

# Pipe Flow Friction Factor Calculations With Excel

Clifford H. McClain

**Pipe Flow Friction Factor Calculations with Spreadsheets** HARLAN H. BENGTON,2017-02-09 The Darcy-Weisbach equation and the Moody friction factor are used for a variety of pressure pipe flow calculations. Many of these types of calculations require a graphical and/or iterative solution. The needed iterative calculations can be carried out conveniently through the use of a spreadsheet. This book starts with discussion of the Darcy-Weisbach equation along with the parameters contained in it and the U.S. and S.I. units typically used in the equation. Several example calculations are included and spreadsheet screenshots are presented and discussed to illustrate the ways that spreadsheets can be used for Darcy-Weisbach/Friction Factor calculations.

**Pipe Flow** Donald C. Rennels,Hobart M. Hudson,2012-05-22 Pipe Flow provides the information required to design and analyze the piping systems needed to support a broad range of industrial operations, distribution systems, and power plants. Throughout the book, the authors demonstrate how to accurately predict and manage pressure loss while working with a variety of piping systems and piping components. The book draws together and reviews the growing body of experimental and theoretical research, including important loss coefficient data for a wide selection of piping components. Experimental test data and published formulas are examined, integrated and organized into broadly applicable equations. The results are also presented in straightforward tables and diagrams. Sample problems and their solution are provided throughout the book, demonstrating how core concepts are applied in practice. In addition, references and further reading sections enable the readers to explore all the topics in greater depth. With its clear explanations, Pipe Flow is recommended as a textbook for engineering students and as a reference for professional engineers who need to design, operate, and troubleshoot piping systems. The book employs the English gravitational system as well as the International System (or SI).

**Fundamentals of Pipe Flow** Robert P. Benedict,1980

**Handbook of Chemical Engineering Calculations** Nicholas P. Chopey,1994 A compilation of the calculation procedures needed every day on the job by chemical engineers. Tables of Contents: Physical and Chemical Properties; Stoichiometry; Phase Equilibrium; Chemical-Reaction Equilibrium; Reaction Kinetics and Reactor Design; Flow of Fluids and Solids; Heat Transfer; Distillation; Extraction and Leaching; Crystallization; Filtration; Liquid Agitation; Size Reduction; Drying; Evaporation; Environmental Engineering in the Plant. Illustrations. Index.

**Velocity Profiles and Friction Factors for Turbulent Pipe Flow with Uniform Wall Suction** H. L. Weissberg,1956

**Rules of Thumb for Chemical Engineers** Carl Branan,2002 Fractionators, separators and accumulators, cooling towers, gas treating, blending, troubleshooting field cases, gas solubility, and density of irregular solids \* Hundreds of common sense techniques, shortcuts, and calculations.

**Handbook of Hydraulic Resistance** I. E. Idelchik,2005 The handbook has been composed on the basis of processing, systematization and classification of the results of a great number of investigations published at different time. The essential part of the book is the outcome of investigations carried out by the author. The present edition of this handbook should assist in increasing the quality and efficiency of the design and usage of industrial power engineering and other constructions and also of the devices and apparatus through which liquids and gases move.

**Natural Gas Pipeline Flow Calculations** Harlan H. Bengton,2017-01-09 Natural gas pipeline flow calculations are discussed and illustrated with examples. The Weymouth equation, Panhandle A equation, Panhandle B equation, and Darcy-Weisbach friction factor equation are discussed for use in natural gas pipeline flow calculations. Natural gas properties needed for the calculations are presented and discussed, including equations for calculating the properties. The properties discussed include density, viscosity, specific gravity, average pipeline pressure, and compressibility factor (as calculated by the CNGA equation). Numerous worked examples are included for gas property calculations and for pipeline flow calculations using all four equations.

**Pipeline Analysis** D.J. Stephenson,1984-02-01 Pipeline Analysis

**Partially Full Pipe Flow Calculation Spreadsheets** Harlan Bengton,2017-01-30 The Manning equation is used for a wide variety of uniform open channel flow calculations, including gravity flow in pipes, the topic of this book. Gravity flow occurs in pipes for partially full flow, up to and including full pipe flow, as long as the pipe isn't pressurized. Equations for calculating area, wetted perimeter and hydraulic radius for partially full pipe flow are included in this book along with a brief review of the Manning equation and discussion of its use to calculate a) the flow rate in a given pipe (diameter, slope, & full pipe Manning roughness) at a specified depth of flow, b) the required diameter for a specified flow rate at a target percent full in a given pipe, c) the normal depth (depth of flow) for a specified flow rate in a given pipe, d) the required pipe slope for a specified flow rate and depth of flow through a given pipe, and d) calculation of an experimentally determined value for the full pipe Manning roughness coefficient. This includes presentation and discussion of the equations for the calculations, example calculations, and spreadsheets to facilitate the calculations. Examples include calculation with both U.S. units and S.I. units.

