NetCastPL4.0

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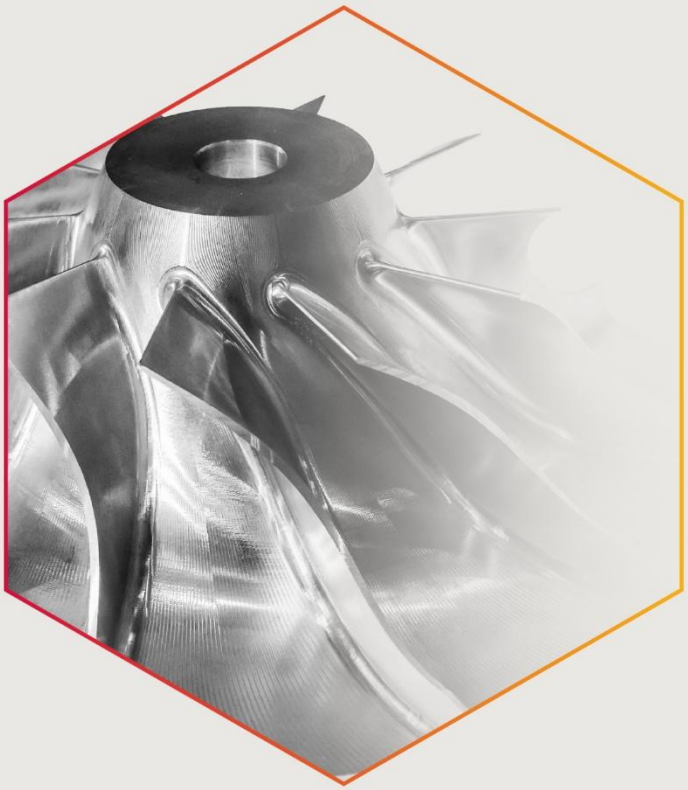

Funded by
the European Union

NETCASTPL4.0
- NETWORKING -

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(Grant Agreement number 101159771)

D5.2 Workshop on Lightweight Castings Innovation

Funding Scheme: Coordination and Support Action

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Dissemination level		
PU	Public	☒
SEN	Sensitive	

NetCastPL4.0 aims to enhance excellence and innovation capacity at AGH, putting AGH in a leading position to nuclei the Networking Pole for Castings Foundry Innovation and Sustainability to face the strategic challenges of Poland and EU foundries and of lightweight components end-user industry. It also aims to engage the country in pan-European collaborative efforts on this topic twinning with the Consiglio Nazionale delle Ricerche (Italy) and AALTO University (Finland). It will put AGH This will be achieved through realization of following specific objectives implemented via 7 WPs:

1. Improving the overall capacity and resources at AGH in advanced lightweight castings science & technology and in emerging Industrial Sustainability assessment and management practices and tools.
2. Conducting exploratory research on "High-tech cast iron and Al alloys for lightweighting castings for the medium and heavy-loaded conditions produced by green molding materials" demonstrating enhanced capacity in novel lightweight materials and components fabrication, modelling and characterisation.
3. Establishing an AGH European Networking Pole on Lightweight Castings Innovation and Sustainability. This will enhance the replication potential developed at AGH, creating strategic partnerships with Research organizations, Universities, Foundries, Industry, Public and Governmental Organizations, and Agencies in light-weighting casting components and Technologies for casting foundries 4.0 development.
4. Providing new results and experiences analysing 3 case-studies in production of light-weight castings components in medium and heavy loaded conditions and automotive for the preparation of a Guide Document on Best Available Practices in the Green Foundries Industry.
5. Leveraging the NetCastPL4.0 partnership at a European level and creating the enabling conditions for a long-lasting joint collaboration.
6. To arrange schools and training workshops in partner countries for scientists and for potential follower foundries and other relevant stakeholders.
7. Raising mobility (internal and external) of scientists and staff in green molding/casting science and technologies.
8. Improving the research management and administration skills at AGH, by creating the Department of European cooperation within AGH.
9. Fostering gender equality issues at AGH and in the castings foundry through implementation of the action plan for Equality, Inclusion, and Diversity.

Table of Contents

1. Scope of the deliverable 5

2. The Workshop organization 6

2.1 Organizational matters 6

2.2 Workshop Programme 7

2.3 Workshop Participants 8

3. Project's dissemination 11

3.1 Workshop promotion 11

3.2 Workshop & other materials promoting the project 12

4. Assessment of the feedback received 15

1. Scope of the deliverable

This deliverable presents the first workshop - Workshop on Lightweight Castings Innovation, organized within NetCastPL4.0 project. The subtitle of the workshop was: "Green Processes in Foundry 4.0 practice of Light-Weight Castings".

