE design (YFCNU);
4- Reverse Engineering (PUT);
5-Computer Programming (Edibon);
6-Sensors and Electronics (UPB); - UPB
7-Virtual Reality/Augmented Reality (Edibon)

Multiplier EVENT ME1 -1 day (40 persons from different companies and 8 foreigners) – EDIBON International S.A. – 25th April 2024

Kick off Meeting – Transnational Project Meeting TPM1 – UNSTPB Bucharest, 27-29 nov 2023

Project workpackages:

IO2 - AMAZE e-toolkit manual for digital learning in producing complex design industrial parts (15.03.2024 – 14.06.2024) – Leading organisation CHNU

comprising the next toolkit modules:

1-Additive Manufacturing (UNSTPB);
2-Smart (Intelligent) Materials (YFCNU+PUT);
3-CAD/CAM/CAE design (YFCNU);
4- Reverse Engineering (PUT);
5-Computer Programming (Edibon);
6-Sensors and Electronics (UNSTPB);
7-Virtual Reality/Augmented Reality (Edibon)

Multiplier Events:

ME2 – 1 day hosted by UNSTPB (ROM) (20 persons out from UNSTPB) and 18 June 2024
ME3 – 1 day hosted by YFCNU (UKR) (20 persons from outside of university) – 20 june 2024
Training staff feedbacks EDIBON (SP) during 4 days, participating from each partner institution 4 persons (in total 16 persons) – 7 may – 12 may 2024
For TPM2 –hosted by PUT (POL) will participate 2 staff, professors, key persons by each institution involved in project (Total 8 pers) and others – 3 days (10 – 12 June 2024)

Kick off Meeting – Transnational Project Meeting TPM1 – UNSTPB Bucharest, 27-29 nov 2023

Project workpackages:

IO3 - AMAZE e-learning VR/AR platform for virtual laboratory (15.06.2024 – 14.09.2024) - Leading organisation Edibon International S.A.

Summer School feedbacks given by students and staffs involved in AMAZE project – UNSTPB – 10 days (staffs and students) – 8-17 July 2024

TPM3 (3 days), hosted by Edibon company (8 persons – 2 persons/institution) – 4-6 sep 2024

Kick off Meeting – Transnational Project Meeting TPM1 – UNSTPB Bucharest, 27-29 nov 2023

Project workpackages:

IO4 – AMAZE e-case studies for project-based learning method used in developing, testing and manufacturing of customized industrial parts by Additive Manufacturing technologies (some 3D models, cases of design or architectural models) (15.09.2024-14.11.2024) – Leading organisation PUT

Multiplier Event ME4 realized at PUT (POL), having invited 20 persons from different companies, universities, research centers (out of PUT) and 5 foreigner's participants – 4 nov 2024

Dissemination Results

SLS – material PA12
FDM – PEEK, PLA, PLA Silk Rainbow, PLA Silk Like Kingfisher Rainbow Colours (Silicone properties)
DLP, SLA – biocompatible photopolymer resins
DMLS/SLM – Ti6Al4V, superalloys INCONEL and Co-Cr

Analysis Test recommended for the materials used for the components:
SEM (Scanning Electron Microscopy)
TEM (Transmission Electron Microscopy)
EDAX (Energy Dispersive X-ray Analysis)
XRD (X-Ray Diffraction)
FTIR (Fourier Transform Infrared Spectroscopy)
RAMAN (Raman Spectroscopy)
AFM (Atomic Force Microscopy)
Contact angle test
Mechanical tests

IO2 - E-toolkit - Politehnica Bucharest (Romania)

Hydraulic pump body – SLDPRT. file Politehnica Bucharest Partner

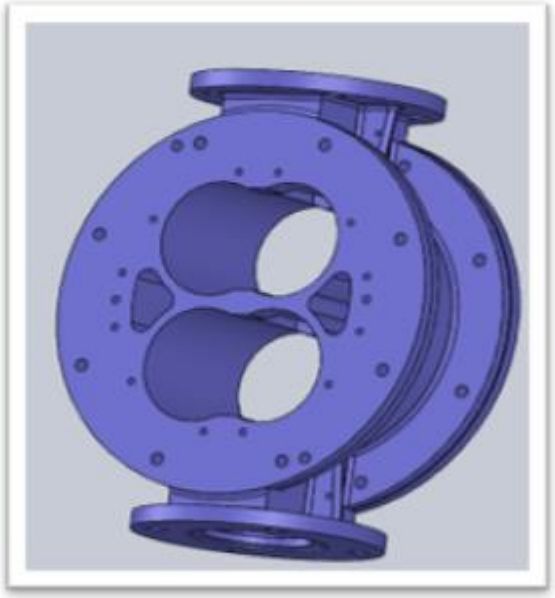


Fig.1. Hydraulic pump body

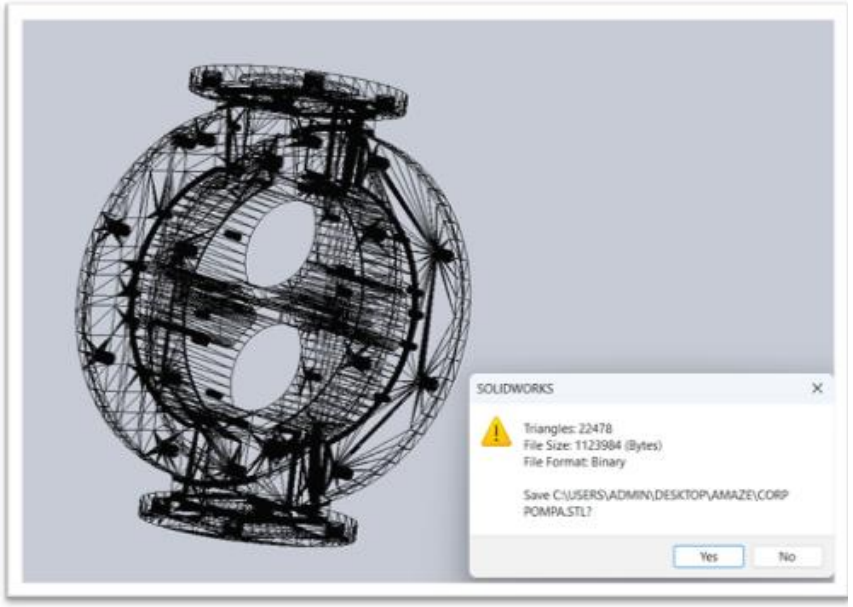


Fig.4. Hydraulic pomp body meshing – STL. file

Fig.19. Hydraulic pump body printed by FDM technology

IO2 - E-toolkit - Politehnica Bucharest (Romania)

Figure 4. Arduino MEGA 2560 board.

