

Ultralightweight Al Foam

A New Fabrication Method to Realize Low-cost and Energy Saving



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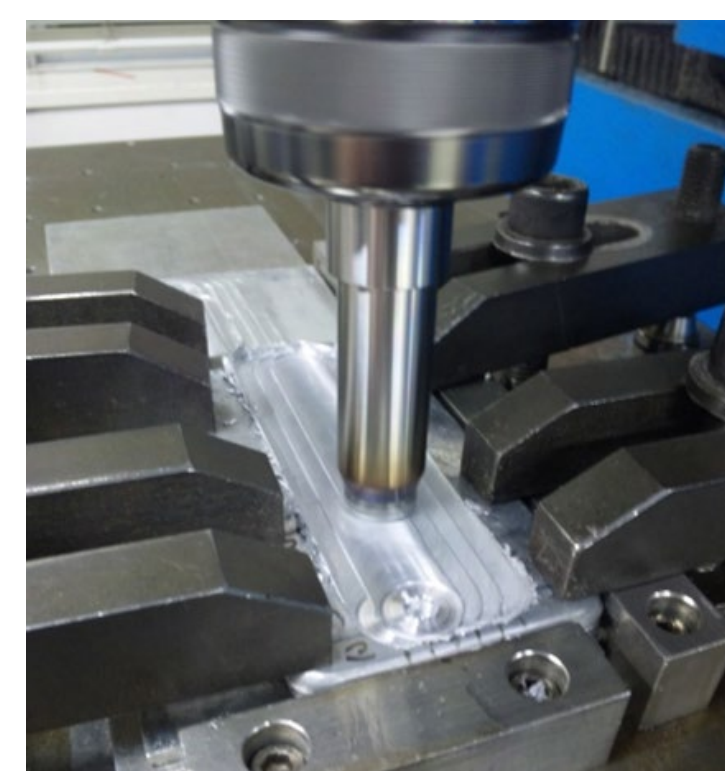
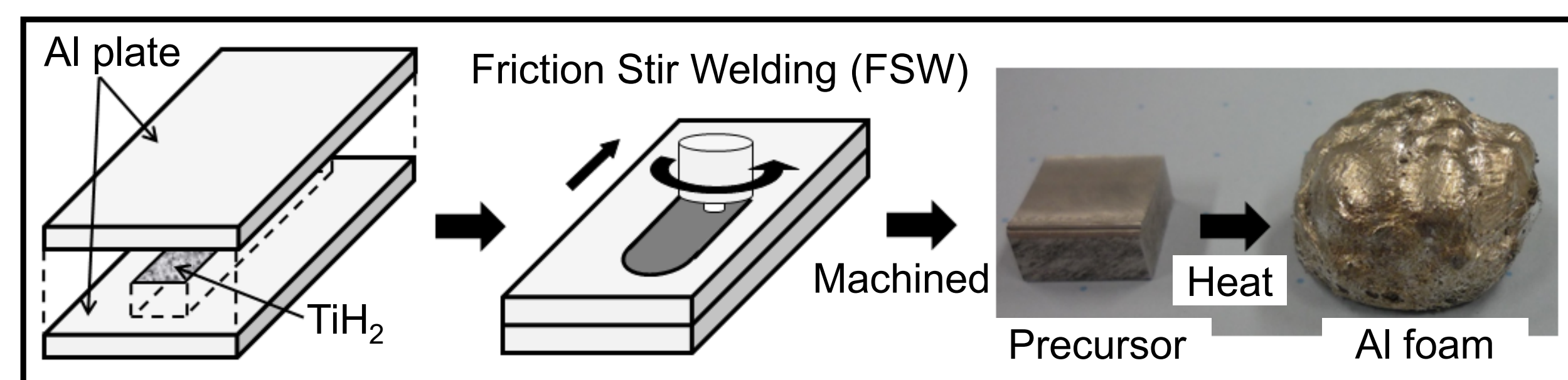
1. Background



Al Foam (Porous Aluminum)

- There is a great demand, but the applications have been narrowed due to its high cost comparing to resin/plastics foam.
- Novel methods to realize low-cost Al Foam has been long-awaited.
- Al Foam has excellent characteristics i.e. ultralightweight, durability against chemicals, endurance against aging

