

## **MATERIAL SCIENCE ENGINEER / POST-DOCTORATE** **6-MONTH CONTRACT**

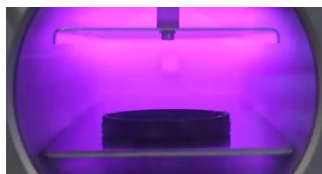
### **Subject: Study of the influence of plasma treatment conditions for NiCr alloys on surface functionalization and adhesion properties**

As part of a research project to develop a plasma-based surface treatment of metal alloys, Ecole des Mines de Paris and Armines are recruiting an engineer, or post-doctoral position, for a **6-month** mission at their Sophia Antipolis site, in partnership with Nice-based Vishay Sfernice.



Vishay is a world-renowned company (23,000 employees at over 120 sites), a leader in the active and passive electronic components. The Vishay Sfernice division in Nice (06-FR) designs, develops and produces electronic components. Various manufacturing processes are used, including vacuum deposition, electrochemistry, dry or wet etching, heat treatment, chemical and plasma treatments.

The objective of the project is to determine, qualify and participate in the implementation of a new *plasma surface treatment*, replacing an existing process, in order to improve adhesion, reproducibility and homogeneity during the assembly of materials.



On the base of promising initial trials carried out by Vishay, the aim of the assignment will be to:

- Carry out a complete bibliographical study on plasma treatment applied to the cleaning and surface functionalisation of nickel- and chromium-based metal alloys.
- Identify plasma equipment suppliers and take part in writing the specifications.
- Establish and manage a surface treatment experimental plan on existing plasma devices at Vishay in Nice and on a plasma reactor prototype at PERSEE Mines Paris centre in Sophia-Antipolis. Possibly, trials at plasma suppliers.
- Carry out surface characterisation (*XPS*, *SEM*, *wettability*) at CEMEF Mines Paris research centre in Sophia-Antipolis.
- Develop a quantitative adhesion test in the research laboratory.
- Help the production plant to identify and deploy a quality control tool for in-plant adhesion.



The DNA of tech.



The scientific objective is to study the influence of plasma treatment conditions for NiCr alloys on the surface functionalisation and adhesion properties of an electrochemically deposited copper coating.

To carry out this study, we are looking for an engineer or master's degree in materials science with *a good knowledge of surface science*. Knowledge of electrochemistry and/or plasma treatment would be highly appreciated. This assignment may also be suitable for a PhD graduate, in which case the contract and remuneration will be adapted to become a post-doctorate.

The scientific part of the assignment will take place on the *campus of the Ecole des Mines de Paris in Sophia-Antipolis*, while the industrial part will be carried out at Vishay in Nice. Sophia Antipolis, Europe's leading technology park with more than 2,500 companies and over 40,000 employees, is located between the town of Antibes and the village of Valbonne, 20 km from Nice.

The company expects a highly operational involvement in the running of this project. The engineer will have to manage the factory tests and sample preparation, analyse the data and propose test plans and solutions.

Key words: Plasma, NiCr metal alloy, NiCr foil, copper deposition, surface treatment, adhesion.

Remuneration: between 2350 € and 3200 € gross per month, depending on level of qualification ( Master / Engineer / PhD) and experience.

Start: January 2024

To submit your application, use the online form on the page  
<https://www.cemef.minesparis.psl.eu/en/postdoctorate>  
or directly on <https://applyfor.cemef.mines-paristech.fr/postdoctoral/>

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