

1. Record Nr.	UNINA9910409997103321
Autore	Papenfuß Christina
Titolo	Continuum Thermodynamics and Constitutive Theory // by Christina Papenfuß
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2020
ISBN	3-030-43989-5
Edizione	[1st ed. 2020.]
Descrizione fisica	1 online resource (XVI, 238 p. 75 illus., 10 illus. in color.)
Disciplina	536.7
Soggetti	Thermodynamics Mechanics Mechanics, Applied Mathematical physics Amorphous substances Complex fluids Materials science Theoretical and Applied Mechanics Theoretical, Mathematical and Computational Physics Soft and Granular Matter, Complex Fluids and Microfluidics Materials Science, general
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Continuum Mechanics: Kinematics and Balance Equations -- Thermodynamics -- Constitutive Theory and State Spaces -- Thermodynamics of Irreversible Processes (TIP) -- Thermodynamics of Irreversible Processes with Internal Variables -- Rational Thermodynamics and Non-Classical Thermodynamics -- Extended Thermodynamics -- Shock Fronts and Hyperbolic Systems of Differential Equations -- Two-Dimensional Systems and Material Surfaces -- Outlook: Mesoscopic Theory of Complex Materials.
Sommario/riassunto	This book presents different thermodynamic approaches in the area of constitutive theory: thermodynamics of irreversible processes, rational thermodynamics, and extended thermodynamics. These different

approaches are analyzed with respect to their presuppositions, as well as to their results, and each method is applied to several important examples. In many cases these examples are archetypes for numerous technologically important materials; i.e. complex materials having an internal structure. Some of the examples dealt with in this book are liquid crystals, colloid suspensions, and fiber suspensions. The book well serves students and researchers who have basic knowledge in continuum mechanics and thermodynamics. It provides a systematic overview of the vast field of thermodynamic constitutive theory, beginning from a historical perspective and concluding with outstanding questions in recent research.
