

Post-doctorate: Modeling Polyolefin Foaming in Extrusion (F/H)

LOCATION 1 RUE CLAUDE DAUNESSE 06904 SOPHIA ANTIPOLIS
SCHOOL MINES Paris - PSL

WORKING ENVIRONMENT AND CONTEXT

Since its creation in 1783, MINES Paris - PSL has been training very high-level engineers capable of solving complex problems in a wide variety of fields.

As the leading engineering school in France by its volume of contract research, MINES Paris - PSL provides a significant research activity oriented towards industry. Its fields of research range from energy to materials, through applied mathematics, geosciences and economic and social sciences. The engineering school is also developing the creation of teaching and research chairs on emerging themes.

Notre établissement fait partie de l'Université PSL. Située au cœur de Paris, celle-ci fait dialoguer tous les domaines du savoir, de l'innovation et de la création. Classée parmi les 50 premières universités mondiales, elle forme au plus près de la recherche des chercheurs, artistes, ingénieurs, entrepreneurs ou dirigeants conscients de leur responsabilité sociale, individuelle et collective.

HOSTING STRUCTURE

Initially restricted to thermoplastics with low glass transition temperatures, the filament extrusion technique has evolved to enable the manufacture of high value-added applications - functional or even critical parts. It is now possible to work with materials with higher glass transition temperatures, such as thermostable thermoplastics. The objective of the SPRING project is to make progress in the use of thermostable thermoplastics reinforced with several millimetre fibres using the FDM process. The knowledge developed should make it possible to produce parts with very good mechanical, static and fatigue properties, including temperature (250°C). This requires the use of technical polymer matrices whose intrinsic characteristics are not fully known, particularly in the still atypical conditions imposed by additive manufacturing. This project led by INOVSYS (Plateforme Mutualisée d'Innovation) will be carried out in collaboration with the Institut de Recherche Dupuy de Lome (IRDLD) - UBS (Université de Bretagne Sud) and the Laboratoire de Mécanique et d'Acoustique (LMA).

TEACHING MISSION

RESEARCH MISSION

CENTRE DE MISE EN FORME DES MATÉRIAUX (CEMEF)

The Centre de Mise en Forme des Matériaux (CEMEF) offers its expertise in the characterization and physical modeling of the rheological, mechanical and crystallization behavior of polymers. It will carry out, in interaction with UBS and LMA, on the existing means, characterizations of matrices, provided by the partners, useful for these models and the understanding of the process. They will aim at helping the understanding of the state of the material in the filament deposition and consolidation phases. They are intended to provide parameters for the modelling of the state of strain generated in FDM.

The properties explored could be :

- Heat capacity.
- Solid viscoelasticity.
- Fluid viscoelasticity.
- Thermal conductivity in the solid state.
- For semi-crystalline polymers and for conditions as close as possible to the process:
 - i) Global crystallization kinetics;
 - ii) viscoelasticity in the solid-liquid and liquid-solid transition zone;
 - iii) spherulitic growth and germination.
- For amorphous polymers and for conditions as close as possible to the process, the glass transition temperatures.

SKILLS

Le candidat recherché devra être titulaire d'un doctorat en science et génie des matériaux. Il devra posséder de solides compétences en polymères.

SPECIAL REQUIREMENTS

L'étude se déroulera au Centre de Mise en Forme des Matériaux (CEMEF), à Sophia-Antipolis.

NON DISCRIMINATION, OUVERTURE ET TRANSPARENCE

Notre établissement, comme l'ensemble de l'Université PSL, s'engage à soutenir et promouvoir l'égalité, la diversité et l'inclusion au sein de ses communautés. Nous encourageons les candidatures issues de profils variés, que nous veillerons à sélectionner via un processus de recrutement ouvert et transparent.

APPLICATION PROCESS

Pour postuler, utiliser le formulaire en ligne via le bouton Postuler

Contacts des encadrants :

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CONTACT

<https://applyfor.cemef.mines-paristech.fr/postdoctoral/>

OTHER INFORMATION

Recherche principal : **Ingénierie** Recherche secondaire : **Ingénierie des matériaux**
Durée du contrat 12 months

Experience years
Niveau doctorant (R1) an

Reference
123

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