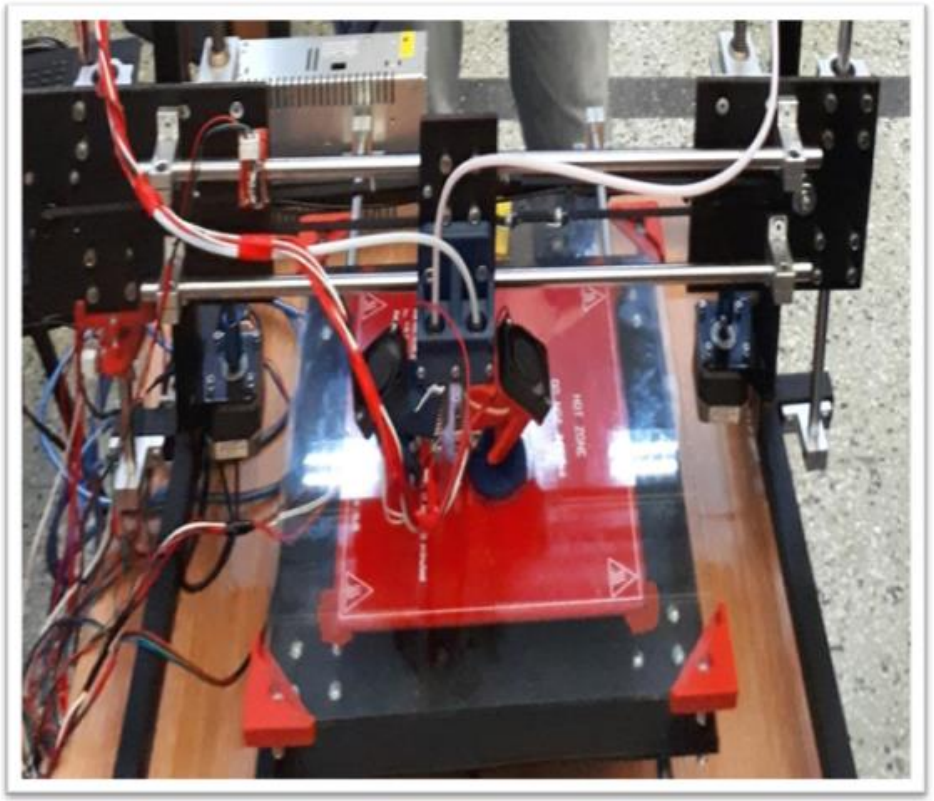


Figure 18. FDM extruder on the 3D hybrid printer

Co-funded by the European Union

Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)

Agreement number 2023-1-RO01-KA220-HED-000155412

European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

AMAZE

IO2 - E-toolkit - Poznan University of Technology (Poland)

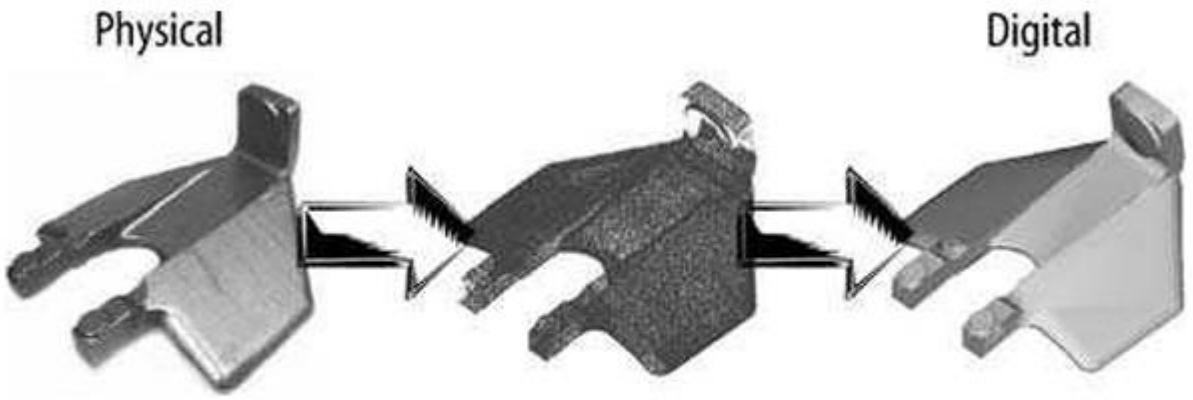


Figure 1.3 Physical-to-digital process

Figure 1.6. Optical scanning device.

IO2 - E-toolkit - Poznan University of Technology (Poland)

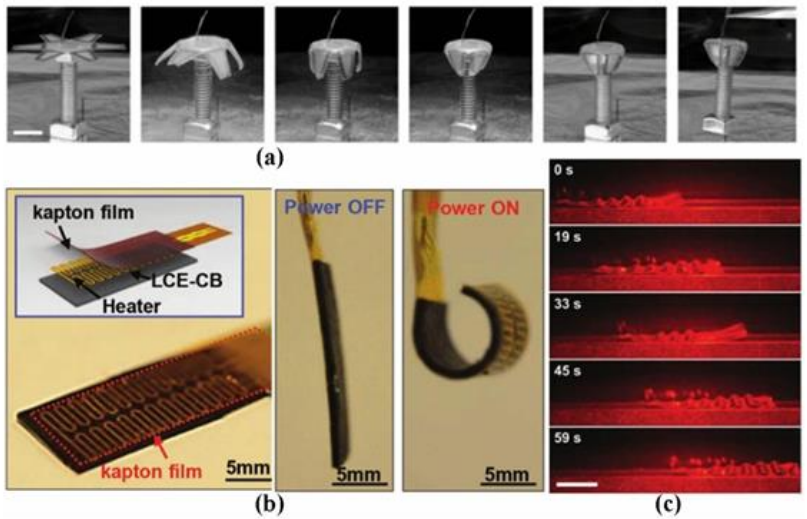


Fig. 2. Applications of thermally responsive actuators/devices in the robots: a A gripper made of thermoplastic polystyrene sheets for grasping objects under the light; b A fully soft robot mimicking an inchworm that can sense the environment and crawl the body adaptively c An LCE light-driven soft robot for mimicking caterpillar locomotion (Hao et al., 2022)

3.1 Piezoelectric materials

The smart materials showcase extraordinary properties setting them apart from conventional materials. They exhibit transiency, responding to various external stimuli; immediacy, with rapid response times; self-actuation, the ability to autonomously alter appearance and shape; selectivity, offering a divided and expected response; directness, with responses confined to the activating event; shape-changing capabilities, adjusting form based on external stimuli; self-diagnostic features, automatically detecting surface cracks; and self-healing characteristics, capable of autonomous repair when damaged or repairable (Bahl et al., 2020).

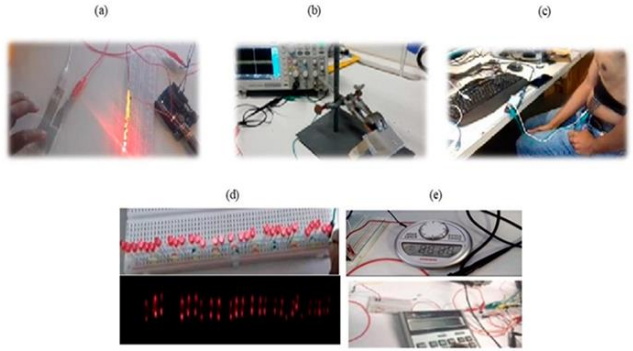
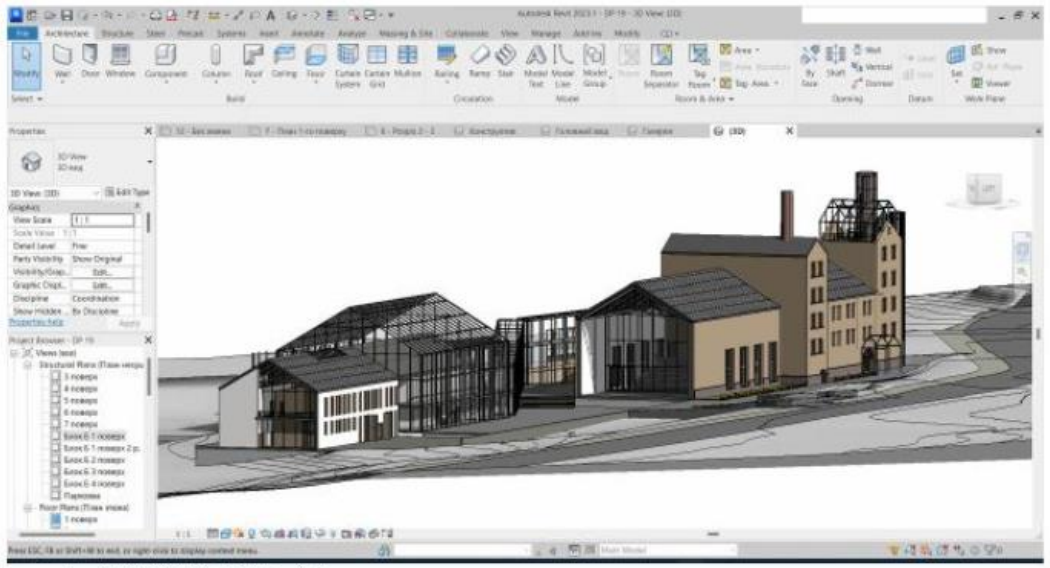


