



PUBLIC SELECTION ESTABLISHED WITH DIRECTOR'S DÉCREE NO. 2023\_PRO\_DMEC\_3 OF 04/07/2023 PURSUANT TO THE NOTICE PUBLISHED IN THE OFFICIAL GAZETTE NO. 14/07/2023, n. 53 FOR 1 POSITION AS FULL PROFESSOR FOR THE COMPETITION SECTOR 09/B1 - MANUFACTURING TECHNOLOGY AND SYSTEMS - SDS ING-IND/16 - MANUFACTURING TECHNOLOGY AND SYSTEMS, PURSUANT TO ART. 18 - LAW 240/2010, AT THE POLITECNICO DI MILANO - DEPARTMENT OF MECHANICAL ENGINEERING (PROCEDURE CODE 2023\_PRO\_DMEC\_3).

## FINAL REPORT

The Selection Board, appointed with RD Index No. 9330 ref. No. 193904 of 23 August 2023, composed by the following Professors:

Prof. Michele MONNO - Politecnico di Milano;  
Prof.ssa Gisela LANZA - Karlsruhe Institute of Technology;  
Prof. Joost R. DUFLOU - Katholieke Universiteit Leuven,

met on 5/12/2023 at 2:30 p.m., for the first teleconference meeting.  
Each board member was connected from his/her workstation.

At the start of the session the members of the Selection Board named the Chairman and the Secretary of the Selection Board:

Prof. Michele MONNO, Mechanical Engineering Dept. – Politecnico di Milano, Chairman;  
Prof. Gisela LANZA, Karlsruhe Institute of Technology, Secretary

Each member of the board declared not to have conjugal nor family relationship or other degree of kinship or affinity up to the fourth degree, not to be in same-sex civil union (as per art. 1 of Law No. 76 of 20.05.2016) and not to form a cohabiting couple (as per art. 1, paragraphs 37 et seq. of Law No. 76 of 20.05.2016) with the other members of this board and that there were no reasons for abstention pursuant to arts. 51 and 52 of the Civil Procedure Code.

The members of the Selection Board and the Secretary declared, pursuant to art. 35-bis of Legislative Decree 165/2001, not to have criminal convictions, even with non-definitive sentences, for offences provided for in Chapter I, Title II of the second book of the Criminal Code.

The Selection Board established the criteria and the parameters according to which the assessment was carried out, and set the minimum score below which the candidate shall not be included in the ranking of candidates.

On 10/01/2024 at 2:30 p.m., the Selection Board met electronically to inspect the list of candidates, who were:

1) COLLEDANI Marcello

Each member of the board declared not to have conjugal nor family relationship or other degree of kinship or affinity up to the fourth degree, not to be in same-sex civil union (as per art. 1 of Law No. 76 of 20.05.2016) and not to form a cohabiting couple (as per art. 1, paragraphs 37 et seq. of Law No. 76 of 20.05.2016) with the candidates and stated that there were no reasons for abstention pursuant to arts. 51 and 52 of the Civil Procedure Code.

Pursuant to the examination and after adequate evaluation, the Selection Board assigned a score to each of the established criteria and a judgment to each publication submitted by the candidate; furthermore, the board evaluated the knowledge of the English language.

Therefore the board, considering the sum of the scores given, expressed a collective judgment in relation to the quantity and the quality of publications, evaluating the overall productivity of the applicant, also with regard to his/her period of activity.

The above-mentioned judgments are attached to this report and they are an integral part of it (Attachment No. 1 to this final report).

The Selection Board drew up, according to the majority of its members, a ranking of candidates selected to carry out the scientific/teaching functions for which the selection was called, in a number equal to a maximum of five times the number of positions available in the competition (Attachment No. 2 to this final report).

THE SELECTION BOARD

*Prof. Michele MONNO (Chairman)*

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*Prof. Joost R. DUFLOU (Member)*

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*Prof. Gisela LANZA (Secretary)*

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## ATTACHMENT No. 1 to the FINAL REPORT

CRITERIA	Quality of scientific and/or project production, assessed on the basis of criteria and parameters recognized by the international scientific community of reference	Teaching activity at the university level in Italy or abroad	Scientific responsibility for funded research projects	Total
COLLEDANI Marcello	35	28	30	93

CANDIDATE: COLLEDANI Marcello

### Overall collective judgement

#### CURRICULUM:

The candidate presents a broad and detailed CV which includes (in addition to publications, teaching activities and funded projects) significant additional elements. Among these:

