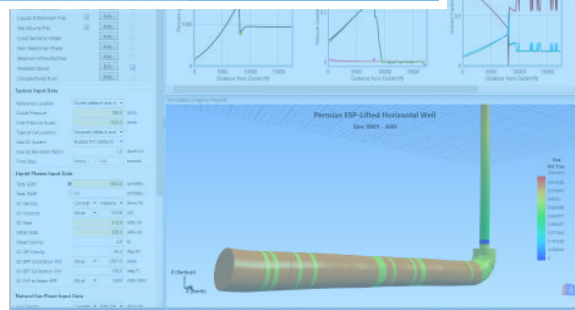
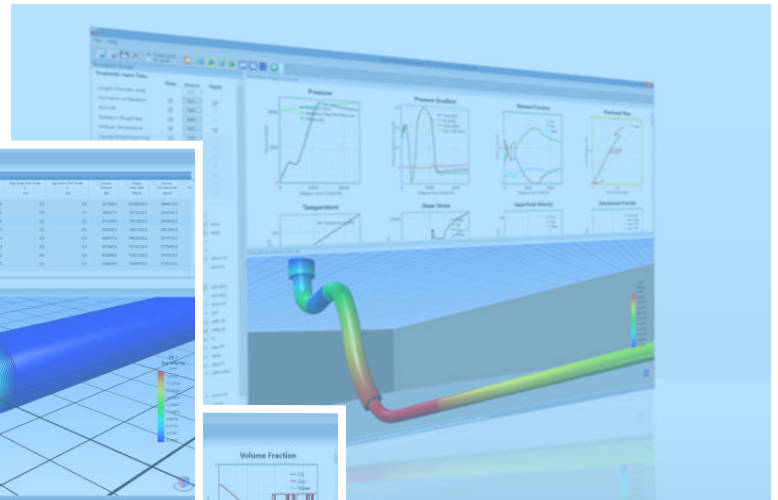
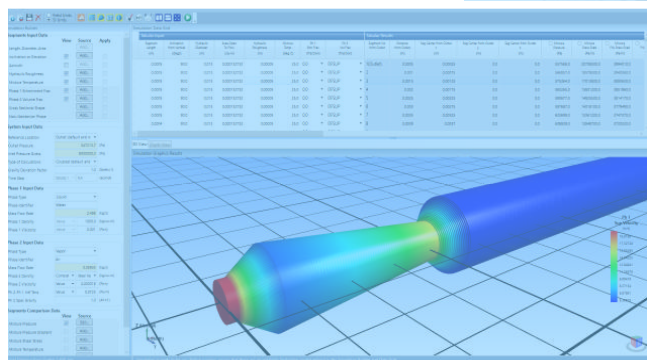




Pipe Fractional Flow

Gain from our analytical perspective™

Fast and accurate prediction for multiphase flow in wells and pipelines



- Reliably accurate solutions
- Wide range of applications
- Simplified GUI and Excel plug-in
- Comprehensive validation
- Customizable standalone engine
- Affordable subscription service

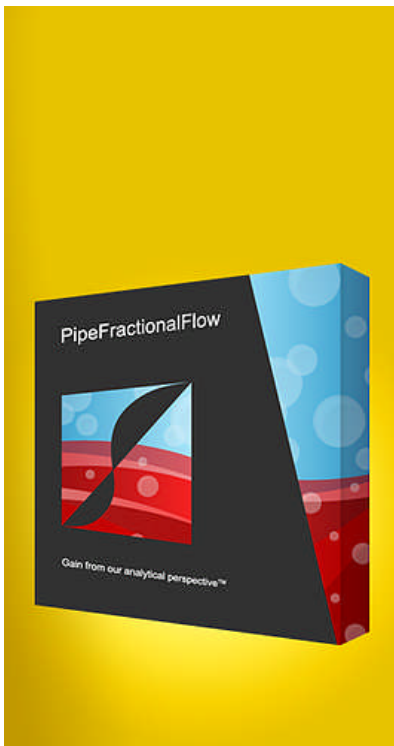
www.pipefractionalflow.com



Empower multiphase pipe flow investigators and amplify their cost savings by providing very fast (productivity gain) and reliably accurate (engineering gain) analytical simulations and easy access to published lab and field data.

PipeFractionalFlow™ is the world's first analytical multiphase flow model for **fast and reliable predictions of steady-state and transient multiphase flow variables along any single-branch closed conduit**. The averaged (1D) code is purposed for the analysis, design and optimization of practical multiphase pipe flow processes in the energy, chemical, process, mechanical and environmental engineering industries and is validated against a wide range of publicly-verifiable conditions in diverse lab-scale and field-scale applications.

