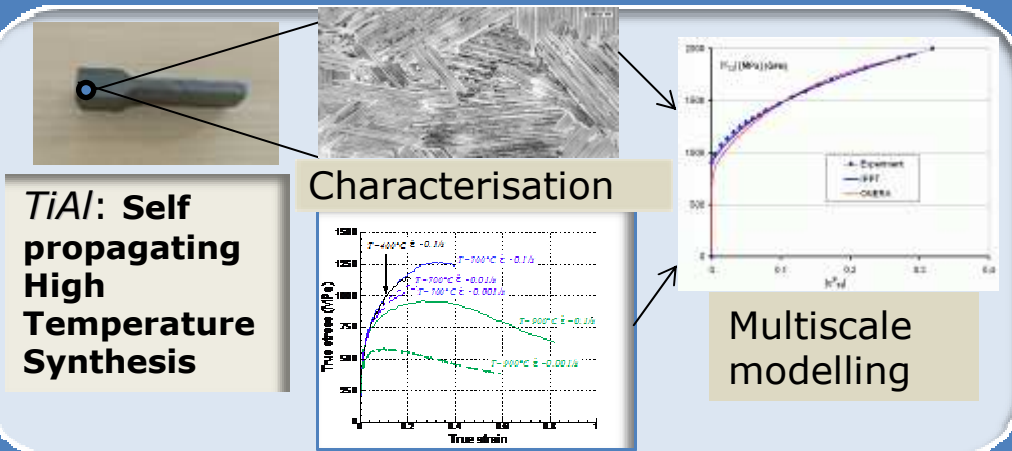
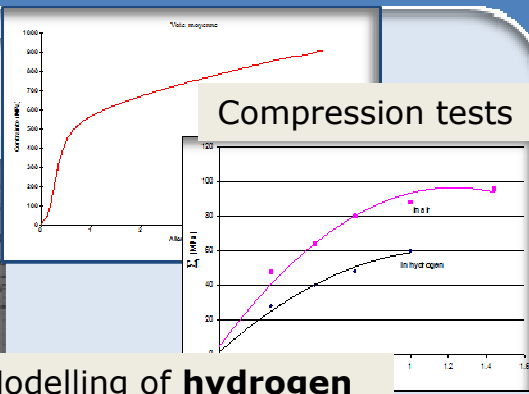
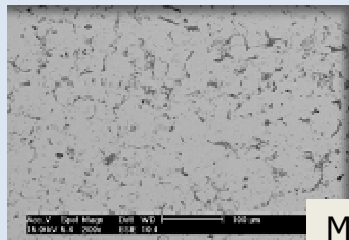


HIMOLO: Intermetallics for High, Moderate and Low temperature applications

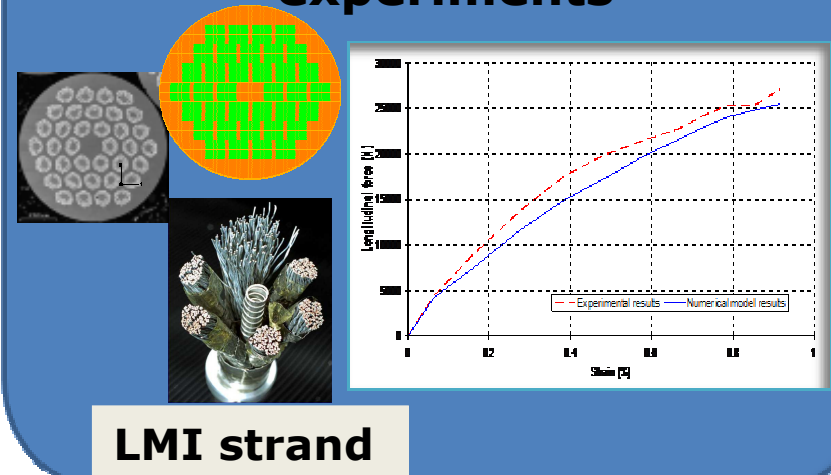
- Definition and optimisation of new processing routes for TiAl, FeAl
- Characterisation and modelling of obtained materials



FeAl: Two stage reaction sintering



Modelling of Nb₃Sn for ITER, Validation based on experiments

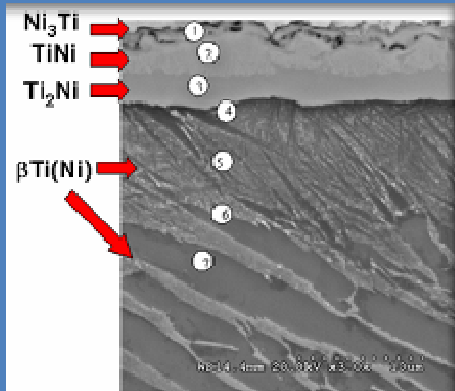


PROJECT PARTNERS

UM (Metz, F; Coordinator), INASMET (San Sebastian, S), IFM (Gliwice, PL), ONERA (Chatillon, F), EADS (Paris, F), IPPT (Warszawa, PL), UNIPAD (Padova, I), IMBAS (Sofia, BG), AGH (Krakow, PL), UH (Hatfield, UK), LMT (Cachan, F), UNIVPM (Ancona, I), MCL/MUL (Leoben, A)

