

# TranSep

## Novel Membrane Pervaporation Process Removes Sulfur from Gasoline

### BENEFITS:

- Polymeric membrane selectively removes sulfur species without removing olefins (less octane loss)
- Ultrathin membrane construction provides high throughput
- Operates at 80-100 °C
- Utilizes patented Venturi vacuum system (no vacuum pump or steam ejectors)
- Works in tandem with existing non-selective hydrotreaters

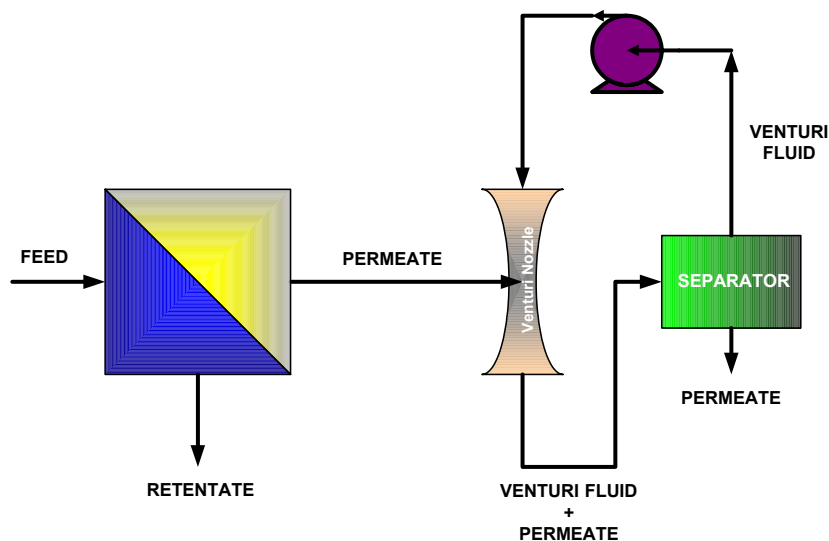
### ADDITIONAL APPLICATIONS:

With a simple change in the membrane and/or Venturi fluid, TranSep can be used to

- Remove mercaptans from natural gas condensates
- Reduce benzene levels in finished gasoline streams in order to meet more stringent proposed benzene limits
- Dehydrate organic solvents such as isopropanol and acetone
- Remove volatile organic compounds like MTBE from groundwater or plant wastewater
- Dehydrate ethanol for biofuels

TranSep™ is a revolutionary pervaporation process that selectively separates the aromatic molecules (containing most of the sulfur) from gasoline streams without also removing the olefins, thereby allowing the high-sulfur product to be non-selectively hydrotreated without significant loss in octane.

What sets TranSep™ apart from other pervaporation processes is the unique and patented use of a Venturi nozzle and special working fluid with which to pull the vacuum required to recover permeate from the downstream side of the membrane. The figure below shows the simplicity of the overall process.



Permeate is recovered from the Venturi liquid at atmospheric pressure thus eliminating expensive refrigeration systems generally required to condense light hydrocarbons at high vacuum. This reduces both the capital and operating costs substantially over conventional pervaporation systems that use vacuum pumps (or steam ejectors) and refrigeration units.

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