Special Issue

Metal Forming Technologies for Producing High-Strength and Lightweight Parts

Message from the Guest Editor

High-strength and lightweight technologies for automobiles and aircraft are very important for improving safety, as well as energy efficiency. Hot stamping can manufacture parts with complex shapes while increasing strength and reducing the springback of parts. Lightweight metals, such as aluminum, magnesium, and titanium, may be used instead of steel to manufacture lightweight parts while securing required strength. In order to improve the low formability of lightweight metals, warm or hot forming methods have been applied. For example, in the case of magnesium, a warm forming is widely applied to improve formability, and in the case of aluminum, a method of increasing the part strength to a steel level through hot forming, in combination with hot stamping, has recently been attempted. However, it is still necessary to understand the material characteristics of lightweight metals that are more complex than steels, and to develop optimal warm/hot forming technologies. Various research articles on metal forming technologies covering materials, forming processes and die technologies related to weight reduction and strength improvement are welcome.

Guest Editor

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Message from the Editorial Board

Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

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