



FlexiFab

Flexible fabrication of lightweight aluminium transport structures

Eurico Assunção

2nd Joining Sub-Platform GA Meeting

4 July 2014

Brussels , BELGIUM

FlexiFab





FLEXIFAB is a European Union funded research project, under the Grant Agreement FP7-SME-2014-2-606156-FLEXIFAB, which aims at creating an automated robotic system to enable welding of aluminium components

- EC Framework 7
- Research for SME Associations
- Start date: 1 November 2013
- Duratio: 3 years
- Total Value: 1 642 000 €

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Flexi-Fab Objective





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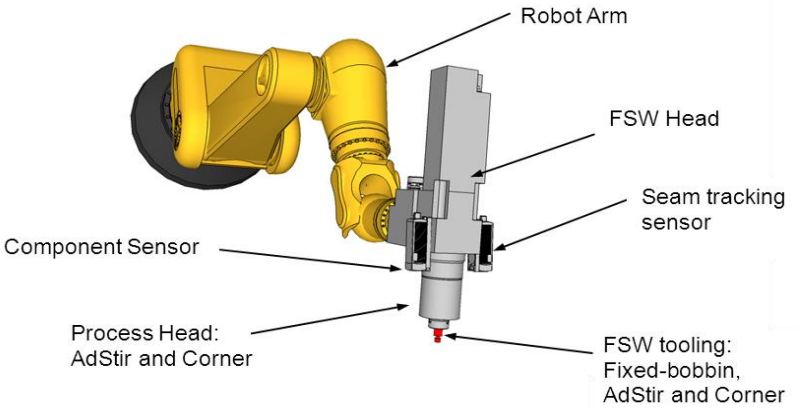
The Flexi-Fab project aims to create a flexible automated robotic FSW system; capable of welding a range of aluminium alloys in a range of joint configurations. This will enable European SMEs in the metal working and fabrication industries to be able to effectively take advantage of the accelerating trend towards light-weight structures for transport.

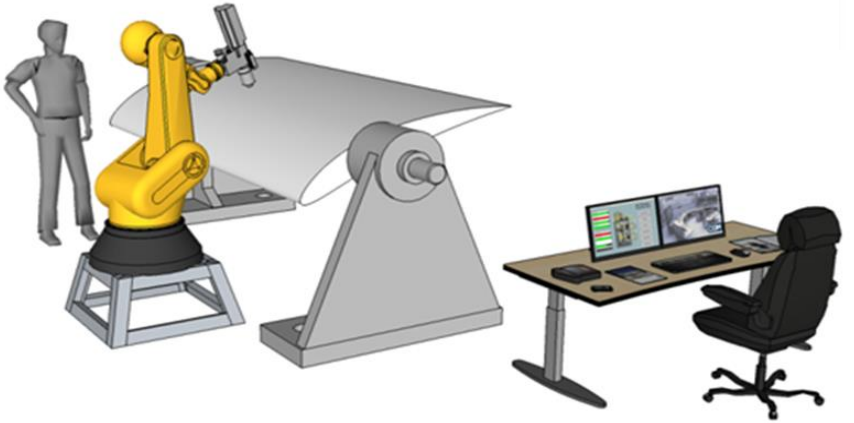
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Flexi-Fab Overview



A flexible FSW welding system capable of automatically fabricating complex structures





