

Residual Stress Effects on

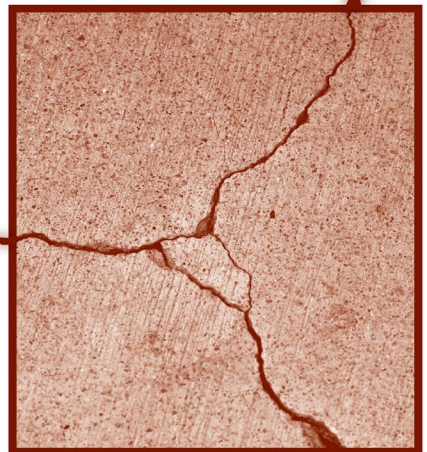
Fatigue and Fracture Testing

and Incorporation of Results into Design

J. O. Bunch
M. R. Mitchell
Editors



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Jeffrey O. Bunch and M. R. Mitchell, editors

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Foreword

This publication, *Residual Stress Effects on Fatigue and Fracture Testing and Incorporation of Results into Design*, contains papers presented at the Symposium on Residual Stress, which was held in Salt Lake City, UT on 19-20 May, 2004. The symposium was sponsored by ASTM International Committee E08 on Fatigue and Fracture. Dr. Jeffrey O. Bunch, Boeing Integrated Defense Systems, presided as symposium chairman and served as editor of this compilation. Co-chair of the symposium, was Dr. Michael R. Mitchell, Northern Arizona University.

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Overview

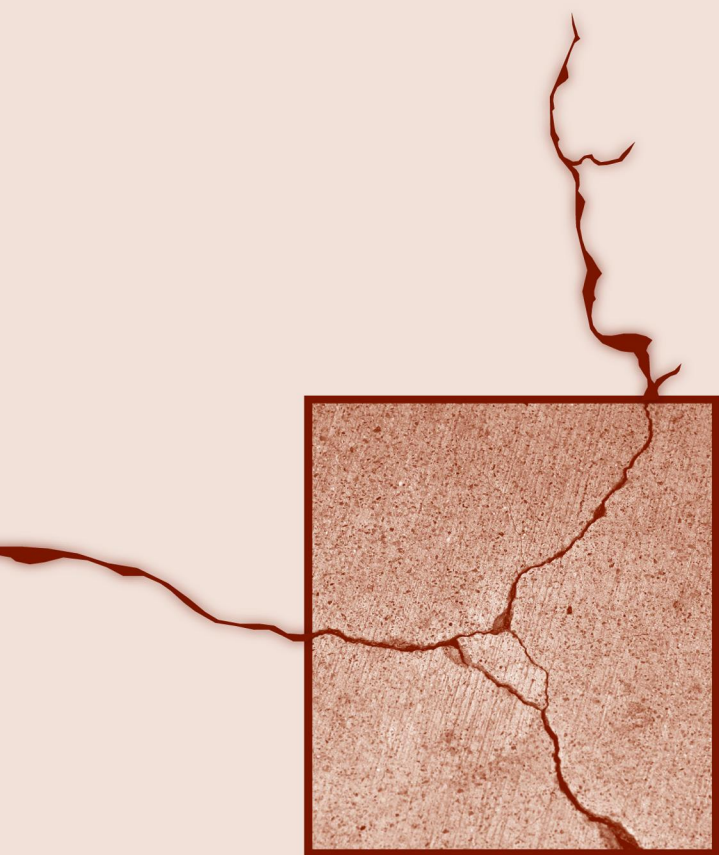
This book represents the research of several authors presented at the *Symposium on Residual Stress Effects on Fatigue and Fracture Testing and Incorporation of Results into Design* held in Salt Lake City, Utah, May 19-20, 2004. This symposium brought together researchers, practitioners of residual stress measurement techniques, structural analysts, and designers specializing in the influence of residual stress on fatigue and fracture. The intent of the symposium was to foster continued dialogue between these groups and thereby provide each with an understanding of the state of knowledge concerning residual stresses and their effect on structural integrity. Residual stresses can be present due to processing and manufacturing of materials and structures, so it is imperative to understand how and why they can influence the test data that we used in structural design methodologies. Residual stresses may also be intentionally engineered into structures in attempts to improve fatigue life, and it is equally important that designers understand how to account for these potential effects on fatigue life.

ASTM Committee E08 on Fatigue and Fracture is committed to providing timely information on the state-of-the-art of fatigue and fracture testing and lifetime prediction methods. Contained in this STP is a continuation of that commitment. Manuscripts covering the influence of processing and methods to account for residual stresses in predicting fatigue life are provided in this volume. Also included are manuscripts in which are discussed several applications of residual stress measurement methods. Engineered residual stresses further address fatigue crack growth and fatigue lifetime predictions of cold-worked holes and the influence of shot peening.

Future workshops and symposia sponsored by ASTM Committee E08 on Fatigue and Fracture are planned and will continue to foster dialogue on this highly important subject in fatigue and fracture.

Dr. Jeffrey O. Bunch
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