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# TMS 2026

155th Annual Meeting & Exhibition

**March 15–19, 2026**
San Diego Convention Center
and Hilton San Diego Bayfront
San Diego, California, USA
#TMSAnnualMeeting

## SUBMIT AN ABSTRACT FOR THE FOLLOWING SYMPOSIUM

**MECHANICS OF MATERIALS**

# Forming and Joining of Advanced Sheet Metal Materials

The automotive industry is increasingly adopting advanced sheet metal materials to achieve significant weight reductions that improve fuel efficiency and electric driving range. New generations of high-strength steels and aluminum alloys offer substantial weight savings at minimal or no additional cost. These materials are also recyclable and have a lower carbon footprint, supporting sustainable and low-emission transportation. However, increased strengths and higher recycled contents present challenges in ensuring formability, minimizing springback, and avoiding forming and joining quality issues. This symposium will explore the latest advancements in the forming and joining of high-strength steels and aluminum alloys.

Key topics will include:

- Application of machine learning (ML) and artificial intelligence (AI) in optimizing metal forming and joining processes.
- Forming and joining behavior of materials with high strengths and/or high recycled content.
- Innovative thermo-mechanical and heating techniques to enhance formability and reduce springback.
- Incremental forming methods, such as roll forming, to control stress states and improve fracture limits.
- Advanced alloying techniques to optimize material properties.
- The integration of ML and AI to predict and mitigate forming and joining defects.
- The impact of high recycled content materials on mechanical behavior and sustainability.
- In-line process control and friction management in stamping and forming operations.
- Flexible forming methods and the use of digitized dies for complex shapes and tight bend radii.
- Warm and hot forming processes for improved material performance. Join us to discuss the challenges and innovations in the forming of advanced sheet metal materials, leveraging cutting-edge technologies to drive the future of sustainable and smart manufacturing.

**SPONSORED BY:**
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**QUESTIONS?**
Contact programming@tms.org