

Special Issue

Fretting Damage and Surface Protection of Metallic Materials

Message from the Guest Editor

Fretting refers to small-amplitude relative movement between contact surfaces due to mechanical vibration, fatigue load and electromagnetic vibration, etc. It leads to disastrous consequences and significant economic losses in aerospace, nuclear power, transportation and other fields. Fretting damage can be classified into fretting wear, fretting fatigue and fretting corrosion. Fretting wear refers to material removal, leading to the loss of fit in an assembly of components. Fretting fatigue occurs due to cyclic load. It facilitates premature initiation and subsequent growth of fatigue cracks, leading to a shorter fatigue life of components or failure at the stress level well below the fatigue limit. Fretting corrosion happens in electrolyte or other corrosive media. Based on the understanding of the fretting damage mechanism, corresponding measures such as structural optimization, surface modification, coating preparation and lubrication can be taken to alleviate it.

This special issue covers topics from the perspective of the fretting damage mechanism to protection methods for metallic materials. Papers and case studies from academia as well as industrial fields are solicited.

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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