

Production of Bulk Forms of Metal Alloys by Machining-Based Processes

Track Code: 65748

Categories:

- Materials and Manufacturing

Keywords:

- Environment
- Foil Sheets
- Materials and Manufacturing

Researchers at Purdue University have developed a new class of machining-based deformation processes for producing foil sheets directly from cast ingot in a single stage of deformation. This technology is built on early findings that hybrid-cutting extrusion based on constrained chip formation offers a fundamentally transformative approach for effecting large process energy savings, lower capital investments, and superior mechanical properties. This approach is radically different from conventional multistage deformation processes, e.g., rolling, drawing, currently used to produce foil sheets.

This new hybrid process will enable foil sheet production with significant reductions in energy consumption, cost, and emissions compared to conventional rolling. The machining-based approach also has important advantages for processing materials of low workability such as Ti and Mg alloys. This will provide critical technology for creating foil sheets from these lightweight alloys at a lower cost, a key enabling step for their widespread application.

Advantages:

- Reduced energy consumption and emissions
- Easier processing of low workability materials
- Lower production cost for sheets of lightweight alloys

Potential Applications:

- Materials
- Manufacturing

People:

- Chandrasekar, Srinivasan "Chandy" (Project leader)
- Compton (Deceased 2/7/17)Heir -Duane, Gayle, Donald, W. Dale
- Efe, Mert
- Mann, James Bradley

- Moscoso, Wilfredo
- Sagapuram, Dinakar
- Saldana, Christopher
- Trumble, Kevin Paul

Intellectual Property:

Application Date: September 26, 2013

Type: NATL-Patent

Country of Filing: United States

Patent Number: 9,687,895

Issue Date: June 27, 2017

Application Date: January 6, 2012

Type: PCT-Patent

Country of Filing: WO

Patent Number: (None)

Issue Date: (None)

Application Date: January 6, 2011

Type: Provisional-Patent

Country of Filing: United States

Patent Number: (None)

Issue Date: (None)

Contact OTC:

Purdue Office of Technology Commercialization

The Convergence Center

101 Foundry Drive, Suite 2500

West Lafayette, IN 47906

Phone: (765) 588-3475

Fax: (765) 463-3486

Email: otcip@prf.org