- Research stays abroad, in particular:
  - in 2008-'09, thanks to a grant from the Rocca Foundation, he spent a year as a visiting researcher at the Laboratory for Manufacturing and Productivity LMP of the Massachusetts Institute of Technology (USA), for research activities coordinated by prof. Stanley Gershwin.
  - from 2009 to 2017 he regularly spent short periods at MIT to continue research collaborations with prof. Gershwin and prof. Gutowski.
- Scientific responsibility of research laboratories, in particular:
  - from 2013 to 2019 he was responsible for the "Mechanical Recycling Cell", one of the three sections of the "Mechatronics De-manufacturing Pilot Plant", installed at ITIA-CNR;
  - since 2019 he has been scientific director of the "Circular Factory for the Electrified Vehicles of the Future (CIRC-eV) laboratory, in which seven Departments of the Politecnico di Milano participate.
  - since 2020 he has been the scientific coordinator of "Eco-Circ" (cooperation agreement for the creation of a pilot infrastructure to support the transition towards the circular economy), with the involvement of five Research Institutes and Universities of the Lombardy Region (including Stiima-CNR, University of Pavia, University of Milan) and four Departments of the Politecnico di Milano.
- Best paper awards and invitations to present papers at national/international conferences.
- The candidate is a member of scientific associations (CIRP, AITEM, AFIL, etc.) and research networks (Vanguard Initiative, European Cluster "4ZDM - Zero Defect Manufacturing, etc.) and participates in numerous technical-scientific conference/symposium committees/International summits.
- He is among the reviewers of numerous Scientific Journals (IIE Transactions, International Journal of Production Economics, IEEE Transactions on Automation Science and Engineering, Annals of OR, SME Journal of Manufacturing Systems, International Journal of Production Research, International Journal of Computer Integrated Manufacturing, Stochastic Models, CIRP Journal of Manufacturing Science and Technology).

- The candidate is also co-founder of the start-up FiberUse-Tech, which deals with the most promising technologies for the recovery and re-use of GFRP (Glass-Fiber Reinforced Plastics), and other composite materials.
- Since 2014, he has been an Associate Professor at the Mechanical Engineering Department of the Politecnico.
- In 2017 he obtained the national qualification (ASN) for the role of first level professor for the scientific sector Ing-Ind/16.
- Since January 2023 he has been part of the Board of the Department of Mechanics of the Polytechnic, with responsibility for "Environmental Sustainability and Energy Efficiency".

QUALITY OF SCIENTIFIC AND/OR PROJECT PRODUCTION, ASSESSED ON THE BASIS OF CRITERIA AND PARAMETERS RECOGNIZED BY THE INTERNATIONAL SCIENTIFIC COMMUNITY OF REFERENCE:

SUBMITTED PUBLICATIONS:

No. of publication	Type/Title of Publication	Judgment
1	CIRP Annals - Manufacturing Technology, (2023) <u>Colledani, M.</u> , Gentilini, L., Mossali, E., Picone, N., O. <i>A novel mechanical pre-treatment process-chain for the recycling of Li-Ion batteries.</i>	Document type: Article in Journal Authors: 4 Citations: 0 SJR: Q1 SCORE: 2
2	Journal of Environmental Management, Volume 264, (2020) <u>Colledani, M.</u> , Mossali, E., Picone, N., Gentilini, L., Rodriguez, O., Perez, J.-M. <i>Lithium-ion batteries towards circular economy: A literature review of opportunities and issues of recycling treatments.</i>	Document type: Article in Journal Authors: 5 Citations: 212 SJR: Q1 SCORE: 2,5
3	Journal of Cleaner Production, Volume 211, (2019) <u>Colledani, M.</u> , Diani M., Lanzarone, E., Pievatolo, A. <i>A comminution model with homogeneity and multiplication assumptions for the Waste Electrical and Electronic Equipment recycling industry.</i>	Document type: Article in Journal Authors: 4 Citations: 10 SJR: Q1 SCORE: 2
4	Journal of Remanufacturing, (2017) Gaspari, L., Colucci, L., Butzer, S., <u>Colledani, M.</u> , Steinhilper, R. <i>Modularization in material flow simulation for managing production releases in remanufacturing,</i>	Document type: Article in Journal Authors 5 Citations: 14 SJR: Q1 SCORE: 2
5	CIRP Annals - Manufacturing Technology, (2017) <u>Colledani, M.</u> , Tolio, T., Duflou, J., Seliger, G., Bernard, A., Kara, S., Battaia, O., Takata, S. <i>Design, Management and Control of Demanufacturing and Remanufacturing Systems.</i>	Document type: Article in Journal Authors: 8 Citations: 146 SJR: Q1 SCORE: 2
6	CIRP Annals - Manufacturing Technology, (2016) <u>Colledani, M.</u> , Battaya, O. <i>A Decision Support System to Manage the Quality of End-of-Life Products in Disassembly Systems.</i>	Document type: Article in Journal Authors: 2 Citations: 39 SJR: Q1 SCORE: 2,5
7	CIRP Annals - Manufacturing Technology, (2013) <u>Colledani M.</u> , Tolio T. <i>Integrated Process and System Modelling for the Design of Material Recycling Systems.</i>	Document type: Article in Journal Authors: 2 Citations: 24 SJR: Q1 SCORE: 2
8	IEEE Transactions on Automation Science and Engineering, (2013) <u>Colledani M.</u> , Wolf M.I., Gutowski T., Gershwin S.-B. <i>A network flow model for the performance evaluation and design of material separation systems for recycling.</i>	Document type: Article in Journal Authors: 4 Citations: 15 SJR: Q1 SCORE: 2
9	Computers in Industry, (2022) Powell, D., Magnanini, M.C., <u>Colledani, M.</u> , Mykelburst, O.	Document type: Article in Journal

