SOCIETY FOR THE ADVANCEMENT OF MATERIAL AND PROCESS ENGINEERING

ADVANCED MATERIALS/ AFFORDABLE PROCESSES

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PREFACE

Welcome to the 23rd International SAMPE Technical Conference, hosted by the New York Metropolitan SAMPE Chapter, and held at the Concord Hotel, Kiamesha Lake, New York.

Over the years SAMPE's membership has naturally been focused on advancing materials and processes. In discussing a theme for this year's conference the committee, by consensus, selected "Advanced Materials/Affordable Processes." SAMPE's members are the developers of materials technologies and should be active as gatekeepers of the technology to insure that affordable concurrent process development is emphasized and achieved prior to production implementation.

The approach of the 21st century will necessitate ever increasing emphasis on affordability, as global competition increases, and manufacturer's financial health will require rapid development and implementation of new materials and affordable processes. It is appropriate that SAMPE's membership accept the challenge and meet it head on.

We wish to thank the speakers, authors, session chairmen, conference committee and the SAMPE Headquarters staff, for their individual contributions which helped make this conference a success.

Robert L. Carri	*Leonard M. Poveromo*	*Judy Gauland*
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23rd International SAMPE Technical Conference
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A QUALITATIVE ANALYSIS OF SOME OF THE ISSUES AFFECTING THE COST OF COMPOSITE STRUCTURES

Michael J. Robinson
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ABSTRACT

As defense spending declines, much of the driving interest in composite structures development for aerospace is shifting from performance benefits to cost benefits. Many manufacturing cost studies have been conducted recently to compare alternative composite fabrication methods, particularly automated methods. These studies are reviewed and their relevance to total system costs are considered. The effect of design choices on cost is discussed. A comparison is made to the cost of production of metallic structures, with a detailed look at launch vehicle fairings and propellant tanks.

KEY WORDS: Cost, automation, design, launch vehicles

1. INTRODUCTION

Composite structures have been investigated and adopted over the years because of the performance benefits the composite materials offer. The higher specific strength and stiffness and other benefits like zero coefficient of thermal expansion (CTE), fatigue resistance, and corrosion resistance have made them attractive for high performance combat aircraft and space and missile systems. But composite structure development can be difficult. Even apart from their anisotropy, these materials are profoundly different from aluminum and other metals in general characteristics and processing. New variations appear constantly and the processing science continues to evolve. The difficulties of developing composite structures and the quest to maximize performance through optimized design have resulted in some very expensive composite parts, some program cancellations, and widespread belief that the high expense is an inherent problem with composite materials.

Cost will continue to be an obstacle in development programs whatever materials are used. But as basic composite materials and manufacturing technology has matured and been applied, we