Special Issue

Fatigue Assessment of Metal Welded Joints

Message from the Guest Editors

In the context of the industrial design process, reliable assessment of fatigue behavior is still a major concern for engineers, since the fatigue phenomenon tends to cause sudden and unexpected failures in engineering structures. These concerns especially apply to welded joints, where the presence of residual stresses and local severe stress/strain concentrations significantly affects material behavior under cyclic loading. In spite of these challenges, most structural applications require the introduction of welded joints. The aim of this Special Issue is to provide an update to the state of the art on approaches for the fatigue assessment of metal welded joints. The topics which deserve particular interest for this Special Issue are applications to hybrid joints or joints between dissimilar materials; applications to full-scale structures and industrial details; criteria for fatigue assessment of welded joints under complex loading conditions, such as multiaxial constant, as well as variable/random fatigue loadings; the effect of residual stresses; and post-weld treatments to enhance the fatigue strength of joints.

Guest Editors

Prof. Dr. Roberto Tovo

Department of Engineering, University of Ferrara, via Saragat 1, 44100 Ferrara, Italy

Prof. Dr. Alberto Campagnolo

Department of Industrial Engineering, University of Padova, 35131 Padova, Italy

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Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
metals@mdpi.com

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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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Department of Materials Science and Engineering, College of Engineering & Applied Science, University of Wisconsin-Milwaukee, 3200 N. Cramer Street, Milwaukee, WI 53211, USA

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