
READER'S GUIDE AND INTRODUCTION

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Resistance to flow is an important engineering subject; it is applicable to every branch of engineering where flows of liquids and gases take place. A few areas where the knowledge of the resistance to flow is a normal requirement in the design and operation of fluid loops, circuits, and systems are air conditioning and ventilation, aeronautical engineering, biochemical and pharmaceutical engineering, chemical engineering, civil engineering, mechanical engineering, nuclear engineering, petroleum engineering, power engineering, as well as all hydraulic, agricultural, and space engineering plants, systems, and equipment. The importance of exact and true values of flow resistance is, primarily, a question of determining the pumping — or power — requirements for any apparatus or, eventually, for the entire plant involved in the motion of fluid. Needless to say, energy requirements are equivalent to the size of the funding capital, or operational, costs and are therefore of prime importance to the practice of engineering.

Professor Idelchik's *Handbook of Hydraulic Resistance* has gained worldwide recognition and reputation among engineers through usage over the last 35 years when the first edition was published in Moscow. The 3rd, posthumous, edition was prepared and submitted to the publisher several months before the death of the author in 1990. It was published in the English language by Begell House in 1996.

In the present, 4th, edition all the errors and misprints that were found in the Russian and English versions of the previous editions have been corrected, and new sections have been written for almost all the chapters of the Handbook (see Preface to the 4th English Edition).

The use of this Handbook can easily be likened to the use of an illustrated catalog. Various pieces of equipment and flow components, including fittings and even entire systems, have been assembled in separate chapters and catalogued, using illustrations, graphs, and tabular data. It is essential to note that the users, both old and new, should acquaint themselves with Chapter 1 before succumbing to the appeal of simply looking up specific values of resistance coefficients, drag values, friction factors, or other data directly in the appropriate chapters. The reading and understanding of Chapter 1 will — in the final tally — save a tremendous amount of time in the subsequent use of this Handbook.