The workshop was organized by all project's partners: AGH University, CNR and AALTO and took place **in Poland on July 03-04, 2025**. Its primary objective was to present both theoretical and practical aspects of implementing green technologies that enable the production of thin-walled components combining high mechanical performance with low weight, cost-efficiency, and a reduced carbon footprint – in line with the European strategy for CO_2 emissions reduction. One day of the workshop (July 03, 2025) was dedicated to technical aspect and took place in two foundry plants located in Rzeszów: Consolidated Precision Products and Zakład Metalurgiczny „WSK Rzeszów" Ltd. Both the companies are members of project's network (https://netcastpl4-0.agh.edu.pl/network-partners/). The second day (July 04, 2025) was dedicated to Science, Policy and Business in the field lightweight castings and took place at the Faculty of Foundry Engineering of AGH University facilities in Krakow. The event gathered various stakeholders such as foundry specialists, scientists, PhD students etc. to stimulate interactions between the various actors in the foundry supply chain. The information of the event was open to public via e.g. project's web platform (https://netcastpl4-0.agh.edu.pl/schools-and-workshops/workshop-on-lightweight-castings-innovation/), e-Newsletter (https://netcastpl4-0.agh.edu.pl/wp-content/uploads/2025/05/How-NetCastPL4.0-Supports-Innovation-in-Lightweight-Castings-%E2%80%93-See-Whats-New.pdf), sent flyers or spreading the information among network partners. The lectures / presentations were delivered by both foundry specialists (from Poland and abroad) and scientists from AGH University, CNR and AALTO.

This deliverable has several goals:

- ✓ Identification and analyzing of new initiatives in the production of thin sections, new industrial, commercial and professional mode in foundries.
- ✓ Providing new results in production of sustainable lightweight castings – materials, components and processes.
- ✓ Fostering gender equality issues at AGH and in the castings foundry.
- ✓ Increasing the awareness of European policy and economic development tendencies including Green Deal aspects.

The present document consists of four chapters. Chapter 1 presents introductory information about the deliverable. Chapter 2 shows the workshop organization. Chapter 3 presents the information about project's dissemination during the workshop. Chapter 4 includes the assessment of the feedback received.

2. The Workshop organization

2.1 Organizational matters

The organizational matters of the workshop took 7 month. It included the following:

- 09.12.2024 - presentation of the workshop concept & discussion;
- 09.12.2024 - 2-days workshop at the beginning of July 2025 was agreed;
- 13.12.2024 – public presentation of the draft of workshop program during oral presentation at Polish Foundrymen's Day 2024 (around 230 participants of the event);
- 20.01.2025 - organization of the 2nd day of workshop in 2-3 foundries located near Rzeszów was agreed;
- 25.04.2025 – the programme of workshop was completed;
- 07.05.2025 - first project of the flyer was sent to partners;
- 15.05.2025 - the information about the workshop is available on project's web platform – public dissemination;
- 15.05.2025 - acceptance of the workshop flyer;
- 16.05.2025 - sending the official invitation to lecturers;
- 21.05.2025 - sending the flyer to representatives of Network partners;
- 21.05.2025 - beginning of registration; individual contact with project office for registration registration;
- 04.06.2025 – public presentation of workshop programme during oral presentation at FOCAST Foundry Salon as well as presenting flyers;
- 23.06.2025 – the end of registration;
- 24.06.2025 – production of personalized badges & certificates;
- 03-04.07.2025 - Workshop on Lightweight Castings Innovation: Green Processes in Foundry 4.0 practice of Light-Weight Castings.

2.2 Workshop Programme

The following workshop programme was agreed and accomplished:

Day 1

July 03, 2025 Workshop at Company site / CPP, WSK Rzeszów

9:30-15:00

Company Visits

A) "Superalloys at CPP"

Lecturer: Jerzy Rozmund, CPP

B) "Cast Iron at WSK Rzeszów"

Lecturers: Władysław Jasiczek and Marcin Łagowski, WSK Rzeszów

C) "Aluminium Alloys at WSK Rzeszów"

Lecturers: Władysław Jasiczek / Robert Jarosz, WSK Rzeszów

Green production processes: CPP, WSK Rzeszów

1. "Concept of lightweighting"

Lecturer: Rafal Cygan, CPP

2. "Ferrous and non-ferrous castings"

Lecturers: Robert Jarosz and Marcin Łagowski, WSK Rzeszów

Day 2

July 04, 2025 Science, Policy and Business / AGH University

09:00-10:30 – "Thermo-mechanical fatigue"

Lecturer: Riccardo Donnini, CNR-ICMATE

10:45-11:45 – "Creep properties of materials"

Lecturer: Giuliano Angella, CNR-ICMATE

12:00-13:00 – "STEM Without Limits: Advancing Inclusion & Equality"

Lecturer: Monica Favaro, CNR-ICMATE

Break

14:30-15:15 – "Policy and Economic developments"

Lecturer: Franco Zanardi, Zanardi Fonderie S.p.A.

2.3 Workshop Participants

The workshop gathered 43 participants from universities, research institutes & companies. Among them were foundry specialists, researchers, PhD students as well as administrative staff. The following entities' & companies' representatives were trained:

- AGH University of Krakow (Faculty of Foundry Engineering, ACMIN),
- Consiglio Nazionale delle Ricerche- Istituto di Chimica della Materia Condensata e di Tecnologie per l'Energia -Italy (CNR ICMATE)
- Aalto University, Department of Mechanical Engineering in the School of Engineering,
- Poznan University of Technology, The Faculty of Mechanical Engineering,
- Lodz University of Technology, Faculty of Mechanical Engineering,
- Silesian University of Technology,
- Łukasiewicz Research Network – Institute of Non-Ferrous Metals,
- Consolidated Precision Products,
- Zakład Metalurgiczny „WSK Rzeszów" Ltd.,
- Zanardi Fonderie S.p.A.,
- DETUR CHEM sp. z o.o.,
- Specodlew Sp. z o.o,
- EUROCAST INDUSTRIES Sp. z o.o. Sp. K.,
- KPR PRODLEW-KRAKÓW Sp. z o.o.,
- Kawmet Foundry,
- Prec-Odlew Sp. z o.o.,
- Teksid Iron Poland,
- Limatherm S.A.,
- Innerco Ltd.,
- Bitech Training Ltd.