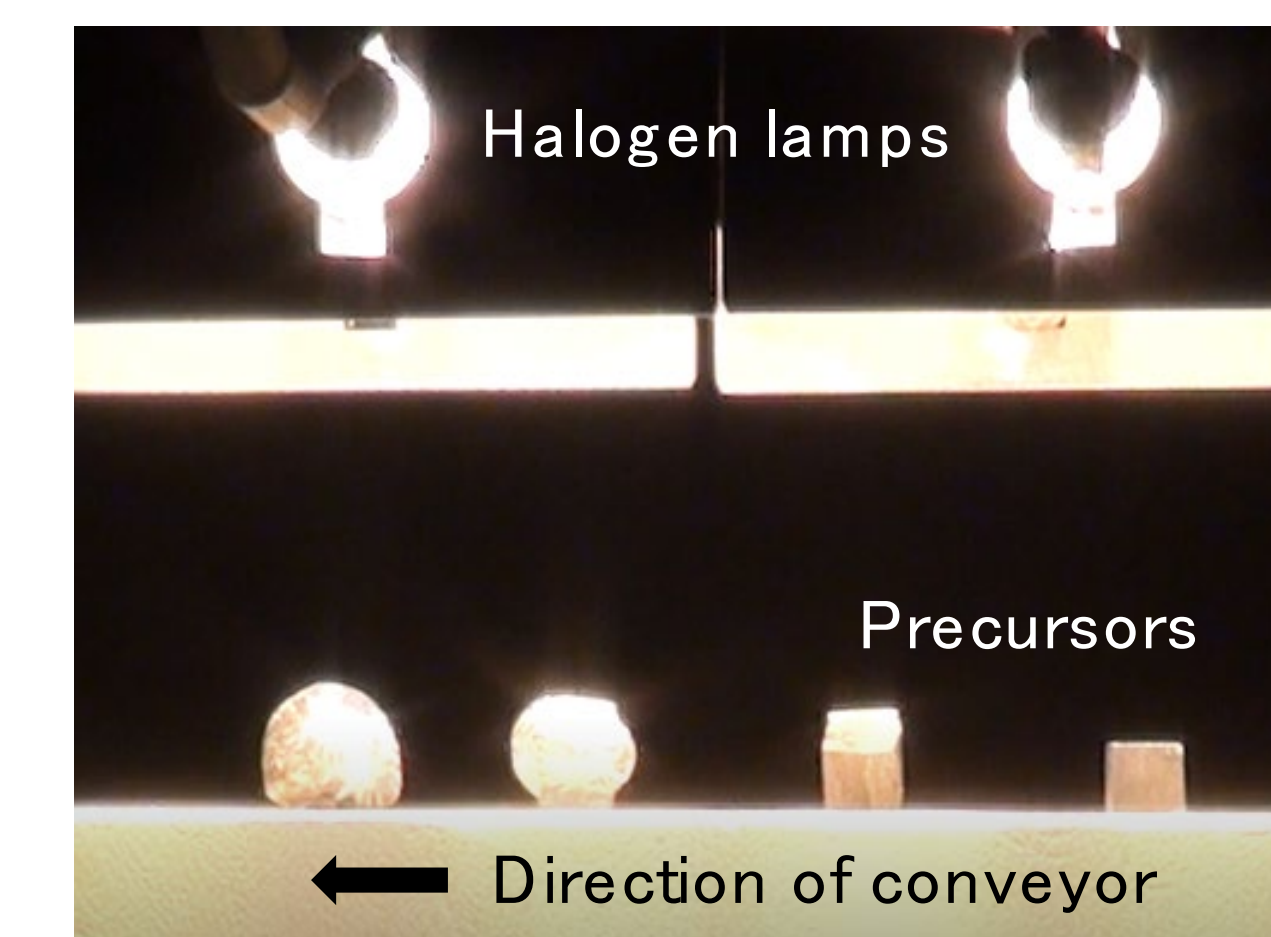
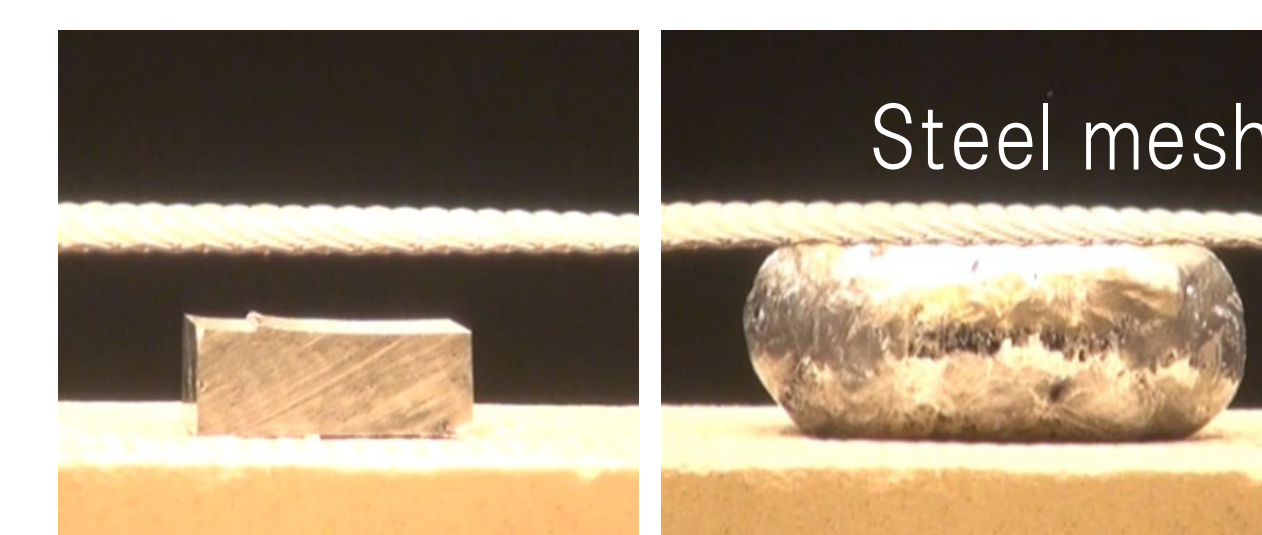
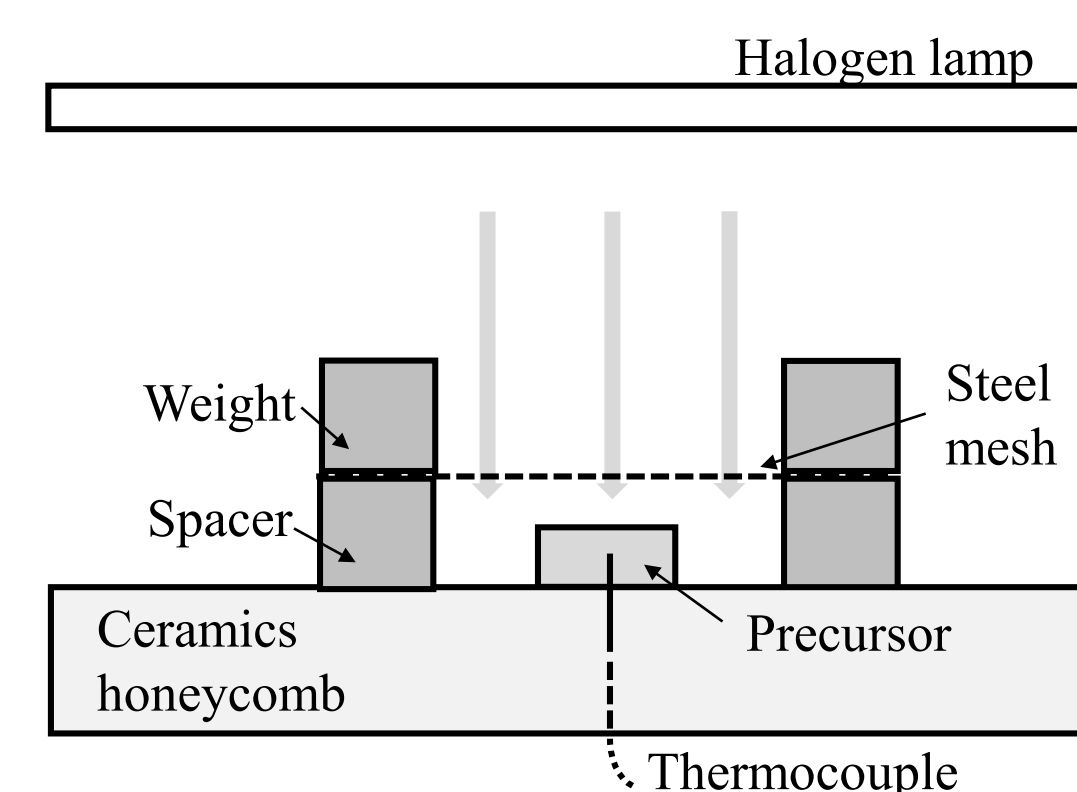
2. (Fabrication Process) Friction Stir Welding



Completely different method of making "Precursor", which is mixture of Al plate and foaming agent, by **FSW(Friction Stir Welding) process** is adopted instead of the conventional way of sintering mixture of Al powder and foaming agent.

- Not require any special environmental condition for the process i.e. at room temperature, at general factory conditions
- Basic patent of FSW process had expired and the technology of FSW process has been well established. And the facility cost of the process is relatively inexpensive.
- The foaming rate can be controllable by the volume of the foaming agent.

3. (Heating Process of Precursor) Optical Heating



Foaming Process adopt **Optical Heating** by using halogen lamps. This new method realize "low cost" and "energy saving" at the same time.

- The facility can be easy to scale up and relatively easy to control.
- "Steel mesh" and/or "heat resistant glass", which transmit light and heat, can be used as molds for shaping Al Foam.
- By special placement of small pieces Precursors, large size Al Foam can be produced relatively easy.

4. Prospective Applications



- Train/Vehicle Materials
- Mobile/Wearable Devices
- Construction Materials
- Shock Absorption Materials
- Soundproof/Sound Absorbing Materials

5. Patent Licensing Available

Patent No.: WO2019/013026(JP,US,EP), WO2011/046152 (JP,US,EP),
WO2010/029864(JP), WO2010/106883(JP)

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