

COMPOSITE MATERIALS

Testing and Design

Thirteenth Volume

STEVEN J. HOOPER

Editor



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Testing and Design,
Thirteenth Volume***

Steven J. Hooper, editor

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The quality of the papers in this publication reflects not only the obvious efforts of the authors and the technical editor(s), but also the work of the peer reviewers. The ASTM Committee on Publications acknowledges with appreciation their dedication and contribution of time and effort on behalf of ASTM.

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Foreword

This publication, *Composite Materials: Testing and Design, Thirteenth Volume*, contains papers presented at the 13th Symposium on Composite Materials: Testing and Design, held in Orlando, Florida on 20–21 May 1996. The sponsor of the event was Committee D30 on Composite Materials and Subcommittee D30.02 on Research and Mechanics.

The symposium chairman was Steven J. Hooper, Department of Aerospace Engineering, Wichita State University, Wichita, Kansas. Session chairmen were Peter Sjoblom, University of Dayton Research Institute, Dayton, Ohio; Erian A. Armanios, Department of Aerospace Engineering, Georgia Institute of Technology, Atlanta, Georgia; Anthony Vizzini, University of Maryland, College Park, Maryland; Charles E. Bakis, Pennsylvania State University, University Park, Pennsylvania; Barry Davidson, Syracuse University, Syracuse, New York; John Fish, Lockheed Martin Skunk Works, Palmdale, California; and Carl Rosseau, Bell Helicopter Textron, Inc., Fort Worth, Texas.

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Overview

The Thirteenth Symposium on Composite Materials: Testing and Design was held 20–21 May 1996 in Orlando, Florida. This symposium, like many of its predecessors, provided a forum for presentations and discussions of issues critical to the design and testing of composite materials. The papers addressed topics in the areas of composite design, interlaminar fracture mechanics, compression testing, metal matrix and ceramic matrix composites, shear testing, and environmental effects.

The lasting value of the STP is due to the fundamental research lead which provides the basis for improvements in testing and design methods. This theme, which has prevailed since the earliest Testing and Design Symposia, is motivated by the fact that our ability to design composite structures is limited by our understanding of their failures. Investigations at the coupon level often represent the most effective approach to solving these problems.

I would like to acknowledge the efforts of the authors, reviewers, session chairmen, and ASTM staff who made this special technical publication possible.

Steven J. Hooper

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Wichita State University, Wichita, Kansas;
Symposium Chairman and Editor

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