

Post-Doc position



Improvement of the tribological behavior of materials for heads of hip joints by modification of surface topography

Country: France

Duration: 12 months

Start: October 2013

Salary net: 2390 euros per month

Employer: Université de Lyon <http://www.universite-lyon.fr/>

Scientific program: LABEX MANUTECH-SISE <http://manutech-sise.universite-lyon.fr/>

Localization of the Post-Doc: Laboratoire de Tribologie et Dynamique des Systèmes (LTDS), Ecole Centrale de Lyon (Ecully - Lyon, France) <http://lt ds.ec-lyon.fr>

Partners:

- Laboratoire Georges Friedel (LGF, Ecole des Mines de St-Etienne, St-Etienne) <http://www.emse.fr/spip/-Laboratoire-Georges-Friedel-UMR-.html>
- Manutech USD in St-Etienne

Scientific leader: Dr Vincent FRIDRICI (LTDS) vincent.fridrici@ec-lyon.fr

Other scientific leader: Dr Jean GERINGER (LGF)

Skills:

We are looking for a post-doc researcher who had some research activities in at least one of these fields: tribology (in particular bio-tribology), surfaces modifications, surface characterization, materials science and engineering. The proposed work is mainly experimental, with tribological tests and surface characterization. So, the post-doc researcher should have good experimental skills. Fluency in English and/or French is required. Good communication skills will be appreciated, for this work with many interactions with different research labs and companies.

Scientific context:

Smooth surfaces are usually used for bearing surfaces in hip joints. As, in the last years, bulk materials have been optimized for this application (use of hard / hard bearings: metal on metal or ceramics on ceramics, with improved alumina-zirconia composites), one of the only way to increase the durability of this contact is to optimize its surface topography.

The objective of the proposed post-doc work is to initiate innovative research in the field of surface topography for heads of hip joints. In collaboration with partners that are specialist of surface modification, the proposed work consists in improving the understanding of the tribological behavior of heads of hip joints in relationship with its surface topography properties.

Studied surfaces will be smooth surfaces with different polishing parameters and surfaces treated by laser to produce ripples or micro-cavities or surfaces modified by mechanical techniques. In all cases, the understanding of the friction and wear mechanisms of the surfaces will allow us to optimize the surface morphology parameters, via mastering the interactions between surface modification process parameters and surface morphology and resulting tribological behavior.

Expected results are of big interest for patients, clinicians and industry.

Proposal of work program:

- Bibliography survey on tribology for hip joints and surface topography modifications
- Study and understanding of the tribological behavior of the surfaces in different conditions representative of the application (tribological test devices for femoral head of hip joints are available in the labs)
- Optimization of surface topography parameters
- Validation of proposed improvements

Contact:

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Please, send resume and cover letter by email before May 17th, 2013.