

1. Record Nr.	UNINA9910460151303321
Autore	Duffa Georges
Titolo	Ablative thermal protection systems modeling // Georges Duffa
Pubbl/distr/stampa	Reston, Virginia : , : American Institute of Aeronautics and Astronautics, Inc., , [2013] ©2013
ISBN	1-62410-172-0
Descrizione fisica	1 online resource (402 p.)
Collana	AIAA education series
Disciplina	629.4/152
Soggetti	Ablation (Aerothermodynamics) - Mathematical models 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 and index.
Nota di contenuto	<p>""CONTENTS""; ""PREFACE""; ""ACKNOWLEDGMENTS""; ""NOMENCLATURE""; ""Chapter 1 Thermal Protection System Conception""; ""1.1 Planetary Reentry""; ""1.2 Orders of Magnitude""; ""1.3 Major Classes of Materials for Thermal Protection Systems""; ""1.4 Physical Problems""; ""Chapter 2 Conservation Laws for a Multispecies Gaseous Medium""; ""2.1 Introduction""; ""2.2 Conservation Laws""; ""2.3 Diffusion in Neutral Medium""; ""2.4 Diffusion in Weakly Charged Media""; ""2.5 Calculation of Transport Coefficients""; ""2.6 Medium in Thermodynamic Nonequilibrium""</p> <p>""Chapter 3 Elementary Chemical Reactions Modeling""""3.1 Gaseous Reactions""; ""3.2 Heterogeneous Reactions""; ""3.3 Relationship Between Homogeneous and Heterogeneous Reactions""; ""Chapter 4 Approximate Methods""; ""4.1 Introduction""; ""4.2 Reactive Laminar Boundary Layers""; ""4.3 Injection (Blowing or Blocking) Coefficient""; ""4.4 The Couette Problem Analogy""; ""4.5 Approximate Calculation of Stagnation Point Heat Flux""; ""4.6 Mass and Energy Balance at Wall""; ""4.7 Steady State Ablation""; ""Chapter 5 Ablation of Carbon""; ""5.1 Oxidation""; ""5.2 Reactions with Nitrogen""</p> <p>""5.3 Sublimation""""5.4 Relations of Dependence""; ""5.5 Reaction Kinetics""; ""5.6 Homogeneous Reactions""; ""5.7 Example: Homogeneous Medium""; ""5.8 Partition of Energy""; ""5.9 Relation Between Incident Flux and Ablation""; ""5.10 Precision of the Ablation</p>

Model"; "5.11 Example of Calculation: A Test with Constant Upstream Conditions"; "Chapter 6 Roughness Formation"; "6.1 General Considerations"; "6.2 Scales of the Problem"; "6.3 Reactivity of a Composite Material"; "6.4 Roughness Formation"; "6.5 Applications"; "Chapter 7 Turbulence and Laminar? Turbulent Transition"
"7.1 Coupling Between Turbulence and Surface State""7.2 Nonlocal Effects of Turbulence"; "7.3 Coupling Between Turbulence and Chemical Reactions"; "7.4 Laminar?Turbulent Transition"; "Chapter 8 Pyrolysis and Pyrolyzable Materials"; "8.1 A Simple Example: PTFE"; "8.2 Phenolic Resin"; "8.3 The General Model"; "8.4 The Different Levels of Solutions"; "8.5 Transport Properties"; "8.6 Application Example"; "8.7 Ablation of Carbon Phenolics"; "Chapter 9 Materials Developing a Liquid Layer"; "9.1 Hydrodynamics of the Liquid Layer"; "9.2 Silica?Resin Materials"
"9.1 Hydrodynamics of the Liquid Layer""9.2 Silica?Resin Materials"; "Chapter 10 Radiation"; "10.1 Introduction"; "10.2 Radiative Transfer Equation"; "10.3 Effects of Coupling Between Flow and Radiation"; "10.4 Radiation in Porous Media"; "Chapter 11 Erosion by Particle Impact"; "11.1 Introduction: Phenomenology"; "11.2 Atmospheres"; "11.3 Effect of Flow on the Particles"; "11.4 Effect of Particles on the Flow"; "11.5 Particle?Wall Interaction"; "11.6 Coupling with Ablation"; "11.7 Discussion"; "Chapter 12 Testing and Specific Test Facilities"
"12.1 Models Used in Reentry"