The graphs 1-2 present the share of participants' groups in numbers. Around 70% of companies' participants represented SMEs.

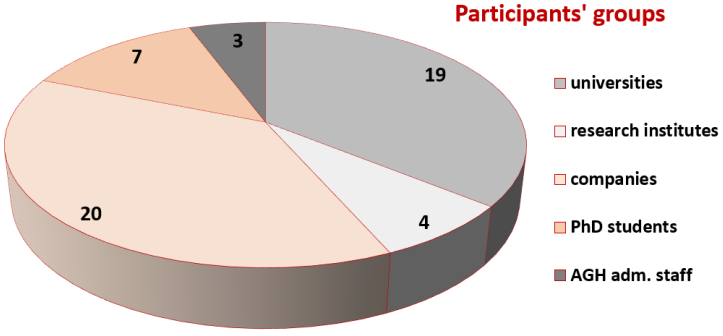


Figure 1. Number of participants in different groups.

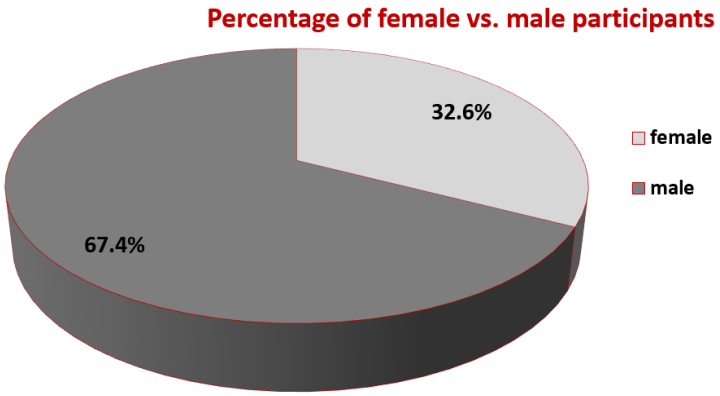


Figure 2. Percentage of female vs. male participants.

According to workshop's objectives and goals, the event was focused on innovative technological solutions in the field of lightweight casting production, with particular emphasis on their role in the automotive and e-mobility sectors. Gender equality was also discussed as well as the impact of European policy and economic on development tendencies including Green Deal aspects. The first day of the event took place at the facilities of two members of the NetCastPL4.0 Network of Excellence: Consolidated Precision Products (CPP) and Zakład Metalurgiczny WSK Rzeszów Sp. z o.o. The site visits provided participants with the opportunity to gain insight into state-of-the-art foundry processes and to observe examples of technology implementations aligned with the Foundry 4.0 idea. CPP Poland, lokated in Rzeszów, is part of the global Consolidated Precision Products Group – a world leader in precision castings for the aerospace and power generation industries. The company specialises in high-performance superalloy-based technologies. WSK Rzeszów Sp. z o.o. is a recognised manufacturer of castings from ferrous and non-ferrous alloys. The enterprise boasts extensive experience in developing technologies for thin-walled and high-strength components for modern industry.

The event programme included presentations by industry experts: Jerzy Rozmund, Władysław Jasiczek, Marcin Łagowski, Robert Jarosz, and Rafał Cygan. Participants also had the opportunity to tour the facilities and engage in discussions on current challenges in the production of thin-walled castings using the investment casting method.

The second day of the workshop took place at the Faculty of Foundry Engineering at AGH University of Krakow and was devoted to the scientific, social, and economic aspects of implementing innovative solutions in lightweight foundry engineering. Experts from CNR-ICMATE and the company Zanardi Fonderie S.p.A. presented the latest research findings and strategies for adapting to the requirements of the Green Deal policy within the industrial sector – both in the European and local contexts. Gender equality aspects were also presented.

The Fig. 3 presents chosen photos taken during the workshop.

Figure 3. The chosen photos taken during the workshop.

3. Project's dissemination

3.1 Workshop promotion

The workshop was promoted:

- on project's web platform / https://netcastpl4-0.agh.edu.pl/schools-and-workshops/workshop-on-lightweight-castings-innovation;
- by sending the e-Newsletter / https://netcastpl4-0.agh.edu.pl/wp-content/uploads/2025/05/How-NetCastPL4.0-Supports-Innovation-in-Lightweight-Castings-%E2%80%93-See-Whats-New.pdf; sent 2025-04-25;
- by spreading the information among Network Partners, also during FOCAST event;
- by producing and sending over the workshop flyer (Fig. 4).