Fig. 6. Demonstration of the PSTS as (a) a touch sensor; (b) water droplets for voltage generation; (c) breathing detection; (d) a PSTH lightening 32 LEDs in the dark (bottom) and at daylight (top); and (e) stored energy powering electronics such as a timer and calculator in operation.(Hossain et al., 2022)

IO2 - E-toolkit - Yuriy Fedkovych Chernivtsi National University (Ukraine)

2 Autodesk Revit interface

The program interface is largely similar to standard Autodesk programs such as AutoCAD,



Inventor, 3D MAX [2, 5] (Fig. 1.).

Fig. 1. Elements of the Revit interface [7]

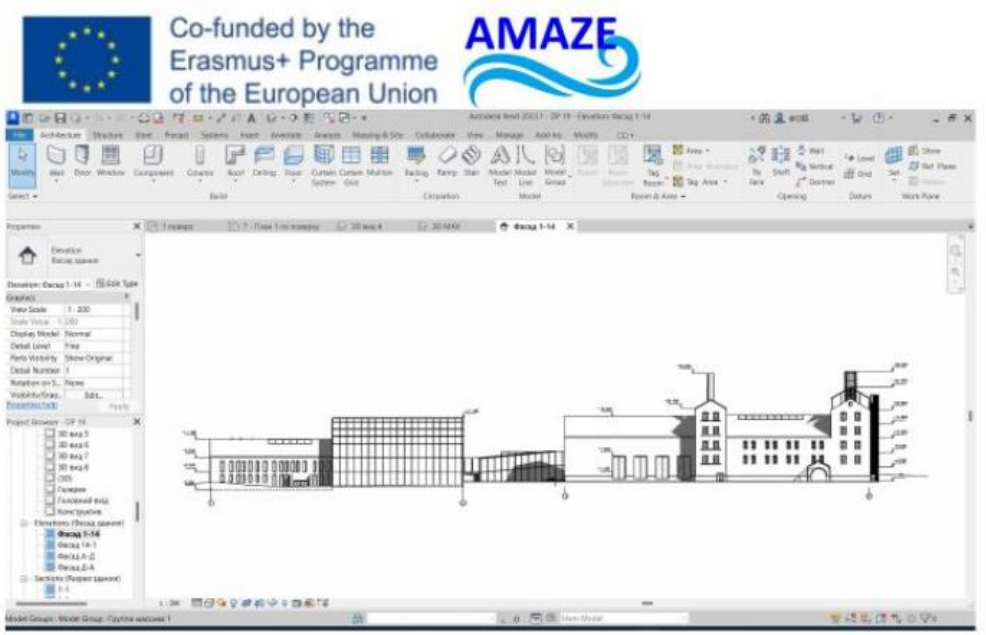


Fig. 4. Levels on the Facades tab [7]

IO2 - E-toolkit - Yuriy Fedkovych Chernivtsi National University (Ukraine)

Co-funded by the Erasmus+ Programme of the European Union AMAZE

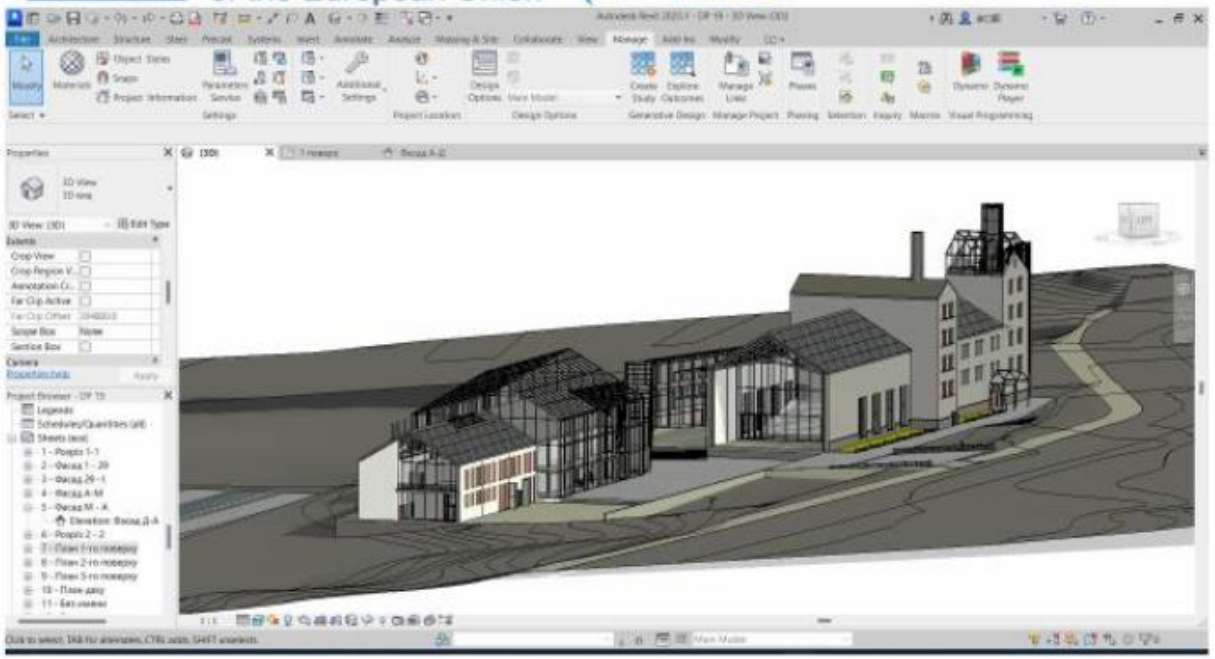


Fig. 9. Realistic style [7]

Co-funded by the Erasmus+ Programme of the European Union AMAZE

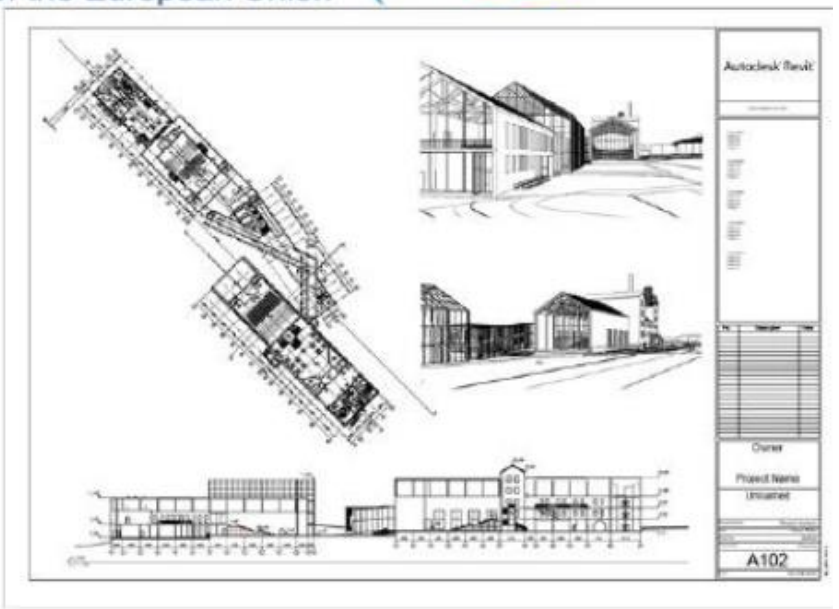


Fig. 20. Completed sheet

IO2 - E-toolkit - Yuriy Fedkovych Chernivtsi National University (Ukraine)

