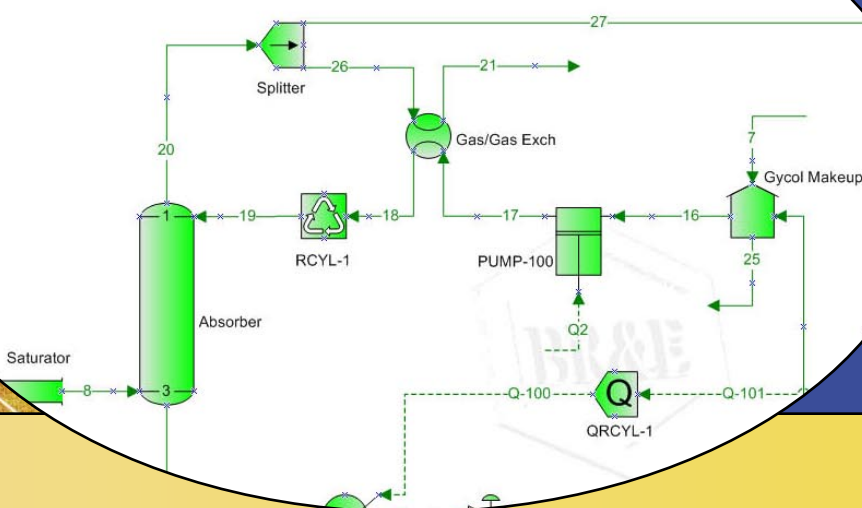




ProMax[®]

with
TSWEET[®] & PROSIM[®]
Process Simulation Software

Glycol Dehydration Unit with Stripping Gas



**Use It.
Love It.[™]**

ProMax is a powerful Microsoft[®] Windows[®] based process simulation package for use in gas processing, oil refining and chemical facilities.

BR&E's process simulation software has served customers worldwide for over 30 years. ProMax provides more benefits to our clients than ever before.



Bryan Research & Engineering, Inc.



ProMax

with TSWEET and PROSIM

Why You NEED ProMax...

ProMax is a powerful and versatile stream based process simulation package. Use ProMax to design and optimize gas processing, refining, and chemical facilities. ProMax contains over 50 thermodynamic package combinations, over 1500 components, OLE Automation tie-ins, specifiers, solvers (including minimizer/maximizer), crude oil characterization and Microsoft Excel® spreadsheet embedding. Get all of this with amazing flexibility and ease of use.

ProMax - Process Design

- Reduce process revamping
- Improve start-up times

ProMax - Facility Optimization

- Reduce operating expenses
- Increase profitability

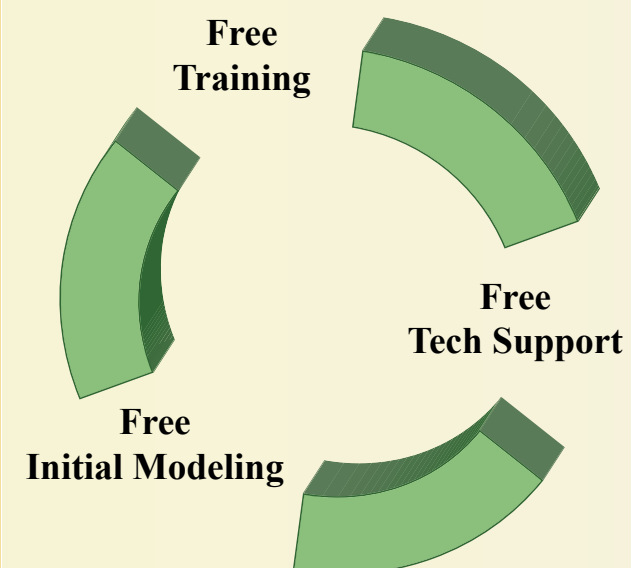
ProMax - Plant Monitoring

- Improve plant reliability
- Increase productivity

#1 BR&E'S CUSTOMER SUPPORT IS SECOND TO NONE.

Meeting the Demands of Today's Engineer - Customer Services

A ProMax license includes much more than just outstanding software with extensive online help. BR&E provides **free technical support**, **free initial modeling** and **free training**. If the numerous process examples and detailed help included with ProMax do not answer all of your questions, you have peace of mind knowing that the BR&E support staff is just a call away.



Engineers design complex plants that are challenging to optimize and operate efficiently. BR&E accepts this challenge and offers **free initial modeling** for Operating Company clients.

Both novice and experienced users gain engineering and simulation skills by attending BR&E training sessions. Class lengths are one to three days.

ProMax training sessions are FREE. Anyone wanting to learn more about ProMax is welcome.



Generate..
Optimize.
collaborate...
Benefit.....
Prosper

Simple user interface and multiple flowsheets

provide the ultimate workflow...

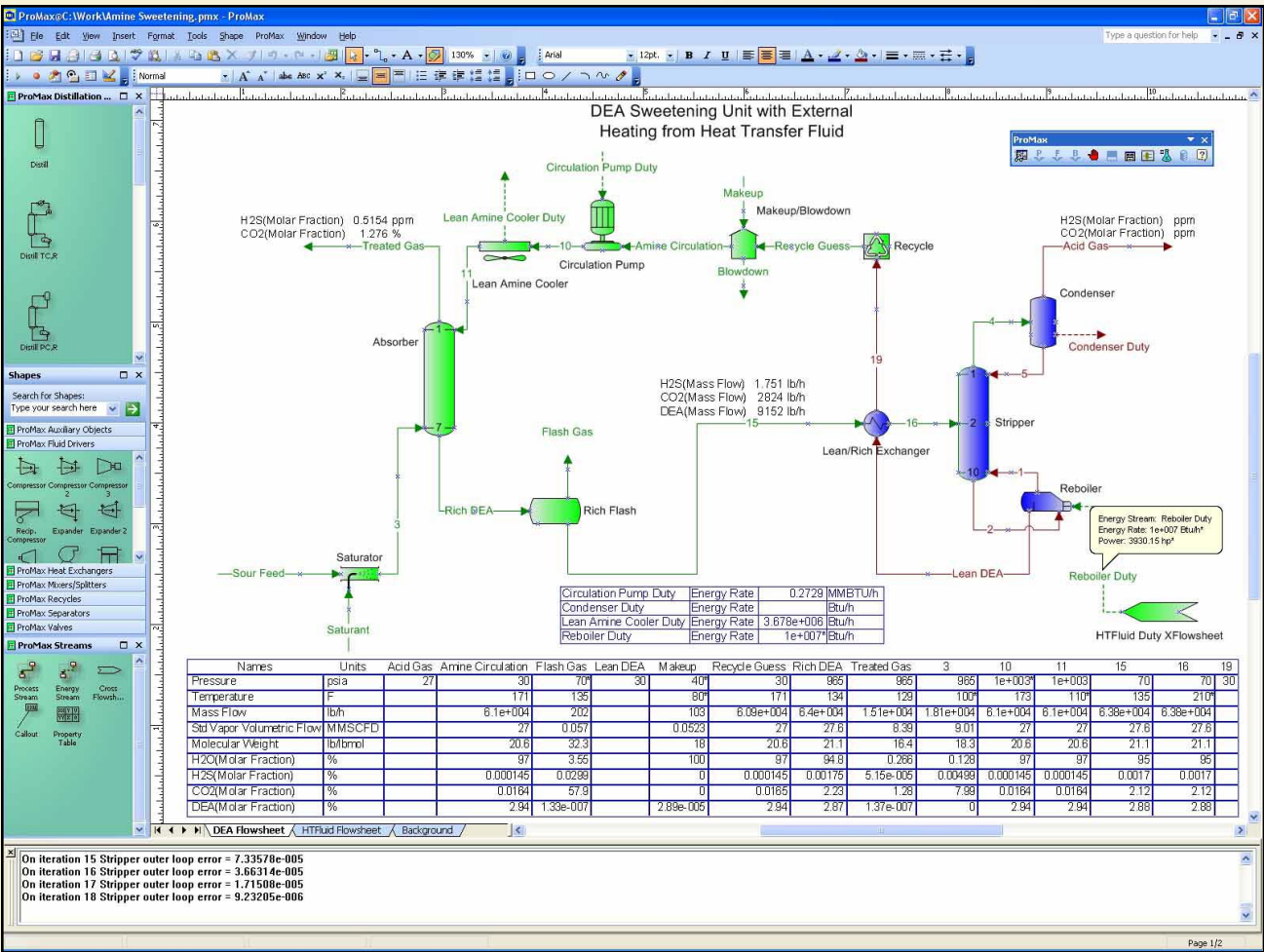
BR&E Flowsheet Drawing Using Microsoft Visio®

