

FRACTURE MECHANICS

Seventeenth Volume



Underwood/Chait/Smith/
Wilhem/Andrews/ Newman
editors

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FRACTURE MECHANICS: SEVENTEENTH VOLUME

Seventeenth National Symposium
on Fracture Mechanics
sponsored by
ASTM Committee E-24
on Fracture Testing
Albany, New York, 7-9 August 1984

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NOTE

The Society is not responsible, as a body,
for the statements and opinions
advanced in this publication.

Dedication

This publication is dedicated to the following group of individuals and their pioneering work in fracture testing:

William F. Brown, Jr.
James E. Campbell
Roy H. Chirstensen
John Hodge
George R. Irwin
Joseph M. Krafft
William T. Lankford
John R. Low, Jr.
Richard A. Rawe
John E. Srawley
Henry J. Stremba
Charles F. Tiffany

Their important contributions were central to the ASTM Special Committee on Fracture Testing of High Strength Sheet Materials, forerunner of Committee E-24 on Fracture Testing.

As a tribute to the founders of ASTM Committee E-24 and to the series of symposia which they helped to establish, the poem on the following page was offered as a special presentation at the Albany meeting.

The 17th Symposium on Fracture

At first a Committee, called E-24,
Studied aspects of fracture not known before;
And Irwin suggested the very best way
Was to write all the terms as functions of K .

This worked for bodies whilst still elastic,
But needed correction as the stresses turned plastic;
Till Rice and some others showed us the way
To express all the terms by the integral J .

And presently users were nothing loath
To use dJ for stable crack growth;
So fracture was thought to be well understood
At the Albany meeting of John Underwood.

But then the Symposium, in second day session,
Was taught a quite salutary lesson;
As the crucial question was faced by John Srawley
That sometimes J would serve us but poorly.

But if these complexities seem to confuse us,
Just follow the founders' advice on consensus
And study the problem until a year older,
Then tell us next time in the Conference at Boulder.

*Dedicated to those founding members
of the original Committee, whom
it was my good fortune to know.*

*Cerdic Renrut
9 August 1984*

Foreword

The Seventeenth National Symposium on Fracture Mechanics was held on 7-9 August 1984 in Albany, New York. ASTM Committee E-24 on Fracture Testing was the sponsor. J. H. Underwood, U.S. Army Armament Research & Development Center, served as symposium chairman and co-editor of this publication. R. Chait, U.S. Army Materials & Mechanics Research Center, C. W. Smith, Virginia Polytechnic Institute & State University, D. P. Wilhem, Northrop Aircraft, W. A. Andrews, General Electric Company, and J. C. Newman, NASA Langley Research Center, served as symposium co-chairmen and co-editors of this publication.

Related ASTM Publications

**Fracture Mechanics: Sixteenth Symposium, STP 868 (1985),
04-868000-30**

**Fracture Mechanics: Fifteenth Symposium, STP 833 (1984),
04-833000-30**

**Fracture Mechanics: Fourteenth Symposium—Volume I: Theory and
Analysis, STP 791 (1983), 04-791001-30**

**Fracture Mechanics: Fourteenth Symposium—Volume II: Testing and
Applications, STP 791 (1983), 04-791002-30**

**Fracture Mechanics (Thirteenth Conference), STP 743 (1981),
04-743000-30**

**Fracture Mechanics (Twelfth Conference), STP 700 (1980),
04-700000-30**

A Note of Appreciation to Reviewers

The quality of the papers that appear in this publication reflects not only the obvious efforts of the authors but also the unheralded, though essential, work of the reviewers. On behalf of ASTM we acknowledge with appreciation their dedication to high professional standards and their sacrifice of time and effort.

ASTM Committee on Publications

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Contents

Introduction	1
APPLICATIONS	
An Application of Fracture Mechanics to a Ship Controllable Pitch Propeller Crank Ring—P. D. HILTON, R. A. MAYVILLE, AND D. C. PEIRCE	5
A New Wide Plate Arrest Test (SCA Test) on Weld Joints of Steels for Low Temperature Application—K. TANAKA, M. SATO, T. ISHIKAWA, AND H. TAKASHIMA	22
Variable Flaw Shape Analysis for a Reactor Vessel under Pressurized Thermal Shock Loading—C. Y. YANG AND W. H. BAMFORD	41
Growth Behavior of Surface Cracks in the Circumferential Plane of Solid and Hollow Cylinders—R. G. FORMAN AND V. SHIVAKUMAR	59
Fracture Toughness of Ductile Iron and Cast Steel—W. L. BRADLEY, K. E. MCKINNEY, AND P. C. GERHARDT, JR.	75
Effect of Loading Rate on Dynamic Fracture of Reaction Bonded Silicon Nitride—B. M. LIAW, A. S. KOBAYASHI, AND A. F. EMERY	95
Resistance Curve Approach to Composite Materials Characterization—M. M. RATWANI AND R. B. DEO	108
A Comparison of the Fracture Behavior of Thick Laminated Composites Utilizing Compact Tension, Three-Point Bend, and Center-Cracked Tension Specimens—C. E. HARRIS AND D. H. MORRIS	124
Residual Strength of Five Boron/Aluminum Laminates with Crack-Like Notches After Fatigue Loading—R. A. SIMONDS	136

