

LIST OF FIGURES

Figure 1 Hexagonal Honeycomb Sandwich Structure	1
Figure 2 Beetle forewing being taken as a sample	2
Figure 3 Scanning electron microscopy photographs.....	3
Figure 4 Implementation of Sandwich Structure Used in Aerospace	3
Figure 5 Common Sandwich Structure	7
Figure 6 Beetle forewing being taken as a sample	8
Figure 7 Scanning electron microscopy photographs.....	8
Figure 8 Existing Beetle Forewing Sandwich Structure. (a) Overall view of Beetle Forewing Sandwich Structure (b) Core of Beetle Forewing Sandwich Structure.	9
Figure 9 Stress Strain Graph.....	16
Figure 10 Illustration of Stress Value Equations.....	17
Figure 11 Illustration of Strain Values Equation.....	18
Figure 12 Type of Bending test. (A) Two-point bending and (B) Three-pint bending	20
Figure 13 Model of Conceptual study.	24
Figure 14 Systematic of Problem Solving.....	25
Figure 15 Beetle Forewing Sandwich Structure.....	36
Figure 16 Specimen Setup with ASTM D 790—17.....	40
Figure 17 Step by Step of the Simulation.....	41
Figure 18 Bending Test of BFS3-3 Side Structure.....	42
Figure 19 Deformation Result from Simulation of BFS3-1	49
Figure 20 Maximum Principal Elastic Strain Result from Simulation of BFS3-1	49
Figure 21 Terminate Point of Strain Limit Exist in the Outer surface of BFS3-1 Structure.....	50
Figure 22 Half Cut of BFS3-1 Core Mechanical Properties While Loaded with 4000 N.....	50
Figure 23 Summary of All BFS Structure Simulation	51
Figure 24 Statistical Test Scheme	56
Figure 25 Graph Normality Test of GRG Value	57
Figure 26 Graph of Applied Force and Deformation of BFS3-1 Structure.....	63
Figure 27 Deformation Result from Simulation of BFS3-1	64
Figure 28 Half Cut of BFS3-1 Core Mechanical Properties While Loaded with 4000 N.....	65
Figure 29 Summary of All BFS Structure Simulation	66

Figure 30 Comparison of The Core Sandwich Structure; a) Honeycomb Sandwich Structure, and
b) Beetle Forewing Sandwich Structure with Trabecula..... 68

Figure 31 Comparison Value Between BFS3-1 With HS-1; a) Comparison of Force Applied
Value, and b) Comparison of Deformation Value..... 69