New Structural Materials Technologies: Opportunities for the Use of Advanced Ceramics and Composites

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Foreword

This technical memorandum responds to a joint request from the House Committee on Science and Technology and the Senate Committee on Commerce, Science, and Transportation to analyze the military and commercial opportunities presented by new structural materials technologies and outline the Federal research and development priorities which are consistent with those opportunities. This memorandum is part of a larger assessment which will address the impact of advanced structural materials on the competitiveness of the U.S. manufacturing sector, and offer policy options for accelerating the commercial utilization of these materials.

New structural materials—ceramics, polymers, metals, or hybrid materials derived from these, called composites—open a promising avenue to renewed international competitiveness of U.S. manufacturing industries. There will be many opportunities for use of the materials in aerospace, automotive, industrial, medical, and construction applications in the next *25* years.

In recent years, several excellent studies have been carried out on both ceramics and polymer matrix composites. This memorandum draws on this body of work and presents a broad picture of where these technologies stand today and where they are likely to go in the future.

OTA appreciates the assistance provided by the contractors, advisory panel, and workshop participants, as well as the many reviewers whose comments helped to ensure the accuracy of the report.

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