ProMax uses Microsoft Visio as its drawing package. You will find that Visio's functionality empowers you to enhance your process flowsheets. Simply drag and drop blocks, streams and process data onto your flowsheet. Combining ProMax, Visio and you is true innovation.

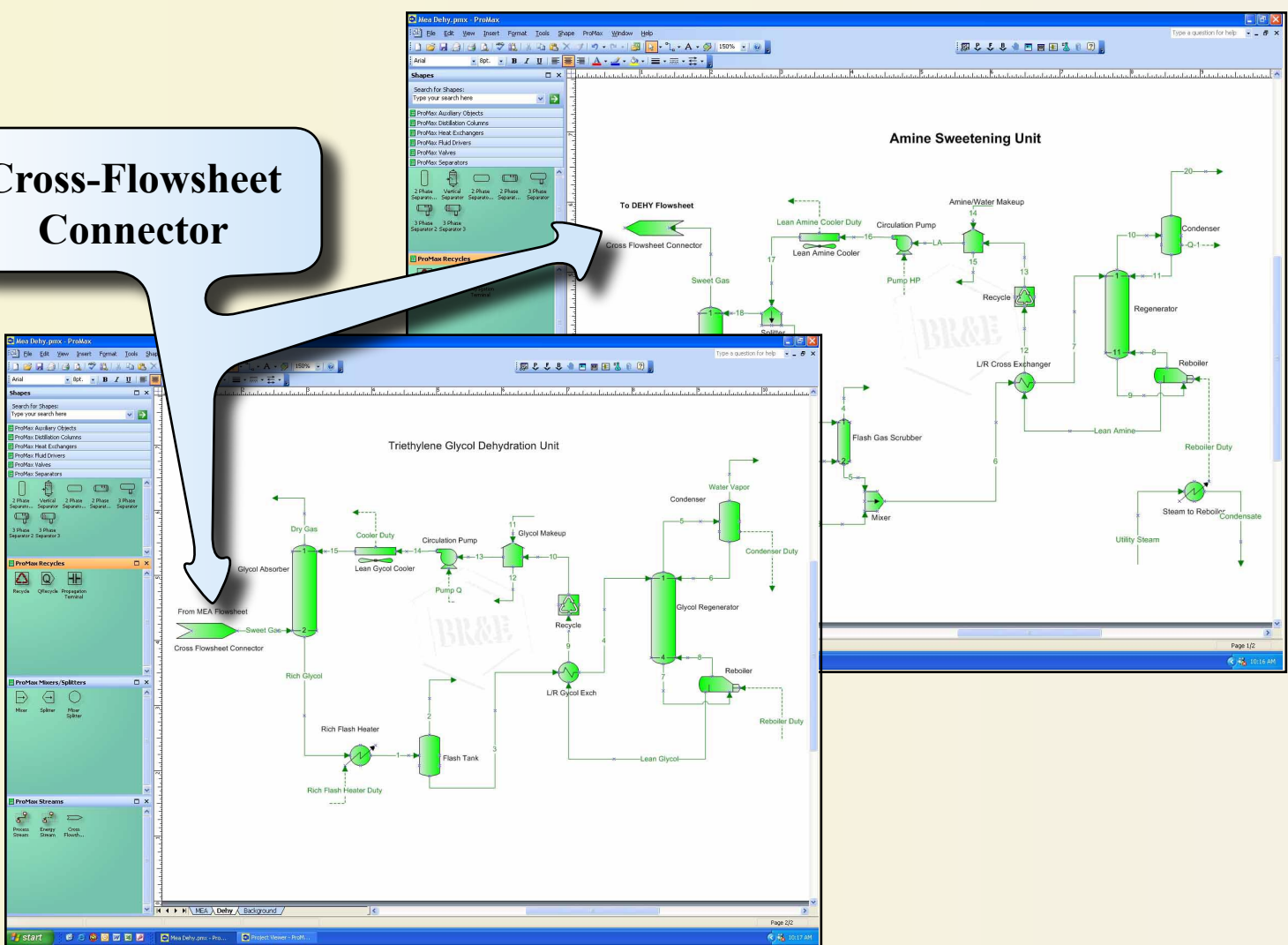


BR&E Multiple Flowsheets in ProMax

ProMax combines the technology of TSWEET and PROSIM. Now all of a facility's independent processes can be modeled in a single project. You have the flexibility to choose the best property package for each process while sharing data between flowsheets.



Cross-Flowsheet Connector



Benefits:

- Completely customize the drawing.
- Easily automate ProMax using VB, VBA, etc.
- Display customized stream material balance directly on drawing.
- Import / Export data directly from / to Excel.
- Enjoy the world's best flowsheeting tool as your simulator.
- Improve workflow efficiency.

Benefits:

- Directly link independent process flowsheets.
- Simplify the simulation by process specific flowsheets.
- Increase accuracy with the best property package per flowsheet.

