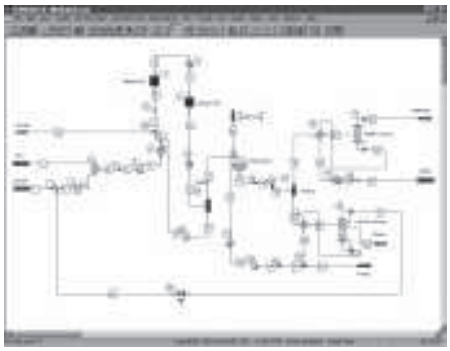
CHEMCAD

Process Simulation Software

The chemical engineering software extension of your thought process.

What can you do with CHEMCAD?

- Increase Productivity by Performing Everyday Chemical Engineering Calculations
- Maximize Profitability by Designing More Efficient New Processes and Equipment
- Reduce Costs and Capital Expeditures by Optimizing/De- Bottlenecking Existing Processes and Equipment
- Comply with Regulatory Agencies by Assessing the Environmental Impact of New or Existing Processes
- Leverage Corporate Information by Maintaining a Central Database of Proprietary and Laboratory Data



What are some common applications of CHEMCAD?

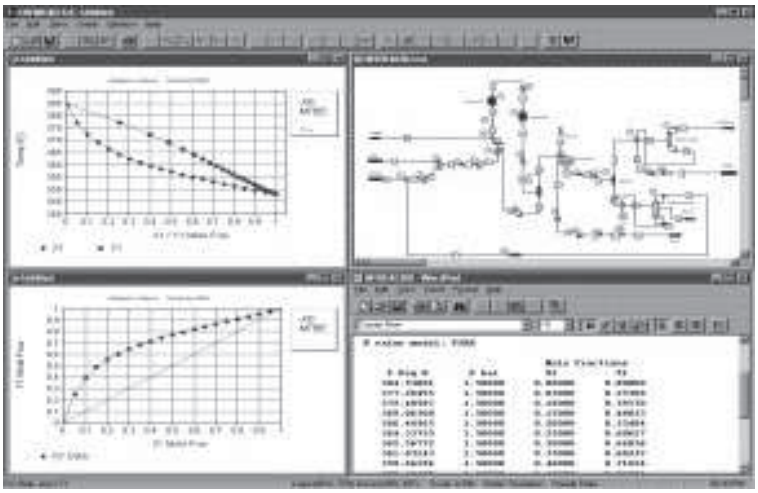
- Distillations/Extractions (Batch & Continuous)
- Reactions (Batch & Continuous)
- Electrolytic Processes
- Thermo-Physical Property Calculations
- Vapor/Liquid/Liquid Equilibrium Calculations
- Equipment Sizing
- Heat Exchanger Networks
- Environmental Calculations
- Safety Analyses
- Cost Estimations
- Flare Header Systems
- Utility Networks

How do you actually use CHEMCAD?

- Draw your flowsheet
- Choose your chemical components
- Choose your thermodynamic model
- Specify your feed streams
- Specify your unit operations
- Run your flowsheet
- Size your equipment
- Investigate cost estimate alternatives
- Assess environmental impact
- Analyze your results/Optimize and repeat as necessary
- Produce Process Flow Diagrams/ Reports

Why should you consider Chemstations?

- Chemstations' mission is to provide the chemical processing industry increased profitability, productivity, and safety via powerful, easy to use engineering software.
- Chemstations' development team is dedicated to creating the best available products through continuous improvement.
- Chemstations' technical support team is willing to stand behind our products and help you achieve your goals.
- Chemstations' global sales and marketing team is positioned to develop long term partnerships by creating opportunities through process solutions.
- Over 400 leading chemical companies have selected CHEMCAD as their primary process simulation software tool, with approximately 90 percent of Chemstations' customers renewing their maintenance agreement year after year.



