

Elena Colombini

EDUCATION

- 2013 PhD title in High Mechanics and Automotive Design and Technology - Title of thesis: Lightweight Hybrid Structures: Nickel Aluminides and Carbon Nanotubes for High Temperature Applications " at University of Modena and Reggio Emilia, Department of Engineering "Enzo Ferrari".
- 2009 Bachelor degree summa cum laude in Design and Development of New Materials (Title of thesis: Correlation between microstructure with mechanical properties of AlSi7Mg0.3 components produced by shell molding) at University of Modena and Reggio Emilia, Department of Engineering "Enzo Ferrari".

RESEARCH and DIDACTIC ACTIVITY

She has presented her research activity in a several number of national and international congresses in the field of microwave applicator design and of microwave applications to powder metallurgy, trying to develop new processes or to enhance materials properties. During last decade he has been using commercial electromagnetic modelling software (Concerto 3.5, Comsol Multyphysics) in order to design new microwave applicators for high and low temperature heat treatments and microwave plasmas.

Her scientific and technological skills are in the metallurgy field and is mainly focused in the study and development of new materials and processes, preferably involving thermal applications of microwaves. Since 2016 her research was focused on High Entropy Alloys (HEAs). The microwave assisted synthetic route was broadly developed by our group to synthesize intermetallics, FGM and now high entropy alloys. Starting from literature composition several modifications have been studied (adding for example Cu, Al, Mo, Zr elements or SiC compound) and synthesized by microwave activation synthesis. The results were compared with traditional techniques (mechanical alloying, SPS, conventional furnaces). She spent one year at the Department Aeronautics and Astronautics (MIT) as Visiting Student. The project was sponsored by Ferrari GeS S.p.A and it grew out of a PhD project based on the study of lightweight hybrid structures for High Temperature Applications.

She has been involved in LIFE+ projects: LIFE10 ENV/IT/000419 - WASTE3, involving the recycling of copper metallurgy waste using also microwave heating and for microwave applications and LIFE13 ENV/IT/000593 - Titanium life in titanium hands, regarding the recycling of Ti turnings using microwave assisted combustion synthesis (responsible of Unit).

At present she is involved as scientific responsible in: "Fondo per il Programma Nazionale della Ricerca (PNR) e Progetti di Ricerca di Rilevante Interesse Nazionale Missione 4 - Componente 2, dalla Ricerca all'Impresa; decreto di ammissione al finanziamento del 01/09/2023, named STEVE - Small-scale Thermomagnetic Energy harvesters: from materials to devices" cod. Progetto P2022KMXBL.

AFFILIATION

Member of:

- Ampere (Association for Microwave Power in Europe for Research and Education) since 2016 (www.ampereurope.org)
- Italian Metallurgical Association (AIM - Associazione Italiana di Metallurgia) since 2010 (www.metallurgia-italiana.net)