Fig. 4.3. Normal types of destruction of cubic samples [2]

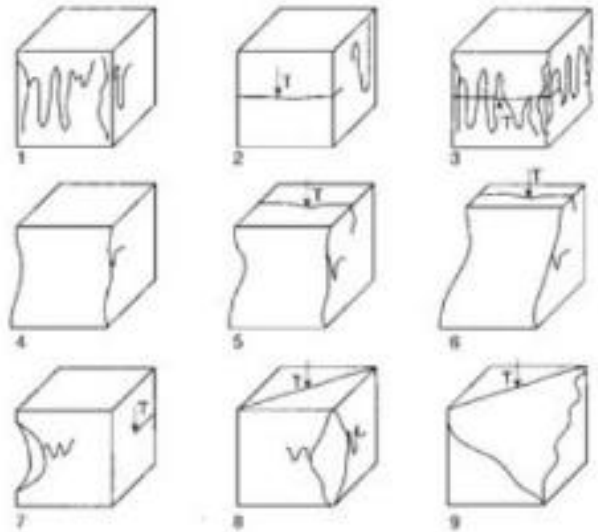


Fig. 4.4. Examples of unusual types of fractures on cubes [2]

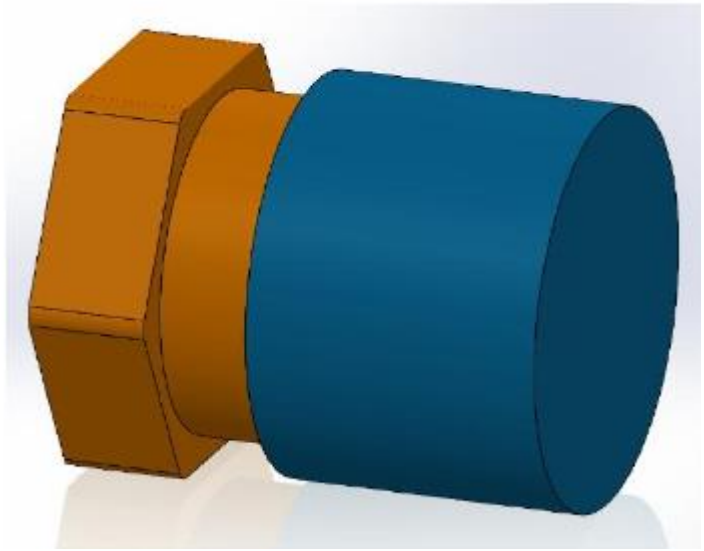
4.4. Tools and equipment

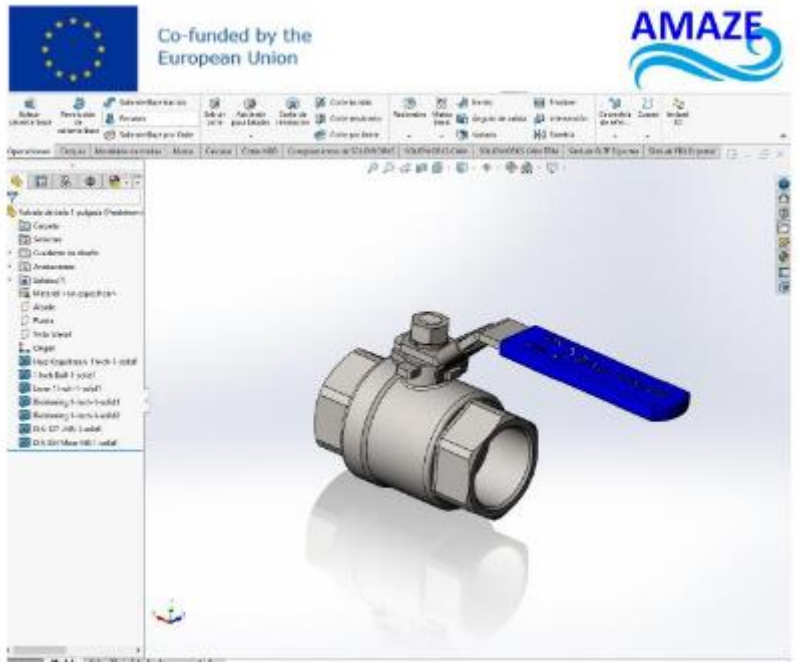
1. TMC-3224 automatic compression testing machine for compression testing accor
   206-1:2001-07 load speed controller or load speed indicator or stopwatch [6];

Fig. 4.1. TMC-3224 automatic compression testing machine

IO2 - E-toolkit - Edibon International S.A. (Spain)

1.5 Optimization and Automation of the Printing Process



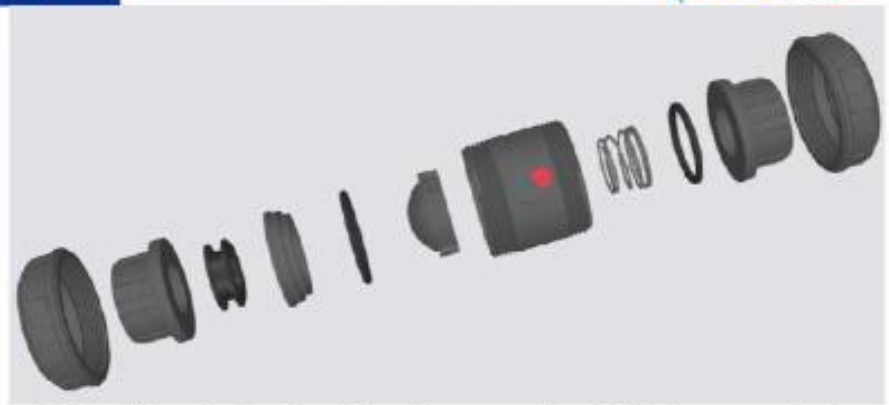


IO2 - E-toolkit - Edibon International S.A. (Spain)

1 Programming in Virtual Reality

Co-funded by the European Union

AMAZE



Onirix is scalable and allows for collaboration on AR projects, facilitating teamwork. The applications of Onirix span marketing and advertising, education and training, tourism and culture, and retail and e-commerce. Brands can create interactive experiences for advertising campaigns, educational institutions can develop immersive learning tools, museums can offer interactive tours, and stores can allow customers to visualize products in their environment before purchasing. In summary, Onirix simplifies the creation and distribution of AR experiences, making it an attractive option for developers and businesses.

