1. Record Nr. UNINA9911011777403321

Autore	Bechert Mathias
Titolo	Draw Resonance / / by Mathias Bechert, Benoit Scheid
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2025
ISBN	3-031-85568-X
Edizione	[1st ed. 2025.]
Descrizione fisica	1 online resource (301 pages)
Collana	Fluid Mechanics and Its Applications, , 2215-0056 ; ; 990
Altri autori (Persone)	ScheidBenoit
Disciplina	531.1134
Soggetti	Rheology Soft condensed matter Polymers Production engineering Soft and Granular Matter Mechanical Process Engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction- One-dimensional Newtonian models- Linear Stability. - Influence of Gravity and Inertia- Role of Surface Tension in Fiber Drawing -- Finite Width Effects in Film Casting -- One-dimensional Viscoelastic Models -- Influence of Viscoelasticity -- Practical Scaling and Stability Maps -- Non-isothermal Film Casting -- Non-isothermal Fiber Drawing -- Conclusions and Outlook.
Sommario/riassunto	This monograph presents many novel aspects of draw resonance, which remains an important field of research in the context of material processing. Draw resonance is used in film casting and fiber spinning at a large industrial scale for the production of polymer films, glass sheets and fibers. The book provides the most complete and coherent picture of draw resonance instability that is available so far in literature, treating all physical aspects together in a consistent and unprecedented way. The argumentation focuses on the physics underlying the observed phenomena, which comprise gravity, inertia, surface tension (for fibre spinning), necking (for film casting), viscoelasticity and thermal effects, all intricately affecting the threshold of the draw resonance. Thus, for the first time, the (de-)stabilizing mechanisms of draw resonance are unraveled, while many stability maps are provided

for practical use. To complete the educational aspect, input files for the free software AUTO-07p are made available online, allowing readers to obtain most of the data provided in the monograph. An indispensable book for graduate students, researchers and professionals in material processing.