

CHIARA BORSELLINO



Associate Professor



PERSONAL INFORMATION

Born in Palermo (Italy) on March 24th 1971, Italian.

 Department of Engineering - University of Messina - Messina - Italy

 +39 090 6765246;  cborsellino@unime.it

 <https://www.unime.it/it/persona/chiara-borsellino>

 0000-0003-1940-8607

CURRENT POSITION

2005 - today, Associate Professor of Mechanical Technology
SSD ING-IND16-MANUFACTURING TECHNOLOGIES AND SYSTEMS
Department of Engineering, University of Messina

PREVIOUSLY

2001 -2005 Researcher (SSD ING-IND 16),
Faculty of Engineering - University of Messina

1998-2001 Research grant for research on the topic:
"Study of the hydroforming process of sheet metal"
University of Palermo.

EDUCATION

PHD IN PRODUCTION ENGINEERING (1994-1998)

University of Palermo

PhD Thesis entitled: "Models of ductile fracture and their application to some cold forming processes." As part of the PhD she spent six months of study and research (February-July 1995), at the Université de France-Comte, Besancon-Cedex, France. Tutor Prof. N. Alberti

MASTER'S DEGREE IN MANAGEMENT ENGINEERING (1989-1994)

University of Palermo

110/110 cum laude with honors at a thesis entitled "Prediction of the formation of ductile fracture during plastic deformation processes", at the Faculty of Engineering

SUPERVISION OF GRADUATE STUDENTS AND DOCTORAL FELLOWS

University of Messina

2003 – present 4 PhD tutored

2019– present 1 Research grant tutored

2001– present more than 80 Master and bachelor students tutored

TEACHING ACTIVITIES

University of Messina

- 2021- present Mechanical technology
(Bachelor of Engineering School of Management engineering - 9 credits) .
- 2020- present Product and process Innovation management
(Master's degree in Electronic Engineering for industry –6 credits)
- 2019 - 2020 Production technology for biomanufacturing
(Master's degree in Mechanical Engineering - 6 credits)
- 2002 – 2021 Mechanical technology
(Bachelor of Engineering School of Industrial Technology - 6 credits)
- 2015 - 2018 Production and process technology
(Master's degree in Mechanical Engineering 6 credits)
- 2005 - 2014 Mechanical technology II
(Master's degree in Mechanical Engineering – 6 credits)
- 2003 - 2004 Shipbuilding technology
(Bachelor of Engineering School of Naval engineering - 6 credits)
- 2002 – 2008 Mechanical plants
(Bachelor of Engineering School of Industrial Technology - 6 credits)
- 2002 – 2005 Mechanical technology
(Master's degree in Materials Engineering– 5 years)

RESEARCH ACTIVITY

The scientific activity has been developed in the field of Manufacturing, mainly on topics related to the study of mechanical and adhesives connections. Non-conventional joining techniques have been studied, performing modelling and experimental characterization of mechanical connections of similar and dissimilar materials, including riveting (self-piercing riveting), clinching and hybrid and innovative techniques (like Friction Stir Welding and orbital riveting). The mechanical characterization, study, and development of materials have been performed with the aim of enhancing their performance and sustainability. Several materials and application fields have been addressed.

The overall scientific production is made of more than 110 papers. 62 of the scientific papers are counted in Scopus with a total number of 1,228 citations, with h- index =20.

RESEARCH PROJECTS AND TECHNOLOGY TRANSFER

2023 Patent pending: J-go -automated portable friction welding system and device and interconnection element kit supplied with a device of a portable friction welding system.

Patent eligible for funding of "Proof of Concept (POC) "Projects: Portable Automated Friction Welding Device (FreeWelding) - Bando MISE - Missione 1 "Digitalizzazione, innovazione competitività, cultura e turismo" - Componente 2 "Digitalizzazione, innovazione e competitività nel sistema produttivo" - Investimento 6 "Sistema della proprietà industriale" finanziato dall'Unione Europea - NextGenerationEU".