ProMax is so easy to use, you will be

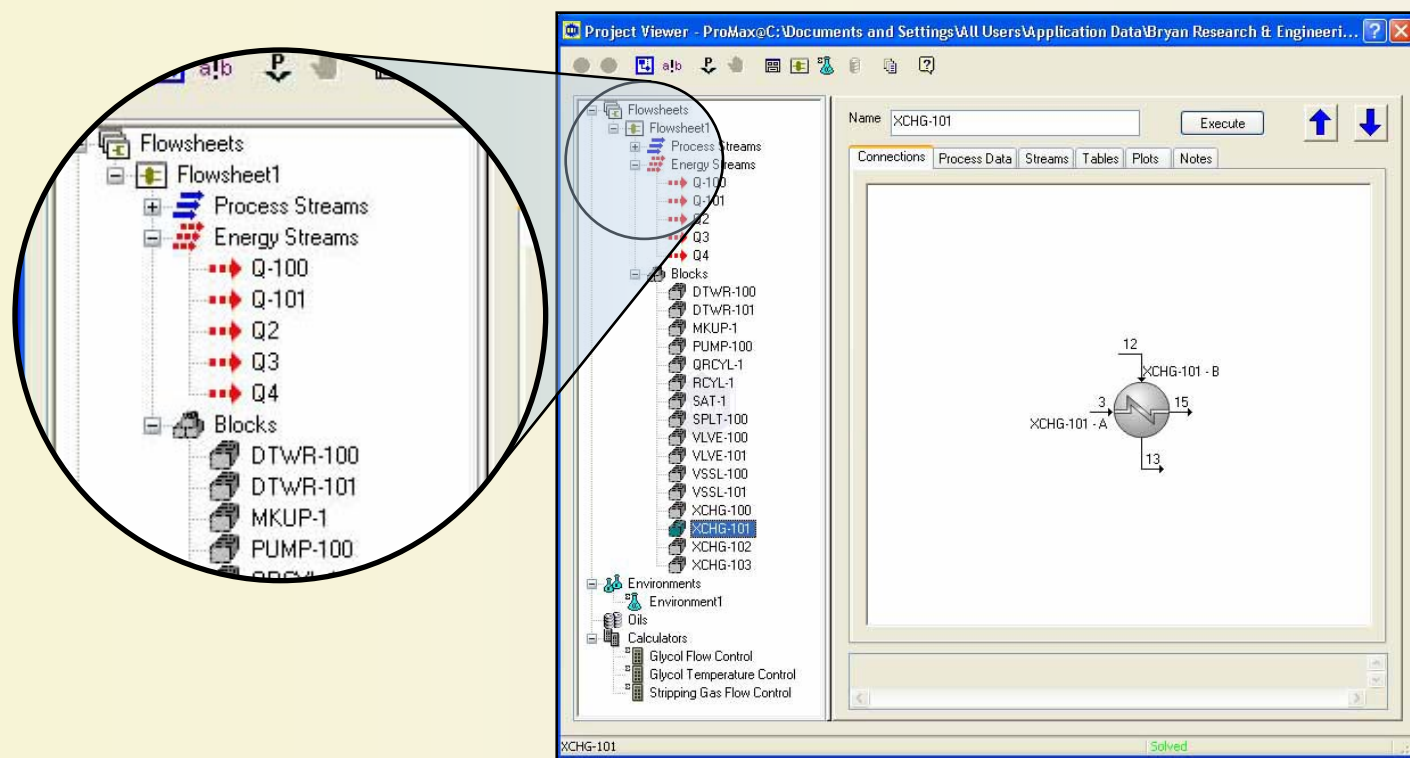
empowered to add more to any project.



The ProMax Project Viewer

Navigate and access all elements of your project via the ProMax Project Viewer. Specifications and results for streams and unit operations can be accessed by double-clicking the item in the flowsheet or by using the navigation tree in the Project Viewer.

The Project Viewer tree lists flowsheets, streams, blocks, environments, oils and calculators.



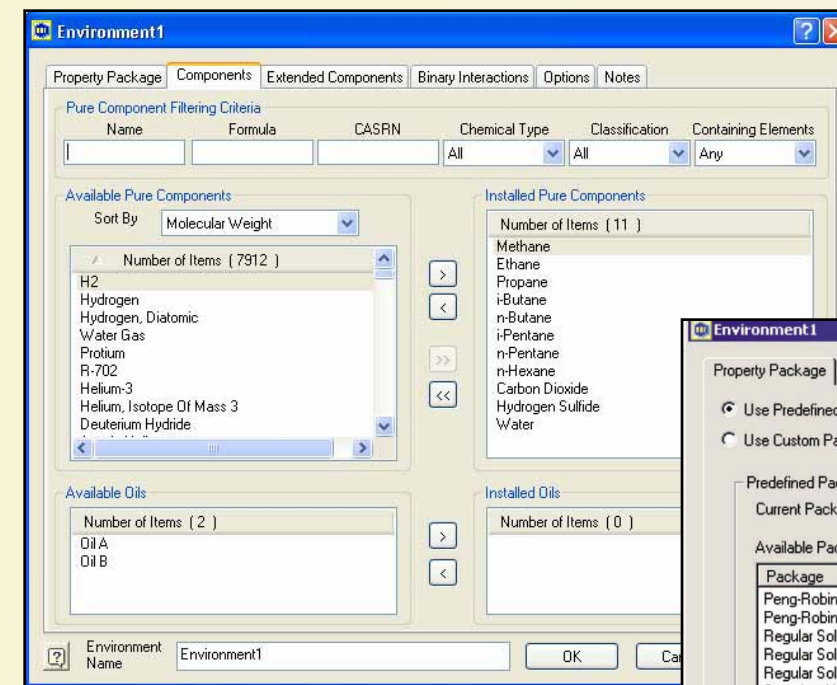
Benefits:

- View results during execution.
- Navigate quickly through complex projects.
- Easily view the entire project.
- Use the Project Viewer as a “Table of Contents” for the simulation.
- The navigation tree concept is used in other aspects of the user interface.

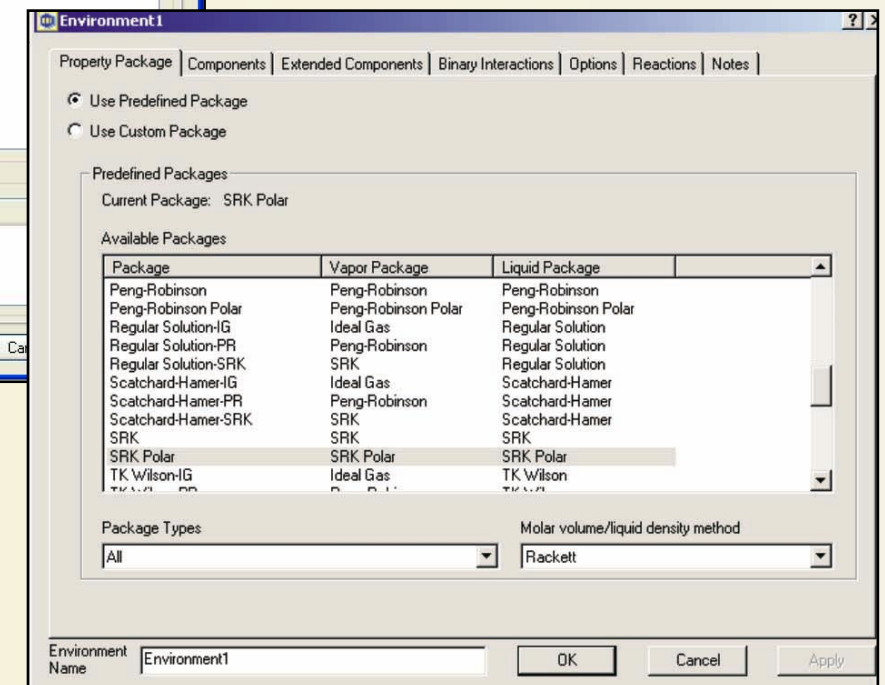


Specifying Environments

Environments link property packages and components to flowsheets. You can assign each flowsheet in a project a different environment or multiple flowsheets can use the same environment. In addition, environments can be created from scratch, edited or duplicated.