FIMLA: Thin Films and Intermetallic Layers

Production of intermetallic coatings using a duplex treatment



Improvement of Materials Surface Properties

Improve the wear resistance of Inconel 600 alloy

Improve the wear resistance of titanium alloys

NiAl Layers

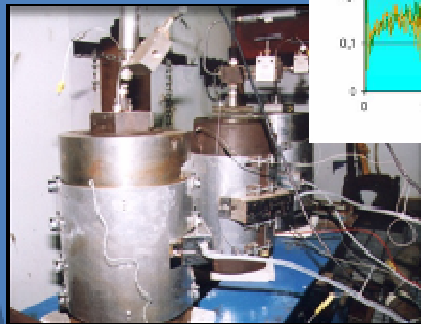
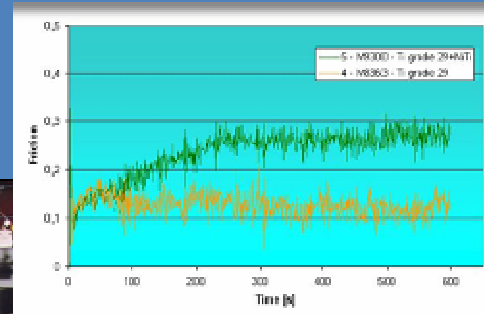
TiAl Layers

NiTi Layers

Retain the mechanical properties of the substrate

Remain stable after exposure to H₂S (O&G Industry)

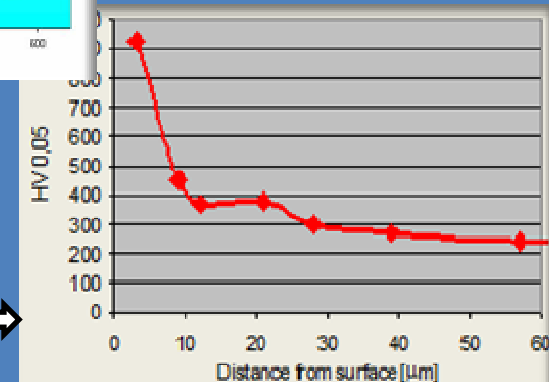
Complex Industrial shapes can be coated



Pressure vessels for H₂S exposure

Ni-Ti layers: Friction

Ni-Ti layers: Microhardness



PROJECT PARTNERS



materials engineering research laboratory



CIDETEC

Centro de Tecnologías Electroquímicas
Centre for Electrochemical Technologies



CRF

CENTRO RICERCHE FIAT

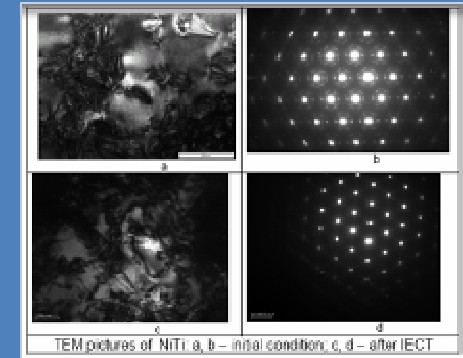
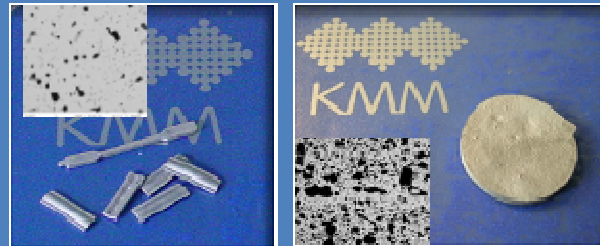


WARSAW UNIVERSITY OF TECHNOLOGY

NITIBIT: Nickel-Titanium Alloys for Biomedical and Transport Applications

Processing

- Multi-stage low-cost processing methods optimised to produce **dense OR porous, high purity NiTi SMA** with required phase transformation
- Properties tailored to requirements using **Impulse Electric Current Treatment**
- **Scaleup to series production (>100 parts)**. Demonstrator produced for automotive application

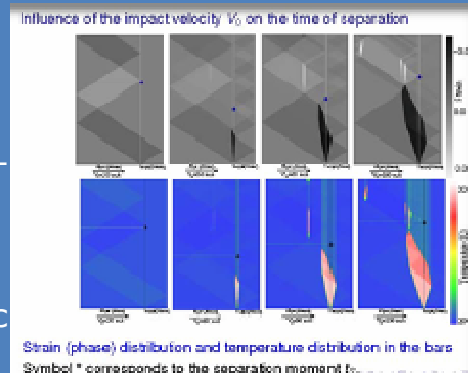


Characterisation

- Hemo- and biocompatibility of NiTi SMA could be improved by **bioactive coatings or plasma immersion ion implantation**
- Preliminary **biocompatibility tests** in simulated body show good biocompatibility

