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Fatigue and Fracture Mechanics

36th Volume

Richard W. Neu
Kim R. W. Wallin
Steven R. Thompson

Guest Editors

In cooperation with ESIS



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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.

Contents

Overview	ix
----------------	----

Swedlow Lecture

Analysis of Material Inhomogeneity in the European Round Robin Fracture Toughness Data Set	
--	--

J. A. Joyce and X. Gao	3
------------------------------	---

Elastic-Plastic Fracture Mechanics

The Significance of a Crack Growth Law for a $C(T)$ Fracture Specimen Undergoing Stable Crack Extension	
---	--

J. R. Donoso, K. Vasquez, and J. D. Landes	33
--	----

Assessing the Loading Rate for a Fracture Toughness Test in the Ductile-to-Brittle Transition Region	
--	--

E. Lucon and M. Scibetta	54
--------------------------------	----

Experimental Estimation of $J-R$ Curves from Load-CMOD Record for SE(B) Specimens	
---	--

X.-K. Zhu, B. N. Leis, and J. A. Joyce	66
--	----

On the Quantification of the Constraint Effect Along a Three-Dimensional Crack Front	
--	--

X. Wang	87
---------------	----

Residual Stress Effects on Fatigue

Influence of Residual Stresses on Fretting Fatigue Life Prediction in Ti-6Al-4V	
---	--

P. J. Golden, D. Buchanan, and S. Naboulsi	105
--	-----

Fatigue Response of Aluminum Aircraft Structure under Engineered Residual Stress Processing	
---	--

K. Langer, S. VanHoogen, and J. Hoover, II	122
--	-----

Influence of the Peening Intensity on the Fatigue Behavior of Shot Peened Titanium Components	
---	--

H. Leitner, B. Oberwinkler, H.-P. Gaenser, and M. Stoschka	134
--	-----

Fretting Fatigue Behavior of Shot-Peened Ti-6Al-4V and IN100	
--	--

S. Mall, J. L. Ng, and E. Madhi	147
---------------------------------------	-----

Prediction of the Fatigue Limit of Prestrained Carbon Steel Under Tensile Mean Stress	
---	--

M. Kang, K. Irisa, Y. Aono, and H. Noguchi	164
--	-----

Practical Challenges Testing Coupons with Residual Stresses from Cold Expanded Holes	
--	--

L. Reid and J. Ransom	183
-----------------------------	-----

The Influence of Residual Stresses on the Fatigue Strength of Cold-Formed Structural Tubes	
--	--

S. Heinilä, T. Björk, and G. Marquis	200
--	-----

The Influence of Residual Stress on the Design of Aircraft Primary Structure	
--	--

D. L. Ball	216
------------------	-----

Elastic-Plastic Finite-Element Analyses of Compression Precracking and Its Influence on Subsequent Fatigue-Crack Growth	
---	--