2021 -400h, research activities in the Project: DAS PHANTOMSHIFFE "Sviluppo di sistemi e processi innovativi per tecnologie altamente avanzate nella produzione di imbarcazioni eco-compatibili a bassa segnatura magnetica a elevata schermatura elettromagnetica" MISE PON" Imprese e Competitività" - settore: Fabbrica intelligente. Coordinator prof. E. Proverbio

2019 - 950h, research activities in the Project: SMART- ART: Sviluppo di metodi avanzati di restauro, diagnostica e telecontrollo per la conservazione del patrimonio artistico architettonico. PO FESR 2014/20120. CP 082030000276 - CUP G79J18000620007. Coordinator prof. L. Calabrese

2019 - 800h, research activities in the Project: SIMARE: Soluzioni Innovative per Mezzi navali ad Alto Risparmio Energetico" PO FESR 2014/2020 - C.P. 08ME7219090182 - CUP G48I18001090007. Coordinator prof. E. Proverbio

2017 - 1330h, research activities in the PON Project: ARS01_00293 THALASSA. Asse II "Sostegno all'innovazione" Area di specializzazione Blue Growth - CUP B46C18000720005. Coordinator prof. E. Proverbio

2017 - ITALIAN PATENT 102017000041086 - L. Calabrese, F. Fabiano, C. Borsellino, L. M. Bonaccorsi, E. Proverbio, R. Ientile, V. Fabiano, V. Filardi, G. Cordasco. "Apparecchio Ortodontico Magnetico".

2015 - 350h, research activities in the Project: PON02-000451_3362185 "INNOVAQUA - "INNOVAQUA - Innovazione tecnologica a supporto dell'incremento della produttività e della competitività dell'acquacoltura siciliana" (WP 2,3,2 Studio preliminare per lo sviluppo di materiali e sistemi funzionali per packaging avanzati - Coordinator Prof. Edoardo Proverbio

2015 - 500h, research activities in the Project: PON02_00153_2939517 "TESEO - Tecnologie ad alta Efficienza per la Sostenibilità Energetica ed ambientale Onboard" autorizzato e finanziato dal Ministero dell'Istruzione, dell'Università e della Ricerca con Decreto Prot. n. 635/Ric. del 08/10/2012 nell'ambito del PON&REC 2007/2013.

2015 - ITALIAN PATENT 102015000078743 - L. Calabrese, F. Fabiano, V. Fabiano, L. M. Bonaccorsi, E. Proverbio, A. Capri, C. Milone, C. Borsellino, "Tecnica di realizzazione di rivestimento composito antigraffio

con azioni antimicrobiche/anti-fungine su supporti ortodontici per l'impiego in ambito medico/odontoiatrico".

2013 - 600h, research activities in the Project: PON02_00153_2939568 "Imbarcazione innovativa a sostentamento alare a basso consumo ed elevato confort per trasporto passeggeri" (WP 2.5 - WP 2.6); Coordinator Prof. Edoardo Proverbio

2012- 300h research activities in the Project: INTEP FESR 2007-2013 linea 4.1.2.A CUP J41J1200011000, (Coordinator Prof. Signorino Galvagno)

2006 Coordinator of the Project MIUR ad E.S.I. S.p.A., "ECOPIOMBO", Project n. 12863, (activity "Study and optimization of the lead separation process after the reaction "" Analysis and rheological characterization of the pastel obtained from the grinding of used batteries") 12 month. Eur 100.000

2006 Scientific Coordinator Spin-Off (Fondo per le Agevolazioni alla Ricerca (FAR) art 11 - D.M. 8 agosto 2000 n. 593 - "MATERIALI e Ricerca per la NAUTICA, Development of new composite sandwich structures for pleasure boating Eur 1.015.000

INSTITUTIONAL RESPONSIBILITIES

2015 - present Member of the PhD Board of PhD in Engineering and Chemistry of Materials and Construction, Department of Engineering, University of Messina

2018-2022 Responsible (contact person) for internationalization in the degree programme in industrial engineering.

