

**PhD SCHOLARSHIP APPLICATION FORM 2016**

ORGANISATION Business Division Business Area	<b>TECNALIA RESEARCH &amp; INNOVATION</b> INDUSTRY AND TRANSPORT Foundry and Steel Industry
Scholarship location Province/Building	BIZKAIA, Parque Tecnológico de Bizkaia. Edificio 700-Derio
Tutor	Dr Iban Vicario

**SCHOLARSHIP DESCRIPTION**

**Title: Development of new High Entropy Alloys (HEA)**

**Brief Description of Scholarship:**

Development of new metallic High Entropy Alloys (HEA). These alloys are currently demanded by the car and electronic industry as part of its search for new features. European projects are the main field where large industries and centres are making an effort to develop these types of alloys.

**Scholarship description:**

These types of alloys require an advanced metallurgical knowledge and extended experimentation to enable a corroboration of structural properties in a laboratory. The scholarship will focus on searching and identifying alloy components which enable a crystalline structure transformation while generating slide planes and crystalline deformations thereby increasing their properties.

Once the theoretical study regarding the search for information and specific metal transformation-based software simulations have been carried out, the next step will be material acquisition and specimen preparation. Finally, tests will be carried out and pilot prototypes manufactured to validate the new materials.

This development aims at obtaining new patents and seeks to be supported by European and national projects.

The following tasks will be carried out:

- Theoretical study of HEAs
- Micro-structural Alloy component analysis and simulations of HEAs

- Laboratory development of new HEAs
- Material acquisition and test preparation
- Prototype definition and property characterisation

The candidate will be trained in:

- Processing techniques to produce components by liquid metal manufacturing routes and everything related to casting processes.
- Learning about material micro-structures, micro-structure concepts, phases and everything related to metallurgy.
- Training and hands-on experience with die casting and gravity casting
- Training in experiment design
- Training in material characterisation: metallography, destructive and non-destructive testing.
- Training in European proposal preparation Technical reports and publications

It would be interesting to carry out the PhD at the Bilbao Higher School of Industrial Engineering and particularly in collaboration with the materials /metallic materials engineering department.

#### **Requirements:**

The PhD candidate shall meet the following requirements:

- Qualification and Specialty: A degree or equivalent qualification in any of the following: Material Engineering / Mechanical Engineering / Engineering
- Languages: Very advanced English level
- IT skills: Microsoft Office.
- The following will be a plus:
  - Proactivity and motivation in the field of research and metallurgy.
  - Knowledge on metallurgy and testing
  - Work experience and studies