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Technical Challenges





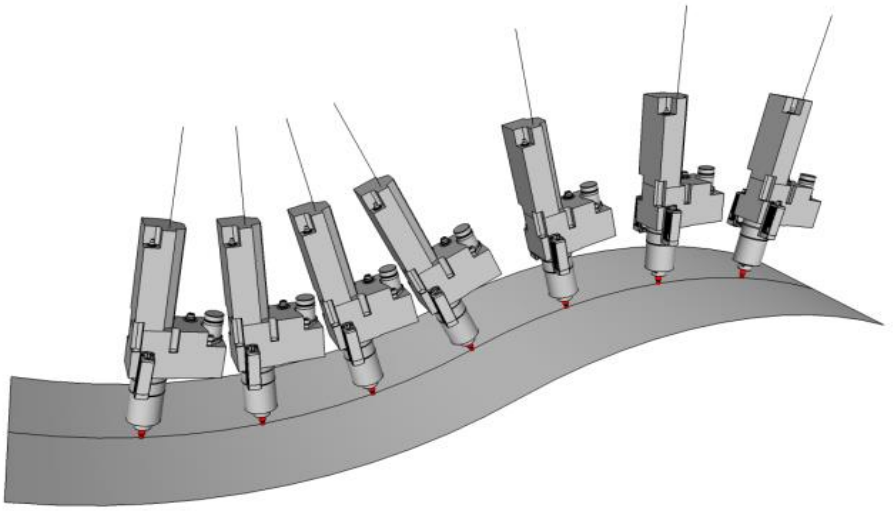
Key technical challenges to overcome

- Develop low force FSW tools to operate on a robotic system and develop welding heads with capabilities of carrying out 3D FSW welding processes.
- Develop closed loop control system to integrate sensors and the robot to position the FSW tool to the component surface and follow the required weld path
- Develop a data logging capability for Quality Assurance
- Assess flexible fixturing

System Control



Control System to integrated sensors and robot to control the orientation and weld traverse path of the new welding heads

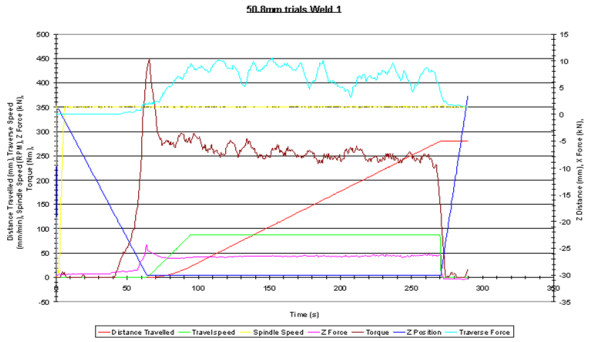


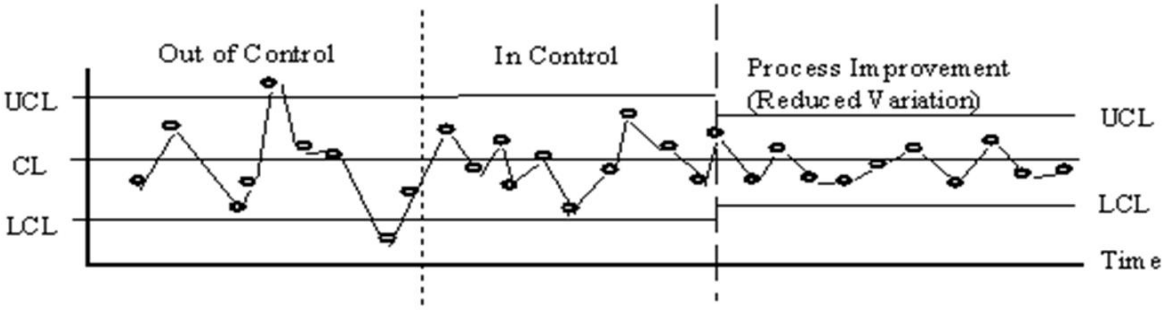
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Quality Assurance



- Data Logging
- Signature Analysis
- Statistical Process Control: It can be used to maintain the consistency of how the product is made and, therefore, of the manufactured product itself and its as-designed reliability





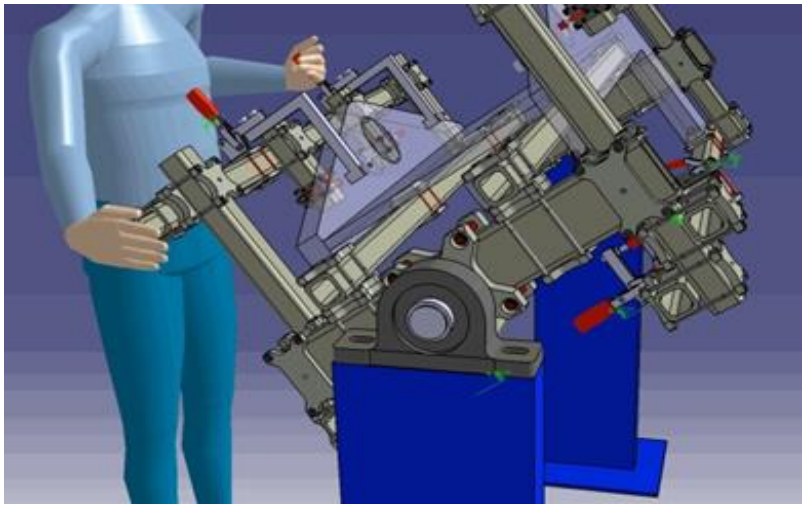
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Fixturing



FSW is a high force process, welds must be rigidly restrained; the tool will try and separate components of butt and lap welds and will try and push material down, due to auguring action of pin.

