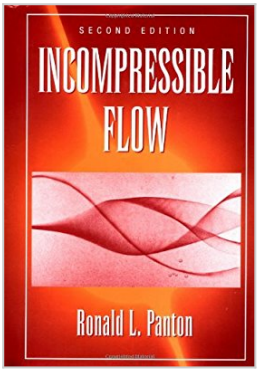

Incompressible Flow

By Ronald L. Panton

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This updated and revised edition of Dr. Ronald L. Panton's Incompressible Flow provides readers with an exceptionally clear, unified, and carefully paced introduction to advanced concepts in fluid mechanics. Dubbed by one reviewer as "the most teachable book on the market," it begins with basic principles and then patiently develops the math and physics leading to the major theories. Throughout, a unified presentation of physics, mathematics, and engineering applications is achieved, and the text is liberally supplemented with helpful exercises and example problems.

Laying the foundation for a thorough understanding of incompressible flow, Dr. Panton devotes the first third of the book to a precise formulation of the physical concepts and mathematical equations governing compressible viscous flows of Newtonian fluids. This part of the book includes chapters on the thermodynamics of simple materials and the mathematics of vector and tensor analysis.

The book's coverage of stream functions and the velocity potential features special approaches in which stream functions can be extended to other coordinate systems. Dr. Panton also emphasizes the physical interpretation of vorticity dynamics by deftly combining vorticity, associated controlling processes, and the laws that govern them.

Subsequent, more detailed coverage of incompressible flow is organized into the various Reynolds number regimes. The discussion of moderate Reynolds number flows introduces a finite difference numerical technique and reviews classic results for flow over a cylinder, including results from large eddy simulations. High Reynolds number flows— that is, inviscid flows and boundary layers— are given a unified treatment over the course of several chapters so as to emphasize their interconnection. The chapter on low Reynolds number flows emphasizes the different singular natures of two- and three-dimensional external flows and reviews a number of recent results concerning internal flows. Dr. Panton concludes by introducing students to the nomenclature and contemporary concepts used in stability, transition, and turbulence— fields in which recent progress has occurred.

Incompressible Flow, Second Edition is the ideal choice for graduate-level fluid mechanics courses offered in mechanical, aerospace, and chemical engineering

programs.

Incompressible flows are flows of gases or liquids for which changes in density are not relevant to the physics of their interactions with solid bodies. Occupying as it does a central position in the science of fluid dynamics, the study of incompressible flows is fundamental to a wide array of scientific and engineering disciplines, including hydraulics; hydrodynamics; aerodynamics; hydrology; mechanical, aerospace, and chemical engineering; and many others.

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Incompressible Flow By Ronald L. Panton Bibliography

- Sales Rank: #2283109 in Books
- Published on: 1996-01-10
- Ingredients: Example Ingredients
- Original language: English
- Number of items: 1
- Dimensions: 9.67" h x 1.80" w x 6.48" l, .0 pounds
- Binding: Hardcover
- 836 pages

Editorial Review

Review

“Incompressible Flow, Fourth Edition is the ideal coursebook for classes in fluid dynamics offered in mechanical, aerospace, and chemical engineering programs.” (*Expofairs.com*, 28 November 2013)

From the Back Cover
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About the Author
RONALD L. PANTON, PhD, is J. H. Herring Centennial Professor of Mechanical Engineering, University of Texas at Austin. He is a member of the ASME Fluid Mechanics Committee and served a term on the AIAA Fluid Dynamics Technical Committees. He is a former associate editor of the Journal of Fluids Engineering.

Dr. Panton received his doctorate from the University of California at Berkeley. He also holds degrees in mechanical engineering, engineering, and mathematics from the University of Wisconsin and Wichita State University. Early in his career, he worked for five years in the aircraft industry and with the U.S. Air Force. He was involved in the prediction of engine performance and analysis of flight test results on a Mach 2 fighter aircraft and worked on the X-15 Research Rocket Plane project.

The principal investigator on over thirty research grants, Ronald L. Panton has focused his research activities primarily on fluid flows and acoustics. He has conducted experimental, theoretical, and numerical studies on a wide variety of projects. His research in turbulent wall layers has centered on correlation laws for mean and fluctuating quantities, in particular, the wall pressure statistics. Other work deals with interaction of turbulence, orifices, and acoustic resonators.

Users Review

From reader reviews:

Mark Hernandez:

Hey guys, do you would like to finds a new book to study? May be the book with the title Incompressible Flow suitable to you? Often the book was written by popular writer in this era. The book untitled Incompressible Flowis a single of several books which everyone read now. This kind of book was inspired a number of people in the world. When you read this publication you will enter the new age that you ever know ahead of. The author explained their strategy in the simple way, therefore all of people can easily to be aware of the core of this e-book. This book will give you a large amount of information about this world now. To help you to see the represented of the world on this book.

Thomas Kelly:

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