

Shear Rolling of Magnesium Sheet for Energy, Transportation, and Defense Applications

High cost and poor formability of Mg sheet restricts the use of Mg in most light weight applications

Asymmetric or shear rolling process results in a reduction of the basal plane texture and improves ductility and room-temperature formability

The focus of this project is to:

- Identify appropriate process parameters through laboratory experiments on the asymmetric rolling process
- Demonstrate industrial implementation of the asymmetric rolling process
- Ascertain improved formability of sheet processed through asymmetric rolling

Project Tasks:

- Design, fabricate, and install shear roll mill at ORNL
- Develop process parameters using shear roll mill and transfer technology to industry
- Fabricate at least two types of components using materials processed with the newly developed manufacturing processing technology

Low cost magnesium sheet has widespread applications across industry

Project Impacts:

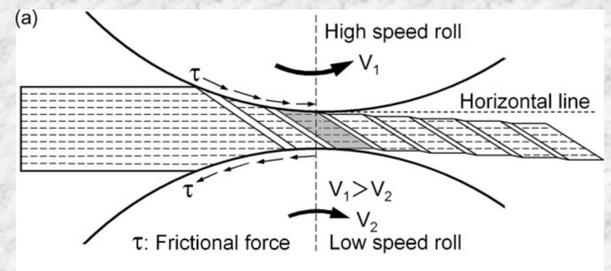
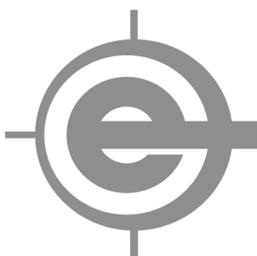
- Demonstrate shear roll process technology in an industrial process environment
- Demonstrate advantages of shear rolling over conventional processing

Application Areas:

Automotive, Aerospace and Defense

Industrial Partner:

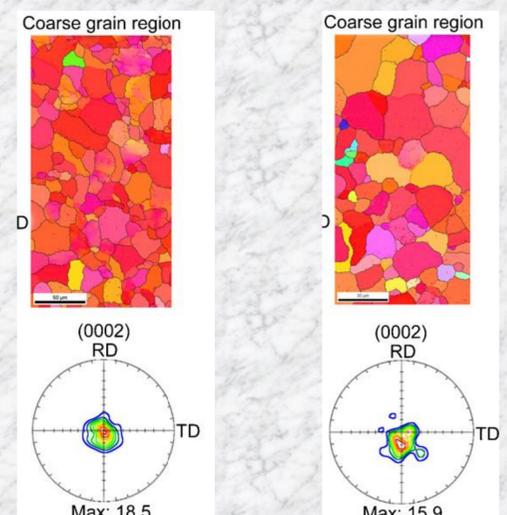
Magnesium Elektron North America



Schematic of Asymmetric (Shear) Rolling



ORNL Rolling Mill with Mg Sheet



Improved formability in symmetric (L) vs. asymmetric (R) rolling



Mg trunk Lid Stiffener



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