Chemstations™

Process Simulation Software

GENERAL FEATURES

- Graphical user interface
- Customized reports and PFDs
- Interactive operation
- Composite heat curve pinch analysis
- Hydrate prediction
- CO_2 prediction
- Distillation curve assay analysis
- Interfaces to Lotus 1-2-3, Excel, and AutoCAD, (or compatible)
- Users may add their own unit operations, thermodynamics, components and/or graphics symbols
- In-line "C" language interpreter
- Users may add their own DDLs
- Steady-state, Unsteady-state, Batch and Dynamic Process Stimulation

THERMODYNAMICS' GENERAL FEATURES

- Vapor phase association
- Different K-Values and/or enthalpies for different units or trays
- Different BIP's for different units or trays
- Vapor-liquid and liquid-liquid equilibrium
- Physical properties estimation of undefined components

K-VALUE OPTIONS

- Hydrocarbons: Peng-Robinson, Soave-Redlich-Kwong, API Soave, Grayson-Streed, Maxwell-Bonnell, BWRS, K-Charts, Regular Solution
- Chemicals: NRTL, UNIQUAC, Wilson, UNIFAC, Margules, Van Laar, Chien-Null, 4-parameter equation of state
- Polymers: UNIFAC for polymers, Florry-Huggins
- Special Systems: amines, sour water, methanol, ethane-ethylene, propane-propylene, partial pressure (Ionic)
- Others: Henry's Gas Law, vapor pressure, User K tables
- Polynomial K-values, user subroutine
- Equation of state for hydrogen-bonding compounds

ENTHALPIES

- Hydrocarbon and Petrochemical: BWRS, Peng-Robinson, Soave-Redlich-Kwong, APIS, Redlich-Kwong, Lee-Kessler
- Chemicals: Latent heat, integral heat of solution
- Water: Steam tables
- Other: amines, polynomial, H tables, user subroutine, mass balance only

EQUIPMENT COST ESTIMATION

- Calculation of the purchase and installed cost of major pieces of plant equipment.

ENGINEERING DATA

- Physical properties databank for pure components
- BIP database for activity coefficient equations
- Electrolytes database
- Vapor phase association databank
- Interface to corporate databases

ELECTROLYTES

- The Pitzer and MNRTL methods for strong and weak electrolytes are available. These methods have been modified to include temperature dependent interaction parameters.
- Binary and ternary interaction parameters for these methods are stored in a database.
- Electrolyte reaction equilibrium data are stored in the databank of the most common industrial systems. Equilibrium is calculated using Gibbs free energy when data is absent.
- Expert system assistance in setting up the electrolyte chemistry.

SOLIDS HANDLING

- Crystallizer
- Centrifugal filter
- Cyclone
- Washer
- Venturi Scrubber
- Baghouse filter
- Screen
- Hydrocyclone
- Vacuum filter
- Electrostatic Precipitator
- Dryer
- Sedimentation separator
- Crusher, grinder

REACTORS

- Stoichiometric
- Equilibrium
- Kinetic (PFR or CSTR)
- Gibbs
- Up to 100 simultaneous reactions
- Flexible rate form
- Water-gas shift data
- Methanation data

DISTILLATION

- Short cut and rigorous
- Simple to complex, multiple column arrangements
- Flexible specifications
- Choice of algorithms
- Rigorous three phase distillation

REACTIVE DISTILLATION

- Reactions may be specified as equilbrium or kinetic equations
- Flexible rate form
- Purity and temperature specifications
- Up to 20 reactions

DYNAMIC UNIT OPERATIONS

- Batch distillation *
- Batch reactors **
- PID controller **
- Control valve **
- Dynamic vessel **
- Discrete event manager **
- Time delay module **

OTHER UNIT OPERATIONS

- Heat exchanger
- Expander/ Turbine
- Compressor
- Pump
- Mixer
- Divider
- Component separator
- Flash
- Rigorous three-phase flash
- Fired heater
- Valve
- LNG Heat exchanger with pinch analysis
- Controller
- Stream reference
- Liquid-liquid extraction
- Line sizing
- Calculator

EQUIPMENT SIZING

- Rigorous equipment sizing routines with spec sheets are available for the following equipment:
  - Trays (Sieve, Bubble cap, Valve)
  - Packing (Random and Structured)
  - Pipes
  - Shell & Tube Heat Exchangers ***
  - Pressure Vessels
  - Orifices
  - Control Valves
- Relief Valves (DIERS)

REGRESSION

- Pure component physical properties regression
- Multiple component VLE and LLE regression
- Regression from UNIFAC
- Regression from infinite dilution data
- Regression of electrolyte data
- Regression of reaction rate data **

Chemstations™

www.chemstations.com