

REINFORCED FIBER COMPOSITES: ANALYSIS AND DESIGN

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ABSTRACT

The steady progress in deployment of Reinforced Fiber Composite (RFC) Structures has progressed to the point where we see two important trends about to take place in the near future. The first is the construction of a 100% Fiber Composite Aircraft Structure and the second is the trend towards 100% Fiber Composite Automobiles. The MS is directed towards the computer solution of all RFC mechanics and design problems impinging on the two trends cited above.

We list the various problems which are by no means an exclusive list. It is provided here to illustrate our broad interest in the domain.

1. Modelling of RFC as a result of the different modes of manufacture. In particular meshing of structures which reflect geometric constraints due to fiber geometry.
2. Macro and micro mechanics of RFC analysis. Methods of FE and SPH Analysis.
3. Comparison of experiments with analysis which will allow us to understand the Strength and Life of RFC Components.
4. Problems of continuous fiber models. Primarily for Aircrafts.
5. Problems of short fiber models. Primarily for less expensive deployment in automobiles.
6. Design and design allowables.
7. The potential that the material offers for structural optimization.
8. The necessity of applying Statistical Methods in Analysis and Design.
9. Low Cycle Fatigue of RFC Components