



# PhD in INGEGNERIA DEI MATERIALI / MATERIALS ENGINEERING - 38th cycle

PNRR\_352 Research Field: DEVELOPMENT OF BIOBASED ADDITIVES FOR HIGH  
PERFORMANCE RESINS IN THE FIELD OF SUSTAINABLE COATINGS

Monthly net income of PhDscholarship (max 36 months)

€ 1325.0

In case of a change of the welfare rates during the three-year period, the amount could be modified.

## Context of the research activity

Motivation and objectives of the research  
in this field

The JRC technical report (JRC124141) states that: "Bio-based alternatives, substituting conventional fossil technologies, offer **potential solutions** for decarbonising chemical activities and **additional** [MA1] **environmental benefits**."

Moreover, Italy's recovery and resilience plan (PNRR) supports the green transition in energy efficiency in residential and public buildings, sustainable mobility and development of renewable energies and the **circular economy** and improvement in waste and water management. Within this framework the present project aims to develop and characterize sustainable biobased additives for the industries of organic coatings. The research activities will be planned in compliance with the new European policies in order to meet climate and energy targets for 2030 as well as to reach the objectives of the European Green Deal.

The search of new biobased additives has also the ambition of shifting the industries of organic coatings towards the realm of environmentally sustainable activities in accordance with the EU taxonomy. Moreover, the EU circular economy action plan will be attentively accounted for when selecting raw materials. Therefore, in the formulation of the new additives some fundamental criteria will be the valorization of waste biomasses, local byproducts of the agri-food supply chain, and biopolymer wastes. The environmental sustainability of any new product developed in this project will be assessed by the



	<p>LCA methodology, to minimize carbon footprint and embodied energy.</p> <p>The research will profit of the longstanding experience in synthesis and formulation of additives of CHEMISOL staff. Moreover, company laboratories and facilities will be fully available for the PhD candidate who will have the possibility to spend working periods in the Castellanza headquarter. CHEMISOL will also exploit its supply chain network to create added value knowledge.</p>
<p><b>Methods and techniques that will be developed and used to carry out the research</b></p>	<p>The research includes activities of:</p> <ul style="list-style-type: none"> <li>• Synthesis and Formulation of biobased additives</li> <li>• Chemical characterization of biobased additives</li> <li>• Innovative coating formulation</li> <li>• Physical, Microstructural and Mechanical characterization of the coated material</li> <li>• Environmental sustainability analysis via LCA.</li> </ul>
<p><b>Educational objectives</b></p>	<p>The research activity should contribute to forming a professional figure in the chemical and material sector who has the adequate knowledge to synthesize and formulate new biobased additive for coatings technology with the aim of increasing sustainability awareness in this sector.</p>
<p><b>Job opportunities</b></p>	<p>The job opportunities will be in the chemical and materials sector under different professional skills: marketing, production and designer.</p>
<p><b>Composition of the research group</b></p>	<p>1 Full Professors 2 Associated Professors 1 Assistant Professors 6 PhD Students</p>
<p><b>Name of the research directors</b></p>	<p>Prof. Gallo Stampino/Dotelli -Dr.Gioanola Chemisol</p>

<b>Contacts</b>
<p><a href="https://mat4en2.cmic.polimi.it">https://mat4en2.cmic.polimi.it</a> <a href="https://www.chemisol.it">https://www.chemisol.it</a></p>



Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad	
Amount monthly	662.5 €
By number of months	6

National Operational Program for Research and Innovation	
Company where the candidate will attend the stage (name and brief description)	CHEMISOL ITALIA SRL - Via Sempione, 13- - 21053 Castellanza (VA) <a href="https://www.chemisol.it">https://www.chemisol.it</a>
By number of months at the company	6
Institution or company where the candidate will spend the period abroad (name and brief description)	The PhD student will be expected to spend a period abroad (at a research center to be defined in accordance with CHEMISOL) to interact and participate in joint research activities potentially foreseen in the project, according to specific experimentation needs
By number of months abroad	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
<p><b>Individual budget for research</b> (during the 3 years): about 5.400 euro</p> <p><b>Teaching assistantship:</b> availability of funding in recognition of supporting teaching activities by the PhD student. There are various forms of financial of for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities within the limits allowed by the regulation.</p> <p><b>Confidentiality:</b> since this is a thematic scholarship, the management of Confidential Information, Results and their publication is subordinate to the restrictions agreed upon with the funding company. Upon acceptance of the scholarship, the beneficiary must sign a specific commitment.</p>