

## BTX Extraction

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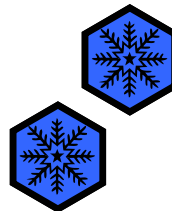


TTC has the technology to:

- Utilize low quality heat (3.5 barg/50 psig steam) for all of the heat in the extraction section.
- Increase the capacity of the extraction section and decrease the energy consumption.
- Make CH Grade benzene and TDI Grade toluene at high recovery.
- Use any commercially available solvent.

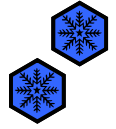
## TTC Labs, Inc.

**280 Harborview Dr.  
Fond du Lac, WI 54935  
(920) 923-9753  
(920) 923-9756 fax  
[www.ttclabs.com](http://www.ttclabs.com)**



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## BTX Extraction



***Process Engineering  
Excellence.***

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## BTX Extraction



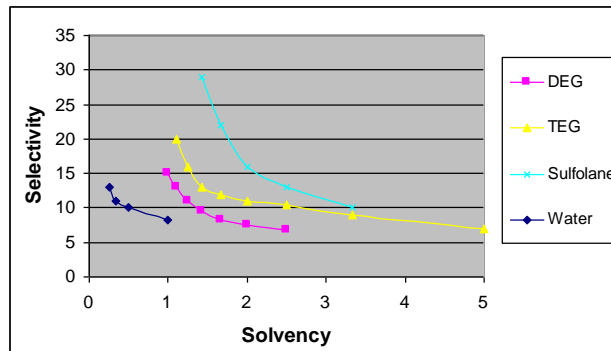
TTC designed Benzene Extraction Unit.

### Focus on Profitability

TTC specializes in low energy consumption and high capacity applications. Rigorous thermodynamic and hydraulic calculations optimize parameters and rate equipment. The following table represents typical values utilizing glycol technology.

| Ratio                               | Reformat | Pygas |
|-------------------------------------|----------|-------|
| % Aromatics                         | 60%      | 85%   |
| LS/F                                | 3.0      | 4.0   |
| Re/Ex                               | 0.6      | 0.5   |
| SS/LS                               | 3%       | 3%    |
| % of theoretical energy consumption | 110      | 120   |

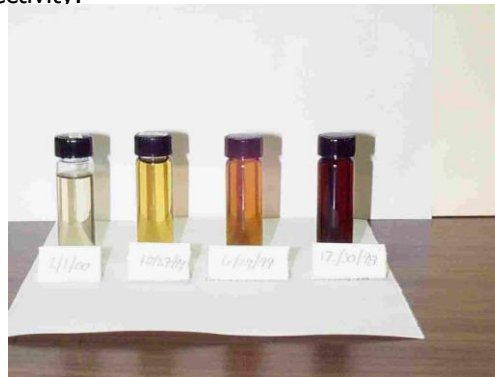
### Solvent Selection



From the chart of solvency versus selectivity, glycols have a lower solvency and selectivity than sulfolane. However, glycols are:

- Less corrosive.
- Easier to separate from the products.
- Easier to heat integrate.

Because there is no single best answer, solvent selection should not be based solely on solvency and selectivity.



Results of solvent corrosion campaign, from right to left.

### Single L-L Extractor

The combination of liquid-liquid extraction and extractive distillation columns exploits the following properties of most BTX solvents:

- L-L extraction provides high recovery at low cost.
- Extractive distillation ("solvent stripper") provides high purity at low cost.
- Combination of L-L extraction and solvent stripper uses the minimum energy because the two columns share a common reflux stream.

Using extractive distillation to achieve high recovery can, for narrow feed ranges, minimize investment costs.

### TTC Services

- Committed to transferring technology.
- Technology schools for operators and engineers.
- Troubleshooting services with free phone calls and emails for tech service.
- Profit programs.
- Revamp designs.
- Grass root designs.
- Process optimization.