

Project 31: Accumulative Roll Bonding of Al and Ti Sheets Toward Low Temperature Superplasticity

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Project Duration

PhD: September 2017 to May 2021

Problem: Superplastic forming requires high temperatures and very low strain rates.

Objective: Develop an in-depth understanding of how accumulative roll bonding affects temperature dependent strength and superplastic properties of Al and Ti alloys.

Benefit: Low temperature superplasticity could result in reduced cost and cycle time due to reduced deformation temperatures and increased strain rates.

Recent Progress

- Literature review of ARB processes pertaining to aluminum alloys
- Development of ARB surface preparation procedures
- Two successful roll bonding cycles of Al 6061 with adequate bonding

Metrics

Description	% Complete	Status
1. Literature review	15	●
2. ARB process development	50	●
3. ARB of select alloys (Al 2024, Al 5083)	0	●
4. Mechanical & microstructural characterization	0	●
5. Process refinement / alloy selection for optimized superplasticity	0	●



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