	<i>Advancing zero defect manufacturing: A state-of-the-art perspective and future research directions.</i>	Authors: 4 Citations: 45 SJR: Q1 SCORE: 2
10	CIRP Annals - Manufacturing Technology, (2020) <u>Colledani, M.,</u> Angius, A. <i>Production quality performance of manufacturing systems with in-line product traceability and rework.</i>	Document type: Article in Journal Authors: 2 Citations: 6 SJR: Q1 SCORE: 2
11	CIRP Journal of Manufacturing Science and Technology, 20, (2018) <u>Colledani, M.,</u> Coupek, D., Verl, A., Aichele, J., Yemane, A. <i>A cyber-physical system for quality oriented assembly of automotive electric motors.</i>	Document type: Article in Journal Authors: 5 Citations: 25 SJR: Q1 SCORE: 2
12	CIRP Annals - Manufacturing Technology, (2015) <u>Colledani M.,</u> Angius A., Horvath A. <i>Production quality performance in manufacturing systems processing deteriorating products.</i>	Document type: Article in Journal Authors: 3 Citations: 21 SJR: Q1 SCORE: 2
13	CIRP Annals - Manufacturing Technology, (2014) <u>Colledani M.,</u> Fischer A., lung B., Lanza G., Schmitt R., Tolio T., Vancza J. <i>Design and management of manufacturing systems for production quality.</i>	Document type: Article in Journal Authors: 7 Citations: 230 SJR: Q1 SCORE: 2,5
14	CIRP Annals – Manufacturing Technology, (2012) <u>Colledani M.,</u> Tolio T. <i>Integrated Quality, Production Logistics and Maintenance Analysis of Multi-Stage Asynchronous Manufacturing Systems with Degrading Machines,</i>	Document type: Article in Journal Authors: 2 Citations: 104 SJR: Q1 SCORE: 2,5
15	International Journal of Production Research, (2011) <u>Colledani M.,</u> Tolio T. <i>Integrated analysis of quality and production logistics performance in manufacturing lines.</i>	Document type: Article in Journal Authors: 2 Citations: 84 SJR: Q1 SCORE: 2,5
16	International Journal of Production Economics, (2009) <u>Colledani M.,</u> Tolio T. <i>Performance Evaluation of Production Systems Monitored by Statistical Process Control and Offline Inspections.</i>	Document type: Article in Journal Authors: 2 Citations: 67 SJR: Q1 SCORE: 2,5

On the date of submission of the application to this evaluation procedure, the Scopus Database recorded the following in relation to the candidate's scientific production:

- 13 chapters published in Scientific Books;
- 47 works published in Scientific Journals surveyed;
- 100 papers present in proceedings of international conferences/symposia;
- 9 reports in National Conference Proceedings.

On the same date, the Scopus Database indicated the following performance indicators for the candidate:

- 2377 citations (1899 excluding the self-referential ones of the authors);
- 125 citations per year (average value from 2004 to 2023);
- 25 H index.

Based on the above, the Commission expresses a very positive opinion on the candidate's scientific production and assigns an overall rating of 35 points to the publications presented (see previous table).

DIDACTIC ACTIVITIES CARRIED OUT IN ITALIAN OR FOREIGN UNIVERSITIES OR BODIES:

From 2003 to 2023, the candidate carried out continuously an intense teaching activity at the Politecnico di Milano, first as a professor assistant and subsequently as a teacher, for the following courses:

- RECONFIGURABLE MANUFACTURING SYSTEMS for the master's degree in Management Engineering and Mathematical Engineering (10 ECTS, ENG);
- MANUFACTURING TECHNOLOGY AND METALLURGY for the master's degree in Mechanical Engineering (10 ECTS, ENG);
- MANUFACTURING TECHNOLOGY I for the bachelor's degree in Mechanical Engineering (10 ECTS, ITA);
- DEMANUFACTURING, for the master's degree in Management Engineering (5 ECTS, ENG);
- PRODUCTION FOR MADE IN ITALY, for the master's degree in Management Engineering (10 ECTS, ENG);
- MANUFACTURING TECHNOLOGY AND QUALITY for the bachelor's degree in Management Engineering (10 ECTS, ITA).