Y. Yamada, J. C. Newman, III, and J. C. Newman, Jr.	240
--	-----

Compression Precracking to Generate Near Threshold Fatigue Crack Growth Rates in an Aluminum and Titanium Alloy	.....	257
J. J. Ruschau and J. C. Newman,Jr.	.....
Residual Stress Effects on Fracture		
Test Results from Round Robin on Precracking and CTOD Testing of Welds	.....	275
S. M. Graham and R. Stanley	.....
Evaluation of Residual Stress Effects on Brittle Fracture Strength Based on Weibull Stress Criterion	.....
Y. Yamashita and F. Minami	.....	312
Evaluation of Residual Stress Corrections to Fracture Toughness Values	.....
M. R. Hill and J. E. VanDalen	.....	340
Impact of Residual Stress and Elastic Follow-Up on Fracture	.....
C. J. Aird, S. Hadidi-Moud, C. E. Truman, and D. J. Smith	.....	355
Multiscale and Physics-Based Approaches		
Focused Ion Beam as New Tool for Local Investigations of the Interaction of Microcracks with Grain Boundaries	.....
M. Marx, W. Schaeff, M. Welsch, and H. Vehoff	.....	377
An Examination of Fatigue Initiation Mechanisms in Thin 35Co-35Ni-20Cr-10Mo Medical Grade Wires	.....
J. E. Schaffer	.....	402
Statistical Analysis of Fatigue Related Microstructural Parameters for Airframe Aluminum Alloys	.....
M. Liao, K. Chisholm, and M. Mahendran	.....	416
Multi-Scale Approach to the Fatigue Crack Propagation in High-Strength Pearlitic Steel Wires	.....
J. Toribio, B. González, J. C. Matos, and F. J. Ayaso	.....	439
Effect of Inhomogeneity in Aligned Grains on Creep-Fatigue Crack Opening and Propagation Behavior of Directionally Solidified Superalloy	.....
M. Yamamoto, T. Kitamura, and T. Ogata	.....	459
Hydrogen/Plasticity Interactions at an Axial Crack in Pipeline Steel	.....
M. Dadfarnia, P. Sofronis, B. P. Somerday, and I. M. Robertson	.....	474
Reactor Components and Materials		
Experimental Study of the Fracture Toughness Transferability to Pressurized Thermal Shock Representative Loading Conditions	.....
M. Scibetta, J. Schuurmans, and E. Lucon	.....	499
Introducing Heterogeneity into Brittle Fracture Modeling of a 22NiMoCr37 Ferritic Steel Ring Forging	.....
X. Zhao, D. Lidbury, J. Quinta da Fonseca, and A. Sherry	.....	518
Stress-Triaxiality in Zr-2.5Nb Pressure Tube Materials	.....
B. W. Leitch and S. St. Lawrence	.....	540
Fatigue Crack Growth		
Effect of Prestrain on Fatigue Crack Growth of Age-Hardened Al 6061-T6	.....
K. Ikematsu, T. Mishima, Minwoo Kang, Y. Aono, and H. Noguchi	.....	561
Analysis of Crack Growth at $R=-1$ Under Variable Amplitude Loading on a Steel for Railway Axles	.....
M. Carboni, S. Beretta, and M. Madia	.....	574

Laser Generated Crack-Like Features Developed for Assessment of Fatigue Threshold Behavior	.....	592
A. T. Nardi and S. L. Smith		
Elevated Temperature and Environmental Effects		
Biaxial Loading Effect on Higher-Order Crack Tip Parameters	.....	609
V. N. Shlyannikov, B. V. Ilchenko, and N. V. Boychenko		
Comparison of the Temperature and Pre-Aging Influences on the Low Cycle Fatigue and Thermo-Mechanical Fatigue Behavior of Copper Alloys (CuCoBe/CuCo2Be)	.....
H. Koeberl, G. Winter, H. Leitner, and W. Eichlseder		641
Components and Structures		
Carrying Capacity Prediction of Steam Turbine Rotors with Operation Damage	.....	659
V. N. Shlyannikov, B. V. Ilchenko, and R. R. Yarullin		
Fatigue Crack Growth in Open and Nut-Loaded Bolts with and without Pretension Loading	.....
R. V. Prakash and A. Bagla		672
In-situ Fatigue Damage Investigations in Welded Metallic Components by Infrared Techniques	.....
J. Medgenberg and T. Ummenhofer		695
Fatigue Crack Growth in Integrally Stiffened Panels Joined Using Friction Stir Welding and Swept Friction Stir Spot Welding	.....
D. A. Burford, B. M. Tweedy, and C. A. Widener		719
Mechanical Evaluation of Mixed As-Cast and Friction Stir Processed Zones in Nickel Aluminum Bronze	.....
A. Nolting, L. M. Cheng, and J. Huang		743
Fatigue Behavior of Adhesively Bonded Aluminium Double Strap Joints	.....
A. E. Nolting, P. R. Underhill, and D. L. DuQuesnay		761
A Simplified Modeling Approach for Predicting Global Distortion in Large Metallic Parts Caused by the Installation of Interference Fit Bushings	.....
R. D. Widdle,Jr., L. C. Firth, and P. W. Reed		778
A Concept for the Fatigue Life Prediction of Components from an Aluminum-Steel Compound	.....
A. Lamik, H. Leitner, W. Eichlseder, and F. Riemelmoser		794
Impact Fatigue Failure Investigation of HVOF Coatings	.....
C. N. David, M. A. Athanasiou, K. G. Anthymidis, and P. K. Gotsis		814
Author Index		825
Subject Index		827

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.

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The background of the entire page features a subtle, abstract pattern of white, wavy, organic lines resembling veins or ripples on a light blue surface.

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