Co-funded by the European Union

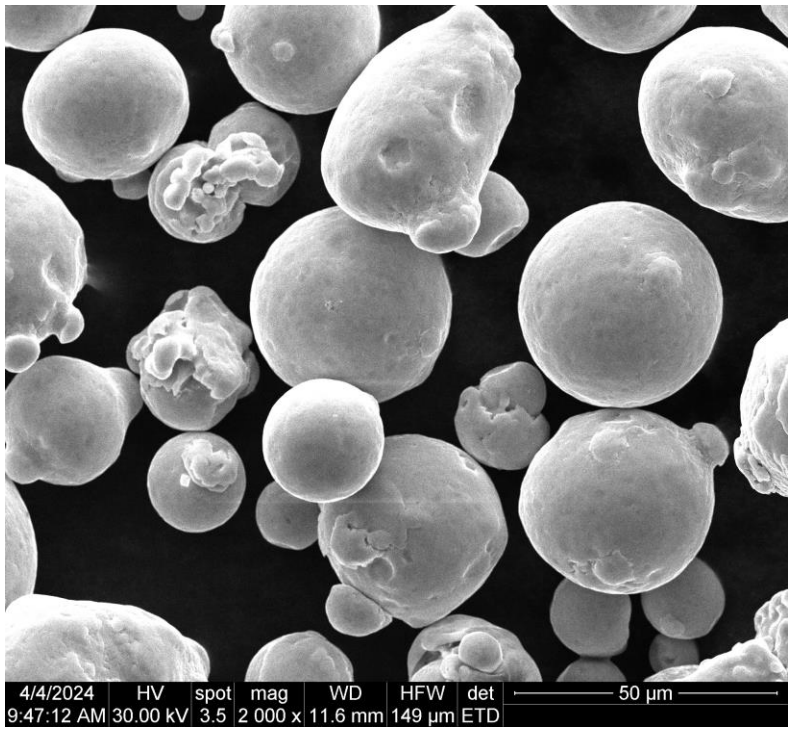
Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)

Agreement number 2023-1-RO01-KA220-HED-000155412

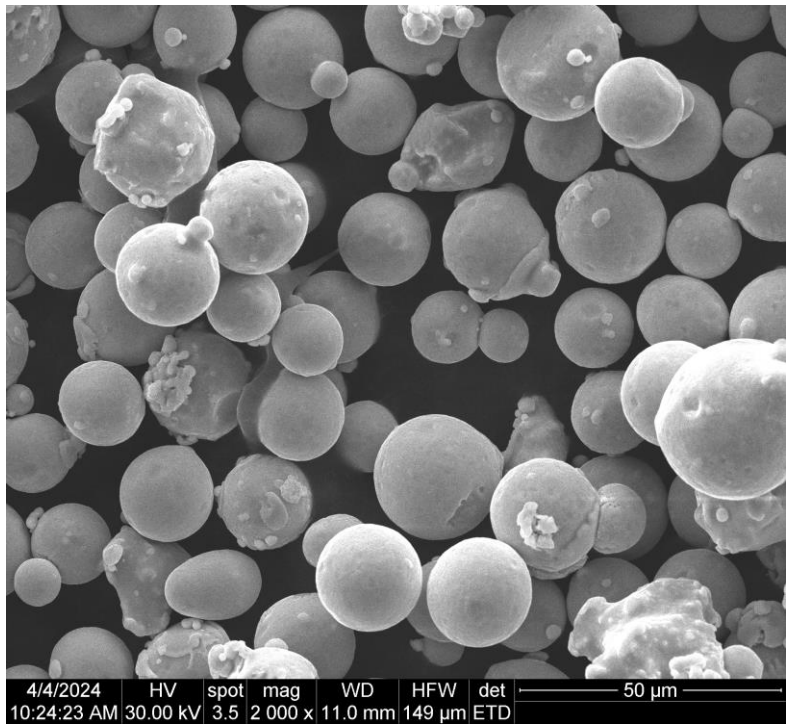
European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

AMAZE

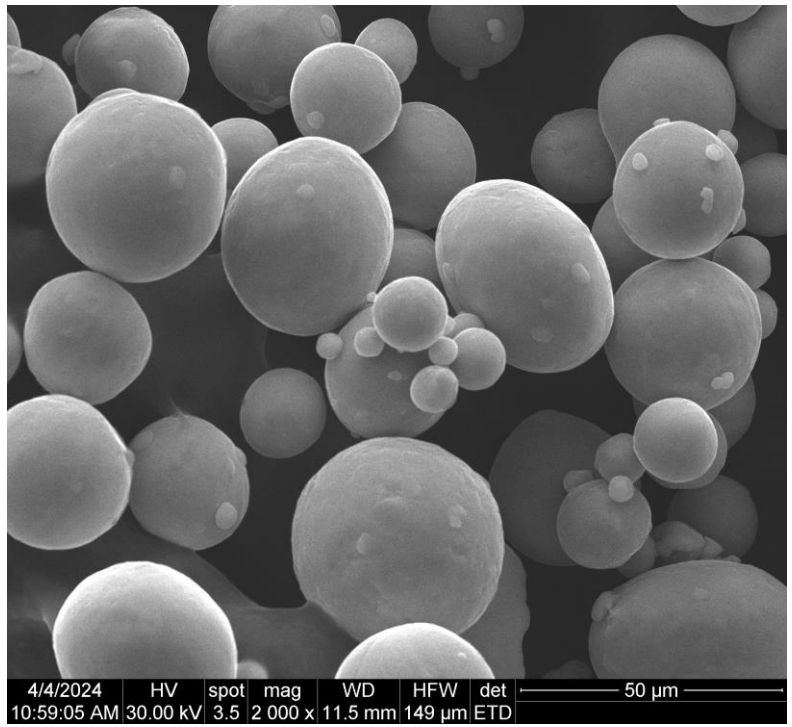
Metallic powders used in SLM (SELECTIVE LASER MELTING)



