Tanner, Roger I.
Engineering rheology. 2nd ed. (English) Zbl 1012.76002
Oxford Engineering Science Series. 52. Oxford: Oxford University Press. xxv, 559 p. (2002).

Publisher's description: This book is a guide for those who wish to make predictions about the mechanical and thermal behaviour of non-Newtonian materials in engineering and processing technology. An introductory survey of the field and a review of basic continuum mechanics serve to show the radical differences between elongational and shear behaviour. Two chapters, one based on a continuum approach and the other using microstructural approaches, lead to useful mathematical descriptions of materials for engineering applications. And there is discussion of lubrication and related shearing flows, and fibre-spinning and film-blowing respectively. A long chapter is devoted to the important new field of computational rheology, and this is followed by chapters on stability and turbulence and the all-important temperature effects in flow. This new edition contains large amounts of material not previously available in book form – for example wall slip, suspension rheology, computational rheology and new results in stability theory.

Table of Contents:

1. Introduction to rheology.

2. Review of continuum mechanics.

3. Viscometric and elongational flows.

4. Continuum-derived theories and experimental data.

5. Microstructural theories.

6. Lubrication, calendaring and related flows.

7. Fibre spinning and film blowing.

8. Computational rheology and applications.

9. Temperature and pressure effects.

10. Stability of flow and turbulence.

Appendix: Formulas in Cartesian, cylindrical, and spherical conditions .

The first edition (1985) and its paperback ed. (1988) have not been received/reviewed.

MSC:

76-01	Introductory exposition (textbooks, tutorial papers, etc.) pertaining to fluid mechanics
76Axx	Foundations, constitutive equations, rheology, hydrodynamical models of non-fluid phenomena

Cited in **4** Reviews
Cited in **36** Documents