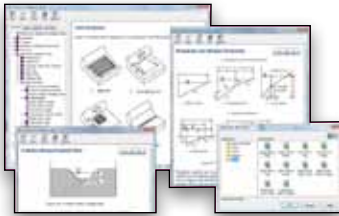# FlowMaster®

Hydraulic Calculator for Open Channels, Pipes, Weirs, Inlets, and Orifices
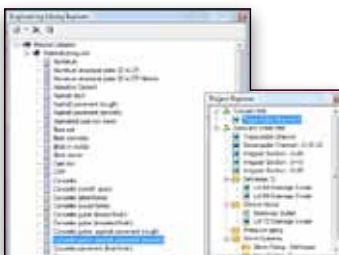
FlowMaster is an efficient calculator product for the design and analysis of a wide variety of hydraulic elements, such as pressure pipes, open channels, weirs, orifices, and inlets.

Design and analyze any type of hydraulic structure

Manage data easily using the Project Explorer and engineering libraries

Document your results by building customized reports and graphs for project submittals

Fast – Easy – Reliable

With FlowMaster, engineers can solve for any unknown property, design for any desired characteristic, and produce detailed reports and rating curves on the fly.

FlowMaster's flexible interface lets users work on multiple projects simultaneously, organize their worksheets in folders, and save them for future use. It also enables users to configure toolbars and dock windows to create work environments that match their workflows.

Productivity is also improved with FlowMaster's engineering libraries, which let users enter main data once and re-use it many times.

Gradually varied flow calculations can also be performed for any free surface flow element.

Pressure Pipe Design

In FlowMaster, engineers can perform a quick check or design by plugging in the known information and automatically solving for pipe length, start and stop elevations and pressures, discharge, diameter, or roughness.

Inlet and Gutter Hydraulics

FlowMaster allows users to design and analyze grate, curb, ditch, slotted, and combination inlets using calculations based on the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 12 and Circular No. 22 methodologies. In sag or on grade conditions a continuously or locally depressed gutter can be considered, and water spread and gutter depth for a gutter or pavement section can be calculated.

Open Channel Hydraulics

With FlowMaster, engineers can easily design and analyze channels, ditches, and free surface pipes of any shape including circular, box, elliptical, parabolic, and irregular channels.

Under uniform flow, FlowMaster solves for discharge, capacity, normal depth, channel dimensions, slope, or roughness, and lets users compare the results using different friction methods.

Gradually varied flow calculations can also be performed for any free surface flow element. Engineers can generate profile views from the calculated results, and view the points in tabular form.

Weir and Orifice Modeling

Modelers can size weirs considering discharge, weir coefficients, and crest, headwater and tailwater elevations for the following types: rectangular, V-notch, Cipolletti, broad crested, or a custom type.

Users of FlowMaster can also design rectangular, circular and generic orifice structures accounting for submergence, and produce rating tables and curves for various headwater and tailwater elevations.

FlowMaster At-A-Glance

Interface, Editing, and Model Management
- Built-in interactive tutorials
- Project Explorer (projects display and management)
- Element worksheets (for convenient data input)
- Customizable engineering libraries
- Material engineering libraries
- Global engineering-units management
- Support for ProjectWise

Hydraulics
- Flow algorithms: uniform, critical, gradually varied flow (for free surface flow)
- Friction-loss methods: Kutter, Manning, Darcy-Weisbach: Swamee and Jain, Darcy-Weisbach: Colebrook-White, Hazen-Williams

- Open channels: rectangular, triangle, trapezoidal, gutter, parabolic, irregular
- Pipes: pressure, circular, box, elliptical, irregular
- Weirs: rectangular sharp-crested, V-notch sharp-crested, Cipolletti sharp-crested, submerged sharp-crested, broad-crested, triangular, and trapezoidal
- Orifices: rectangular, circular, generic (including the modeling of sluice gates)
- Inlets:
  » HEC-12 and HEC-22 flow computation methodologies
  » Flows in gutter on grade, including uniform gutter cross slope and composite gutter section
  » Flow in ditch or median section on grade
  » Inlet types (on grade and in slag): grate, curb opening, ditch, combination, slotted drain

Results Presentation
- Summarized and detailed reports of inputs and outputs
- Advanced tabular reporting with filtering and sorting capabilities
- Rating tables
- Rating curves
- Gradually varied flow profile graphs and tables
- Cross section plots