Over 1500 pure components are available in ProMax, many with multiple aliases. This allows you to choose from over 7900 component names. Multiple filters make it easy to locate the component you need.



Specify a custom package or select from over 50 predefined thermodynamic package combinations. These packages enable the user to simulate a variety of different gas processing, refining, electrolytic and molecular chemical systems. For example:

- | | | | |
|-------------------|-------------|-------------------|----------------------|
| -SRK | -BWRS | -NBS Steam Tables | -Wilson |
| -Peng Robinson | -Chien-Null | -UNIFAC | -Scatchard-Hamer |
| -NRTL | -Lee-Kesler | -UNIQUAC | -Heat Transfer Fluid |
| -Electrolytic ELR | -Margules | -Van Laar | -TK Wilson |

Gas Processing

Process Focus - Amine Sweetening



Process Focus - Glycol Dehydration/Hydrate Inhibition

Amine sweetening in ProMax is a significant improvement from TSWEET, the industry standard. Benefits include more complete thermodynamic models, calculation of more thermo-physical properties and better integration with hydrocarbon packages and unit operations. These benefits allow you to model many more processes such as complex absorber / stripper configurations, three-phase flashes and oils in amine units. The following amines are available either individually or as blends: MEA, DEA, DGA, MDEA, DIPA, TEA, and AMP. ProMax also introduces BR&E's new Electrolytic-ELR model. This new model is a significant improvement to the NRTL acid gas model in TSWEET. The sweetening package also continues TSWEET's unprecedented ability to model selective absorption using CO₂ kinetics.

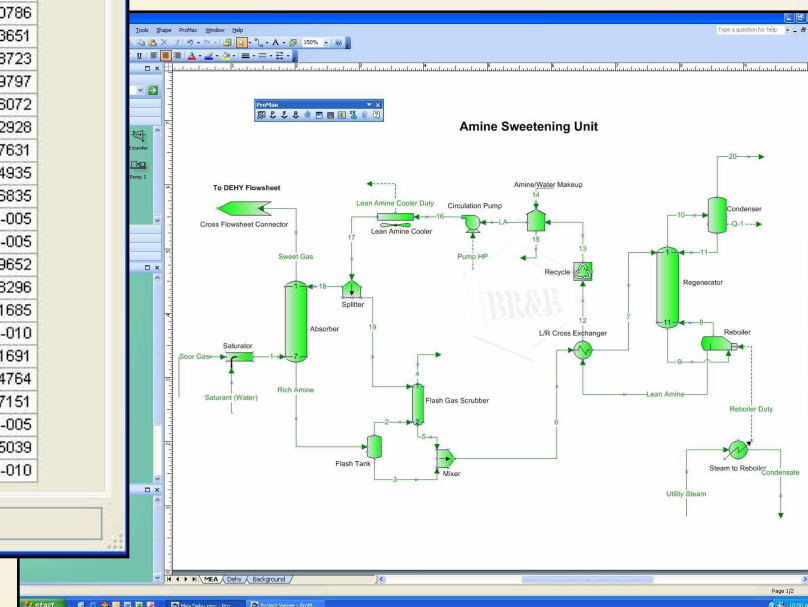
BR&E is the leader in predicting the performance of both glycol dehydration and hydrate suppression systems. Benefits include rigorous predictions for water content, hydrate formation temperature, water dew point and CO₂ freeze out. The best in industry BTEX solubility predictions from PROSIM have been carried forward into ProMax.

Full Species Information for 9

Ionic Strength 0.0617736

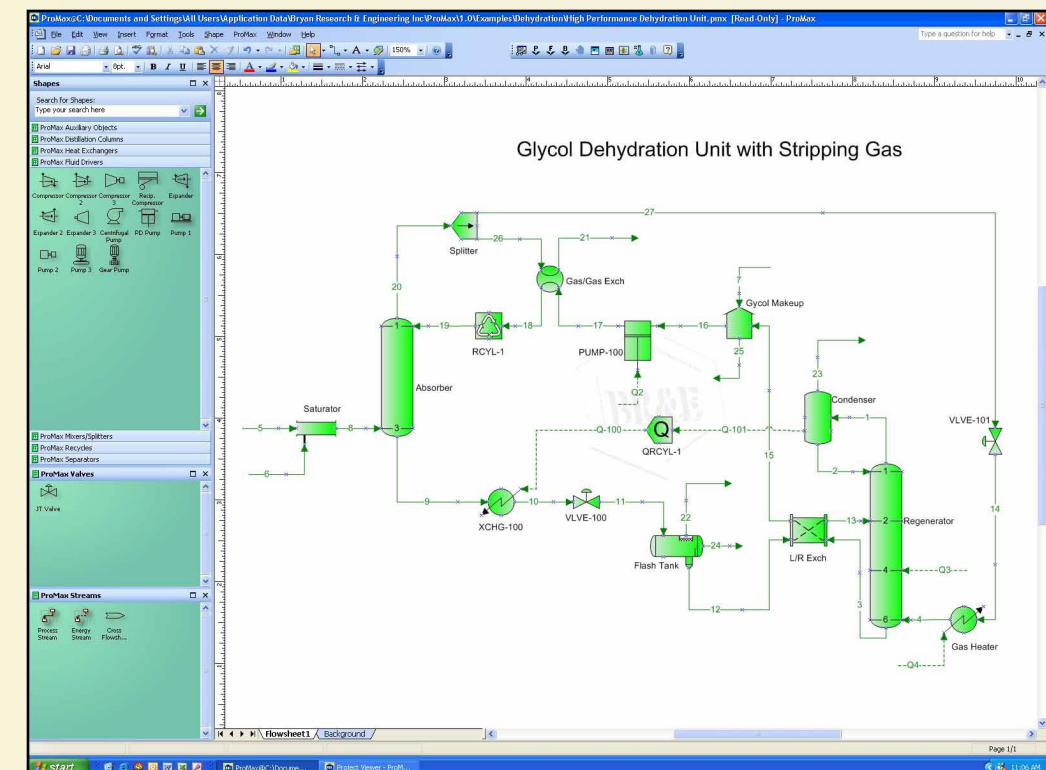
	Molarity gmol/L	p[Molarity]	Molar Flow lbmol/h	Mole Fraction %	Mass Flow lb/h	Mass Fraction %
N2	0.000151097	3.82074	0.0399235	0.000372174	1.1184	0.000411939
CO2	0.0013093	2.88296	0.34595	0.003225	15.2251	0.00560786
H2S	5.5368e-005	4.25674	0.0146296	0.00013638	0.498604	0.000183651
C1	0.0313026	1.50442	8.27092	0.077103	132.686	0.0488723
C2	0.0028014	2.55262	0.740199	0.00690027	22.2571	0.00819797
C3	0.00107357	2.96917	0.283663	0.00264436	12.5083	0.0048072
iC4	9.06783e-005	4.0425	0.0239594	0.000223354	1.39257	0.000512928
nC4	0.000151617	3.81925	0.0400609	0.000373455	2.32843	0.000857631
iC5	2.49136e-005	4.60356	0.00658279	6.13659e-005	0.47494	0.000174935
nC5	4.36984e-005	4.35953	0.0115462	0.000107635	0.833043	0.000306835
nC6	1.06173e-005	4.97398	0.00280536	2.61521e-005	0.241753	8.9045e-005
nC7	1.61703e-006	5.79128	0.000427259	3.98299e-006	0.0428122	1.57691e-005
DEA	0.576281	0.239366	152.268	1.41946	16008.8	5.89652
H2O	37.5465	-1.57457	9920.7	92.4825	178724	65.8296
[HCO3-]	0.196775	0.706031	51.9927	0.484685	3172.43	1.1685
[H+]	5.59402e-009	8.25228	1.47808e-006	1.37789e-008	1.48981e-006	5.48744e-010
[DEACOO-]	0.982803	0.00753353	259.681	2.42079	38468.4	14.1691
[CO3--]	0.0230753	1.63685	6.09705	0.0568378	365.877	0.134764
[DEAH+]	1.23088	-0.0902162	325.229	3.03184	34521	12.7151
[OH-]	2.58946e-005	4.58679	0.00684198	6.37821e-005	0.116364	4.28604e-005
[HS-]	0.00512732	2.29011	1.35476	0.0126293	44.8073	0.0165039
[S--]	2.10113e-010	9.67755	5.55169e-008	5.17538e-010	1.78021e-006	6.55704e-010