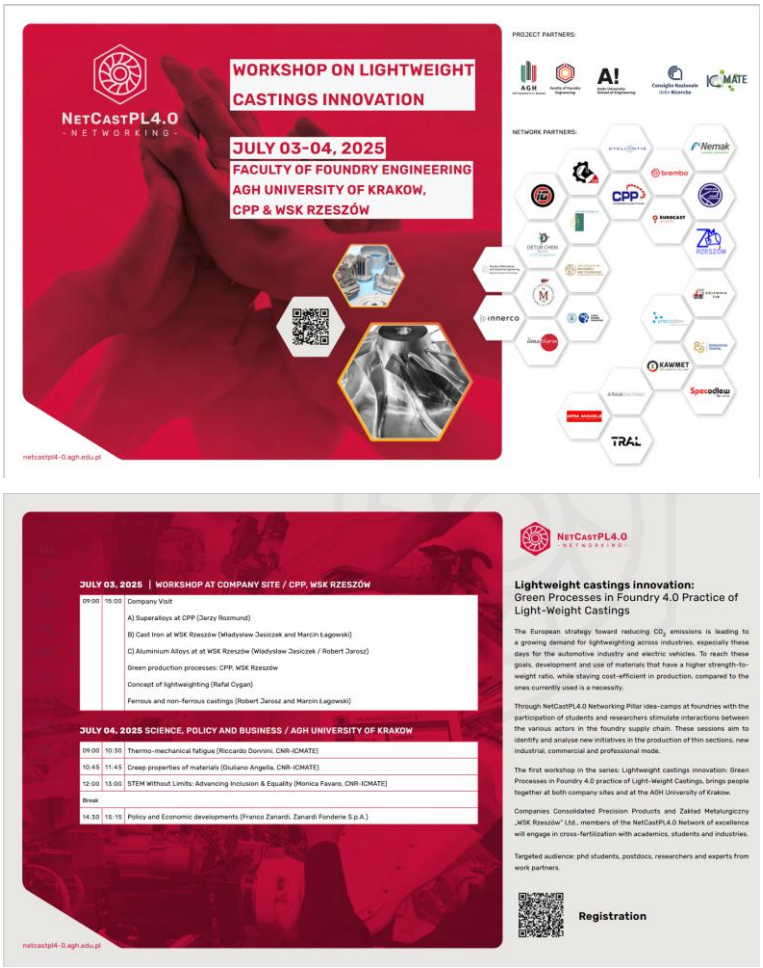


Figure 4. Workshop flyer.

3.2 Workshop & other materials promoting the project

The project was promoted among the workshop participants by:

- materials produced for participants (pencil, notebook, badge, certificate, promotional lanyard, candy) (Fig. 5);

pencil

notebook

badge

certificate

promotional lanyard

traditional Polish candy

Figure 5. Projects of dissemination materials.

- by presenting the project's logotype during presentation, also by using the project's presentation template by lectures (Fig. 6).

Figure 6. Template of project's Power Point presentation.

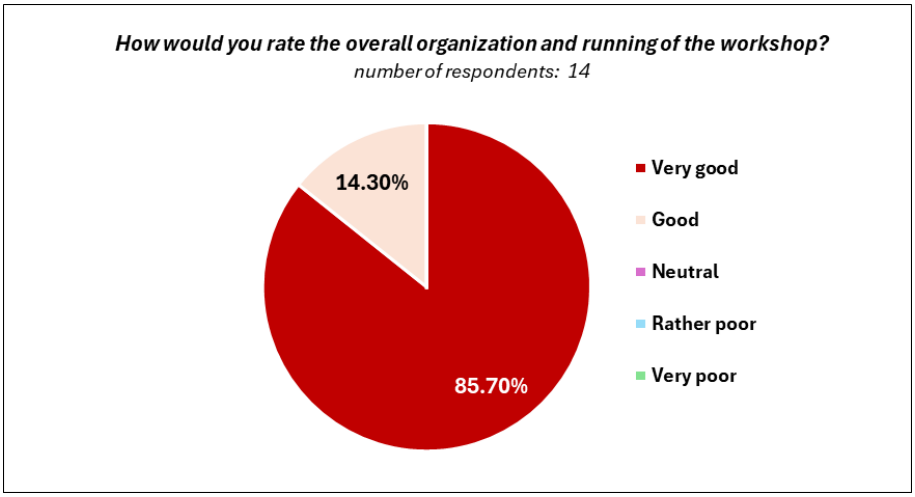
- by spreading among participants the project's flyers both in English and in Polish and by presenting project's banner during lectures at AGH FFE (Fig. 7).

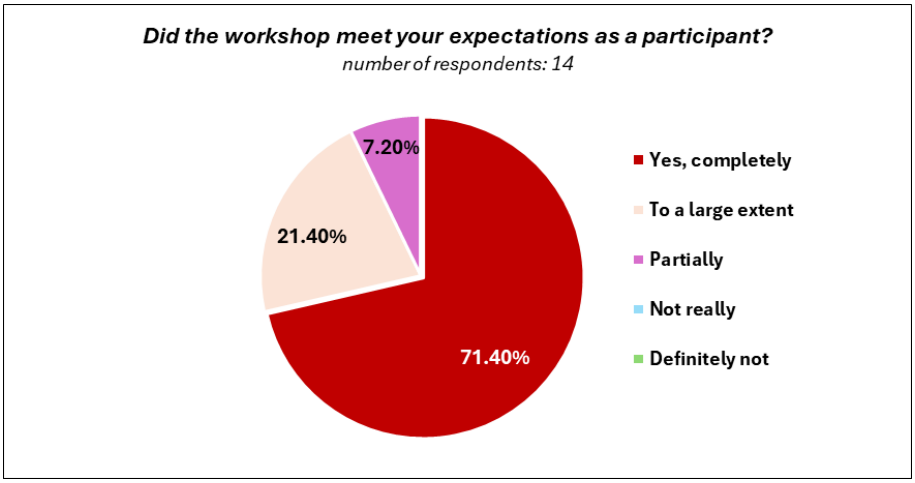
Figure 7. Project's logotype, banner & flyer (English version).

