Oxide particles during FSW welding of Cu

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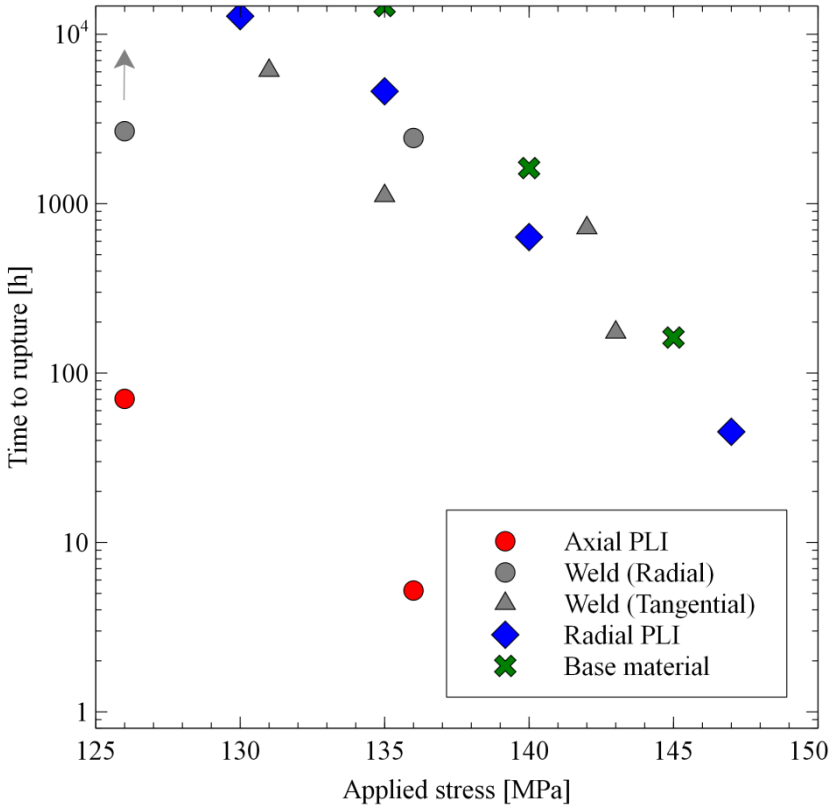
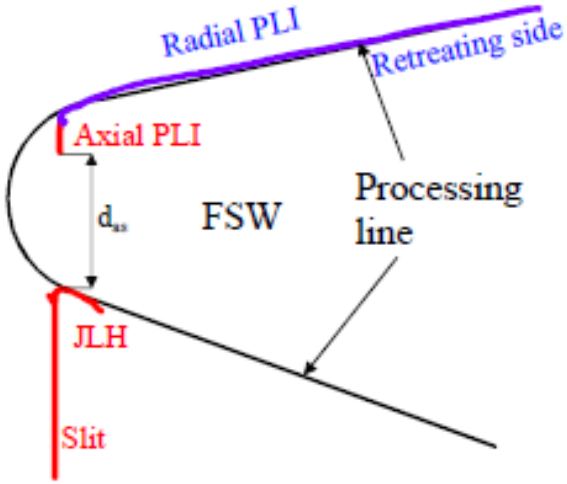
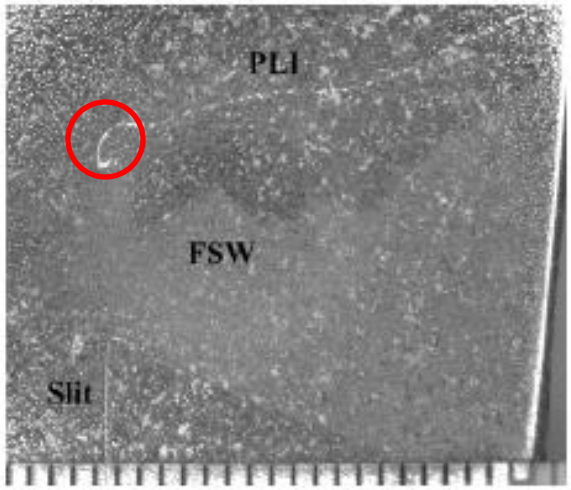
Issue: oxide particles

