

Special Issue

Advanced Steel Design: Casting, Forming and Heat Treatment

Message from the Guest Editors

Various types of advanced steels are used in modern industry and engineering applications. Due to the complexity of the microstructures and their evolutions in advanced steels, the whole process design and control is crucial—from casting and forging to manufacturing and heat treatment. Strength and ductility (toughness) are two key mechanical properties of crystalline metallic materials. Strength and ductility depend on the presence of crystal defects and how they evolve and are rearranged under thermal mechanical coupling conditions. A thorough understanding of how these processes influence strength and toughness forms the key to the analysis of existing and the design of improved innovative structural elements. The aim of this SI is to understand the relationship between microstructures and mechanical properties in advanced steels. For energy and car industry applications, improving and developing new steels in these fields can help to meet the demand of carbon emission and carbon neutralization.

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Message from the Editor-in-Chief

Materials (ISSN 1996-1944) was launched in 2008. The journal covers twenty-five comprehensive topics: biomaterials, energy materials, advanced composites, advanced materials characterization, porous materials, manufacturing processes and systems, advanced nanomaterials and nanotechnology, smart materials, thin films and interfaces, catalytic materials, carbon materials, materials chemistry, materials physics, optics and photonics, corrosion, construction and building materials, materials simulation and design, electronic materials, advanced and functional ceramics and glasses, metals and alloys, soft matter, polymeric materials, quantum materials, mechanics of materials, green materials, general. *Materials* provides a unique opportunity to contribute high quality articles and to take advantage of its large readership.

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