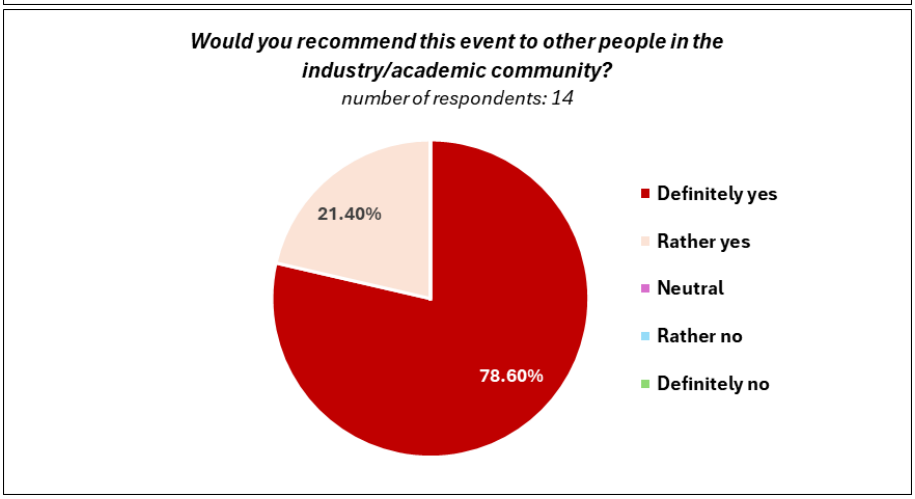
4. Assessment of the feedback received

In order to improve the future workshops, after the event, participants received a survey to assess their level of satisfaction with the workshop organization and lectures' level. The questionnaire was prepared in Polish and English and sent to workshop participants on July 11, 2025.

The survey results are presented on figs. 8-9: figure 8 – general workshop evaluation; figure 9 – evaluation of lectures.







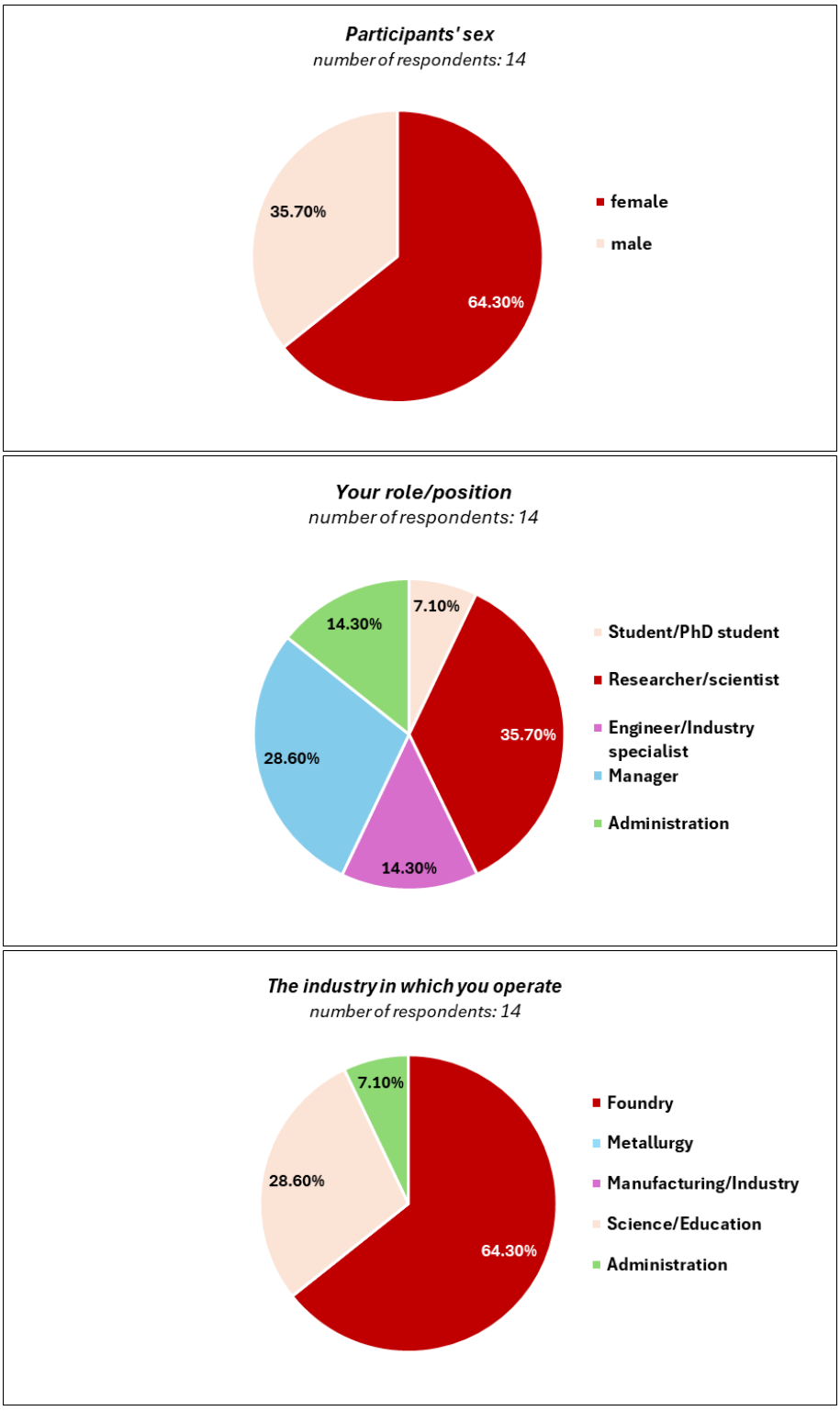
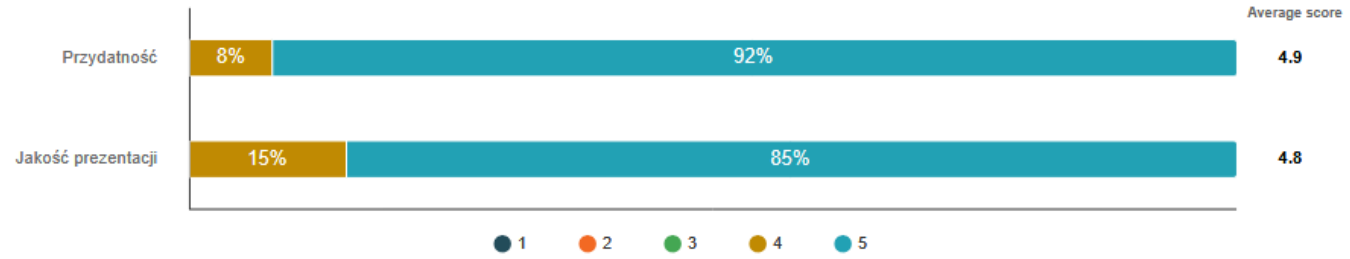


