Advanced Fluid Statics and Liquid Structure

Dr. Sanjay Kumar

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Advanced Fluid Statics and Liquid Structure

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.

About the Author

Dr. Sanjay Kumar, passed post graduate in physics with specialization in electronics from M.S. College, Saharanpur, affiliated to C.C.S. University, Meerut, Master of philosophy in Physics from C.C.S. University, Meerut Campus & Doctorate from C.C.S. University, Meerut with calibration of Delhi University, Delhi in Material Science. He is also passed CSIR-UGC NET-JRF and GATE examination. Presently he is working as Asst. Professor in J.V. Jain (PG) College, Saharanpur (UP). He has also been into teachings and research for nine years and so. He has also published around two lab manual for 9th and 10th classes and has also authored for articles and researcher papers in various journals-nationally and internationally and supervise three students of Ph.D. He has been into an active participant for paper setting for universities.

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