Display ionic species for liquid streams.



Benefits:

- Model virtually any amine unit configuration.
- Best available predictions of amine solution-acid gas VLE as well as actual plant data.
- Model real or ideal stages in absorbers and strippers.
- Optimize the type of amine, amine flow rate and reboiler duty.
- Determine hydrocarbon / BTEX absorption in amine solutions.



Benefits:

- Select EG, DEG, TEG, Methanol solvents with BR&E proprietary interactions.
- Utilize unsurpassed Methanol - H₂O - Hydrocarbon VLE / VLLE / LLE predictions.
- Calculate hydrate, ice and solid CO₂ formation temperatures, and water content.
- Predict BTEX and VOC emissions accurately.
- Optimize glycol flow rate.
- Calculate hydrate inhibitor requirements.

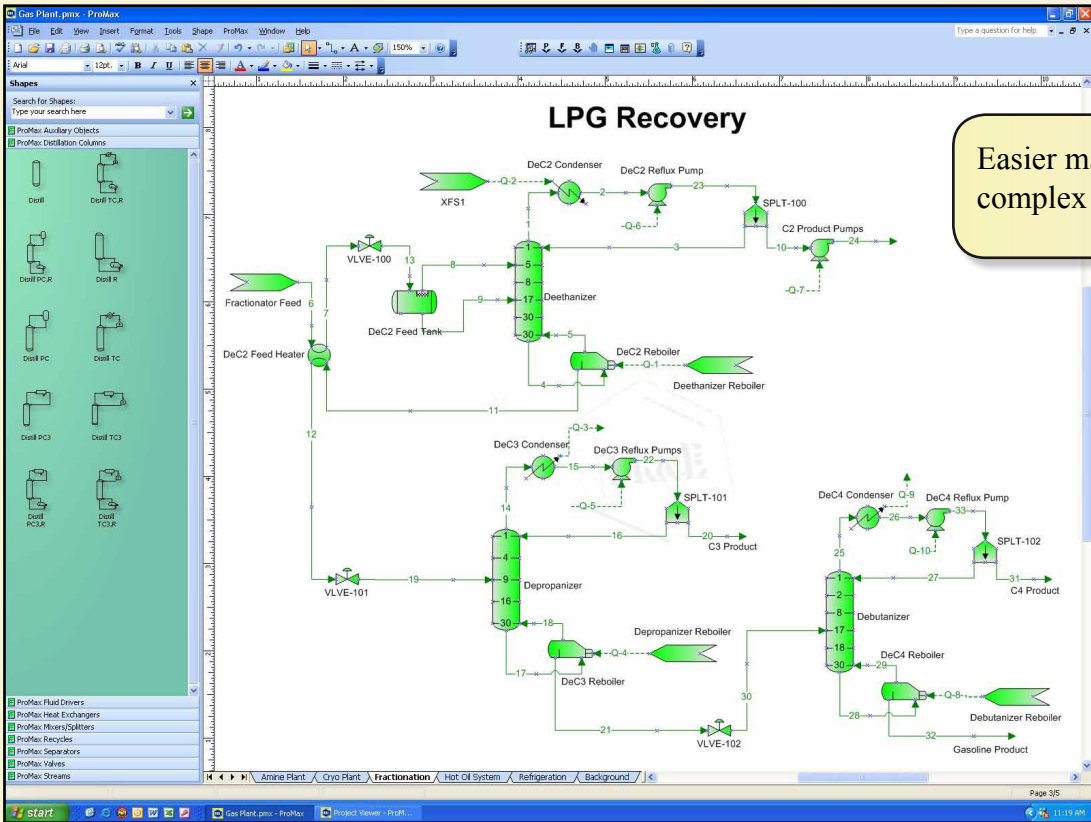
Refining

Process Focus - LPG Recovery & Fractionation

Process Focus - Crude Oil Refining

Model separation processes such as refrigeration, cryogenic, lean oil and other common fractionation applications.

- Cryogenic
- Lean Oil
- Refrigeration
- Fractionation
- Nitrogen Rejection
- Others



