



Oxide particles during FSW welding of Cu

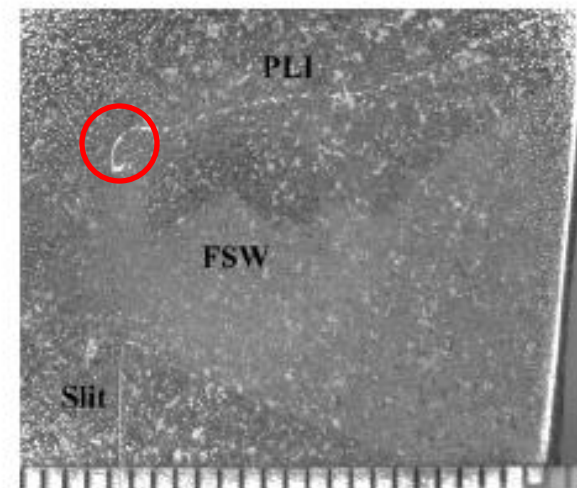
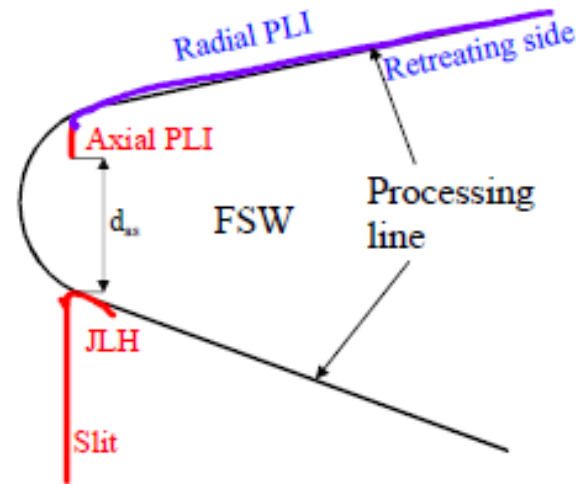
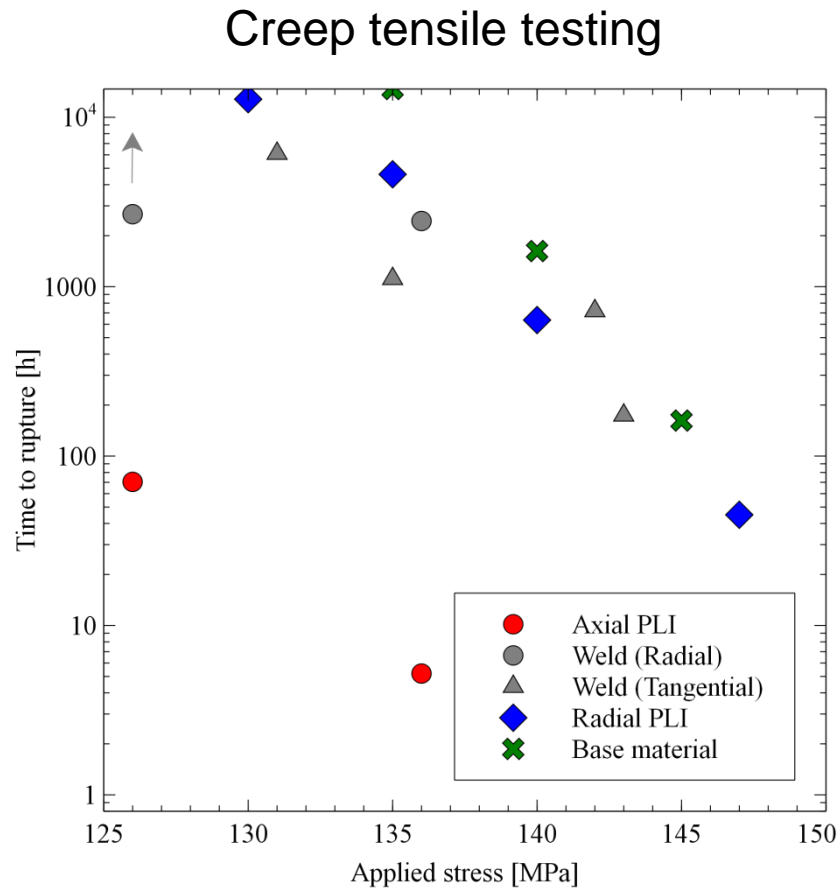
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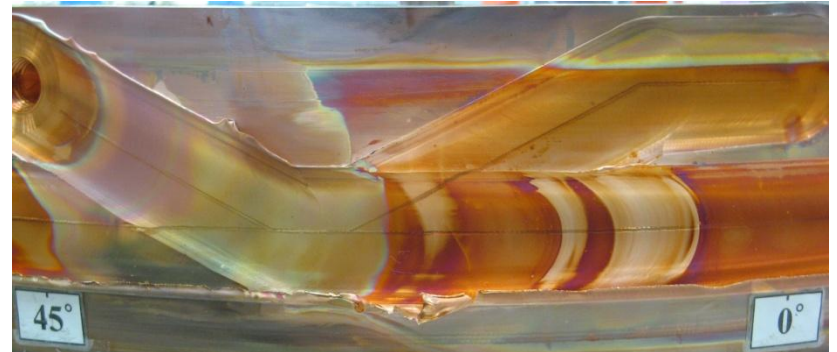
² HBS Engineering, Glostrup, Denmark. ⁴ EXOVA, Linköping.

