Foreword

THIS SPECIAL ISSUE OF JAI, Special Technical Publication STP 1508, Fatigue and Fracture Mechanics: 36th Volume, contains papers presented at the Seventh International ASTM/ESIS Symposium on Fatigue and Fracture (36th ASTM National Symposium on Fatigue and Fracture Mechanics) held November 14-16, 2007 in Tampa, Florida. The symposium was jointly sponsored by ASTM International Committee E08 on Fatigue and Fracture and the European Structural Integrity Society (ESIS). The symposium was co-chaired by Dr. Richard W. Neu of Georgia Institute of Technology, USA, Dr. Kim R. W. Wallin of the Academy of Finland, Finland, and Mr. Steven R. Thompson of Air Force Research Laboratory, USA.
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Overview

This book compiles the work of several authors who made presentations at the Seventh International ASTM/ESIS Symposium on Fatigue and Fracture (36th ASTM National Symposium on Fatigue and Fracture Mechanics), sponsored by ASTM Committee E08 on Fatigue and Fracture and the European Structural Integrity Society (ESIS). The symposium was held on November 14-16, 2007, in conjunction with the November 12-13, 2007 standards development meetings of ASTM Committee E08.

The symposium opened with the Jerry L. Swedlow Memorial Lecture given by James A. Joyce of the U.S. Naval Academy. Following his lecture, several papers on related topics involving elastic-plastic fracture mechanics were presented.

Many of the papers presented in the symposium focused on one of three major themes: residual stress effects on fatigue and fracture, multiscale and physics-based approaches, and reactor components and materials. Each of these areas presents their own challenges to the development and application of engineering approaches to predict the structural integrity and remaining life of systems.

A major highlight of the symposium was the extensive number of papers on residual stress effects. ASTM Committee E08 recognizes that residual stresses, both intentionally-applied and manufacturing-induced, can have a significant effect on properties used in durability and damage tolerance design methodologies. These papers aim to ensure that testing standards are robust enough to meet users’ needs.

In addition to the major themes, other papers cover the latest research in fatigue crack growth, and in understanding and predicting the effects of elevated temperatures and environment. Finally, several papers deal with fatigue and fracture of specific components, joining methods, surface treatments, and coatings.

Richard W. Neu
Georgia Institute of Technology
Atlanta, Georgia, USA

Kim R. W. Wallin
Academy of Finland
Espoo, Finland

Steven R. Thompson
Air Force Research Laboratory
Wright-Patterson Air Force Base, Ohio, USA