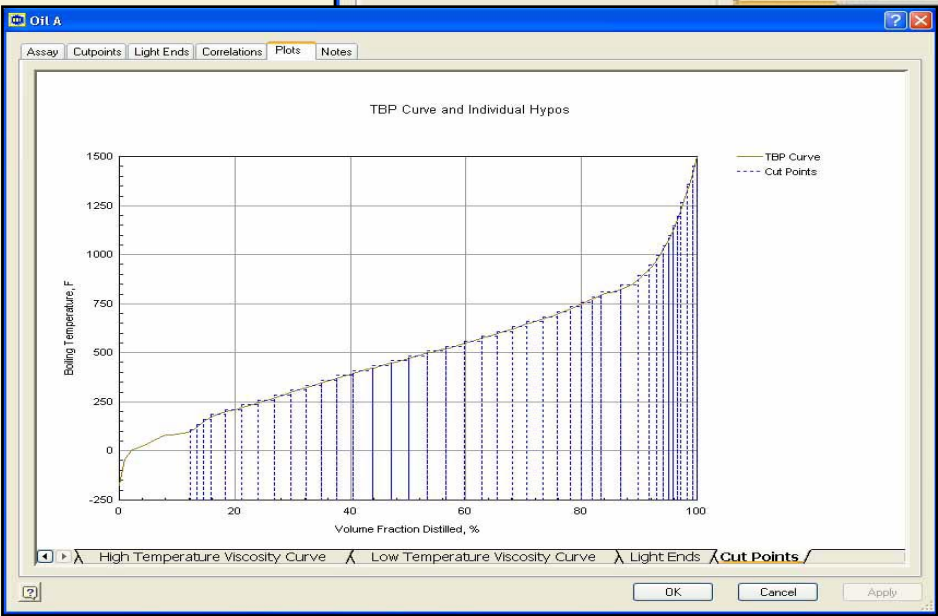
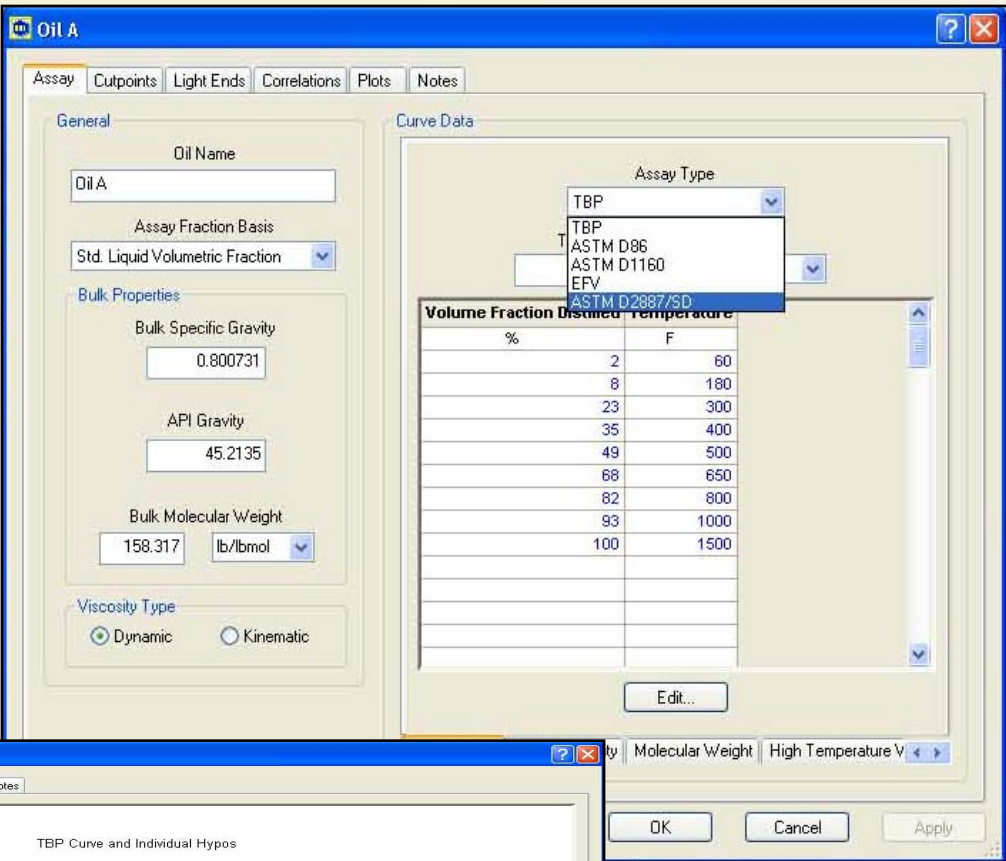
Easier management of complex exchangers.

Use multiple flowsheets to manage process units individually.



Characterize single or multi-component oils and blends for use in common refining applications.

- Atmospheric and Vacuum Towers
- Three Phase Columns
- Complete Oil Characterization and Blending
- Side Strippers and Pumparounds



- Analyze operational problems.
- Choose from Assay Types:
 - TBP
 - ASTM D86
 - ASTM D1160
 - ASTM D2887/SD
 - EFV

Benefits:

- Check for solids formation automatically.
- Connect energy streams from exchangers directly to column stages.
- Model brazed aluminum multi-sided exchangers.
- Investigate operational performance.



Process Focus - Chemicals



Promax has pure components and exclusive thermodynamic property packages that allow simulation of many chemical plant processes.

- Over 50 property package combinations.
- More than 1500 components.
- Includes over 70 chemical groups.

Benefits:

- Investigate operational performance.
- Optimize using parametric studies.
- Evaluate process variations.

Process Focus - Equipment Rating / Sizing

Pipelines / Gathering System Networks

- Specify ambient conditions and overall heat transfer coefficient.
- Calculate pressure drop for horizontal, vertical and inclined flow.
- Obtain results for one, two and three phase flow.
- Select from a wide range of correlations.
- Perform backward calculations.

Column Sizing / Separator

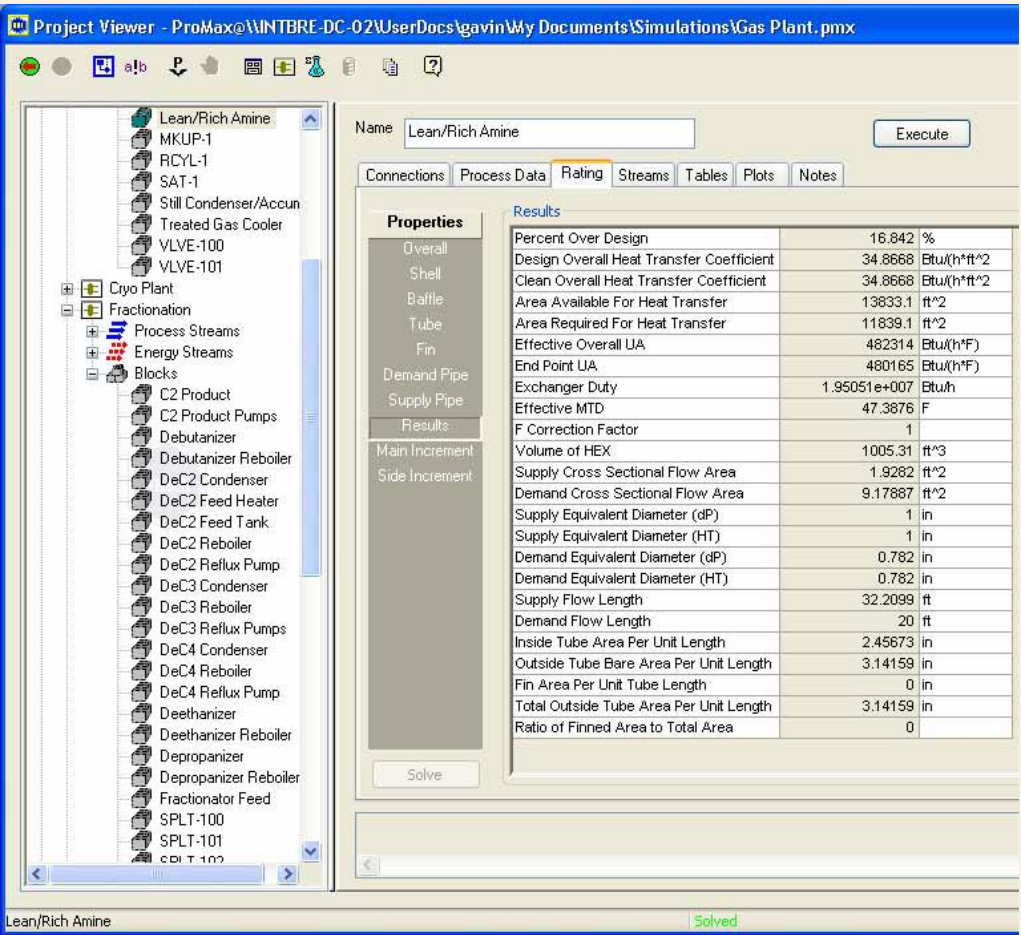
- Specify ASME pressure vessel materials of construction.
- Size three-phase separators with heavy liquid boots.
- Size two-phase horizontal and vertical separators.
- Specify detailed column internals.
- Size both packed and trayed columns.



