



# AFT Arrow 4.0

## Compressible Pipe & Duct Flow Modelling

Reduce installed cost, increase operating efficiency and do it in less time. Today's demands on the systems engineer leave the traditional methods of compressible flow analysis lacking. Simplifying assumptions and approximations do not yield answers with sufficient precision to assure an efficient and reliable system. The days of compromise are over. With an efficient, intuitive interface providing access to a powerful compressible flow solver, *AFT Arrow™* provides the systems engineer the capability to model real gases undergoing real processes. Along with its equipment simulation capabilities and extensive output reports, *AFT Arrow* is ideally qualified for modeling real compressible flow systems including steam, compressed air, chemical and petrochemical process gases, natural gas transport and many more.



### Wide Range of Applications

Whether your system is a single flow path or complex network, open or closed loop, *AFT Arrow* handles it all. With a library of system components from fittings to compressors to control and relief valves available within its drag-and-drop interface, you'll be building models of your compressible flow system in surprisingly little time. *AFT Arrow's* capabilities let you confidently develop a new system design, analyze an existing system for modifications or explore the operating envelope. *AFT Arrow's* powerful compressible flow solver is unique in its ability to analyze systems with heat transfer and high velocities, including sonic choking, providing the piping systems engineer an amazingly broad range of applications.

Optional add-on modules further expand your system modeling capabilities to include automatic, multi-variable goal seeking and extended control simulation and system costing. The optional Chempak™ thermo-physical property database makes available 600 gases and allows the user to define non-reacting pre-mixtures and simulate dynamic flow mixing within the model.

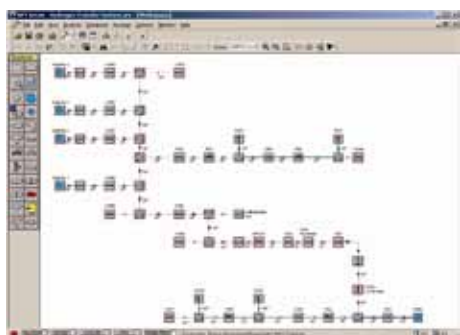
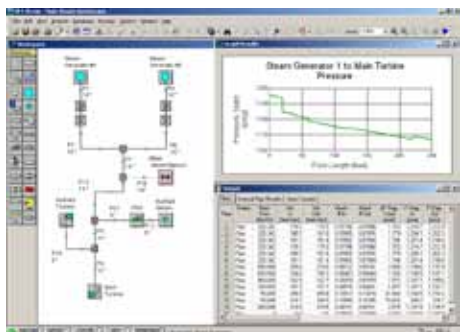
*AFT Arrow's* broad range of capabilities meet the needs of design and operational simulation for systems ranging from industrial to pipeline to infrastructure and in just about any industry.

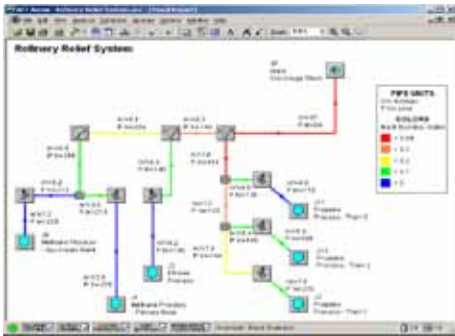
When you're ready to move up to the leading edge in design and simulation tools for gas flow systems, *AFT Arrow 4.0* is the preferred choice.

### World Class Solution & Interface Technology

*AFT Arrow's* powerful solution engine simultaneously solves the five fundamental equations of flow; mass, momentum, energy, state and Mach number. Users may select ideal or real gases, and between isothermal, adiabatic or generalized heat transfer conditions. An intelligent solver sets a new standard in solver robustness and speed by dynamically selecting the optimum calculation method based on the solution progress.

This analytical power is readily accessible through an interface that assures a short learning curve and high productivity. Models are assembled graphically in a familiar schematic format complimented by extensive, user configurable output reporting. Scenario Manager raises the what-if potential of system modelling to a new level. Multiple system configurations varying by any modelling parameter are easily managed within a single model file with a familiar hierarchical interface. Changes in the base configuration are automatically inherited by its descendants.





#### Other software in the range includes:

**AFT Fathom** - Pipe and duct flow modelling for incompressible fluids

**AFT Impulse** - Waterhammer modelling

**AFT Mercury** - Cost reduction through intelligent system sizing for incompressible fluid systems

**AFT Titan** - Cost reduction through intelligent system sizing for compressible fluid systems

**AFT Chempak Suite** - Thermo-physical fluid properties

## Verifiable Performance with the Support You Need

Building on the confidence of the thousands of applications of its predecessors, *AFT Arrow 4.0* brings a new level of capabilities and ease of use to compressible flow analysis. AFT Arrow's leading edge flow analysis is backed by technical support provided by a team of customer oriented engineers with real world experience who understand your projects. More than software support, AFT provides the pipe flow analysis knowledge that comes with extensive engineering experience.

### New in Version 4.0

- Optional add-on modules:
  - GSC** – goal seek & control automates determination of input to achieve specified output & simulate control functions.
  - CST** – tie system component and piping costs to your model
- Compressor/fan energy cost analysis, head curve modeling (in addition to pressure rise) and fixed head option
- View input and output data for multiple scenarios simultaneously
- Modify selected input via Excel™ spreadsheet transfer

## Applications

### Pipe Sizing

With real gas modelling under generalized heat transfer conditions, *AFT Arrow* provides the precision you need to accurately size pipelines. The comprehensive output details the contribution of individual line losses to the overall system. Visual Report's color coding by selected criteria clearly illustrates individual lines in the context of the entire system.

### System Operation

A system's operating envelope can be fully explored by quickly and easily varying system parameters and configuration.

Change the number of compressors in operation, compressor speed, control valve settings, valve positions, fluid properties, virtually any modelling parameter. An *AFT Arrow* model provides a realistic and accurate representation of your system's characteristics allowing testing under a wide variety of conditions long before committing to hardware.

### Choked Flow

Solution capabilities include sonic choking allowing design and analysis of critical flow conditions including flare and relief systems.

### Mixing Processes

With the optional Chempak add-on, pre-defined gas mixtures can be modeled at any point in the system. Mixtures from intersecting flow streams of differing gases are automatically combined in accordance with the flow solution.

### Compressor/Fan Selection

With compressor and fan modelling capabilities including flow vs. pressure, heat of compression, variable speed, controlled discharge pressure and multiple unit series and parallel operation, *AFT Arrow* facilitates investigating compressor and system interaction over the full range of operation.

### Control Valve Selection

With comprehensive output and ease of changing component specifications, determining control valve capacity and insuring adequate pressure drop is greatly facilitated. Simulating pressure, flow control and relief valves, operation can be tested over the system operating envelope.

## System Requirements

- Windows 95 or higher or Windows NT or higher
- 128 MB RAM recommended
- 800 x 600 display minimum
- Stand-alone or network



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