1. Record Nr. UNINA9910449819703321

Titolo	Accelerated aging of materials and structures : the effects of long-term elevated-temperature exposure / / National Research Council
Pubbl/distr/stampa	Washington, District of Columbia : , : National Academy Press, , 1996 ©1996
Descrizione fisica	1 online resource (65 p.)
Collana	Publication NMAB ; ; 479
Disciplina	620.16
Soggetti	Metallic composites Materials - Deterioration Airplanes - Materials - Deterioration Electronic books.
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.
Nota di contenuto	ACCELERATED AGING OF MATERIALS AND STRUCTURES; Copyright; COMMITTEE ON EVALUATION OF LONG-TERM AGING OF MATERIALS AND STRUCTURES USING ACCELERATED TEST METHODS; NATIONAL MATERIALS ADVISORY BOARD; Acknowledgments; Preface; Contents; Executive Summary; MATERIALS AGING CHARACTERIZATION; Service Environment; Materials and Degradation Mechanisms; Characterization of Aging Responses; Accelerated Methods; Analysis of Structures; REPORT ORGANIZATION; 1 Introduction; AGING OF MATERIALS AND STRUCTURES; CASE STUDY: HIGH-SPEED CIVIL TRANSPORT; 2 Aircraft Operating Environment; THE CONCORDE EXPERIENCE HSCT CONDITIONSGround Exposure; Flight Exposure; Airframe; Engine; SUMMARY AND RECOMMENDATION; 3 Candidate Materials; ALUMINUM ALLOYS; TITANIUM ALLOYS; SUPERALLOYS; POLYMER-MATRIX COMPOSITES; Thermoset Matrices; Thermoplastic Matrices; CERAMIC-MATRIX COMPOSITES; 4 Degradation Mechanisms; ALUMINUM ALLOYS; Microstructural Changes; Residual Stresses; Strength; Toughness; Time-Dependent Deformation and Damage Accumulation; Fatigue; Creep; Environmental Effects; Summary: Aluminum Degradation Mechanisms; TITANIUM ALLOYS; Microstructural Variations;

Deformation Processes; Environmental Effects

Summary: Titanium Degradation MechanismsSUPERALLOYS; Microstructural Changes; Deformation and Damage Accumulation; Oxidation; POLYMER-MATRIX COMPOSITES; Microstructural Changes; Damage Accumulation: Matrix Cracking; Environmental Effects; Thermal Degradation and Oxidation; Hygrothermal Effects; Summary: Polymer-Matrix Composite Degradation Mechanisms; CERAMIC-MATRIX COMPOSITES; Thermochemical Degradation; Mechanical Degradation: Effects of Corrosive Reactions; Summary: Ceramic-Matrix Composite Degradation Mechanisms; RECOMMENDATION; 5 Accelerated Methods for Characterization of Aging Response

METALLIC ALLOYSThe Concorde Experience; Creep Deformation and Failure; Creep-Fatigue Failure; Creep and Creep-Fatigue Crack Growth; Acceleration and Analytical Methods; Microstructural Changes; Accelerating Creep Tests; Accelerating Fatigue Tests; POLYMER-MATRIX COMPOSITES; Current Methods; Moderate- Temperature Applications; High-Temperature Applications; Accelerated Methods; Thermal Degradation and Oxidation; Matrix Cracking; Hygrothermal Effects; CERAMIC SYSTEMS; Oxidation and Volatilization; Mechanical Response; Behavior of the Constituents; Behavior of the Composite

ANALYSIS OF STRUCTURESMetallic Materials; Composite Materials; CHAPTER SUMMARY, CONCLUSIONS AND RECOMMENDATIONS; Characterization Methods; Accelerated Methods; Analysis of Structures; Approach to Materials Aging Characterization; References; Appendix Biographical Sketches of Committee Members