With the newest capabilities and leading edge science-oriented research developments in this field, we provide simpler, focused analytical understanding for the most common multiphase flow applications. Our simulator is designed for use by practicing engineers. It is very affordable, has a free GUI, an Excel plug-in, a web-based licensing and a customizable standalone engine that can be called from programming or third-party codes.



Typical Applications

- Accurate Bottom-Hole Pressure from Surface Well Test Data
- Two-Phase and Three-Phase Wells (VLP generation)
- Constant (Circular and Non-Circular) Cross-Sectional Area Multiphase Flow
- Variable Cross-Sectional Area Multiphase Flow (Chokes, nozzles, valves)
- Liquid-Liquid Flow (Heavy oil and water)
- Liquid-Solid and Gas-Solid Flow (Slurry, pneumatic conveying)
- Sand Production in Oil and Gas Wells
- Non-Newtonian Multiphase Flow (Well blowout, chemical EOR modeling)
- Fracture Injection Multiphase Well (Foam flow, proppant-laden fluid)
- Annular Flow with Multi-Directional Entrainment
- Horizontal Well Liquids Loading, Gas-Lift and ESP-Lift (AL optimization)
- Horizontal Wellbore (Simulate production log along lateral)
- Cross-Country Compositional Multiphase Pipeline Flow
- Subsea and Hilly-Terrain Pipeline Leak Detection (Leak location modeling)
- Perforated Horizontal Wellbore Multiphase Flow (Lateral length optimization, multiple fluid influx cross-jets)
- Complete Well History FBHP Prediction from Surface Conditions
- Transient Flow (Pipeline rate changes and riser base gas-lift liquids removal)
- Pipe Wall and Phase Shear Stress Calculations for Pipe Erosion and General Corrosion Mechanistic Models and Correlations
- Steam-Brine Production and Injection Geothermal Flow
- Transient real-time Virtual Flow Metering (Integrated production surveillance, monitoring, optimization and allocation) and FBHP Calculation from Online Surface Sensors

Visit the step-by-step PipeFractionalFlow™ simulation workflows guide at www.pipefractionalflow.com/simulationworkflows to learn how to model typical applications listed above.

Why PipeFractionalFlow™ Software?

Productivity Gain from Ultrafast Solutions

Simpler analytical formulation avoids large amounts of multi-field equations or computing time for much reduced solution times.

Accuracy Gain from Validated and Benchmarked Solutions

Comprehensive validation against the world's largest database of published multiphase flow data, ANNA, means high-fidelity solutions.

Savings Gain from Lower Cost Solutions

At a fraction of the cost of very expensive multiphase flow simulation providers, engineers can now provide cost-effective solutions.

Capabilities Gain from Customizable Engine Integration and Automation

Our Engine can be called from external apps (Excel) or run in transient real-time process mode for Internet of Things solutions (Raspberry Pi).

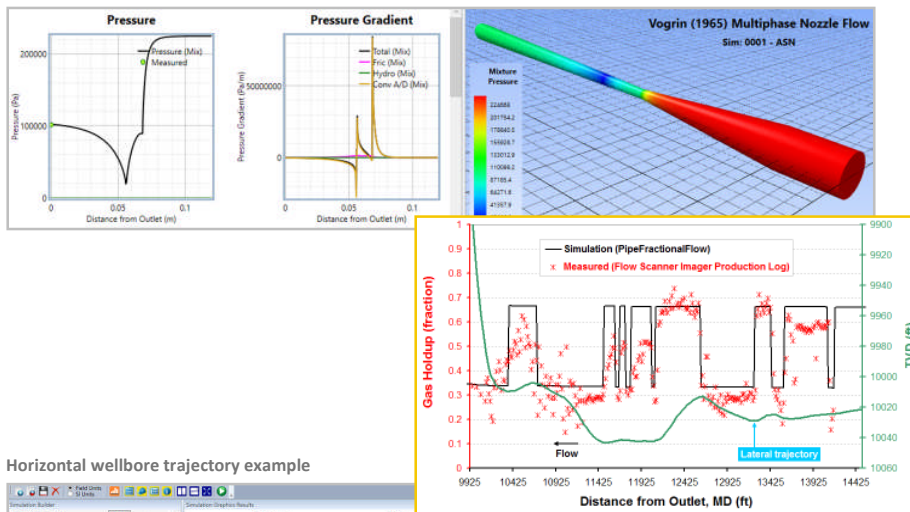
Usability Gain from Flexible Subscription-Based Web Licensing

Web licensing avoids the need for long IT setup times and engineers can activate the software directly upon installation.

