



Development of Morphing Aircraft Structure Using SMP

By Soo-Chan Jee

Biblioscholar Dez 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x7 mm. This item is printed on demand - Print on Demand Neuware - The U.S Air Force needs new aircraft which provide longer flight time, less fuel consumption, better aerodynamics in order to perform Air Force missions successfully as the mission environment changes rapidly. A morphing wing aircraft is considered as a potential new aircraft for those missions. This thesis explores Shape Memory Polymer (SMP) properties test results and its application for morphing wing skin. Several SMP composite laminates were considered for investigating shape changing characteristics required for morphing skin. The braided composite preforms used in making SMP composites were explored in morphing wing operating system based on the results of property tests. The system definition, life cycle of system, user analysis, and some architecture for identifying systems effectively formed the basis for the generic system engineering process presented. Further, this thesis explores initial geometric deformability, recovery characteristics, material property estimates, and develops the system using morphing material in order to present a concept for emerging morphing wing aircraft as a potential future Air Force's alternative. Based upon this research, the material system considered here does not meet the morphing requirement...



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