625 INCONEL

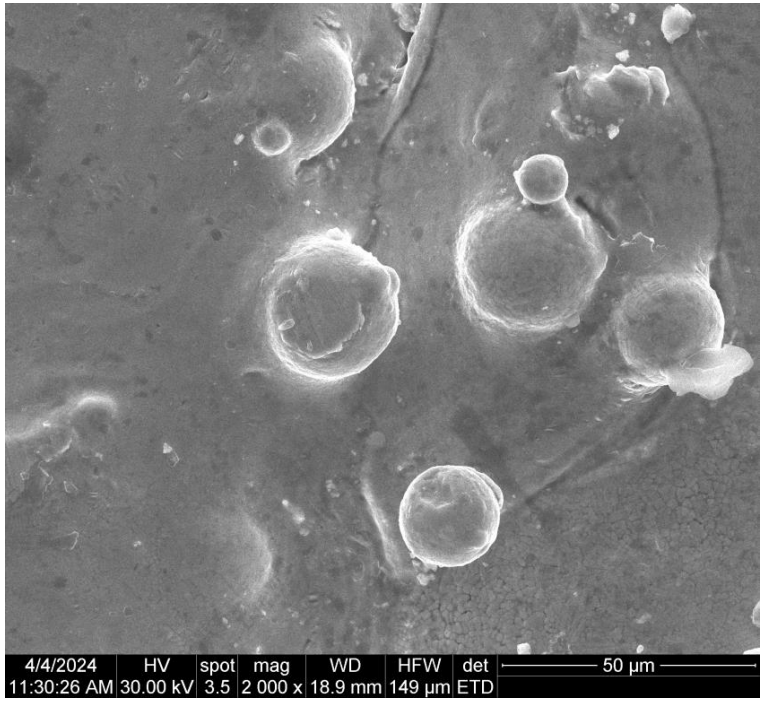


718 INCONEL

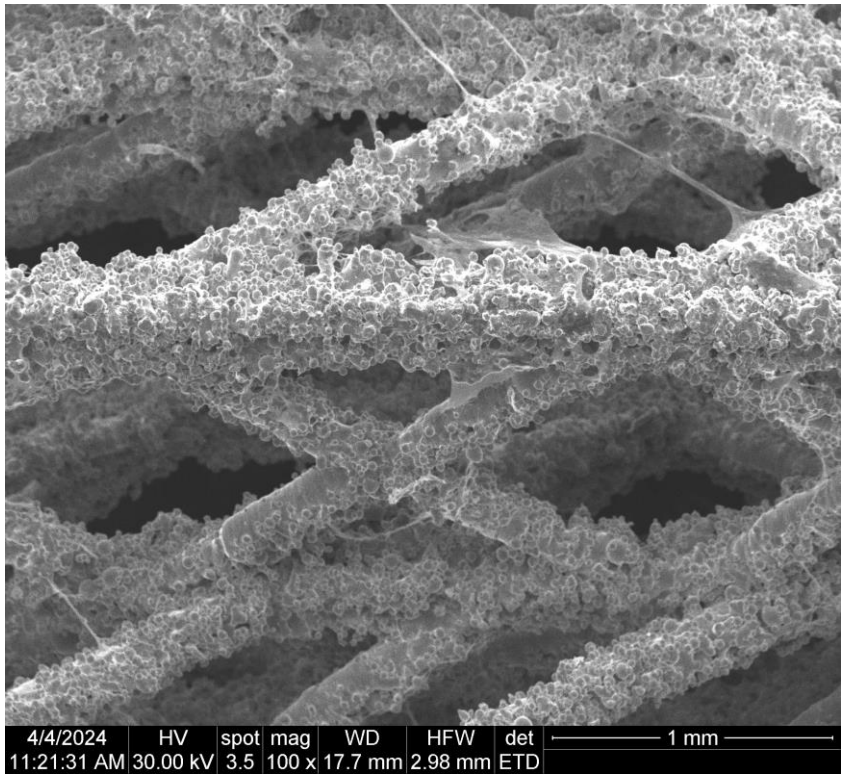


Ti6Al4V

Sintered parts used in SLM (SELECTIVE LASER MELTING)

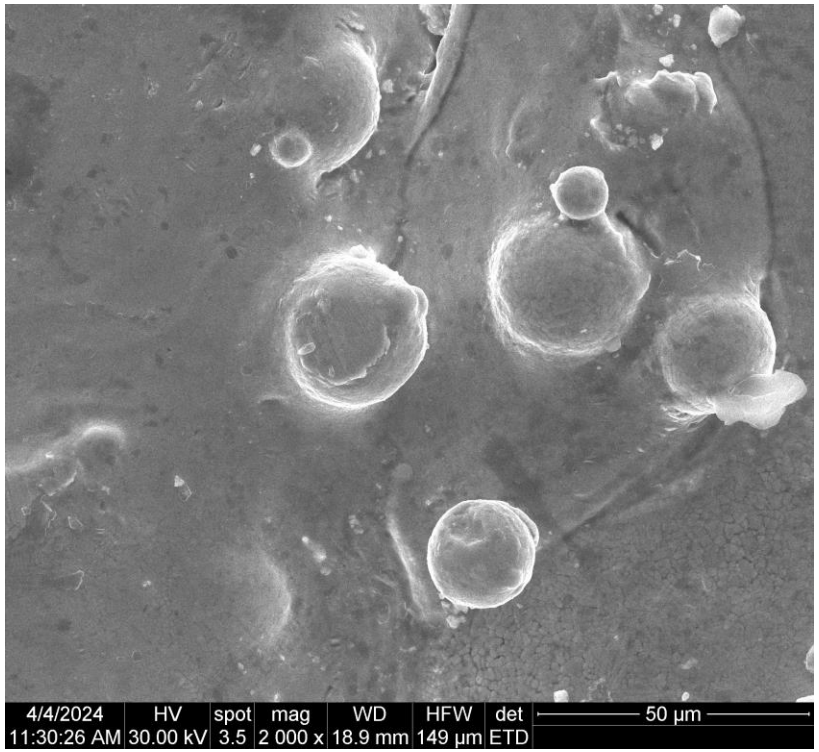


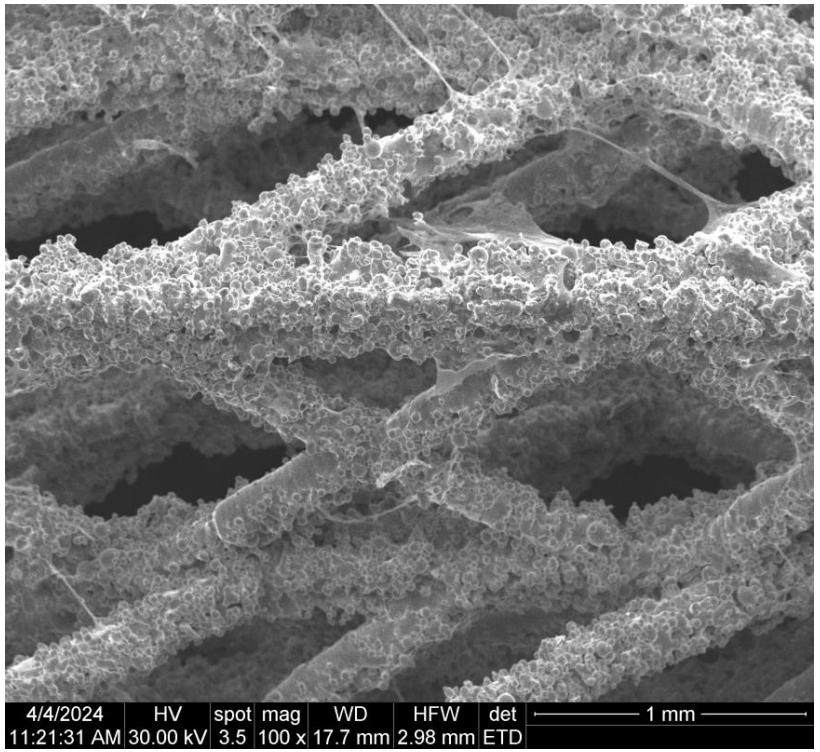
625 INCONEL

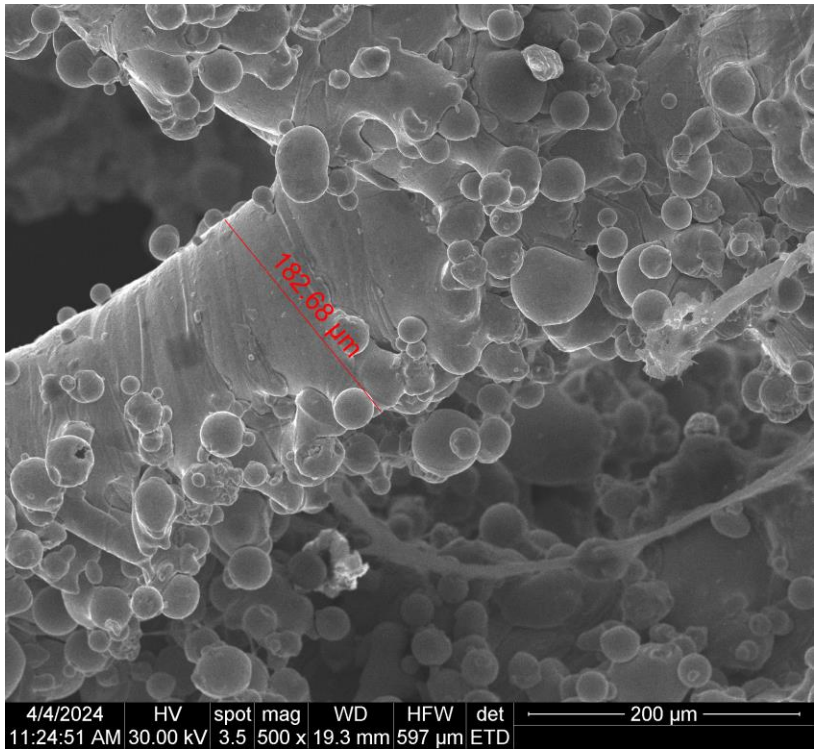


Ti6Al4V

Sintered parts used in SLM (SELECTIVE LASER MELTING)

