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Nota di contenuto	Cover; Title Page; Copyright Page; Contents; Preface; Acknowledgements; 1 Stress and Strain Analysis of Symmetric Composite Single Lap Joints Under Combined Tension and In-Plane Shear Loading; 1.1 Introduction; 1.2 Equations and Solution; 1.2.1 Model Description; 1.2.2 Governing Equations for Tension Loading Nx; 1.2.3 Governing Equation for In-Plane Shear Loading Nxy; 1.2.4 Solutions; 1.2.4.1 Adhesive Peel Stress azz Due to Nx; 1.2.4.2 Adhesive Shear Stress axz Due to Nx; 1.2.4.3 Adhesive Shear Stress ayz Due to Nxy; 1.3 Solution Verification; 1.4 Yield Criterion; 1.5 Case Studies 1.6 SummaryReferences; 2 Finite Element Modeling of Viscoelastic Behavior and Interface Damage in Adhesively Bonded Joints; 2.1 Introduction; 2.2 Finite Element Analysis of Viscoelastic Adhesively Bonded Joints; 2.2.1 Constitutive Relation; 2.2.2 Numerical Example; 2.2.2.1 Stress Distribution along Overlap Length; 2.2.2.2 Effect of Thermal Expansion; 2.3 Damage Analysis of Viscoelastic Adhesively Bonded Joints; 2.3.1 Constitutive Relation of Cohesive Element; 2.3.1.1 Linear Elastic Traction-Separation Law; 2.3.1.2 Damage Initiation and Evolution; 2.3.2 Numerical Example 2.3.2.1 Joint Stiffness2.3.2.2 Damage of Cohesive Elements; 2.3.2.3 Effects of Interface Damage on Adhesive Layer; 2.4 Summary and Conclusions; Acknowledgements; References; 3 Modeling of Cylindrical

Joints with a Functionally Graded Adhesive Interlayer; 3.1 Introduction; 3.2 Axisymmetric Model; 3.2.1 Stress Fields in the Bonded Assembly; 3.2.1.1 Inner Adherend; 3.2.1.2 Adhesive; 3.2.1.3 Outer Adherend; 3.2.2 Stiffness Tailored Adhesive Interlayer; 3.2.2.1 Tubular Joints; 3.2.2.2 Shaft-Tube Joints; 3.3 Constitutive Models of the Adherends and FMGB Adhesive; 3.4 Variational Approach 3.4.1 Case I: FMGB; 3.4.2 Case II: FMGB; 3.4.3 Case III: MMB1; 3.4.4 Case IV: MMB; 3.5 Solution Procedure; 3.6 Results and discussion; 3.6.1 Influence of Bond Length (L); 3.6.2 Influence of Modulus Function; 3.6.3 Influence of Stiffness Mismatch; 3.7 Summary; References; 4 A Simplified Stress Analysis of Bonded Joints Using Macro-Elements; 4.1 Introduction; 4.1.1 Context; 4.1.2 Objective; 4.1.3 Overview of the Simplified Linear Elastic Method; 4.1.4 Overview of the Paper; 4.2 Linear Elastic 1D-Bar and 1D-Beam Models; 4.2.1 1D-Bar Model; 4.2.1.1 Formulation of the BBa Element 4.2.1.2 Assembly of the Stiffness Matrix for a Single-Lap Joint 4.2.2 1D-Beam Model; 4.2.2.1 Formulation of the BBe Element; 4.2.2.2 Validation on the Example Single-Lap Joint; 4.3 Assuming a Non-linear Adhesive Material; 4.3.1 Numerical Approach; 4.3.2 Example of Application to Structures: Single-Lap Joint, In-Plane Loading; 4.3.2.1 Equilibrium of the Structure; 4.3.2.2 Determination of the Nodal Residue; 4.3.2.3 Projected Stresses; 4.3.2.4 Solution Procedure; 4.3.3 Considering a Bi-Triangular Damage Evolution Adhesive Behavior; 4.4 Validation; 4.4.1 Overview 4.4.2 FE Models for a Validation Purpose

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## Sommario/riassunto

The book comprehensively charts a way for industry to employ adhesively bonded joints to make systems more efficient and cost-effective. Adhesively bonded systems have found applications in a wide spectrum of industries (e.g., aerospace, electronics, construction, ship building, biomedical, etc.) for a variety of purposes. Emerging adhesive materials with im

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