

Advances in Aircraft Structures

Editor

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CONTENTS

Preface	i
Contents	ii
Contributing Author	iv
Aircraft Structural Design and Testing	
1 Design of IIUM Aircraft Fuselage Using Composite Material (5168/20218)	1
2 Fabrication and Testing of IIUM Aircraft Fuselage Structure Made of Composite Laminate Material (5168/20223)	8
3 Design and Fabrication of Fuselage Model for Laboratory Purpose (5168/20225)	16
4 Simulation of Fuselage Model for Laboratory Purpose (5168/20228)	24
5 Propeller Blade Stress Analysis using CATIA (4625/20230)	30
6 Lateral Crushing of Composite Fuselages (4625/20232)	37
7 Corrosion Detection in Aircraft Structures by Ultrasonic Method (4980/20233)	45
8 Fatigue Damage Characterization of Aluminum Alloy Plates (4980/20235)	55
Composite Structures	
9 Determination of Mechanical Properties of Corrugated Hybrid Composite (5168/20237)	63
10 Composite Failure Mechanism of Corrugated Hybrid Composite Subjected to Bending Loading (5168/20239)	70
11 Study of Energy Absorption of Foam-Filled Honeycomb Structure (5168/20241)	79
12 Experimental Study of Indentation on Composite Structure (5168/20245)	86
13 Simulation Study of Composite Structure Subjected to 3 Points Bending Load (5168/20246)	93
14 Experimental Study of the Strength of Sandwich Structure with Honeycomb Core (5168/20248)	101
15 Buckling of Composite Columns (4625/20249)	107
16 Buckling of Composite Perforated Plates (4625/20253)	117
17 Structural Analysis of an Active Beam (4625/20254)	125
18 Characterization of Composite Materials using Full Field Data (6377/20256)	131

19	Application of Virtual Fields Method to Composite Plate Bending Problem	(6377/20262)	137
20	Mode I Delamination Simulation using LS-DYNA	(3563/20263)	143

Structural Instability

21	Buckling of Long Column	(4625/20264)	150
22	Buckling of Thin Walled Sections	(4625/20265)	158
23	Effect of Boundary Conditions on the Buckling Behavior of Perforated Plates	(4625/20266)	167
24	Effect of Cutout Shape on the Critical Buckling Load of Perforated Plates.	(4625/20267)	174
25	Experimental Determination of Critical Buckling Load for a Perforated Plate	(4625/20268)	182
26	Accurate Geometric Stiffness Matrix Formulation of Beam Finite Element	(6327/20269)	190

Structure Analytical Methods

27	The Constitutive Equation Gap Method	(6377/20270)	198
28	The Equilibrium Gap Method	(6377/20271)	202
29	The Reciprocity Gap Method	(6377/20272)	206
30	The Virtual Fields Method	(6377/20273)	210
31	Numerical Construction of Piecewise Virtual Fields	(6377/20274)	215
32	Numerical Model of Noise Effect in Full Field Data	(6377/20274)	221
33	Optimized Virtual Fields with Noise Minimization	(6377/20276)	227
34	Axial Stiffness Matrix of Non-Uniform Bernoulli-Euler Bar Elements		233
35	Finite Element Model Updating	(6377/20277)	240

Chapter 5

Propeller Blade Stress Analysis Using CATIA

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Abstract

A procedure for modeling and stress analysis of a propeller blade using CATIA software have been detailed. The blade has been modeled with its twist angle and the results for different material have been presented graphically.

Keywords: *Propeller, design, stress, modeling, CATIA.*

1. Introduction

In the design of propeller one of the major steps is the stress analysis of the propeller. In this work a procedure has been detailed on the stress analysis of blades using CATIA software.

In the design of the propeller the first step is to select an airfoil for the blade that would give the best performance to the propeller and aircraft. Here Clark-Y type is chosen for our airfoil. As a next step, point generations of Clark-Y airfoils using “profil 2.24 software” was made, then the generated point was exported to Microsoft Excel which was later imported to CATIA VR18 software where those points were plotted to get the shape of the desired airfoil. Then connect those points with lines to get the shape of the blade.

As the propeller selected measured 2 meter in diameter, we can set one side of blade as having 1 meter in length and later on we can just mirror the image of blade 1 to the other side to get the two-bladed propeller. As a next step divide the