

FIBER-STRENGTHENED METALLIC COMPOSITES

STP 427



AMERICAN SOCIETY
FOR TESTING
AND MATERIALS

FIBER-STRENGTHENED METALLIC COMPOSITES

A symposium
presented at the
AMERICAN SOCIETY FOR
METALS 1966 Metals Congress
Chicago, Ill., 2-3 November 1966

ASTM SPECIAL TECHNICAL PUBLICATION NO. 427

List price \$12.75; 30 per cent discount to members



published by the
AMERICAN SOCIETY FOR TESTING AND MATERIALS
1916 Race Street, Philadelphia, Pa. 19103

© BY AMERICAN SOCIETY FOR TESTING AND MATERIALS 1967
Library of Congress Catalog Card Number: 67-20392

NOTE

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

Foreword

The Symposium on Fiber-Strengthened Metallic Composites was presented in three sessions during the American Society for Metals 1966 Metals Congress, 2-3 November 1966, Chicago, Ill. The symposium was sponsored by the Aerospace Panel of the ASTM-ASME Joint Committee on Effect of Temperature on the Properties of Metals. Jack L. Christian, General Dynamics Convair, was symposium chairman, and R. B. Clapper, National Aeronautics and Space Administration, was vice-chairman. Presiding at the three sessions were Mr. Christian, Mr. Clapper, and J. J. Heger, U.S. Steel Corp.

Related ASTM Publications

**Materials for Aircraft, Missiles, and Space Vehicles,
STP 345 (1963), \$7.00**

**Newer Structural Materials for Aerospace Vehicles,
STP 379 (1965), \$6.00**

Contents

| | |
|--|-----|
| Introduction | 1 |
| Interior Elastic Stress Field in a Continuous, Close-Packed Filamentary Composite Material Under Uniaxial Tension—H. R. PIEHLER | 3 |
| Electroforming to Make Composite Materials—N. R. ADSIT | 27 |
| Effect of Temperature on Mechanical Properties of Boron-Electrodeposited Nickel Composites—J. A. ALEXANDER AND W. F. Stuhrke | 34 |
| Fundamental Study of Metal Matrix Composites—W. T. KAARLELA, W. S. MARGOLIS, AND H. R. THORNTON | 53 |
| How Metal Matrix Composites Are Made—L. W. DAVIS | 69 |
| Fibering of Oxides in Refractory Metals—R. W. JECH, J. W. WEETON, AND R. A. SIGNORELLI | 91 |
| High Energy-Rate Forming of Fibrous Composites—R. K. ROBINSON . | 107 |
| Analysis of Stress-Rupture and Creep Properties of Tungsten Fiber Reinforced Copper Composites—D. L. MCDANELS, R. A. SIGNORELLI, AND J. W. WEETON | 124 |
| Metallurgical and Geometrical Factors Affecting Elevated Temperature Tensile Properties of Discontinuous Tungsten Fiber Reinforced Composites—D. W. PETRASEK, R. A. SIGNORELLI, AND J. W. WEETON | 149 |
| Summary of ASTM/ASME Composite Symposium—W. F. STUHRKE .. | 176 |

