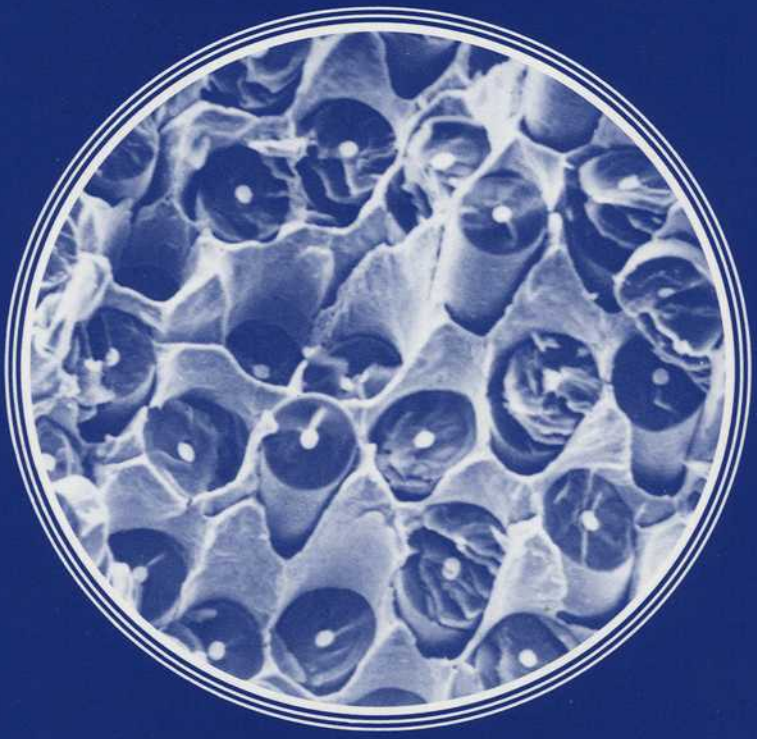
Testing Technology of METAL MATRIX COMPOSITES



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Peter R. DiGiovanni and Norman Ray Adsit, editors

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Foreword

The symposium on Testing Technology of Metal Matrix Composites was held 18–20 November 1985 in Nashville, Tennessee. ASTM Committee D-30 on High Modulus Fibers and Their Composites sponsored the symposium. Peter R. DiGiovanni, Raytheon Company, and Norman Ray Adsit, Rohr Industries, served as symposium cochairmen and coeditors of this publication.

Contents

NONDESTRUCTIVE EVALUATION AND PHYSICAL TESTS

FRACTURE BEHAVIOR AND NONDESTRUCTIVE EVALUATION

MECHANICAL TEST METHODS AND MATERIAL CHARACTERIZATION

Overview

While the use of Metal Matrix Composites (MMCs) has increased significantly in recent years and there are many future applications, standard test procedures and an understanding of the failure mechanisms have not kept pace. This symposium and the resulting book is a first attempt to address this specific issue.

The keynote address given at the symposium by Jerome Persh, of the Office of the Undersecretary of Defense for Research and Engineering, gave a clear prospective of the need and the importance of MMCs. Mr. Persh dealt with the need to have standard methods of evaluating competing systems so that one can arrive at the system with the most appropriate material.

A total of forty-one papers were initially scheduled for presentation. Eleven had to be cancelled and two more were not included in this book. The resulting twenty-eight papers are divided topically into:

1. Special Topics (Including High Temperature)
2. Theoretical Considerations
3. Nondestructive Evaluation and Physical Tests
4. Fracture Behavior and Nondestructive Evaluation
5. Mechanical Test Methods and Material Characterization

Work included in this volume covers material systems from the continuous silicon carbon/titanium system to the particulate reinforced aluminum system. The form of the material varied from precast block to braided pieces. While the end applications of these systems vary, the need to obtain accurate and reliable test data does not vary. Tests and test methods are given for elevated temperature tests, dynamic modulus tests, coefficient of expansion tests, compression and buckling tests, among others. In all cases there is a need for an evaluation of the material before the destructive tests are conducted, that is, a need for nondestructive evaluation.

N. R. Adsit
Rohr Industries, Chula Vista, Ca 92012; symposium co-chairman and co-editor.

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