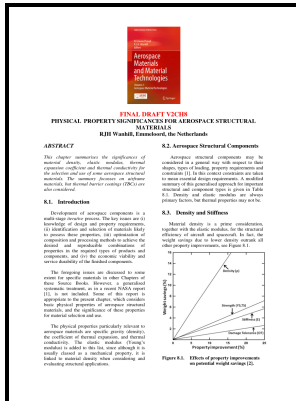


# Effect of thermal stresses on the integrity of three built-up aircraft structures

## Dryden Flight Research Center - 2 Aircraft Operating Environment



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Notes: Bibliographical references: p.15-17.

This edition was published in 1980



Filesize: 17.110 MB

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### Thermal stress

Based on Manson—Coffin and Paris formulas, an approach is developed to predict failure of aircraft lugs under thermal stress and oblique loading angle.

### The effect of thermal stresses on the integrity of three built

Microcracks may grow into transverse ply cracks, which finally form initiations of delamination and subsequent failure of the laminate.

### Hygro

Subsequently, the variation in shape and residual stress distribution in the laminates following moisture saturation could be analysed. The stress intensity factor was determined using the J-integral approach even for coarse meshes.

### Thermal Residual Stress

For they must have not only adequate resistance to bending but also adequate torsional rigidity to resist twisting. This chapter describes a number of innovative concepts and discusses the developments required to enable their application on next-generation aircraft.

### Residual stress

The committee does not believe that, in the approximately 20-year purview of this report, systems involving adaptive materials will be available, practical, and sufficiently low enough in cost to enable application on commercial aircraft. Thus, it can be concluded that 0.

### Effect of Interference on the Mechanics of Load Transfer in Aircraft Fuselage Lap Joints

**ALUMINUM ALLOYS** Historically, the chief damage mechanisms for aluminum alloys in aircraft applications are corrosion and fatigue, mechanisms generally associated with an aging fleet Bucci and Konish, 1994. The most common fiber coatings—carbon and boron nitride—are currently unacceptable because of their susceptibility to oxidation. Wind loads Wind load is primarily horizontal load caused by the movement of air relative to earth.

### **Thermal Expansion Cracks in Brick Walls & Foundations**

Johannesson and Ogin 1995 , reproduced by permission of Elsevier Science Ltd from *Acta Metallurgica et Materialia*, 1995, 43, 4337—4348. These stresses can cause fiber-matrix interfacial failure or radial cracking in the matrix radiating from fiber surfaces. In the present work, we experimentally investigate the mode II fracture toughness behavior of dissimilar metal-composite adhesive joints using the end-notched flexure ENF test.

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