2014-2018 Rector's delegate of the university building commission - on behalf of the Rector collaborated in the planning of the activities of bringing the classrooms and teaching spaces of the University up to standard

2003 - 2015 Member of the PhD Board of PhD in engineering and materials chemistry, Department of Engineering, University of Messina

2015 - 2020 Member of the board for Quality Assessment of Master Degree in Mechanical Engineering, Department of Engineering, University of Messina

2007-present Responsible for the machining mechanical lab (5Axis CNC milling machine: MAZAK VARIAXIS i-600 -Turning center: YAMAZAKI MAZAK - QUICK TURN NEXUS 200MY mk II - Geared head drill press "Sermacc - R40", Power Engine Kw 1,84 - Knee-and-column Milling machine ITAMA FV 60-ing kw 3.75 - Universal Testing Machine (model Tenso Test TT2,5-GU, Lonos, Italy) - 10 N load-cell, sensibility of 0.001 N. 2,5kN load-cell - Precision: UNI - EN 10002/2 - Rotational viscometer with concentric measuring systems Rheomar RM180. 3D Digital microscope/profilometer - HIROX KH8700).

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

1995 - present Associazione Italiana di Tecnologia Meccanica (AITEM).

MAJOR COLLABORATIONS

Prof. RM Chandima Ratnayake, Computer Aided Subtractive (i.e. machining with CNC machines) and Additive (i.e. 3D printing) Manufacturing; Computer aided process planning, Department of Mechanical and Structural Engineering and Materials Science, University of Stavanger, STAVANGER, NORWAY.

Prof. Roman Wdowik, CNC machine tools, computer aided manufacturing, process planning, subtractive machining (mainly grinding, cutting), hybrid systems and processes, Ignacy Łukasiewicz Rzeszów University of Technology, Rzeszów, Poland

Prof. Antonio Nanni, Department of Civil, architectural and environmental engineering, College of Engineering, University of Miami. USA

Member of the research group: TREES-MATS- Technology and Research on Energy, Environment and Safety of Materials and Structures in the Engineering Department of University of Messina. [Technology and Research on Energy, Environment and Safety of Materials and Structures \(cineca.it\)](http://www.cineca.it)

RECENT PUBLICATIONS:

- 2024 Guido Di Bella; Chiara Borsellino; Gianluca Buffa; Michela Simoncini; Archimede Forcellese; Simone Panfiglio . Book chapter DOI: 10.1007/978-3-031-41163-2_14. White Paper on Innovative Joining Technologies for Naval Applications.
- 2023 Di Bella, G., Borsellino, C., Khaskhoussi, A., Proverbio, E.; Effect of Tool Rotation Direction on Mechanical Strength of Single Lap Friction Stir Welded Joints between AA5083 Aluminum Alloy and S355J0 Steel for Maritime Applications. Doi 10.3390/met13020411. Metals
- 2023 .Chairi, M., El Bahaoui, J., Hanafi, I., Favaloro, F., Borsellino, C., Di Bella, G., -Finite Element Analysis of Ceramic–Composite Structures for Ballistic Applications: Effect of Ceramic Thickness and Cell Structure. 10.1002/adem.202301089
- 2023 Di Bella, G.; Favaloro, F.; Borsellino, C. Effect of Process Parameters on Friction Stir Welded Joints between Dissimilar Aluminum Alloys: A Review. Metals, 13, 1176. <https://doi.org/10.3390/met13071176> Academic Editor: Masahiro Fukumoto
- 2023 Marabello, G. | Borsellino, C. | Di Bella, G. - Carbon Fiber 3D Printing: Technologies and Performance—A Brief Review. 10.3390/ma16237311
- 2022 Khaskhoussi A, Di Bella G, Borsellino C, Calabrese L, Proverbio E. Microstructural and electrochemical characterization of dissimilar joints of aluminum alloy AW5083 and carbon steel S355 obtained by friction welding. Metallurgia Italiana; 9: 15-21.
- 2022 Di Bella G, Alderucci T, Favaloro F, Borsellino C. The Effect of Thickness on Strength of Single Lap Orbital Riveted Aluminum/Composite Joints Used in Marine Environments. Metals; 12: 2068. <https://doi.org/10.3390/met12122068>
- 2022 Guido Di Bella, Tiziana Alderucci, Chiara Borsellino, Riccardo Miranda & Antonino Valenza. Comparative analysis between co-curing and adhesive bonding of glass-epoxy composite laminates and AA5083 aluminium sheets for Maritime application: effect of surface pattern, Journal of Adhesion Science and Technology, DOI: 10.1080/01694243.2022.2054603
- 2021 Alderucci T., Borsellino C., Di Bella G., Favaloro F., Effect of Temperature on Curing Time of Single-Lap Adhesive Joints in Marine Applications 10.3390/CMDWC2021-10002 2021 Material Proceedings - Mater. Proc. Open Access 4 0,40
- 2021 Alderucci T., Borsellino C., Di Bella G. -Effect of surface pattern on strength of structural lightweight bonded joints for marine applications. International Journal of Adhesion and Adhesives DOI:10.1016/j.ijadhadh.2021.103005. pp.103005-103018. ISSN:0143-7496
- 2021 Di Bella, G.; Calabrese, L.;Borsellino, C.; Alderucci, T. Effect of Sheets' Thickness and Rivet Geometry on Mechanical Properties of Orbital Riveted Aluminium Joints: Experimental and Numerical Analysis. J. Manuf. Mater. Process., 5, 102. <https://doi.org/10.3390/jmmp5040102> Manuscript ID: jmmp-1376476 - Open Access Q2 4 0,40 Scopus
- 2021 C. Borsellino, S. Urso, T. Alderucci, G. Chiappini, M. Rossi, P. Munafò- Temperature Effects On Failure Mode Of Double Lap Glass-Aluminum And Glass-Gfrp Joints With Epoxy And Acrylic Adhesive. International Journal of Adhesion and Adhesives Volume 105, March 2021, 102788 -<https://doi.org/10.1016/j.ijadhadh.2020.102788> -s2.0-S0143749620302517

