Special Issue

Low Temperature Treatment of Stainless Steel

Message from the Guest Editor

Stainless steels are an important class of iron-based alloys which are employed in different industrial fields owing to their very good corrosion resistance in many environments. The performance of stainless steel components can be further improved upon by means of surface engineering techniques. Low temperature treatments are known as an effective mean of surface modification of stainless steels and they have been applied to all the classes of these alloys. By using environments containing nitrogen and/or carbon at temperatures able to inhibit the formation of chromium compounds, the increase in surface hardness, and thus in wear and fatigue resistance, can be obtained, maintaining or even increasing corrosion resistance. With these treatments, metastable phases, known as expanded austenite or S phase and expanded martensite, form, and their peculiar characteristics have been the subject of much research over recent years.

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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