Process Focus - Equipment Rating / Sizing

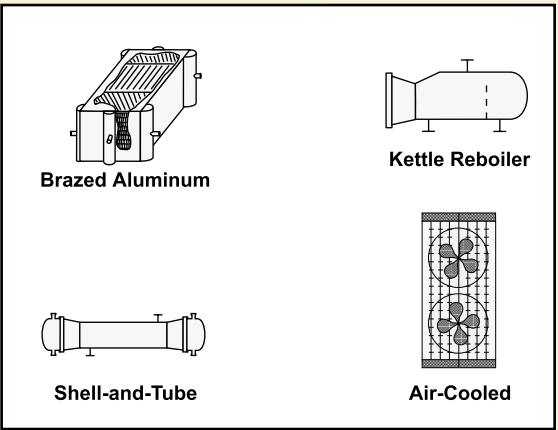
Heat Exchangers

- Calculate complete exchanger details.
- Choose from over 30 heat transfer fluids.
- Generate TEMA datasheets.
- Rate as well as size: shell and tube, fin fan and compact exchangers.



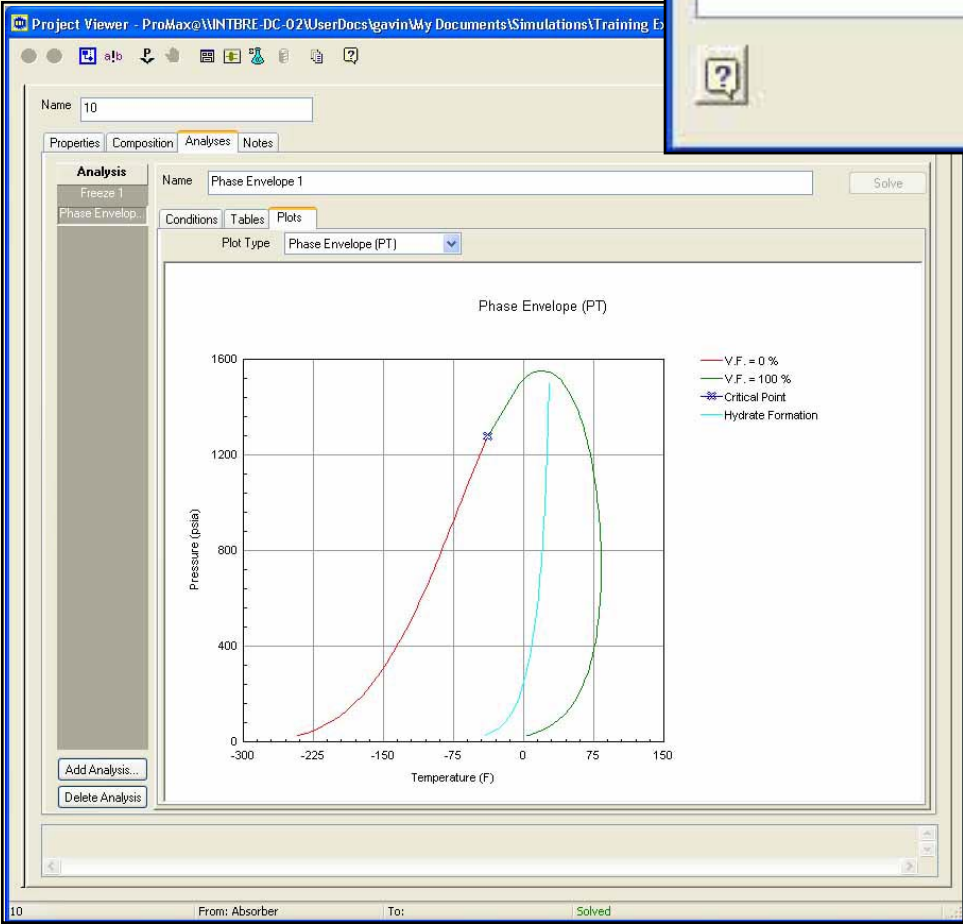
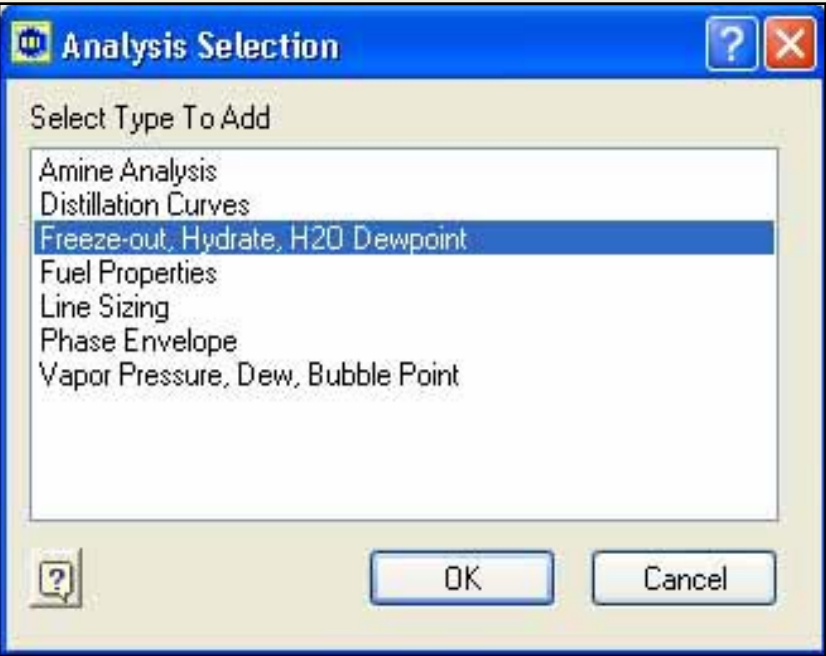
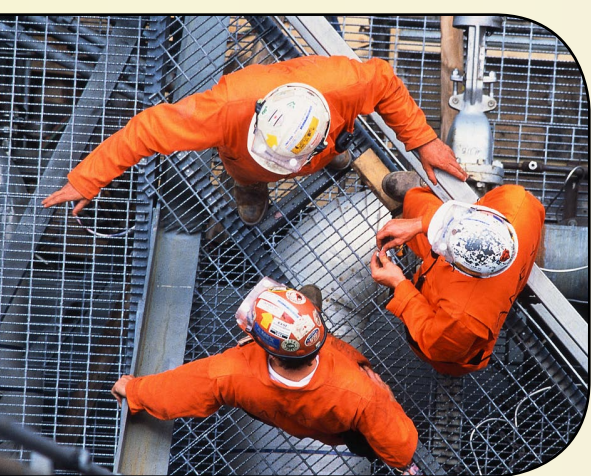
Benefits:

