



Electromagnetic Forming of Aluminum Sheet

The Importance of Our Work

Develop technology for applying electromagnetic forming to aluminum sheet. Primary goals are to understand formability and coil durability issues through a combination of experiments and analysis.

Benefits

- Enhanced formability
- Retention of properties (versus high temp. forming)
- Retention of surface finish
- One-sided dies
- Lightweight tooling
- High production rates
- Minimal or no springback

Project Participants

Industry – DaimlerChrysler
Ford Motor
General Motors

National Lab – Pacific Northwest National Laboratory
Los Alamos National Laboratory

University – The Ohio State University

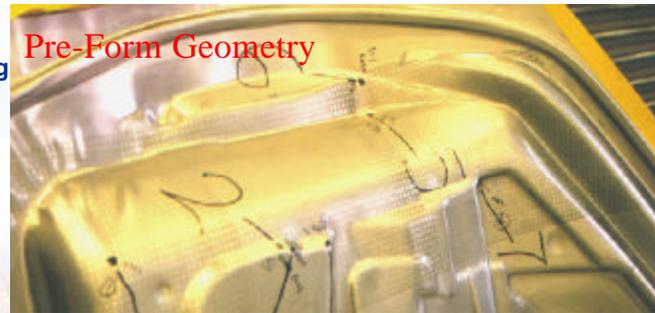
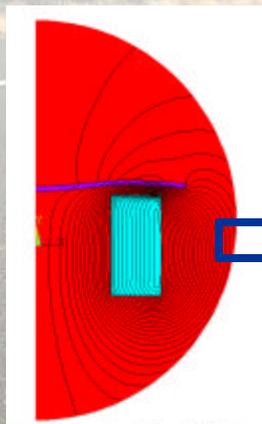
Analysis

Predict:

- EM Fields
- Temperatures
- Stresses
- Deformation

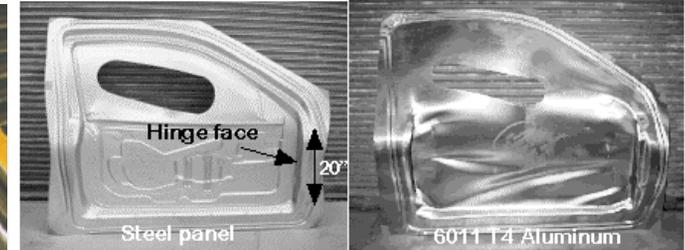
Design:

- Coil
- Dies
- Electronic Circuit
- Workpiece
- Structural Supports

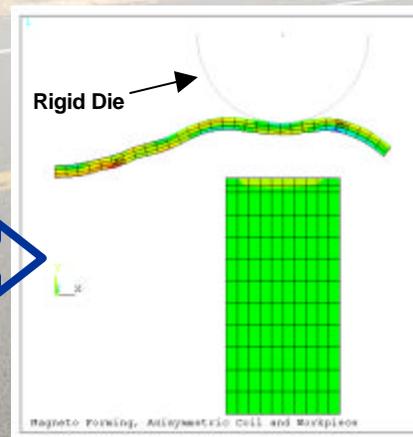
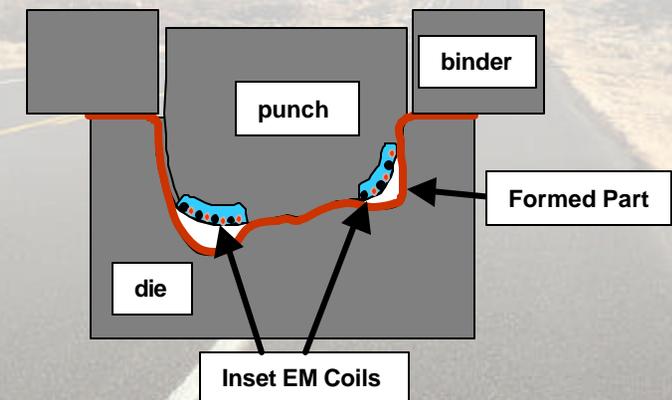
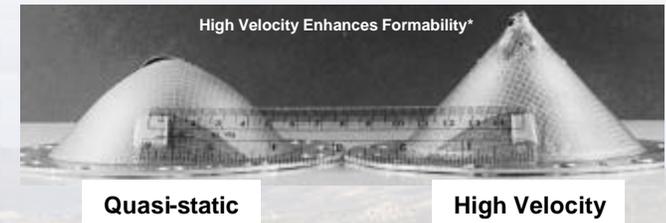


Automotive Demonstration Project of Hybrid Forming*

Experiment



Aluminum Formability Challenge*



Predicted Deformation, 0.12 millisecond

EMF Technology Development Needs

- Coil Design for Sheet
- Coil/Insulator Durability
- Formability Rules
- Hybrid System Design
- Numerical Modeling
- Design for Production

*Images courtesy Prof Glenn Daehn, The Ohio State University