Flexible, re-configurable systems need to be assessed.



Current Progress



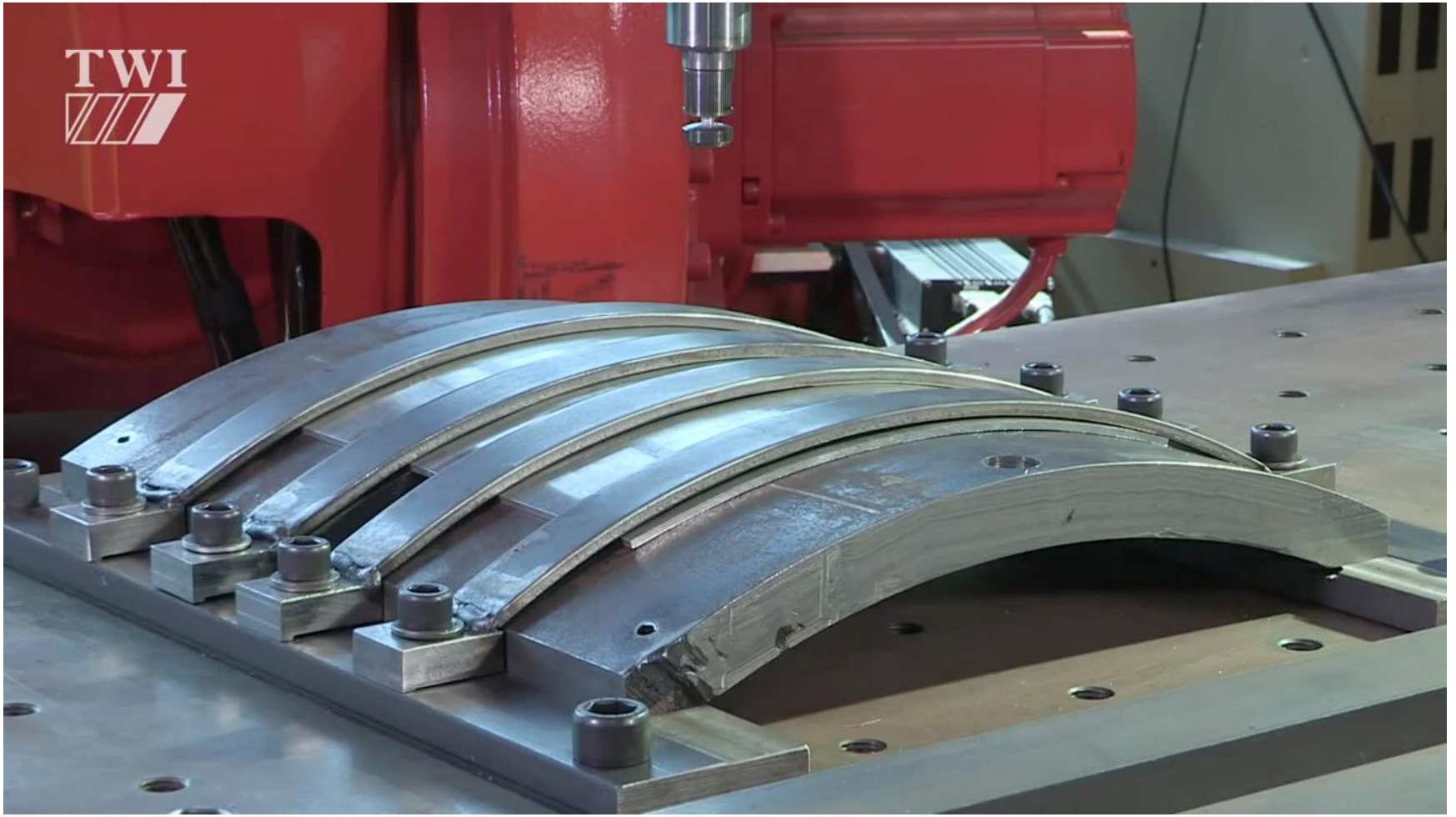
Conventional FSW machine



RoboStir machine



Current Progress



FlexiFab Partners





The project is comprised of a transnational consortium:

- European Federation for Welding, Joining and Cutting
- Asociatia de Sudura din Romania
- Meta Vision Systems Limited
- Innora SA
- igm Robotersysteme AG
- Bodula Division Industrial SL
- RRS Schilling GmbH
- TRA-C Industrie
- TWI Limited
- Lund University

