

# NASA National Center for Advanced Materials

## PERFORMANCE BULLETIN

at the National Institute for  
Aviation Research



November 7, 2005

N05-04

## Progress of Material Qualification

The National Center for Advanced Materials Performance has concluded collection of information for the shared materials database. The success of a shared database depends on the materials that have been selected, making the material selection process a vital part of the project.

Data has been gathered on 56 resin systems from ten different material suppliers. The NCAMP Industry Advisory Board, which consists of aircraft companies, has been asked to review and select the materials. The materials provided are weighed for selection into the shared database by the companies on the board. In order to provide more feedback to material suppliers, we have also asked the companies to provide a brief explanation on their decision. These comments will be provided to each material supplier confidentially and the name of the providing company will remain private.

## Comparison of Various Acceptance Criteria

Through computer generated simulations, the effect of various changes to the acceptance criteria, the original qualifying samples and the equivalency samples on the acceptance rate of the equivalency samples were examined. Simulated samples were generated with varying sample sizes, means, and standard deviations. They were then tested according to various

acceptance criteria to check the reliability of those criteria and to determine the effect of changes in those variables on the failure rates of the samples. They were tested based on qualifying samples of both size 18 and 30, which also had varying means and standard deviations. The acceptance criteria examined were:

- AGATE Criteria - Detailed in DOT/FAA/AR-03/19 “Material Qualification and Equivalency for Polymer Matrix Composite Material Systems: Updated Procedure”, Final Report Sept. 2003 with alpha set at 0.01.
- Cpk-based Criteria - A minimum Cpk of 1.33 is desired. The needed sample mean and minimum values are computed from the qualifying sample values based on those criteria.
- Criteria presented at Sept. 1994 Mil-Hdbk-17 meeting - A total of eight different acceptance criteria used at that time by companies were tested to see how they performed compared to the AGATE and Cpk-based criteria.

NCAMP staff will be giving a presentation about this topic at the next MIL-17 meeting.