Figure 8. The survey results - general questions.

Superalloys at CPP (Jerzy Rozmund)

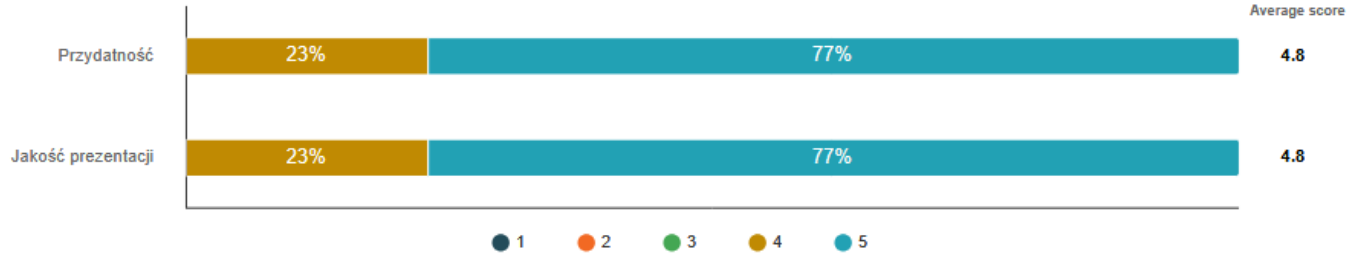
Number of respondents: 13



	1	2	3	4	5	Average	Median
Przydatność	0.0%	0.0%	0.0%	7.7%	92.3%	4.9	5.0
Jakość prezentacji	0.0%	0.0%	0.0%	15.4%	84.6%	4.8	5.0
Total	**0.0%**	**0.0%**	**0.0%**	**11.6%**	**88.5%**	**4.9**	**5.0**

Cast Iron at WSK Rzeszów (Władysław Jasiczek and Marcin Łagowski)

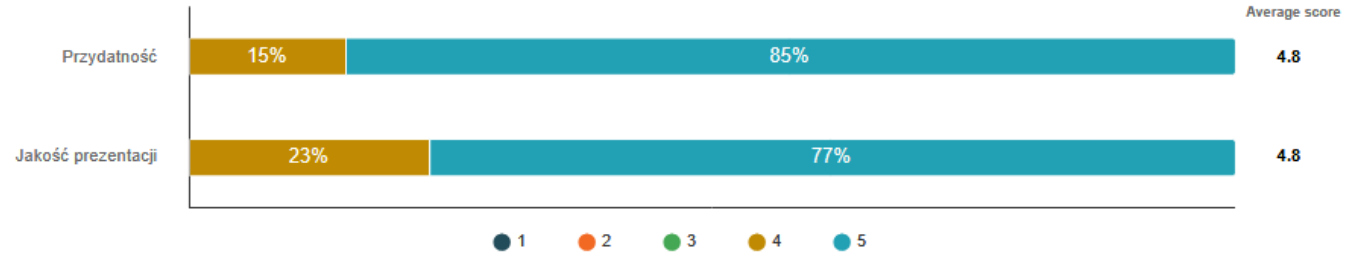
Number of respondents: 13



	1	2	3	4	5	Average	Median
Przydatność	0.0%	0.0%	0.0%	23.1%	76.9%	4.8	5.0
Jakość prezentacji	0.0%	0.0%	0.0%	23.1%	76.9%	4.8	5.0
Total	**0.0%**	**0.0%**	**0.0%**	**23.1%**	**76.9%**	**4.8**	**5.0**

Aluminium Alloys at WSK Rzeszów (Władysław Jasiczek / Robert Jarosz)