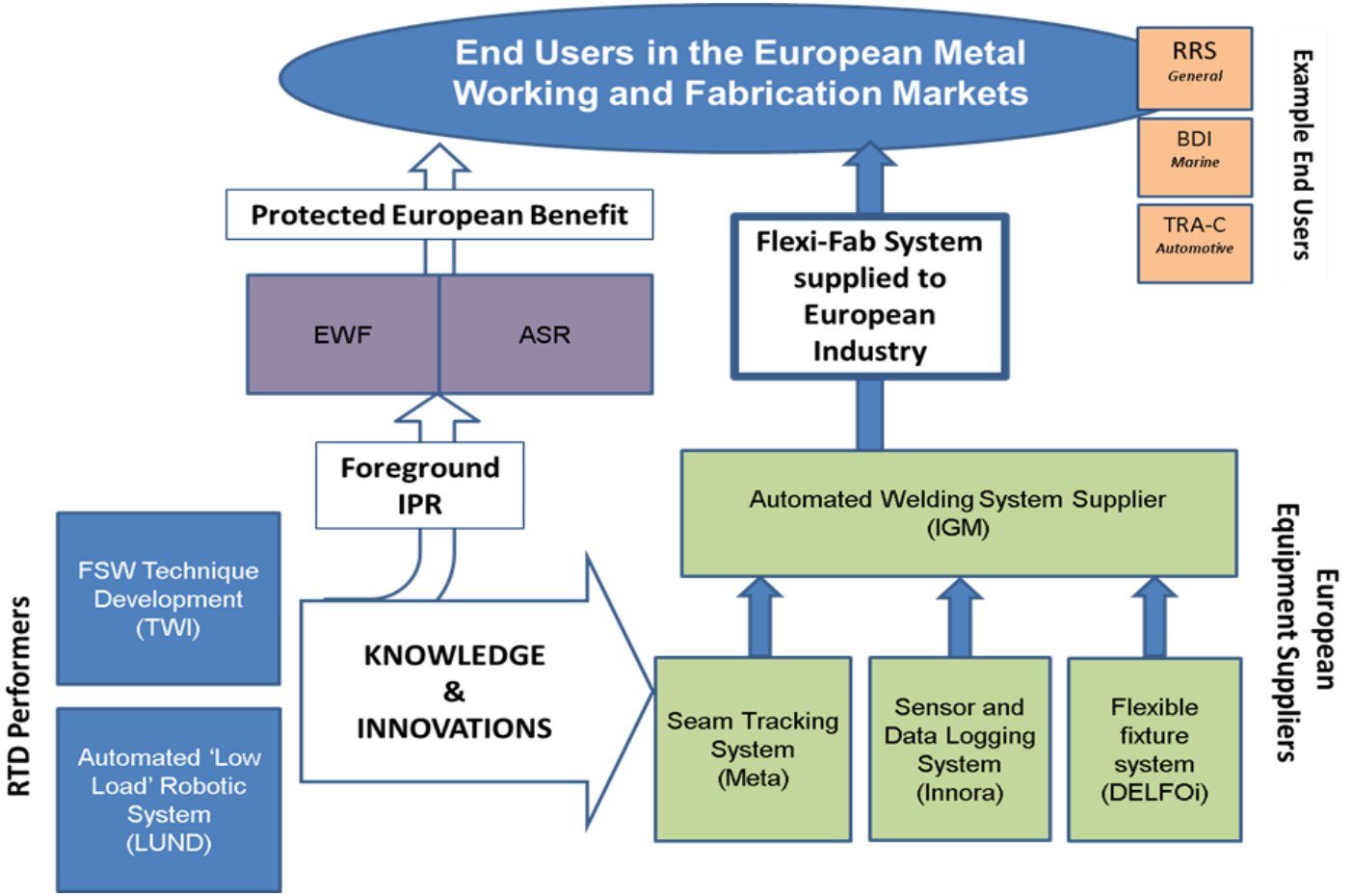
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Project Overview





Structure of the Flexi-Fab project



Project Overview



Potential Benefits to SME's:

- Reduced costs, mainly due to lack of scrapage and re-working
- Enhanced working conditions
- Physical demands reduced
- Enhance scope for a large number of application areas
- Improved labour productivity in the metal-working sector
- Alleviates the serious lack of skilled welding personnel in Europe

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The FLEXIFAB project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. FP7-SME-2014-2-606156-FLEXIFAB.





Thank You

www.flexifab.info

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