

# Introduction

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The American Society For Testing and Materials in conjunction with the Metallurgical Society of the American Institute of Mining, Metallurgical, and Petroleum Engineers and the American Society of Mechanical Engineers, held the Third Conference on Composite Materials: Testing and Design on 21-22 March 1973 in Williamsburg, Va. The objectives of this conference were the same as those of its organizing group (ASTM Committee D-30), that is, to stimulate research and promote the understanding of the behavior of fibers and their composites, including reexamination of conventional tests in the light of structural design data requirements and composite properties. Because the field of advanced composites is so rapidly growing and changing, it is possible to meet such broad objectives only insofar as the progress to date is concerned—and this the Third Conference has done successfully. The previous two similar conferences were held in New Orleans in 1969 (STP 460) and Anaheim in 1971 (STP 497), and succeeding conferences will continue to be held as long as encouragement of new developments continues to be needed. This volume includes most of the papers given at the conference—and because its eight sessions (on testing methods, analytical treatments, experimental studies, environmental effects, fatigue and fracture behavior, wear properties, metallic composites, and aircraft applications) covered the total subject adequately in both depth and breadth, it will make a valuable addition to the library of the scientist, analyst, designer, or testing engineer who is seeking a better understanding of the mechanical behavior of composites.

The papers in this volume provide a focus on the design of engineering applications of composite materials in industrial, military, and consumer uses; the testing of such materials and products; and the service behavior and performance of the products. Contributions dealing with design and test methods, fatigue and fracture phenomena, effects of environmental conditions, friction and wear behavior, impact response, manufacturing technology, and related topics are emphasized. Both theoretical and experimental approaches are described, and useful data are presented. It is hoped that the dissemination of the results of recent advancements and successes will encourage similar fallouts to other commercial and military areas.

Special thanks for the preliminary organization and scheduling of the conference papers are due to the original chairmen, Professor C. A. Berg, University of Pittsburgh and Professor F. J. McGarry, of the Massachusetts Institute of Technology.

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