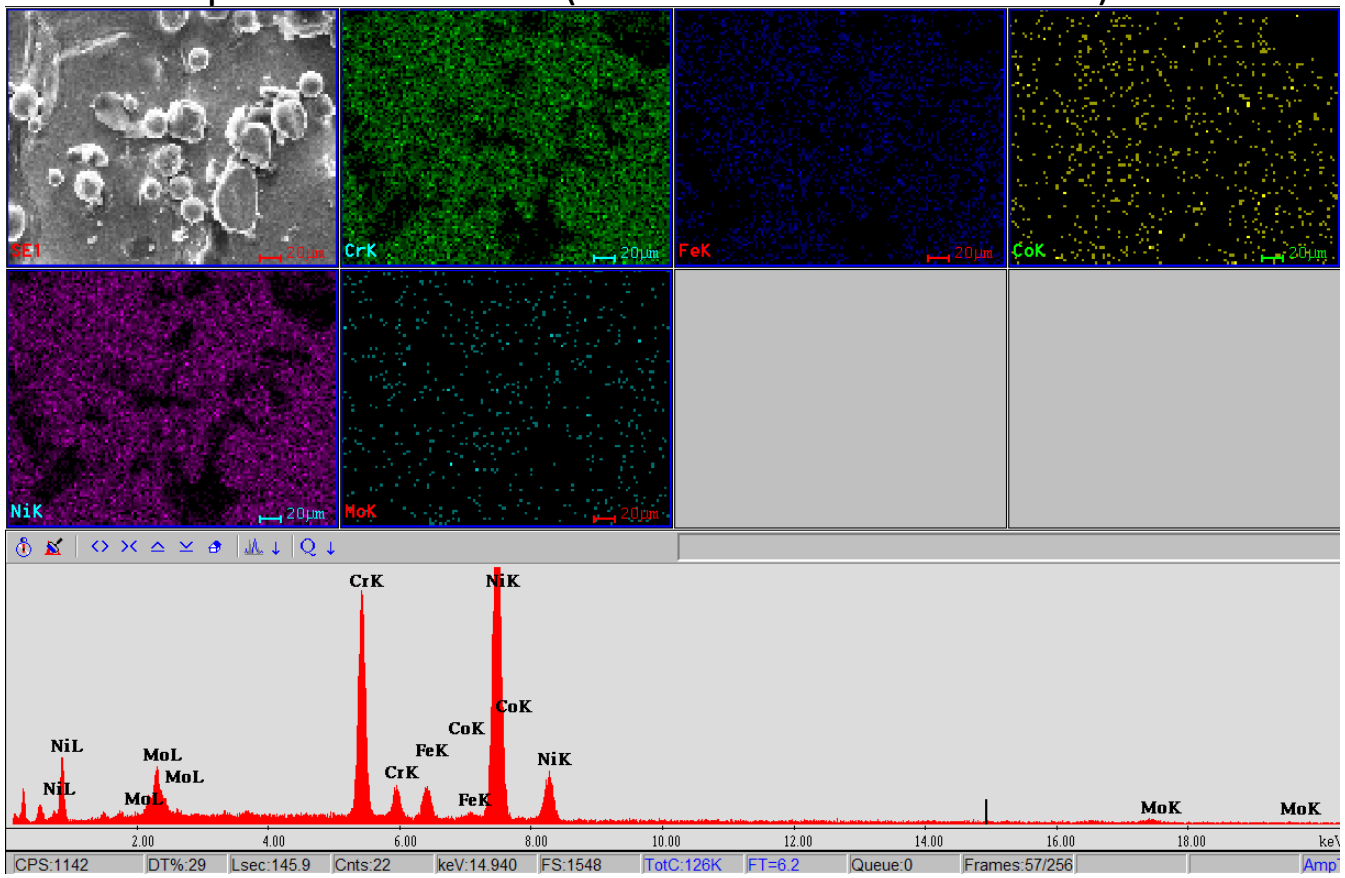






625 INCONEL

Sintered parts used in SLM (SELECTIVE LASER MELTING)



625 INCONEL

Co-funded by the European Union

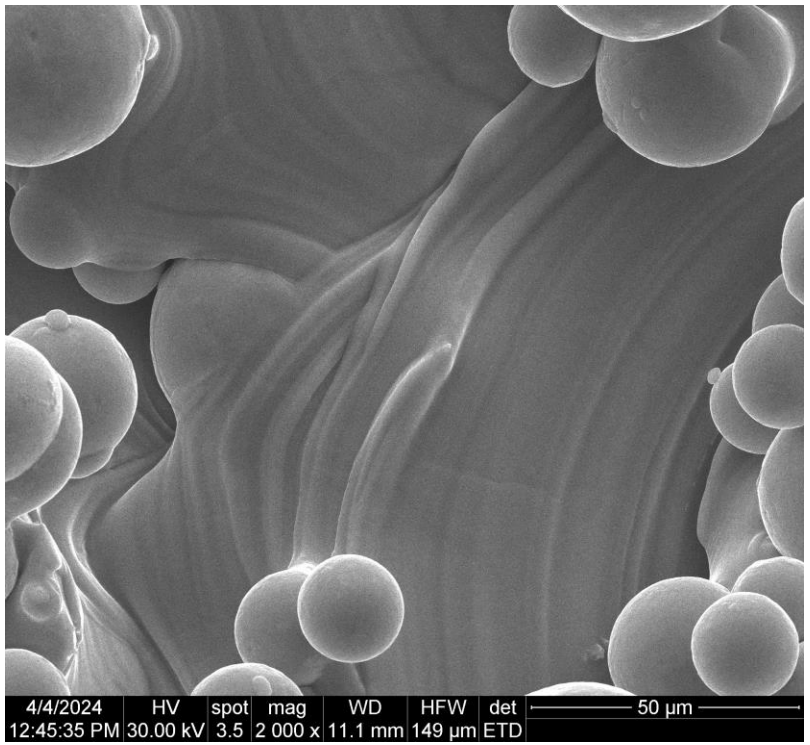
Erasmus+ Programme Key Action 2 Cooperation Partnerships for Higher Education (KA220-HED)

