

TRANSACTIONS OF THE ASME



JOURNAL OF ENGINEERING MATERIALS AND TECHNOLOGY



SETTING THE STANDARD
1880 2005

Editor
HUSEYIN SEHITOGLU (2008)

GEORGE J. WENG
(Past Technical Editor)
DAVID L. McDOWELL
(Past Technical Editor)

Materials Division
Associate Editors
E. BUSO (2004)
M. CHERKAOUI (2005)
S. K. DATTA (2006)
H. GARMESTANI (2006)
M. F. HORSTEMEYER (2006)
S. MALL (2004)
R. MCCLUNG (2004)
M. MILLER (2005)
G. NEWAZ (2006)
A. PELEGRI (2006)
A. M. RAJENDRAN (2004)
A. SASTRY (2006)
W. SOBOYEJO (2005)
M. ZHOU (2004)

PUBLICATIONS DIRECTORATE
Chair, ARTHUR G. ERDMAN

OFFICERS OF THE ASME
President, HARRY ARMEN
Executive Director
VIRGIL R. CARTER
Treasurer
R. E. NICKELL

PUBLISHING STAFF
Managing Director, Engineering
THOMAS G. LOUGHIN
Director, Technical Publishing
PHILIP DI VIETRO
Production Coordinator
COLIN McATEGR
Production Assistant
MARISOL ANDINO

Transactions of the ASME, Journal of Engineering Material and Technology (ISSN 0094-4289) is published quarterly (Jan., Apr., July, Oct.) by The American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016. Periodicals postage paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to Transactions of the ASME, Journal of Engineering Materials and Technology, c/o THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS, 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300.

CHANGES OF ADDRESS must be received at Society headquarters seven weeks before they are to be effective.
Please send old label and new address.

STATEMENT from By-Laws. The Society shall not be responsible for statements or opinions advanced in papers or ... printed in its publications (B7.1, Par. 3).

COPYRIGHT © 2004 by the American Society of Mechanical Engineers. For authorization to photocopy material for internal or personal use under those circumstances not falling within the fair use provisions of the Copyright Act, contact the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923; tel: 978-750-8400, www.copyright.com. Request for special permission or bulk copying should be addressed to Reprints Permission Department.

INDEXED by Applied Mechanics Reviews and Engineering Information, Inc. Canadian Goods & Services Tax Registration #126148048

Journal of Engineering Materials and Technology

Published Quarterly by ASME

VOLUME 126 • NUMBER 4 • OCTOBER 2004

RESEARCH PAPERS

- 329 A Slip-Based Model for Strength Evolution During Cyclic Loading
H. S. Turkmen, M. P. Miller, P. R. Dawson, and J. C. Moosbrugger
- 339 Modeling Cyclic Deformation of HSLA Steels Using Crystal Plasticity
C. L. Xie, S. Ghosh, and M. Groeber
- 353 Bilinear Behavior in Nano and Microindentation Tests of fcc Polycrystalline Materials
A. A. Elmoustafa, A. A. Ananda, and W. M. Elmahboub
- 360 Practical Methods for the Design of Sheet Formed Components
Wei Gan, R. H. Wagoner, Kunming Mao, Shane Price, and Firooz Rasouli
- 368 On Hydrogen-Induced Void Nucleation and Grain Boundary Decohesion in Nickel-Base Alloys
Y. Liang and P. Sofronis
- 378 Creep Behavior of Al-Si Die-Cast Alloys
Tim Jaglinski and Roderic Lakes
- 384 Tensile Deformation and Rotating-Bending Fatigue Properties of a Highelastic Thin Wire, a Superelastic Thin Wire, and a Superelastic Thin Tube of NiTi Alloys
R. Matsui, H. Tobushi, Y. Furuichi, and H. Horikawa
- 392 Measurement and Microstructural Evaluation of Creep-Induced Changes in Magnetic Properties of a 410 Stainless Steel
A. Polar, J. E. Indacochea, M. L. Wang, V. Singh, and G. Lloyd
- 398 Prediction of Brinell Hardness Distribution in Cold Formed Parts
Ahmet Demir and Fazil. O. Sonmez
- 406 Thermo-Mechanical Modeling of Hot Forging Process
Siamak Serajzadeh
- 413 Equivalent Time Temperature Model for Physical Aging and Temperature Effects on Polymer Creep and Relaxation
Ever J. Barbero and Kevin J. Ford
- 420 Formation of Microscopic Voids in Resin Transfer Molded Composites
Youssef K. Hamidi, Levent Aktas, and M. Cengiz Altan
- 427 Combined Edge and Anisotropy Effects on Fickian Mass Diffusion in Polymer Composites
Levent Aktas, Youssef K. Hamidi, and M. Cengiz Altan
- 436 Mechanical Behavior in the Silicon Carbide Reinforced Aluminum 6061 Composites Degraded by Room or High Temperature 3.5% NaCl Solution
J. J. Ahn and S. Ochiai
- 443 On Identification of Material Models When Nonrepeatability of Test Data is Present: Application to Textile Composites
Abbas S. Milani and James A. Nemes
- 450 Thermal Shock Strength of a Semi-infinite Piezoelectric Medium
Bao-Lin Wang and Yu-Guo Sun

(Contents continued on inside back cover)

This journal is printed on acid-free paper, which exceeds the ANSI Z39.48-1992 specification for permanence of paper and library materials. ©™
© 85% recycled content, including 10% post-consumer fibers.