

Advanced Fluid Statics and Liquid Structure

Dr. Sanjay Kumar



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RANDOM PUBLICATIONS
NEW DELHI (INDIA)

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ISBN 978-93-86391-40-7

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Published in 2018 in India by

RANDOM PUBLICATIONS

4376-A/4B, Gali Murari Lal, Ansari Road
New Delhi-110 002

Phone : +9111-43580356, 011-23289044, 011-43142548

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Type Setting by : Friends Media, Delhi-110089
Printed at : Sanat Printers

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Fluid Statics and Fluid Dynamics form the two constituents of Fluid Mechanics. Fluid Statics deals with fluids at rest while Fluid Dynamics studies fluids in motion. In this chapter we discuss Fluid Statics. A fluid at rest has no shear stress. Consequently, any force developed is only due to normal stresses i.e., pressure. Such a condition is termed the hydrostatic condition. In fact, the analysis of hydrostatic systems is greatly simplified when compared to that for fluids in motion. Though fluid in motion gives rise to many interesting phenomena, fluid at rest is by no means less important. Its importance becomes apparent when we note that the atmosphere around us can be considered to be at rest and so are the oceans. The simple theory developed here finds its application in determining pressures at different levels of atmosphere and in many pressure-measuring devices. Further, the theory is employed to calculate force on submerged objects such as ships, parts of ships and submarines. The other application of the theory is in the calculation of forces on dams and other hydraulic systems. Fluid statics or hydrostatics is the branch of fluid mechanics that studies fluids at rest. It encompasses the study of the conditions under which fluids are at rest in stable equilibrium as opposed to fluid dynamics, the study of fluids in motion. Hydrostatics are categorized as a part of the fluid statics, which is the study of all fluids, incompressible or not, at rest. This book will prove definitive and ideal reference tool to research scholars, academicians and educationists.

Contents: Fluid Viscosity and Liquid; Properties of Fluids; Fluids and Hydrostatic Static Pressure; Fluid Statics; Viscosity and Surface Tension; Fluid Velocity and Acceleration; Fluid Transport; Statistical and Fluid Mechanics; Fluid Motion.

About the Author



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New Delhi-110002, Ph : +91-11-43142548/43580356 / 23289044
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ISBN 978-93-86391-40-7



9 789386 391407

6.99x (px.)