POLITECNICO DI MILANO

PhD in INGEGNERIA STRUTTURALE, SISMICA, GEOTECNICA / STRUCTURAL SEISMIC AND GEOTECHNICAL ENGINEERING - 41st cycle

THEMATIC Research Field: DEVELOPMENT OF INNOVATIVE MATERIAL MODELS AND NUMERICAL METHODS RELATED TO CARDBOARD FOOD PACKAGE FORMING PROCESSES

Monthly net income of PhDscholarship (max 36 months)
1500.0 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 supervising research group has a consolidated experience in the formulation of inelastic material models, including fracture and delamination. The objective of the project is to extend a state-of-the-art model to accurately represent out-of-plane failure mechanisms in paperboard, in particular the delamination of board plies, using of the phase-field approach. The model will be grounded in experimental evidence from literature and ongoing industrial methods. Collaboration with Max IV facilities in Lund, Sweden, will enable a deep investigation of the microscopic phenomena leading to a macroscopic collapse of the material. The ultimate goal is to develop advanced virtual simulation tools to improve the efficiency of carton package and filling equipment design. The project is supported and will be carried out in strict collaboration with Tetra Pak Packaging solutions.
Methods and techniques that will be developed and used to carry out the research	The research consists mainly in the theoretical development and implementation of innovative material models and numerical simulation tools, involving advancements in existing computational methodologies such as elastoplastic FEM, and phase-field fracture models.

Educational objectives	The Ph.D. student engaged in this project is expected to acquire the ability to tackle complex problems in nonlinear solid mechanics and to develop effective problem-tailored solution procedures.
Job opportunities	There is a growing need for post-docs with specific expertise in computational mechanics and in the modeling of complex engineering problems, applicable both to civil engineering structures/infrastructures and to industrial components.
Composition of the research group	2 Full Professors 0 Associated Professors 0 Assistant Professors 0 PhD Students
Name of the research directors	C. Comi, U. Perego

Contacts
claudia.comi@polimi.it - +390223994215 umberto.perego@polimi.it - tel. +390223994214 www.dica.polimi.it

Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents	--

Scholarship Increase for a period abroad	
Amount monthly	750.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
List of Universities, Companies, Agencies and/or National or International Institutions that are cooperating in the research:

Universities:

•Lund University, Lund, Sweden

National/International Institutions:

•Tetra Pak Packaging Solution (Modena)

Educational activities (purchase of study books and material, funding for participation to courses, summer schools, workshops and conferences): financial aid per PhD student per year. The Ph.D. course supports the educationalactivities of its Ph.D. students with an additional funding equal to 10% of the scholarship, startingfrom the first year.

Teaching assistantship: availability of funding in recognition of support to teaching activities by the PhD student. There are various forms of financial aid for activities of support to the teaching practice. The PhD is encouraged to take part in these activities, within the limits allowed by the regulations.

Computer availability: each Ph.D. student has his/her own computer forindividual use.

Desk availability: each Ph.D. student has his/her own desk, cabinet and locker.