SUBCRITICAL CRACK GROWTH

Hold-Time Effects in Elevated Temperature Fatigue Crack Propagation—T. NICHOLAS AND T. WEERASOORIYA	155
Interactive Effects of High and Low Frequency Loading on the Fatigue Crack Growth of Inconel 718—A. PETROVICH, W. BESSLER, AND W. ZIEGLER	169
Creep Crack Growth under Non-Steady-State Conditions—A. SAXENA	185
An Application of Stress Intensity Factor to Fatigue Strength Analysis of Welded Invar Sheet for Cryogenic Use—I. SOYA, H. TAKASHIMA, AND Y. TANAKA	202
An Automated Photomicroscopic System for Monitoring the Growth of Small Fatigue Cracks—J. M. LARSEN	226
An Experimental and Numerical Investigation of the Growth and Coalescence of Multiple Fatigue Cracks at Notches—A. F. GRANDT, JR., A. B. THAKKER, AND D. E. TRITSCH	239
Near-Tip Crack Displacement Measurements During High-Temperature Fatigue—W. N. SHARPE, JR., AND J. J. LEE	253
Viscoplastic Fatigue in a Superalloy at Elevated Temperatures—R. WILSON AND A. PALAZOTTO	265

FRACTURE TESTING

Fracture Testing with Arc Bend Specimens—J. H. UNDERWOOD, J. A. KAPP, AND M. D. WITHERELL	279
J_{Ic} Testing Using Arc-Tension Specimens—J. A. KAPP AND W. J. BILINSKY	297
Investigation and Application of the One-Point-Bend Impact Test—J. H. GIOVANOLA	307
Mode II Fatigue Crack Growth Specimen Development—R. J. BUZZARD, B. GROSS, AND J. E. SRAWLEY	329
Discussion	345

A Compact Mode II Fracture Specimen—L. BANKS-SILLS AND M. ARCAN	347
Influence of Partial Unloadings Range on the J_I-R Curves of ASTM A106 and 3-Ni Steels—G. E. SUTTON AND M. G. VASSILAROS	364
Fracture Toughness Testing of Zircaloy-2 Pressure Tube Material with Radial Hydrides Using Direct-Current Potential Drop—P. H. DAVIES AND C. P. STEARNS	379
Assessment of J-R Curves Obtained from Precracked Charpy Specimens—J. A. KAPP AND M. I. JOLLES	401

DUCTILE FRACTURE

A Single Specimen Determination of Elastic-Plastic Fracture Resistance by Ultrasonic Method—K. HIRANO, H. KOBAYASHI, AND H. NAKAZAWA	415
J-Resistance Curve Analysis for ASTM A106 Steel 8-Inch-Diameter Pipe and Compact Specimens—M. G. VASSILAROS, R. A. HAYS, AND J. P. GUDAS	435
Influence of Crack Depth on Resistance Curves for Three-Point Bend Specimens in HY130—O. L. TOWERS AND S. J. GARWOOD	454
An Investigation of the I and dJ/da Concepts for Ductile Tearing Instability—M. R. ETEMAD AND C. E. TURNER	485
Computation of Stable Crack Growth Using the J-Integral—J. E. CARIFO, J. L. SWEDLOW, AND C.-W. CHO	503
Evaluation of Environmentally Assisted Cracking of a High Strength Steel Using Elastic-Plastic Fracture Mechanics Techniques—E. M. HACKETT, P. J. MORAN, AND J. P. GUDAS	512
Plastic Energy Dissipation as a Parameter to Characterize Crack Growth—T. J. WATSON AND M. I. JOLLES	542

ANALYSIS AND MECHANISMS

Stress Intensity Factors for a Circular Ring with Uniform Array of Radial Cracks of Unequal Depth—S. L. PU	559
Weight Functions of Radial Cracks Emanating from a Circular Hole in a Plate—G. T. SHA AND C.-T. YANG	573

An Empirical Surface Crack Solution for Fatigue Propagation Analysis of Notched Components—J. F. YAU	601
Extension of Surface Cracks During Cyclic Loading—H. M. MÜLLER, S. MÜLLER, D. MUNZ, AND J. NEUMANN	625
Comparison of Predicted versus Experimental Stress for Initiation of Crack Growth in Specimens Containing Surface Cracks—W. G. REUTER	644
Comparison of Ductile Crack Growth Resistance of Austenitic, Niobium-Stabilized Austenitic, and Austeno-Ferritic Stainless Steels—P. BALLADON AND J. HERITIER	661
Minimum Time Criterion for Crack Instability in Structural Materials—H. HOMMA, D. A. SHOCKEY, AND S. HADA	683
Discussion	694
Dynamic Crack Propagation and Branching under Biaxial Loading—A. SHUKLA AND S. ANAND	697
Assessing the Dominant Mechanism for Size Effects on CTOD Values in the Ductile-to-Brittle Transition Region—T. L. ANDERSON AND S. WILLIAMS	715
Dynamic J-R Curve Testing of a High Strength Steel Using the Key Curve and Multispecimen Techniques—J. A. JOYCE	741
AND E. M. HACKETT	773
Discussion	
Boundary Layer Effects in Cracked Bodies: An Engineering Assessment—C. W. SMITH, J. S. EPSTEIN, AND O. OLAOSEBIKAN	775
Stress Intensity Factors for Circumferential Surface Cracks in Pipes and Rods under Tension and Bending Loads—I. S. RAJU	789
AND J. C. NEWMAN	
Summary	809
Author Index	817
Subject Index	819

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