- Perform parametric studies.
- Investigate:
 - Fouling
 - Pressure Drop
- Minimize size and costs
- Maximize process efficiency



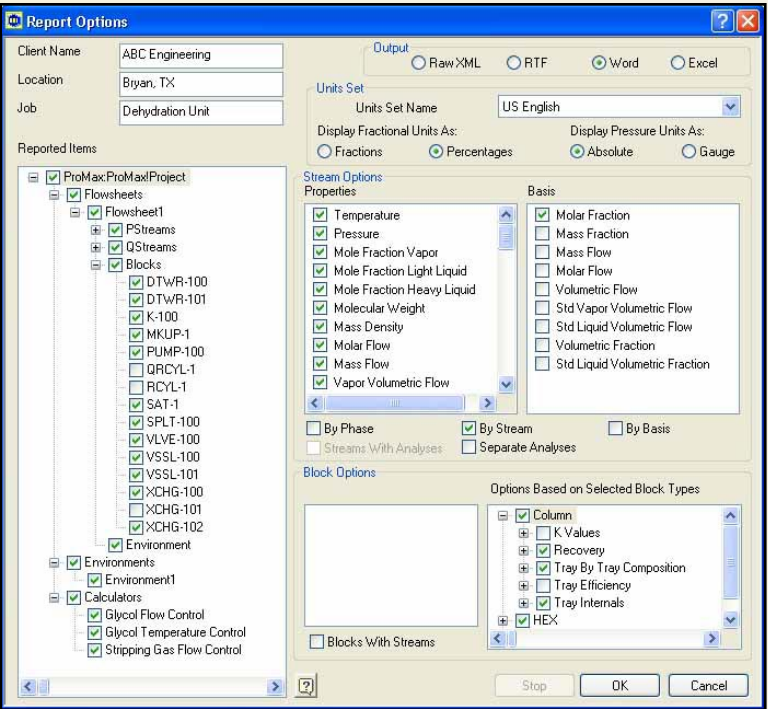
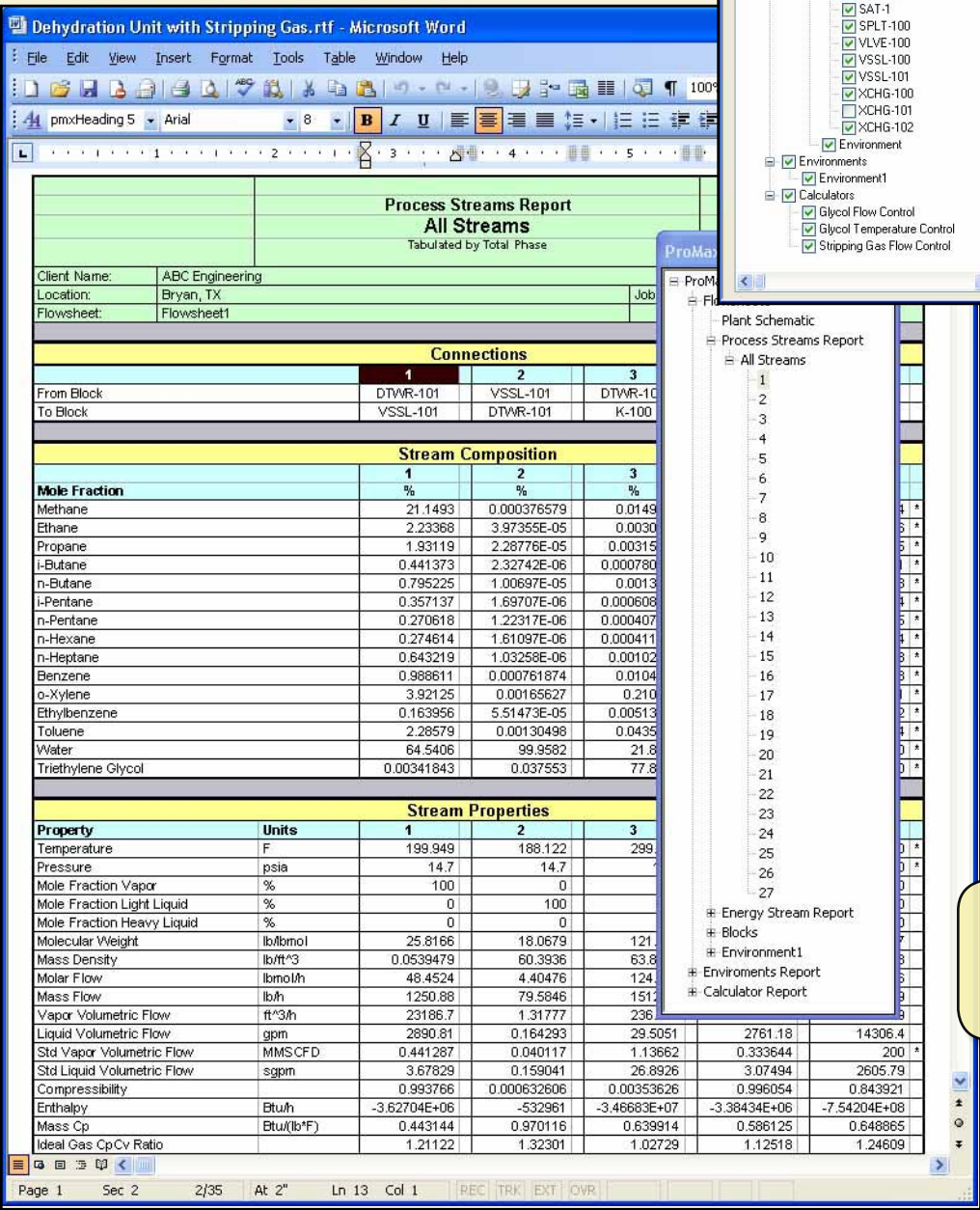
Stream Analyses

Adding an analysis to a stream gives you detailed supplementary information. Some analyses have graphical representations. Separating these analyses from standard stream data makes ProMax fast and efficient. Examples of these analyses are: phase envelopes, vapor pressure tests, fuel properties and solids formation. Other calculations available by using these tools include pH, acid gas loading and line sizing.



Reporting

- Generate Reports via Microsoft Word, Excel, RTF (Rich Text Format) and Raw XML.
- Customize your report from a single property of one stream to any combination of properties of blocks, streams and other simulation items.



Report generation is made easy with the familiar navigation tree.

Inside your generated report, use the report navigator to quickly find needed data.

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Process Simulation Software



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