

# **MANUFACTURE OF HIGH PERFORMANCE THERMOPLASTIC COMPOSITE STRUCTURES**

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## **ABSTRACT**

The use of thermoplastic composites, using high performance polymers such as Victrex PEEK, for structural applications in the aerospace sector is seen as one of the major routes to reducing the weight of aircraft, improving efficiency and thus reducing the environmental impact of the aerospace sector.

One of the keys to the increased use of thermoplastic composites is through improved manufacturing techniques which will reduce the cost of manufacture, cost of tooling, enable complex components to be manufactured with ease and will facilitate rapid expansion of manufacturing volume with limited capital investment.

This paper reviews the problems associated with using standard thermoset-composite processing techniques for the manufacture of high-performance-thermoplastic-composite components.

Current investigations into the use of novel processing techniques for the manufacture of thermoplastic composite structures will be reported and discussed in the context of the reduction of manufacturing cost, improved ease of processing and potential commercial manufacturing routes will be considered.

**KEY WORDS:** Advanced Composite Materials, High Temperature Composite Materials, Vacuum Bagging

## **1. INTRODUCTION**

Interest in the use of thermoplastic composites for the manufacture of aerospace fuselage and sub-structures is increasing due to the potential weight savings and the subsequent consequences of this in terms of efficiency and environmental benefits [1]. Thermoplastic composites offer several advantages over the thermoset composites currently being used, these including:

- Better impact performance
- Better fatigue performance
- Better mechanical performance generally