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Soggetti	Aerospace engineering Astronautics Mathematical models Thermodynamics Heat engineering Heat transfer Mass transfer Structural materials Aerospace Technology and Astronautics Mathematical Modeling and Industrial Mathematics Engineering Thermodynamics, Heat and Mass Transfer Structural Materials
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Nota di contenuto	Passive Thermal Protection -- Active Thermal Protection -- Combined Thermal Protection -- Conclusions.
Sommario/riassunto	This book is devoted to studies of unsteady heat and mass exchange processes taking into account thermochemical destruction of thermal protective materials, research of transpiration cooling systems, thermal protection of composite materials exposed to low-energy disturbances, as well as the numerical solution of heat and mass transfer of the exchange. It proposes several mathematical models of passive and active thermal protection systems with regard to factors such as

surface ablation, surface roughness, phase transition of a liquid in porous materials, rotation of the body around its longitudinal axis, and exposure to low-energy disturbances. The author studies the possibilities to control thermochemical destruction and heat mass exchange processes in transpiration cooling systems exposed to low-energy disturbances. The numerical analysis of the heat and mass exchange process in carbon plastics under repeated impulse action is also presented. The numerical solutions of problems are compared with the known experimental data. The book is intended for specialists in the field of thermal protection and heat mass exchange, as well as graduate and undergraduates in physics and mathematics. Explores development of new methods of thermal protection for Hypersonic Flying Apparatus; Introduces the complete studies of the problem of protection of HFA; Educates the reader on critical methods of thermal protection of HFA and illustrates how to solve related problems.