Special Issue

Influence of Mechanical Treatment on Casting Alloys and Components

Message from the Guest Editor

Wrought materials have dominated the arena for applications subjected to fatigue and for applications where ductility is a critical feature. New requirements arising from new demands will ask more of components in terms of both design freedom and part performance, particularly improved strength, ductility and fatigue performance combined with significant weight reduction and component function integration. The only process capable of enough design freedom and cost-effectiveness is casting but its fatigue performance is limited. The combination of hybrid processing including a casting process with subsequent deformation of the part either on the surface alone or a heavier deformation targeting pore closure and deformation. The current Special Issue targets the relationship between process-microstructure and workability as well as the end result with an understanding of how the material final properties depend on the post-casting deformation process. This includes full forging of castings, local upsetting with cross-section deformation as well as more gentle deformation not resulting in deformation of a cross section. This latter also includes deep tolling and peening processes.

Guest Editor

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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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