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Titolo	Thermodynamics and Energy Conversion / / by Henning Struchtrup
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ISBN	3-662-43715-5
Edizione	[1st ed. 2014.]
Descrizione fisica	1 online resource (XVIII, 597 p. 211 illus., 6 illus. in color.)
Disciplina	621.042
Soggetti	Thermodynamics Heat engineering Heat transfer Mass transfer Chemical engineering Fluid mechanics Continuum physics Energy systems Engineering Thermodynamics, Heat and Mass Transfer Industrial Chemistry/Chemical Engineering Engineering Fluid Dynamics Classical and Continuum Physics Energy Systems
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Introduction: Why Thermodynamics? -- Systems, States, and Processes -- The First Law of Thermodynamics -- The Second Law of Thermodynamics -- Energy Conversion and the Second Law -- Properties and Property Relations.-Reversible Processes in Closed Systems -- Closed System Cycles.-Open Systems -- Basic Open System Cycles -- Efficiencies and Irreversible Losses -- Vapor engines -- Gas engines -- Compressible flow: Nozzles and Diffusers -- Transient and inhomogeneous processes in open systems -- More on property relations -- Thermodynamic equilibrium -- Mixtures -- Psychrometrics -- The Chemical Potential -- Mixing and Separation -- Phase

	Equilibrium in Mixtures -- Reacting Mixtures -- Activation of Reactions -- Combustion -- Thermodynamics of Fuel Cells.
Sommario/riassunto	This textbook gives a thorough treatment of engineering thermodynamics with applications to classical and modern energy conversion devices. Some emphasis lies on the description of irreversible processes, such as friction, heat transfer and mixing, and the evaluation of the related work losses. Better use of resources requires high efficiencies, therefore the reduction of irreversible losses should be seen as one of the main goals of a thermal engineer. This book provides the necessary tools. Topics include: car and aircraft engines, including Otto, Diesel and Atkinson cycles, by-pass turbofan engines, ramjet and scramjet; steam and gas power plants, including advanced regenerative systems, solar tower, and compressed air energy storage; mixing and separation, including reverse osmosis, osmotic powerplants, and carbon sequestration; phase equilibrium and chemical equilibrium, distillation, chemical reactors, combustion processes, and fuel cells; the microscopic definition of entropy. The book includes about 300 end-of-chapter problems for homework assignments and exams. The material presented suffices for two or three full-term courses on thermodynamics and energy conversion.