Issue: oxide particles



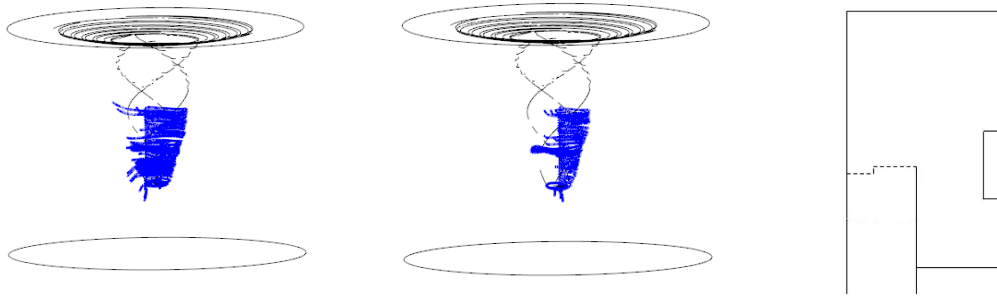
First step: Remove oxygen

- Welded in air until 2010
- Currently welded in Argon
- Still some minor amount of oxide particle remains

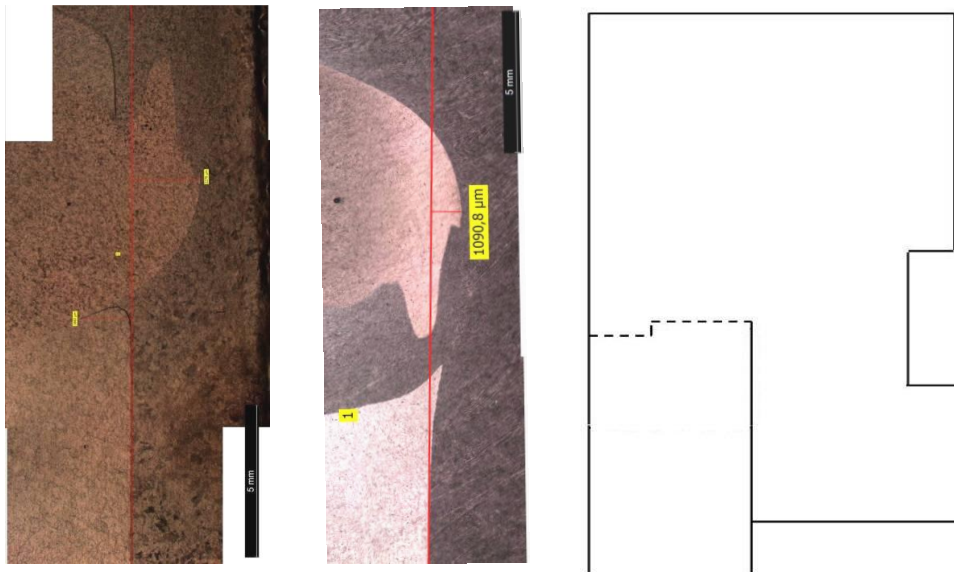


Tuning the process

- Changed Y-position, to distribute oxide particles more:

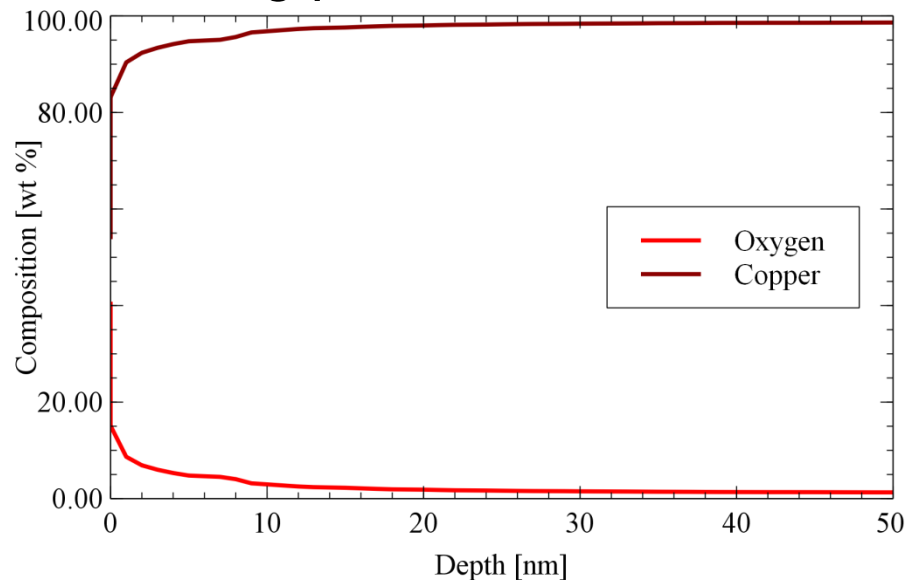


- Changed welding direction, to remove half-bonded line:



Outlook: Removing the oxide particles

- Quantify the oxide growth
 1. Measure the oxidation kinetics at low oxygen content.
 2. Record the thermal history of the faying surfaces.
- Determine cleaning procedures.



- Set upper limit of oxygen content as a process parameter.

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About this Symposium

Meeting	2013 TMS Annual Meeting & Exhibition
Symposium	Friction Stir Welding and Processing VII
Sponsorship	TMS Materials Processing and Manufacturing Division TMS: Shaping and Forming Committee
Organizer(s)	Rajiv S. Mishra , University of North Texas Murray W. Mahoney, (retired from Rockwell Scientific) Yutaka Sato, Tohoku University Yuri Hovanski, Pacific Northwest National Laboratory Ravi Verma, General Motors
Scope	This symposium is the seventh Friction Stir Welding and Processing symposium held during TMS Annual Meetings. This symposium will present fundamentals and the current status of friction stir welding (FSW) and solid-state friction stir processing of materials. It will provide researchers and engineers with an opportunity to review the current status of the friction stir related processes and discuss the future possibilities. Papers are sought on all aspects of friction stir welding and processing.
Abstracts Due	2012-07-31
Proceedings Plan	Planned: A print-only volume

PRESENTATIONS APPROVED FOR THIS SYMPOSIUM INCLUDE

[Advances in Temperature Control of FSP](#)
[Aluminum Tailor-Welded Blanks for Automotive Applications](#)
[An Innovative Process Applied to the Joining of Steel to Aluminum in a Lap-Joint Configuration](#)
[Analysis of Mechanical and Metallurgical Properties of Friction Stir Butt Welded AA2024](#)
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[Assisted Friction Stir Welding of Carbon Steel: Use of Induction and Laser as Preheating Techniques](#)
[Comparison between Friction Stir and Submerged Arc Welding applied to Joining DH36 and E36 Shipbuilding Steel](#)
[Defect Identification in FSWs Using Data Analysis Techniques](#)
[Determining System Parameters for Temperature Control in Friction Stir Processing](#)
[Double Sided Multipass Friction Stir Processing and Its Effect on the Superplastic Forming Behaviour of a 5086 Aluminum Alloy](#)
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[Effect of Corrosion in NaCl-Based Solutions on the Mechanical Properties of Friction-Stir Welded AZ31B Sheet](#)
[Effect of Friction Stir Processing on Armor Grade Materials](#)
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[Effect of Initial Microstructure on the Microstructural Evolution and Joint Efficiency of a WE43 Alloy during Friction Stir Welding](#)