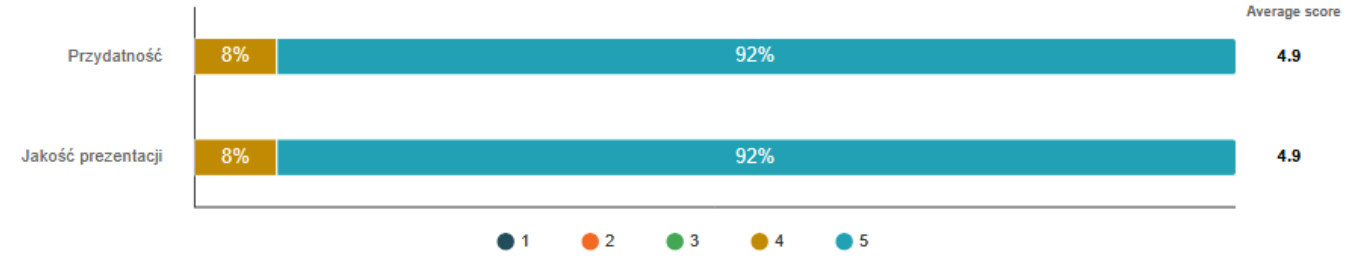
Number of respondents: 13



	1	2	3	4	5	Average	Median
Przydatność	0.0%	0.0%	0.0%	15.4%	84.6%	4.8	5.0
Jakość prezentacji	0.0%	0.0%	0.0%	23.1%	76.9%	4.8	5.0
Total	**0.0%**	**0.0%**	**0.0%**	**19.3%**	**80.8%**	**4.8**	**5.0**

Concept of lightweighting (Rafał Cygan)

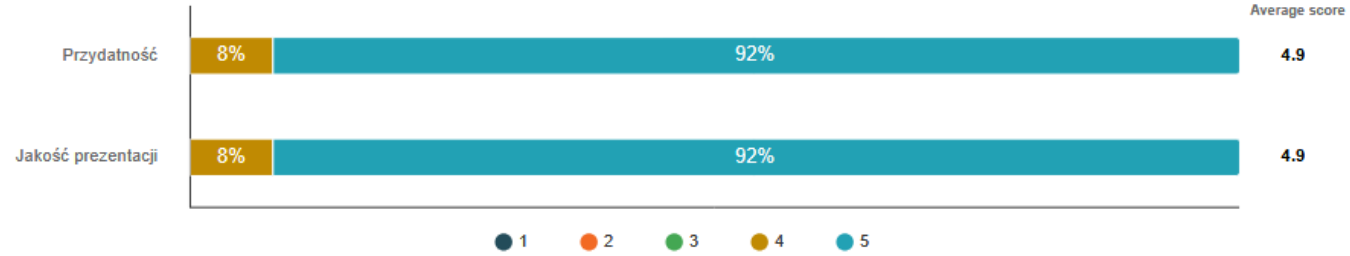
Number of respondents: 13



	1	2	3	4	5	Average	Median
Przydatność	0.0%	0.0%	0.0%	7.7%	92.3%	4.9	5.0
Jakość prezentacji	0.0%	0.0%	0.0%	7.7%	92.3%	4.9	5.0
Total	**0.0%**	**0.0%**	**0.0%**	**7.7%**	**92.3%**	**4.9**	**5.0**

Ferrous and non-ferrous castings (Robert Jarosz and Marcin Łagowski)

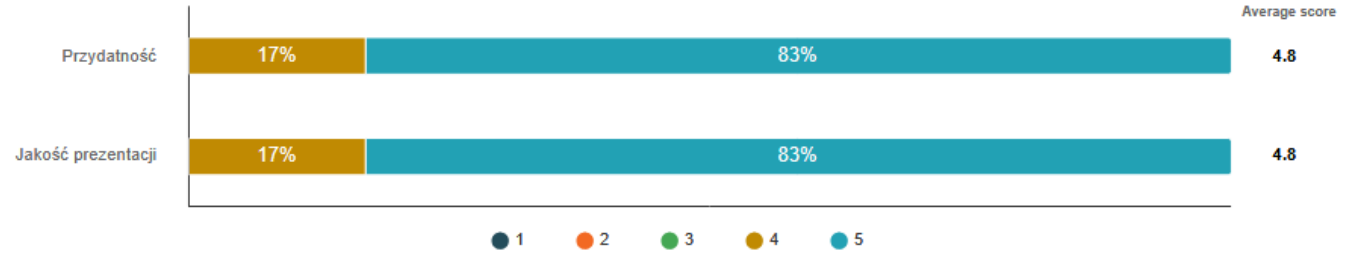
Number of respondents: 13



	1	2	3	4	5	Average	Median
Przydatność	0.0%	0.0%	0.0%	7.7%	92.3%	4.9	5.0
Jakość prezentacji	0.0%	0.0%	0.0%	7.7%	92.3%	4.9	5.0
Total	**0.0%**	**0.0%**	**0.0%**	**7.7%**	**92.3%**	**4.9**	**5.0**

Thermo-mechanical fatigue (Riccardo Donnini, CNR-ICMATE)