Creep tensile testing

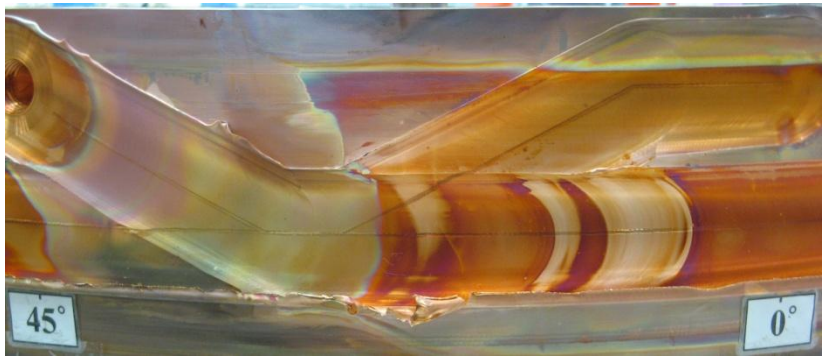






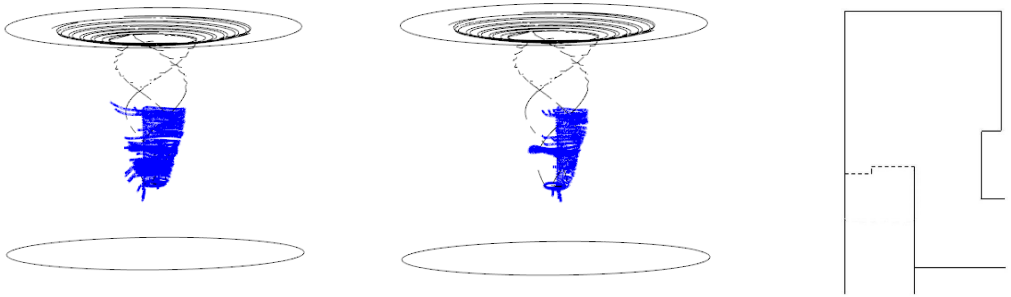
First step: Remove oxygen

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

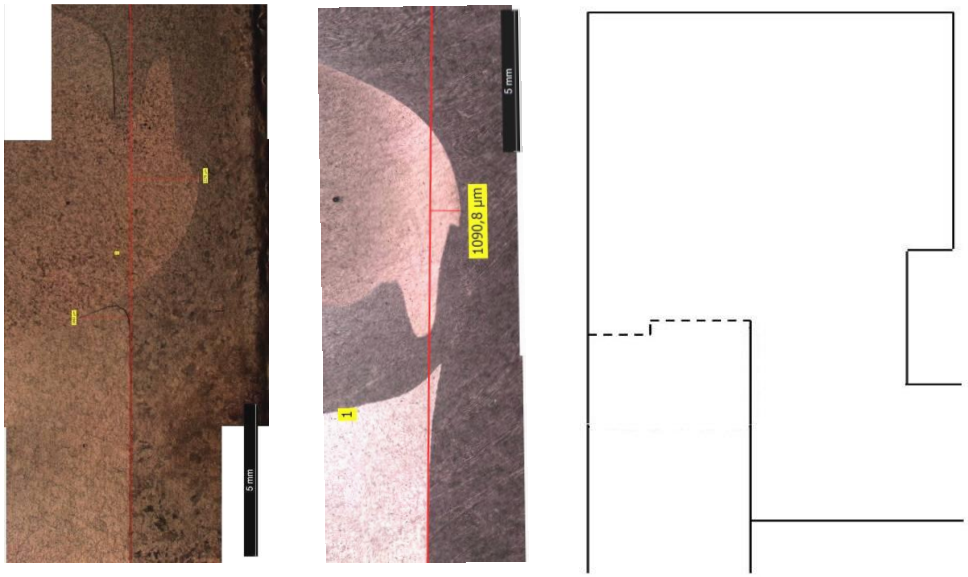


Tuning the process

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

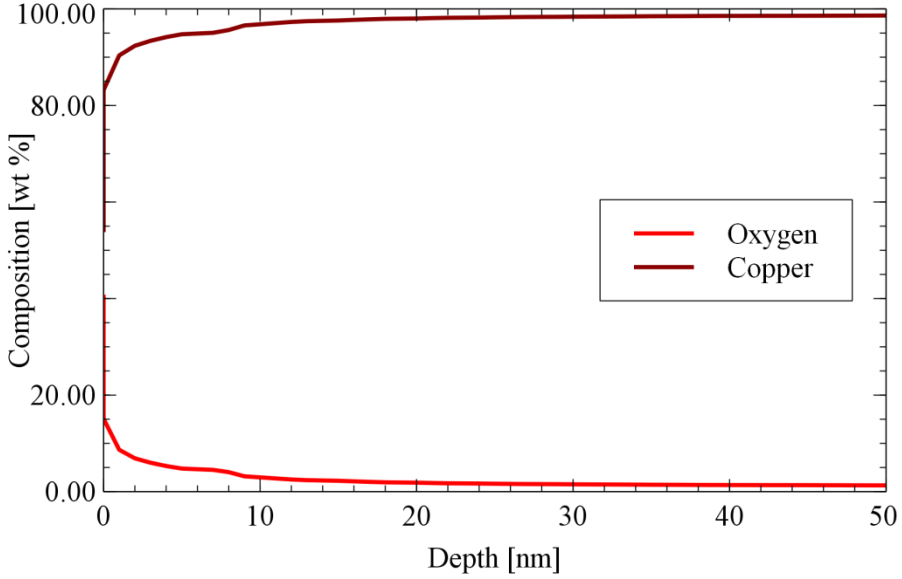


- Changed welding direction, to remove half-bonded line:



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

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