

Special Issue

Manufacturing and Defects Influence on Fatigue Performance of Rolling Elements

Message from the Guest Editors

Rolling bearings are widely used and investigated as mechanical systems, and they are currently facing new challenges relating to new technologies such as electric vehicles and sustainable development. Their related rolling elements (balls, rollers, needles), less studied in bibliography, need to be investigated and developed in parallel with the investigation on their fatigue performance and their potential defects, limit and impacts. The development of new materials, new technologies and manufacturing processes for rolling elements requires a deeper investigation on material behavior, to estimate the failure mechanisms and the life of systems during service. The investigation of the fatigue behavior of rolling element when affected by manufacturing processes, material properties, surface and inner defects can become, in this frame, critical. The Special Issue aims at presenting the latest research on rolling elements manufacturing, damage detection and localization and their influence on rolling elements' life expectancy.

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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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