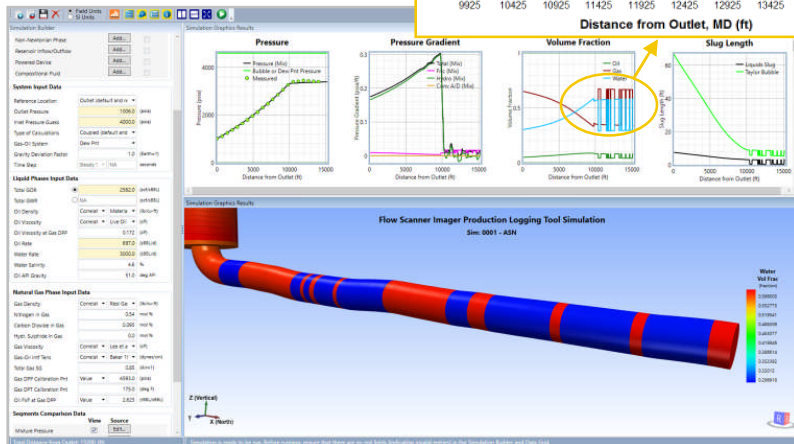
Analysis Gain from Reduced Unproductive Problem Setup Time

Our analytical software requires much fewer input data and can use readily available basic field data to reduce problem setup time.

Horizontal multiphase nozzle flow example



Horizontal wellbore trajectory example



Key Features

Simplified inputs

Requires readily available minimal information in the field such as surface flow rates, surface pressure and temperature, fluids data (oil API, gas gravity) and well data (trajectory, diameter).

Comprehensive outputs

In addition to common outputs of multiphase flow simulation tools (pressures, volume fractions, flow rates), our software furnishes single-point and distributed variables for local flow characteristics such as wall and phase shear stresses, mixture and phase pressure gradients, phase entrainment fractions, phase density and viscosity variations, component compositions, liquid height, film thickness, slug lengths, velocities and frequencies.

Simplified user interface

Our minimalist (free) user interface was designed to offer the simplest user experience without unnecessary breaks in solution workflows or several nested layers of pop-ups. Less time spent on problem setup means more time for what-if analyses. Alternatively, we offer the unique advantage of calling our standalone Engine executable or DLL from Excel for quick and easy-to-implement integration within existing workflows.

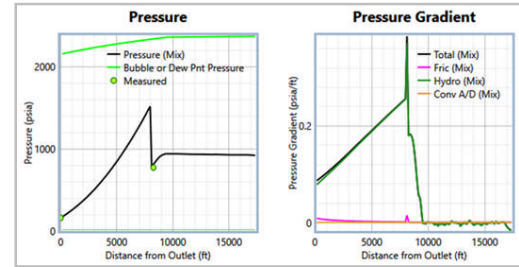
Fast and accurate solutions (Productivity advantage)

Our path-breaking discovery of a set of analytical, macroscopic, deterministic models that govern the collective, net behavior of pipe flow mixtures over a wide range of publicly-verifiable conditions is what differentiates us from all other multiphase flow simulation providers on the market. It is the foundation for transforming old paradigms and long-held beliefs about the accuracy limitations of averaged (1D) multiphase flow modeling.

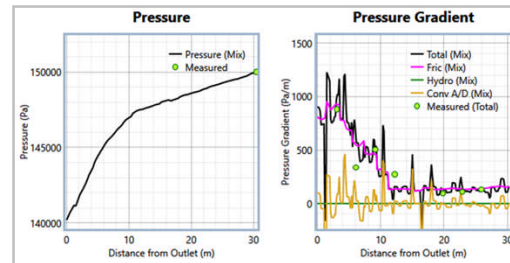
Applications in Multiple Disciplines (Life-of-well modeling)

We provide quite useful design, analysis and optimization capabilities for various engineering disciplines at different stages of your well or pipeline. From early-stage pre-FEED, FEED, exploration and drilling, to completion and production assurance, to reservoir simulation and decline analysis, to process and online facilities equipment and eventually to mature-stage well intervention and artificial lift, our fast analytical simulator can be used to optimize life-of-well planning and decisions.

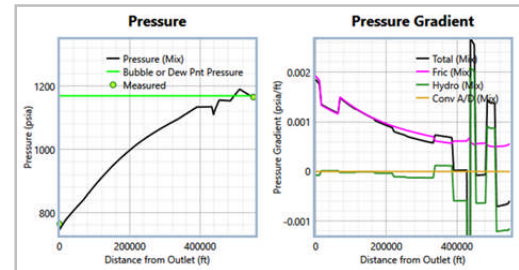
Horizontal well ESP-lift pump intake pressure example



Perforated horizontal wellbore multiple cross-jet inflow example



Compositional hilly terrain cross-country pipeline example



Transient riser-flowline gas-lift example