RECENT PUBLICATIONS:

- 2020 De Domenico, Dario; Urso, Santi; Borsellino, Chiara; Spinella, Nino; Recupero, Antonino Bond behavior and ultimate capacity of notched concrete beams with externally-bonded FRP and PBO-FRCM systems under different environmental conditions. Construction And Building Materials. DOI:10.1016/j.conbuildmat.2020.121208. pp.1-16. - ISSN:0950-0618 vol. 265
- 2020 Urso S., Alderucci T., Borsellino C., Compatibility and temperature effect on hybrid painted glass-aluminum bonded joints, Journal of Building Engineering, Journal of Building Engineering, 31, 101371, <https://doi.org/10.1016/j.jobbe.2020.101371>ISSN:2352-7102.
- 2019 Urso, S.; Hadad, H. A.; Borsellino, C.; Recupero, A.; Yang, Q. D.; Nanni, A. 2019. Numerical modelling of FRCM materials using augmented-FEM. DOI:10.4028/www.scientific.net/KEM.817.23. pp.23-29. In KEY ENGINEERING MATERIALS - ISSN:1013-9826 vol. 817
- 2019 D. De Domenico, G. Ricciardi, R. Montanini, A. Quattrocchi, C. Borsellino, G. Benzoni –“Experimental thermo-mechanical behavior of double curved surface sliders under bidirectional excitation” 16WCSI – 1st-6th july2019 S. Pietroburgo
- 2018 R. Wdowik, M. Magdziaka , R.M. C. Ratnayakeb , C. Borsellino. “Application of process parameters in planning and technological documentation: CNC machine tools and CMMs programming perspective”. 6th CIRP Global Web Conference “Envisaging the future manufacturing, design, technologies and systems in innovation era” - Procedia CIRP.
- 2018 Di Bella, C. Borsellino, L. Calabrese, E. Proverbio, Durability of orbital riveted steel/aluminium joints in salt spray environment, Journal of Manufacturing Processes, Volume 35, Pages 254-260, ISSN 1526-6125, <https://doi.org/10.1016/j.jmapro.2018.08.009>.
- 2018 T. Alderucci, V. Terlizzi. S. Urso, C. Borsellino, P. Munafò, Experimental study of the adhesive glass-steel joint behavior in a tensegrity floor, International Journal of Adhesion and Adhesives 85. 293-302; <https://doi.org/10.1016/j.ijadhadh.2018.04.017>

I AUTHORIZE THE PROCESSING OF MY PERSONAL DATA PURSUANT TO LEGISLATIVE DECREE 30 JUNE 2003, N. 196 AND THE GDPR (EU REGULATION 2016/679).

Messina, February 2024

