



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

**THEMATIC Research Field: ENVIRONMENTAL AND PERFORMANCE EVALUATIONS OF FLEXIBLE POLYMER-BASED PACKAGING MATERIALS TO BE USED IN FOOD AND INDUSTRIAL SECTORS.**

**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 "Packaging and packaging waste directive", issued in 1994, had the ambition to regulate packaging design and packaging waste in order to reduce the ever-increasing amount of waste produced in this specific field ([https://environment.ec.europa.eu/topics/waste-and-recycling/packaging-waste\\_en](https://environment.ec.europa.eu/topics/waste-and-recycling/packaging-waste_en)).

In particular, plastics materials are emerged as a global problem in waste management. As a consequence, the European Commission launched a plastics strategy in 2018 with the specific aim of transforming the way plastic products are designed, produced, used and recycled. Then, in 2019 the goal of the Single-use Plastics Directive was just "to prevent and reduce the impact on the environment of certain plastic products and to promote a transition to a circular economy?"

In particular, the EU strategy foresees that by 2030 all plastic packaging should be reusable or recyclable in a cost-effective manner. Within this EU framework, the objective of this project is to select new plastics materials and design cost-effective flexible packaging. Moreover, environmental sustainability and circularity will be fundamental selection criteria adopted in materials selection. Indeed, environmental performances of every flexible packaging designed during the research will be assessed via Life Cycle Assessment.



	Thanks to the collaboration with the company Goglio, a large share of primary data on production processes will be made available for LCA studies.
<b>Methods and techniques that will be developed and used to carry out the research</b>	The research will be carried out in strict collaboration with Goglio SpA, a company which is leader in flexible packaging production. The Company can host the PhD student and share his technical facilities in terms of testing, formulation and processing of packaging. Indeed, the research can include activities of:- Selection and chemical characterization of polymers and additives- Physical, Microstructural and Mechanical characterization of the materials- Design of innovative packaging- Evaluation of end-of-life strategies- Environmental sustainability analysis via LCA
<b>Educational objectives</b>	The research activity should contribute to forming a professional figure in the packaging and materials sector who has the adequate knowledge to design advanced flexible packaging with a special focus on increasing sustainability awareness in this sector.
<b>Job opportunities</b>	The job opportunities will be in the packaging and materials sector under different professional skills: marketing, production and designer.
<b>Composition of the research group</b>	1 Full Professors 2 Associated Professors 1 Assistant Professors 6 PhD Students
<b>Name of the research directors</b>	Prof. Giovanni Dotelli

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

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

<b>Scholarship Increase for a period abroad</b>
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Amount monthly	662.5 €
By number of months	6

**Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information**

**Confidentiality:** 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.

**Individual budgetfor research** (during the 3 years): about 5.400 euro

**Teaching assistantship:** 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.