Modelling

- Multiscale model of pseudoelastic behaviour to simulate response of NiTi (non-proportional loading paths)
- Numerical analysis of non-uniform response of polycrystalline NiTi (quasi-static and dynamic loading)



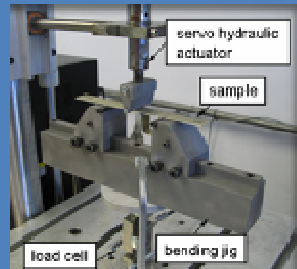
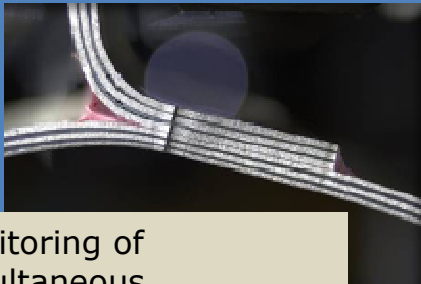
PROJECT PARTNERS



JOINING: Joining of Ceramics to Metals: New Concepts and Testing

New concepts in processing and testing of ceramics and metal-to-ceramics joints

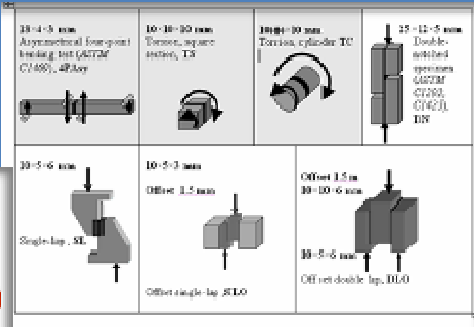
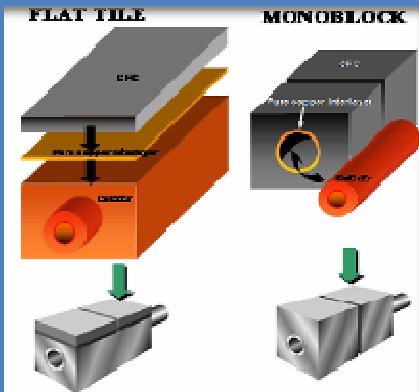
Glare™



Monitoring of simultaneous delamination and debonding processes

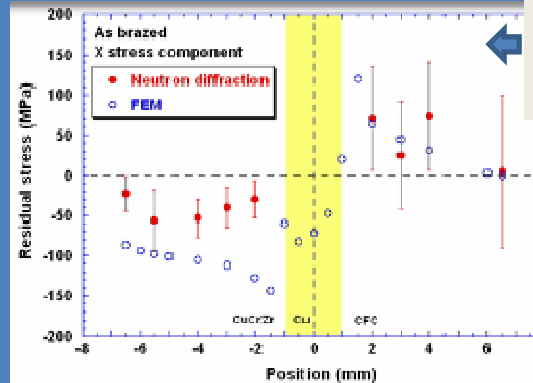
Non conventional tests and life prediction

New flat and circular joint technologies and new mechanical tests

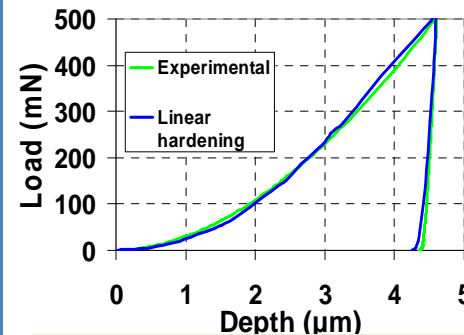
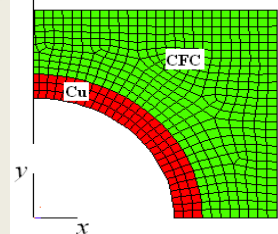


New technology to join C/C to Cu in a single step process, on circular surfaces; New joining material for fuel cells

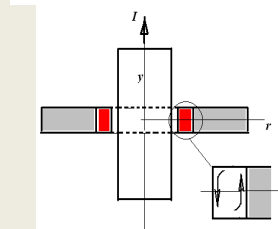
Comparison and validation of the design by modelling and testing of joined parts in working conditions



FEM calculation for the residual stress in a C/C-Cu joint



load vs penetration-depth curves while indenting the stressed metal phase (Cu)



residual stresses of C/C to Cu joints by direct passage of electric current

PROJECT PARTNERS **POLITO** (Coord., Torino, I), LMT (Cachan, F), MERL (Hertfordshire, UK), NETCOM (Chesterfield, UK), POLIMI (Milano, I), ALENIA (Naples, I), FIAT (Torino, I), IMRSAS (Kosice, Sk), IPSUA (Kyiv, Ukr), UNIVPM (Padova, I), INASMET (San Sebastian, S)