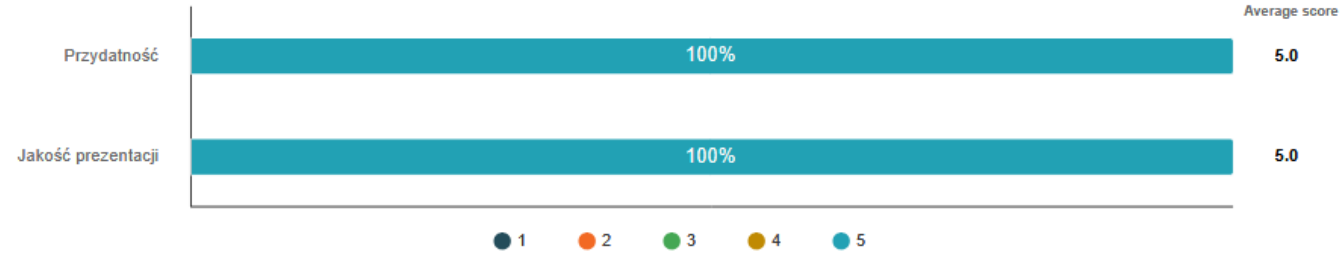
Number of respondents: 12



	1	2	3	4	5	Average	Median
Przydatność	0.0%	0.0%	0.0%	16.7%	83.3%	4.8	5.0
Jakość prezentacji	0.0%	0.0%	0.0%	16.7%	83.3%	4.8	5.0
Total	**0.0%**	**0.0%**	**0.0%**	**16.7%**	**83.3%**	**4.8**	**5.0**

Creep properties of materials (Giuliano Angella, CNR-ICMATE)

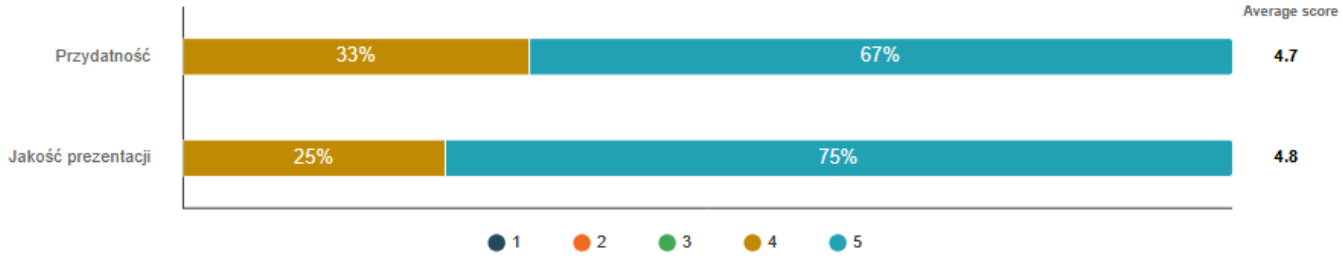
Number of respondents: 12



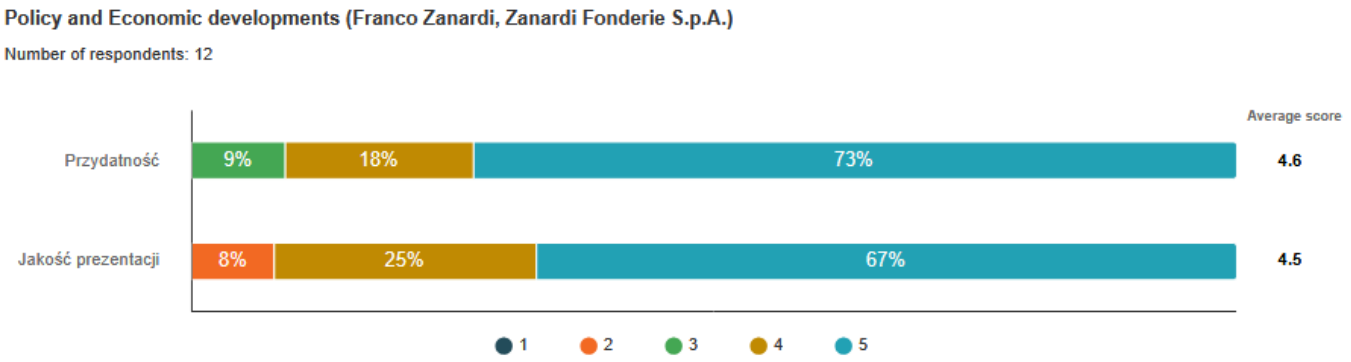
	1	2	3	4	5	Average	Median
Przydatność	0.0%	0.0%	0.0%	0.0%	100.0%	5.0	5.0
Jakość prezentacji	0.0%	0.0%	0.0%	0.0%	100.0%	5.0	5.0
Total	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**	**5.0**	**5.0**

STEM Without Limits: Advancing Inclusion & Equality (Monica Favaro, CNR-ICMATE)

Number of respondents: 12



	1	2	3	4	5	Average	Median
Przydatność	0.0%	0.0%	0.0%	33.3%	66.7%	4.7	5.0
Jakość prezentacji	0.0%	0.0%	0.0%	25.0%	75.0%	4.8	5.0
Total	**0.0%**	**0.0%**	**0.0%**	**29.2%**	**70.9%**	**4.7**	**5.0**



	1	2	3	4	5	Average	Median
Przydatność	0.0%	0.0%	9.1%	18.2%	72.7%	4.6	5.0
Jakość prezentacji	0.0%	8.3%	0.0%	25.0%	66.7%	4.5	5.0
Total	**0.0%**	**4.2%**	**4.6%**	**21.6%**	**69.7%**	**4.6**	**5.0**

Figure 9. The survey results – lectures' evaluation.

According to the presented resalts, all the lectures were evaluated well, both from their usefulness & quality point of view.

Additionally, among participants' remarks the following comments were listed:

- *"Fewer recorded or online presentations."*
- *"In my opinion, the practical part of the workshop should be longer and the presentations shorter."*
- *"Large-size casting foundry."*
- *"No comments."*
- *"Workshop at a ductile iron foundry."*
- *"Visiting industrial plants is a very good idea."*