

UNIDEMI – Research Unit in Mechanical and Industrial Engineering

Title: Research Interests

Research Team: MTA



R&D Unit in Mechanical and Industrial Engineering



Prof. Rosa Miranda

Associate Prof with Habilitation in Mechanical Technology
Welding Eng, IWE/EFW, 1982
Main Previous positions:
Assistant, IST
Head of High Power Beams Lab., ISQ
Assessor of R&D Dept., ISQ
Invited Prof., Coimbra Univ.
Researcher at IDMEC

Objectives

Main research interests:

Welding and joining technologies

- Process development
- Welding metallurgy
- Effect of shielding gases in arc welding, fume and nanoparticles analysis

Laser welding

Laser additive manufacturing

Nanojoining with silver nanoparticles

Friction Stir Welding and Processing

Methodology

Cooperation with national and international organizations such as:
IST; Coimbra and Porto Universities - PT
Cranfield University – UK
Waterloo University - Canada
Nantes University and Snecma - FR
Graz University – AT
Laser Center Madrid and Politecnica Univ of Madrid – SP
Bucharest and Timisoara Universities – RO
Tshingua University - China

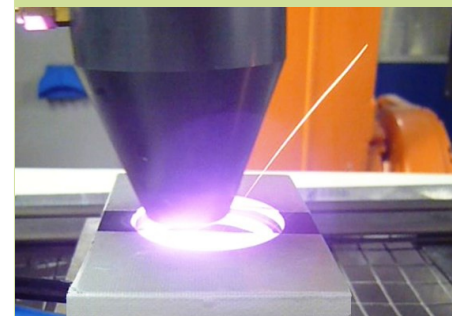
Expected Results

MICROBOND - PTDC/EME-TME/100990/2008 - Joining micro to small scale systems in shape memory alloys using last generation infrared lasers

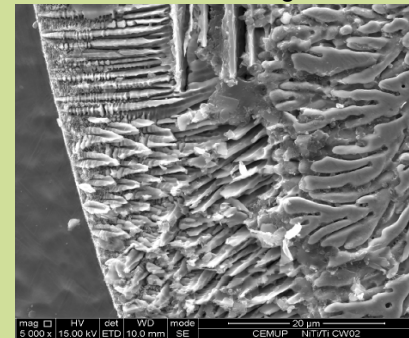
Establish boundaries of applicability (technological and economical) to join shape memory alloys in micro components or in larger ones, but within a small scale for aeronautic and biomedical applications.

FRISURF - PTDC/EME-TME/103543/2008 - Technology developments of Friction Stir Processing to produce Functionally Graded Materials and improve surfaces for advanced engineering applications

Develop FS and FSP technologies; Optimize tools; Produce surface coatings; Exploit industrial applications



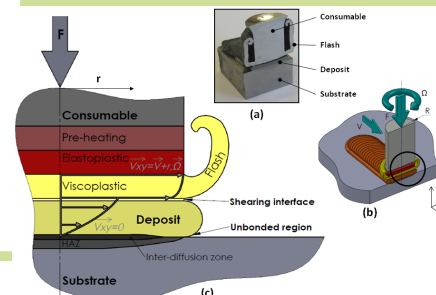
Laser welding



Laser welded Ti6Al4V



Friction Surfacing



Process modelling