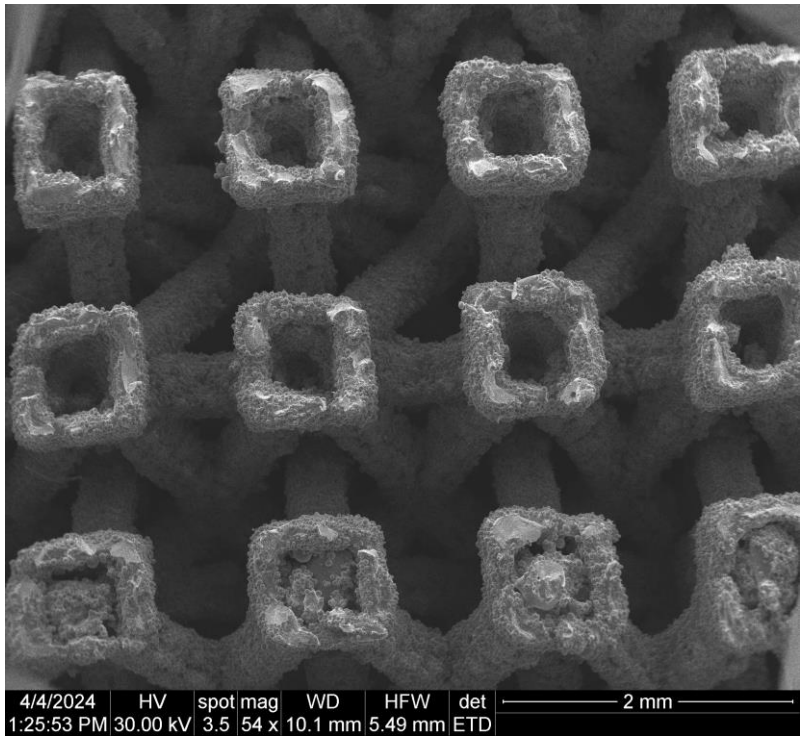
Agreement number 2023-1-RO01-KA220-HED-000155412

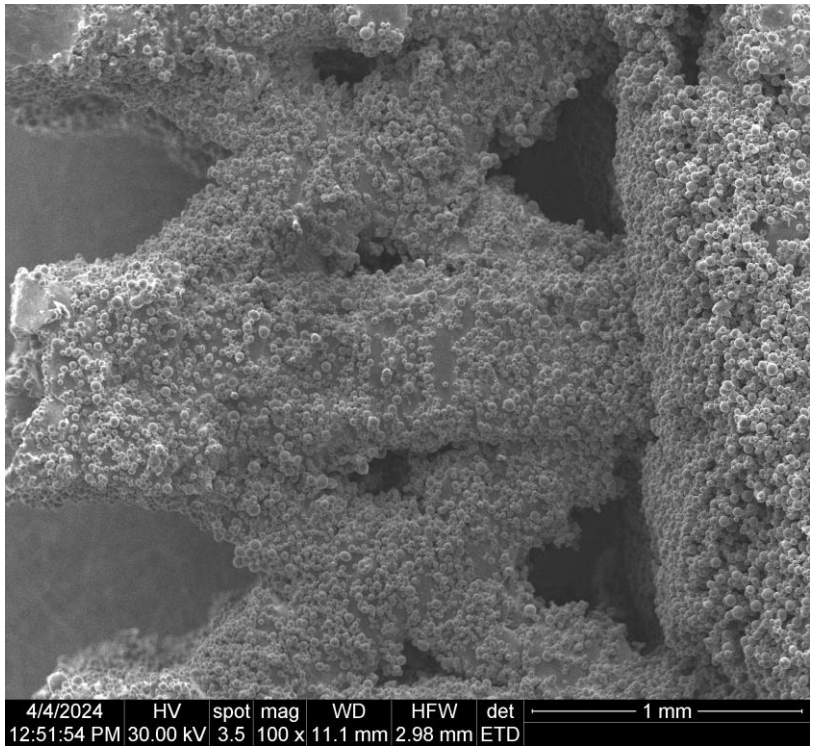
European Network for Additive Manufacturing in Industrial Design for Ukrainian Context

AMAZE

Sintered parts used in SLM (SELECTIVE LASER MELTING)

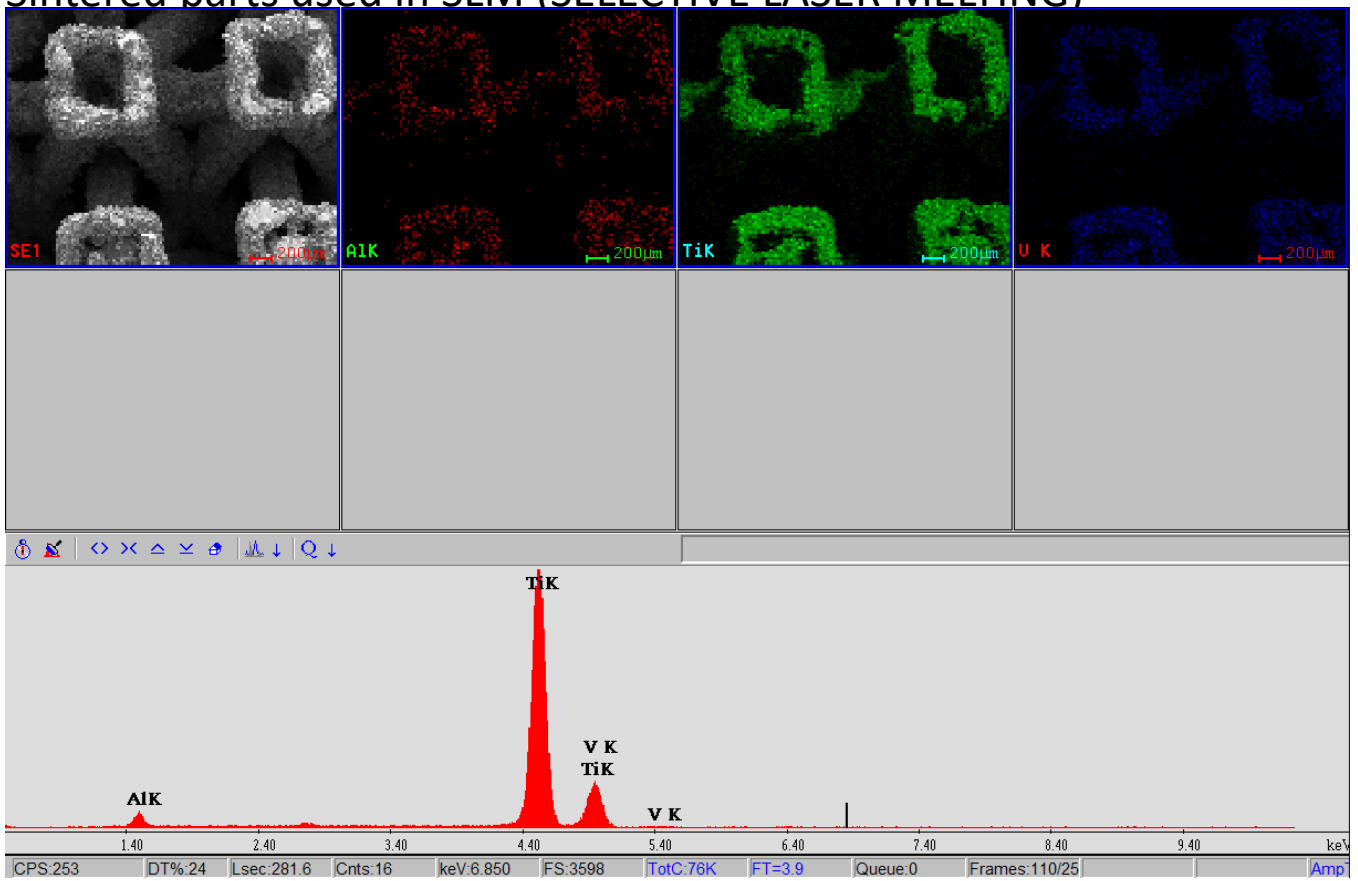






Ti6Al4V

Sintered parts used in SLM (SELECTIVE LASER MELTING)



Ti6Al4V

AMAZE PROJECT - RESEARCH DIRECTIONS

This project will lead to the opening of new topics and research directions that will be capitalized in projects such as:

- HORIZON 2020
- CORDIS EU
- EEA GRANTS
- EUROSTARS (EUREKA)
- TEMPUSV
- ERASMUS-MUNDUS ACTION3, etc.

Thank you!

Thank you!