This project is co-financed by the European Union and the Republic of Turkey

TWI (Yorkshire Technology Centre)

Stephen Cater

stephen.cater@twi.co.uk

Description of the Organization

- TWI Technology Centre (Yorkshire) is an extension of the resources at company headquarters in Cambridge, and complements TWI's work with key technologies:
  - Fibre Laser Processing
  - Friction Stir Welding
  - Laser Direct Metal Deposition
  - Cold Spraying

- In addition, TWI Yorkshire runs a range of training courses, and enables its customers to access all of TWI's technologies and develop novel solutions through Technology Transfer programmes.

- TWI has a long established history in successfully delivering over 90 Framework projects.

Description of your research interest

- Our main interest is in transferring the proven technology of friction stir welding (FSW) to welding steel. FSW is a low energy, low hazard, solid state welding technique that produces extremely strong welds with excellent fatigue resistance, low distortion, good corrosion resistance, and can be performed in almost all types of steel. Several research programmes are currently demonstrating the benefits of FSW for steel, and the technique is in industrial use for aluminium, magnesium and copper welding.

- Friction stir welding of steel makes high demands on the tool materials. Current steel FSW tools are expensive ($4000 or more), have a short lifetime and are not manufactured in Europe

- We wish to develop a European FSW tool material that has low cost, high performance and long life.

NMP Factory of the Future 2013:10
"Manufacturing processes for composites or engineered metallic materials"

- Objectives:
  - To determine the relative contributions of fatigue, wear and fracture to steel FSW tools
  - To develop a manufacturing process for composite metallo-ceramic materials
- Expected results
  - The development of a hybrid too material combining toughness, hardness and wear resistance…

Consortium - profile of known partners

No	Partner Name	Type	Country	Role in the Project
01	TWI	RTD	UK	Provide fundamental data on requirements and evaluate materials
02		RTD		
03		RTD		
04		SME		
05		SME		
06		SME		
07	Confidential	LE		Materials supplier / processor
08	Confidential	LE		Shipbuilder – end user / validation

Consortium - required partners

No	Expertise	Type	Country	Role in the project
01	Materials engineering	**RTD**		Provision of fundamental knowledge of materials properties, metallic and ceramic
02	Stress engineering / modelling	**RTD**		Modelling of stress on tool
03	Materials processor	**SME**		Manufacture tooling material blanks
04	Tool / designer maker	**SME**		Manufacture prototype tool
05				
06				
07				
08				

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TurKey 2012 Enabling Technologies

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Friction and Forge Processes

+44 114 269 9046

stephen.cater@twi.co.uk

www.twi.co.uk