**Strategies to reduce friction losses and their implications for the energy efficient design of internal flow domains** Daschiel, Gertraud Maria,2015-01-29

**Gas Pipeline Hydraulics** Shashi Menon,Pramila Menon,2013 This book is concerned with the steady state hydraulics of natural gas and other compressible fluids being transported through pipelines. Our main approach is to determine the flow rate possible and compressor station horsepower required within the limitations of pipe strength, based on the pipe materials and grade. It addresses the scenarios where one or more compressors may be required depending on the gas flow rate and if discharge cooling is needed to limit the gas temperatures. The book is the result of over 38 years of the authors' experience on pipelines in North and South America while working for major energy companies such as ARCO, El Paso Energy, etc.

**Pipe Friction Factors for the Turbulent Flow of Lead-bismuth Eutectic** ,1954 The majority of reported pipe friction experiments are for the flow of air, water, and oil, while few experimental friction factor data are available for liquid metal flow. One exception is the mercury pressure drop investigation reported by Hartmann in 1926. The purpose of the present investigation was to obtain additional friction factor data for liquid metal flow, in this case lead-bismuth eutectic flow in a circular pipe. A comparison of these results with those found for water in the same tube as well as a comparison with the results of Hartmann is then possible.

**Piping and Pipeline Calculations Manual** Philip Ellenberger,2014-01-22 Piping and Pipeline Calculations Manual, Second Edition provides engineers and designers with a quick reference guide to calculations, codes, and standards applicable to piping systems. The book considers in one handy reference the multitude of pipes, flanges, supports, gaskets, bolts, valves, strainers, flexibles, and expansion joints that make up these often complex systems. It uses hundreds of calculations and examples based on the author's 40 years of experiences as both an engineer and instructor. Each example demonstrates how the code and standard has been correctly and incorrectly applied. Aside from advising on the intent of codes and standards, the book provides advice on compliance. Readers will come away with a clear understanding of how piping systems fail and what the code requires the designer, manufacturer, fabricator, supplier, erector, examiner, inspector, and owner to do to prevent such failures. The book enhances participants' understanding and application of the spirit of the code or standard and form a plan for compliance. The book covers American Water Works Association standards where they are applicable. Updates to major codes and standards such as ASME B31.1 and B31.12 New methods for calculating stress intensification factor (SIF) and seismic activities Risk-based analysis based on API 579, and B31-G Covers the Pipeline Safety Act and the creation of PhMSA

**Friction Factors for Large Conduits Flowing Full** United States. Bureau of Reclamation,1965 This monograph is intended to furnish the engineer up-to-date, practical information for accurately estimating the friction losses in large concrete, steel, and wood-stave pipes running full steady flow conditions. It

summarizes experimental information obtained through field measurements and large-scale laboratory experiments which the Bureau of Reclamation has compiled from worldwide sources over a period of years. Charts are presented for obtaining friction factors for concrete pipe, continuous-interior, full-riveted and spiral-riveted steel pipe, and wood-stave pipe. These will assist the designer in predicting the behavior of a particular conduit.

**Fluid Flow in Piping** Joseph Marius Dalla Valle, 1946

**Fluid Flow in Pipes** Clifford H. McClain, 1963

**Prediction of Pressure Drop in Pipe Flow of Water that Contains Friction Reducing Additives** Frederick Walter Boyle, 1967

**Fox and McDonald's Introduction to Fluid Mechanics** Robert W. Fox, Alan T. McDonald, John W. Mitchell, 2020-06-30 Through ten editions, Fox and McDonald's Introduction to Fluid Mechanics has helped students understand the physical concepts, basic principles, and analysis methods of fluid mechanics. This market-leading textbook provides a balanced, systematic approach to mastering critical concepts with the proven Fox-McDonald solution methodology. In-depth yet accessible chapters present governing equations, clearly state assumptions, and relate mathematical results to corresponding physical behavior. Emphasis is placed on the use of control volumes to support a practical, theoretically-inclusive problem-solving approach to the subject. Each comprehensive chapter includes numerous, easy-to-follow examples that illustrate good solution technique and explain challenging points. A broad range of carefully selected topics describe how to apply the governing equations to various problems, and explain physical concepts to enable students to model real-world fluid flow situations. Topics include flow measurement, dimensional analysis and similitude, flow in pipes, ducts, and open channels, fluid machinery, and more. To enhance student learning, the book incorporates numerous pedagogical features including chapter summaries and learning objectives, end-of-chapter problems, useful equations, and design and open-ended problems that encourage students to apply fluid mechanics principles to the design of devices and systems.

**Piping Calculations Manual** Shashi Menon, 2005 This on-the-job resource is packed with all the formulas, calculations, and practical tips necessary to smoothly move gas or liquids through pipes, assess the feasibility of improving existing pipeline performance, or design new systems. Contents: Water Systems Piping \* Fire Protection Piping Systems \* Steam Systems Piping \* Building Services Piping \* Oil Systems Piping \* Gas Systems Piping \* Process Systems Piping \* Cryogenic Systems Piping \* Refrigeration Systems Piping \* Hazardous Piping Systems \* Slurry and Sludge Systems Piping \* Wastewater and Stormwater Piping \* Plumbing and Piping Systems \* Ash Handling Piping Systems \* Compressed Air Piping Systems \* Compressed Gases and Vacuum Piping Systems \* Fuel Gas Distribution Piping Systems

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