Midwest Mechanics Seminar Series*, 2005-2006

Turbulent Pipe Flow and Why Moody Was Wrong

by

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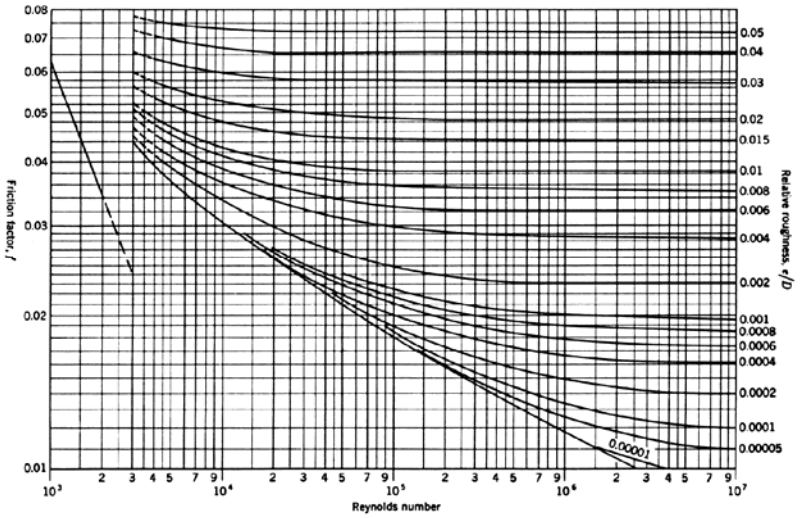
Friday, September 30, 4-5 pm, Grissom 274

Informal cookie & coffee reception in Grissom 390 at 3:30 pm

The Moody Diagram has been used to estimate frictional losses in smooth and rough pipes since it was first proposed in 1944. Recent experiments at Princeton in fully-developed turbulent pipe flow have shown that many of the assumptions made in deriving this engineering guide are not correct. In particular, a detailed study of the velocity profile in a smooth pipe at very high Reynolds numbers has led to an improved correlation for the smooth pipe friction factor, and a careful examination of the behavior for rough surfaces demonstrates the shortcomings of the friction factor correlation used by Moody for transitionally rough surfaces.



Biography:

Dr. Smits received his Ph.D. from the University of Melbourne, Australia, in 1975. After serving two years as a Research Assistant to Professor P. Bradshaw at Imperial College, London, he returned to the University of Melbourne as a Research Fellow, working with Professor P.N. Joubert. He was appointed Assistant Professor in the Department of Mechanical and Aerospace Engineering at Princeton University in 1981, promoted to Associated Professor in 1985, and Full Professor in 1991. From 1998 to 2004, Professor Smits served as Chairman of his department.

** Sponsored jointly by the Schools of Aeronautics & Astronautics and Mechanical Engineering*
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