He has been supervisor of 67 master theses, 9 of which in collaboration with international universities (1 with MIT, USA; 5 with KTH, Sweden; 1 with University of Bayreuth, Germany; 1 with University Linkoping, Sweden; 1 with University of Bristol, UK). He was also the supervisor of 6 doctoral theses.

The Commission expresses a very positive opinion regarding the teaching activity carried out by the candidate, to which it awards 28 points.

#### SCIENTIFIC RESPONSIBILITY FOR FUNDED RESEARCH PROJECTS:

Regarding the funded research projects, the candidate was Scientific Manager and Coordinator of the following international projects (already completed and reported):

- H2020 FoF-03-2016: "ForZDM, Integrated Zero Defect Manufacturing Solution for High Value Adding Multi-stage Manufacturing systems";
- H2020 CIRC-01-2016: "FiberEUse - Large scale demonstration of the techno-economical benefits of new circular economy value-chains based on the reuse of end-of-life fiber reinforced composites";
- H2020 DT-ICT-07-2019: "DigiPrime - Digital Platform for Circular Economy in Cross-sectoral Sustainable Value Networks";
- I3-2021-INV1-MANU: "DeremCo - De-and Remanufacturing for Circular Economy Investments in the Composite Industry".

And the following (in progress):

- H2020-MSCA-ITN-2018, "Digiman 4.0 - MANufacturing Technologies for Zero-defect Industry 4.0 Production";
- H2020-NMBP-TR-IND-2020, "DAT4-ZERO - Data Reliability and Digitally-enhanced Quality Management for Zero Defect Manufacturing in Smart Factories and Ecosystems";
- CE-SC5-31-2020, "Trick - Product Data Traceability Information Management by Blockchains Interoperability and Open Circular Service Marketplace";
- DIGITAL-2021-TRUST-01-DIGPASS, "Cirpass - Collaborative Initiative for a Standards-based Digital Product Passport for Stakeholder-Specific Sharing of Product Data for a Circular Economy";
- HORIZON-CL4-2021-TWIN-TRANSITION-01-07, "Circular Twain - AI Platform for Integrated Sustainable and Circular Manufacturing";
- HORIZON-CL4-2022-TWIN-TRANSITION-01-01, "RaRe2 - Human-centred Rapid Reconfiguration of Production and Value Chain in Fast Changing Scenarios";
- HORIZON-CL4-2022-TWIN-TRANSITION-01-07, "DaCapo - Digital assets and tools for Circular value chains and manufacturing products";
- I3-2021-INV2a-MANU, "SMART-Growth - Artificial intelligence enhanced, sustainable growth of rare-earth materials based laser crystals".

The candidate also had responsibility for scientific/organizational coordination in over 20 scientific research projects (regional/national/international) and for about ten industrial research contracts between the Mechanical Engineering Department of Politecnico and national companies.

Based on the CV and documentation received, the Commission assigns the candidate 30 points for Scientific Responsibility in funded research projects.

#### SCRUTINY OF THE DEGREE OF KNOWLEDGE OF THE ENGLISH LANGUAGE:

Knowledge of the English language is attested both by the teaching activity in the language carried out by the candidate and by the coordination of the numerous international projects in which he has taken part.

THE SELECTION BOARD

*Prof. Michele MONNO (Chairman)*

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*Prof. Joost R. DUFLOU (Member)*

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*Prof. Gisela LANZA (Secretary)*

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# POLITECNICO MILANO 1863

PUBLIC SELECTION ESTABLISHED WITH DIRECTOR'S DECREE NO. 2023\_PRO\_DMEC\_3 OF 04/07/2023 PURSUANT TO THE NOTICE PUBLISHED IN THE OFFICIAL GAZETTE NO. 14/07/2023, n. 53 FOR 1 POSITION AS FULL PROFESSOR FOR THE COMPETITION SECTOR 09/B1 - MANUFACTURING TECHNOLOGY AND SYSTEMS - SDS ING-IND/16 - MANUFACTURING TECHNOLOGY AND SYSTEMS, PURSUANT TO ART. 18 - LAW 240/2010, AT THE POLITECNICO DI MILANO - DEPARTMENT OF MECHANICAL ENGINEERING (PROCEDURE CODE 2023\_PRO\_DMEC\_3).

## ATTACHMENT No. 2 to the FINAL REPORT

### MERIT RANKING

SURNAME AND NAME	Overall score
COLLEDANI Marcello	93

Milan, 10/01/2024

#### THE SELECTION BOARD

*Prof. Michele MONNO (Chairman)*

*Prof. Joost R. DUFLOU (Member)*

*Prof. Gisela LANZA (Secretary)*

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