

1. Record Nr.	UNINA9910820707903321
Titolo	Mechanics of composite materials : proceedings of the fifth symposium on Naval structural mechanics, held at the Marriot Motor Hotel, Philadelphia, Pennsylvania, May 8-10, 1967 // edited by F. W. Wendt, H. Liebowitz, N. Perrone
Pubbl/distr/stampa	Oxford, England : , : Pergamon Press Ltd, , 1970 ©1970
ISBN	1-4831-4779-7
Descrizione fisica	1 online resource (903 p.)
Collana	Office of Naval Research. Structural Mechanics Series
Disciplina	620/.11
Soggetti	Composite materials Fibrous composites Reinforced plastics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and indexes.
Nota di contenuto	Front Cover; Mechanics of Composite Materials; Copyright Page; Preface; Table of Contents; WELCOMING ADDRESS; SESSION I: REQUIREMENTS; CHAPTER 1. MISSILE AND AIRCRAFT SYSTEMS CONSTRAINTS AND OPERATIONAL REQUIREMENTS; SHIP SYSTEMS CONSTRAINTS AND OPERATIONAL REQUIREMENTS; I. NAVY SHIP; II. NAVY MISSION; III. ENVIRONMENT; IV. MATERIALS REQUIREMENTS; CHAPTER 2. MATERIALS, AND ENGINEERING PROBLEMS; ABSTRACT; I. INTRODUCTION; II. TENSILE STRENGTH; III. COMPRESSIVE STRENGTH; IV. SHEAR; V. EVALUATIONS, AND THEIR IMPLICATIONS; VI. CONCLUDING DISCUSSION; ACKNOWLEDGEMENTS; REFERENCES SESSION II: APPLICATIONS CHAPTER 3. STRUCTURAL USES OF COMPOSITES; I. INTRODUCTION; II. EXAMPLES; I I I . STRESS ANALYSIS; IV. CONCLUSIONS; ACKNOWLEDGEMENTS; REFERENCES; CHAPTER 4. THE USE OF COMPOSITE MATERIALS IN NAVAL SHIPS; I. INTRODUCTION; II. USE IN SURFACE SHIPS; III. USE IN SUBMARINES; IV. POSSIBLE FUTURE USES; V. OBSTACLES TO EXPANDED USE; ACKNOWLEDGEMENTS; REFERENCES; CHAPTER 5. APPLICATIONS OF REINFORCED PLASTICS IN AIRCRAFT; I. INTRODUCTION; II. RADOMES; III. FUSELAGE AND WINGS; IV. EMPENNAGE; V. ROTATING PARTS; VI. PRESSURE VESSELS; V I I .

SUMMARY

CHAPTER 6. APPLICATIONS OF COMPOSITE MATERIALS IN RE-ENTRY VEHICLES I. INTRODUCTION; II. THE ENVIRONMENT; III. APPLICATIONS; IV. SUMMARY; A CKNOWLEDGEMENTS; REFERENCES; CHAPTER 7. APPLICATIONS OF COMPOSITE MATERIALS IN SPACE VEHICLE STRUCTURES; ABSTRACT; I. INTRODUCTION; II. CHARACTERISTICS OF FILAMENTARY COMPOSITES; III. SPACE VEHICLE DESIGN CONSIDERATIONS; IV. SPACE VEHICLE APPLICATIONS; REFERENCES; INTERNATIONAL FORUM; CHAPTER 8. COMPOSITES RESEARCH IN ENGLAND; CHAPTER 9. FRENCH DEVELOPMENTS IN THE FIELD OF THERMAL-RESISTANT AND MECHANICAL COMPOSITES; I. THERMAL PROBLEMS II. MECHANICAL STRUCTURES REFERENCES; CHAPTER 10. COMPOSITES RESEARCH IN GERMANY; SESSION III: MICROMECHANICS; CHAPTER 11. THEORY OF COMPOSITE MATERIALS; 1. INTRODUCTION; 2. GENERAL CONSIDERATIONS; 3. ELASTIC PROPERTIES OF STATISTICALLY ISOTROPIC TWO-PHASE MATERIALS; 4. ELASTIC PROPERTIES OF FIBER-REINFORCED MATERIALS; 5. CONDUCTIVITY, DIELECTRIC CONSTANT AND MAGNETIC PERMITTIVITY OF COMPOSITES; 6. VISCOELASTIC COMPOSITES; 7. PLASTICITY OF COMPOSITES; 8. CONCLUSIONS; REFERENCES; CHAPTER 12. STATISTICAL THEORY OF HETEROGENEOUS MEDIA; ABSTRACT; I. INTRODUCTION; II. STATISTICAL FORMULATION III. EFFECTIVE CONSTANTS IV. EVALUATION OF THE BOUNDS ON k USING A PARTICULAR CELL MODEL; REFERENCES; CHAPTER 13. STRESS-STRAIN RELATIONS FOR COMPOSITE MATERIALS IN SHELLS OF ARBITRARY GEOMETRY; I. INTRODUCTION; II. GENERAL REMARKS; III. STIFFNESS TENSOR FOR FIBER-REINFORCED SHELLS; IV. CONCLUDING REMARKS; REFERENCES; CHAPTER 13. STRAINS AND STRESSES IN MATRICES WITH INSERTS; ABSTRACT; I. INTRODUCTION; I I . SPECIFICATION OF STRESS AND STRAIN CONDITIONS AT INTERFACE OF MATRICES AND INSERTS; III; . METHODS TO BE USED; IV. THREE-DIMENSIONAL ANALYSIS; V. TWO-DIMENSIONAL ANALYSIS (BONDED INSERTS) VI. TWO-DIMENSIONAL ANALYSIS (NO-PINCHING)

Sommario/riassunto

Mechanics of Composite Materials contains the proceedings of the Fifth Symposium on Naval Structural Mechanics held in Philadelphia, Pennsylvania, on May 8-10, 1967. The papers explore the mechanics of composite materials for naval applications. The structural requirements of a system and the fundamental mechanical properties of composite materials, as well as the behavior of such materials under various environmental conditions, are discussed. This book is comprised of 40 chapters and begins with an analysis of missile and aircraft systems constraints and operational requirements, along with