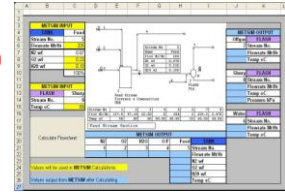


METSIM®

FEATURES



Complete Project Simulation in Five Modes

- Material Balance calculates consistent mass balances from measured plant data.
- Parameterization back calculates equipment parameters from actual operations.
- Steady State Simulation predicts mass and energy balances for alternative cases.
- Equipment Design sizes equipment based upon design criteria and mass balances
- Dynamic Simulation calculates and plots time dependent process

Flowsheet Features

- Flowsheet and Dynamic Graphics
- Handles Very Large Flowsheets
- May Run Portions of Flowsheets
- Robust Flowsheet Convergence
- Easy to Add New Unit Operations
- Unlimited Number of Streams

Chemistry Features

Online Thermodynamic Database
 Chemical Kinetics and Phase Equilibrium
 Eight Solid, Liquid, Molten, Gas Phases

Process Controller Features

Feedback and PID Controllers
 Logic/Expert System Controllers
 Equations may be Entered by User

Budgeting

Operating Costs
 Mining Costs (Opcost)

Full Graphical Interface

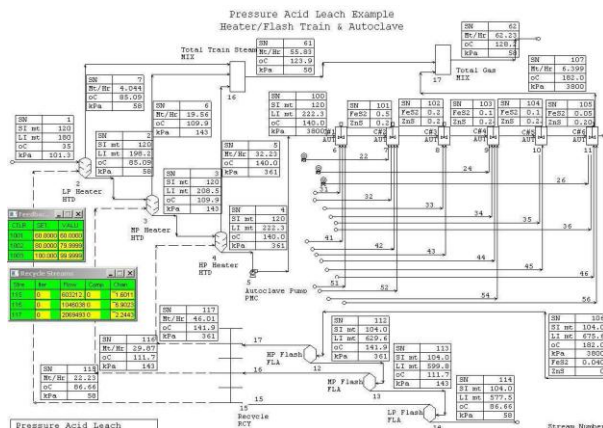
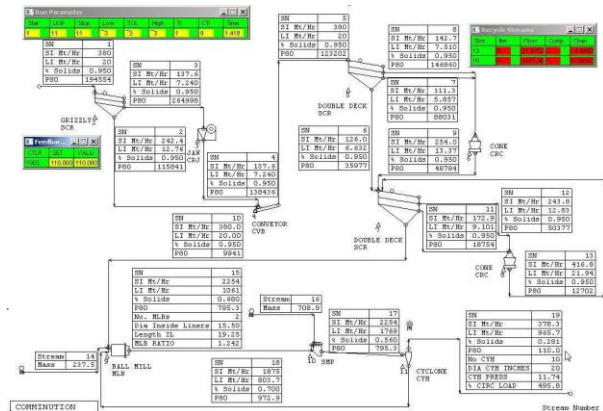
Truly Interactive Program and Menus
 Easy to Learn, Get Immediate Results

Compatibility Features

Spreadsheet Interface to Excel
 DDE interface to Excel, InTouch
 DXF interface to AutoCAD

Low Cost, One-Time License Fee

Updates and Support Also Available
 for a Low Annual Fee



METSIM is Developed by:

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METSIM, the premier process modeling software, is capable of accurately simulating a wide variety of processes for inorganic chemicals, hydrometallurgy, pyrometallurgy, alternative energy and environmentally sensitive processes. Process designers benefit greatly from using the many tools that Metsim possesses. Over 620 companies and universities in 54 countries are using Metsim for the design, simulation, and operation of complex heap leaching systems, metallurgical plants, tailings ponds, fertilizer plants, etc. The long list continues to grow daily.

Metsim has the following modules: Base, Mine, Comminution, Heat Balance, Dynamic Simulation, Contouring, Costing, and Engineering. An Iron and Steel Module is under development.

The **Base Module** includes chemical, beneficiation and hydrometallurgical unit operations to simulate flotation, leaching, solid/liquid separation, solvent extraction, electrowinning, and numerous other equipment such as tanks, pumps, bins, stockpiles, etc.

The **Comminution Module** includes unit operations for crushing, screening, grinding, classification, gravity separation, dense media, and coal preparation. This module is used when liberation and particle size analyses are critical in the process.

The **Heat Balance Module** includes models for autoclaves, dryers, kilns, furnaces, boilers, and steam and gas handling equipment. An interface to FactSage is available to access Fact's extensive databases for slags, mattes, and alloys.

The **Dynamic Simulation Module** focuses on time dependent models such as heap leaching, solar energy/weather effects, and tailings ponds or processes where there is a large variation in feeds.

The **Contouring Module** is used for building complex heap leach and tailings facility models from DXF contour files and for displaying data graphically.

The **Mine Module** allows import of drill-hole data, the mine block model and the mining sequence. The feed to the waste dumps, heaps, stockpiles and plant can then be taken directly from the mine. This allows dynamic simulation over the life of the mine. With Metsim's new interface to Logikos's Overview security and asset tracking system, real time simulation and control will become the new standard.

The **Engineering Module** allows any process engineer to easily perform preliminary design calculations, size equipment, generate equipment and instrumentation lists, simulate and test process control strategies, and build operator training interfaces.

The **Costing Module** calculates and reports plant operating costs. It also includes OPCOST, a capital and operating cost program for mining, which calculates manpower, fuel and supplies, and generates equipment purchase and replacement schedules. This module does not calculate plant capital cost.

Features:

- Fully graphical interface for building models and printing flowsheets
- Over 180 unit operations with more being added monthly
- DDE, Dynamic Data Exchange, for easy interfacing to Excel, InTouch, PID controllers, etc.
- DXF file input and output for interfacing to AutoCad and other graphic programs
- Option to display, on the flowsheet, variables such as temperature, pH, assays for rapid debugging

Additional Services

CONSULTANCY - METSIM's Agents can add to your team's capability through our consultancy services. As a group, we have the widest range of modelling skills and experience worldwide. Services range from simple assistance with setting up models to subcontracting complete model building and development.

AUDITING - How do you know you are getting value for money when using third parties or inhouse staff to develop models for you? We can audit models and check on their quality to insure they incorporate the latest METSIM tools and techniques available.

PROJECT MANAGEMENT - To insure maximum return on your investment, we can manage any or all aspects of model development. We can provide services in training, modelling, monitoring and auditing to insure best practice, efficiency and reliability.