

Emerging Technology Acid Gas Removal



**EPA's Natural Gas STAR Program,
Pioneer Natural Resources USA, Inc., and
The Gas Processors Association
June 17, 2003**

New Developments in Acid Gas Removal Technologies

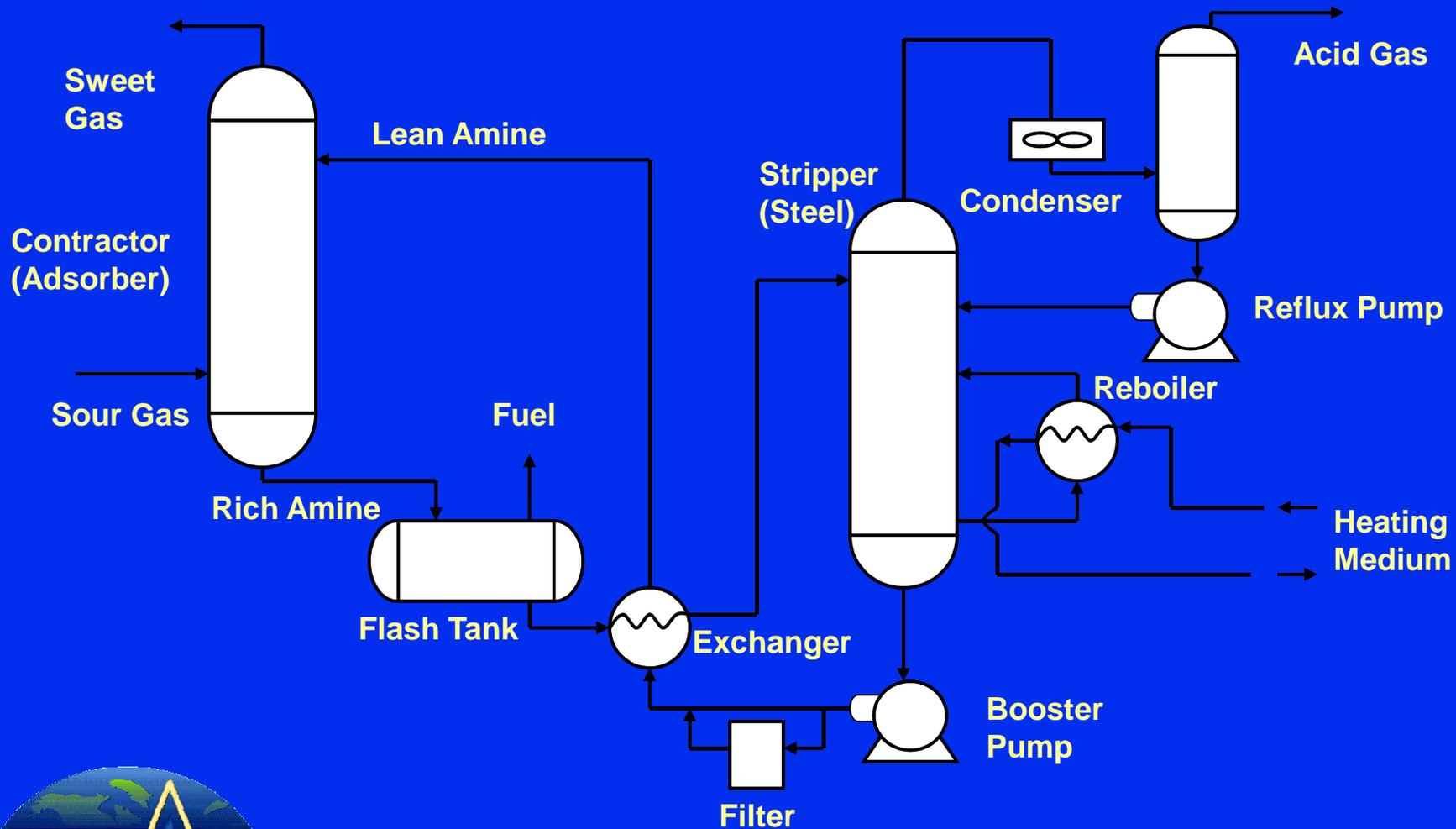
- Typical Amine Process
- IGT & Uhde Morphysorb[®] Process
- Engelhard Molecular Gate[®] Process
- Comparison



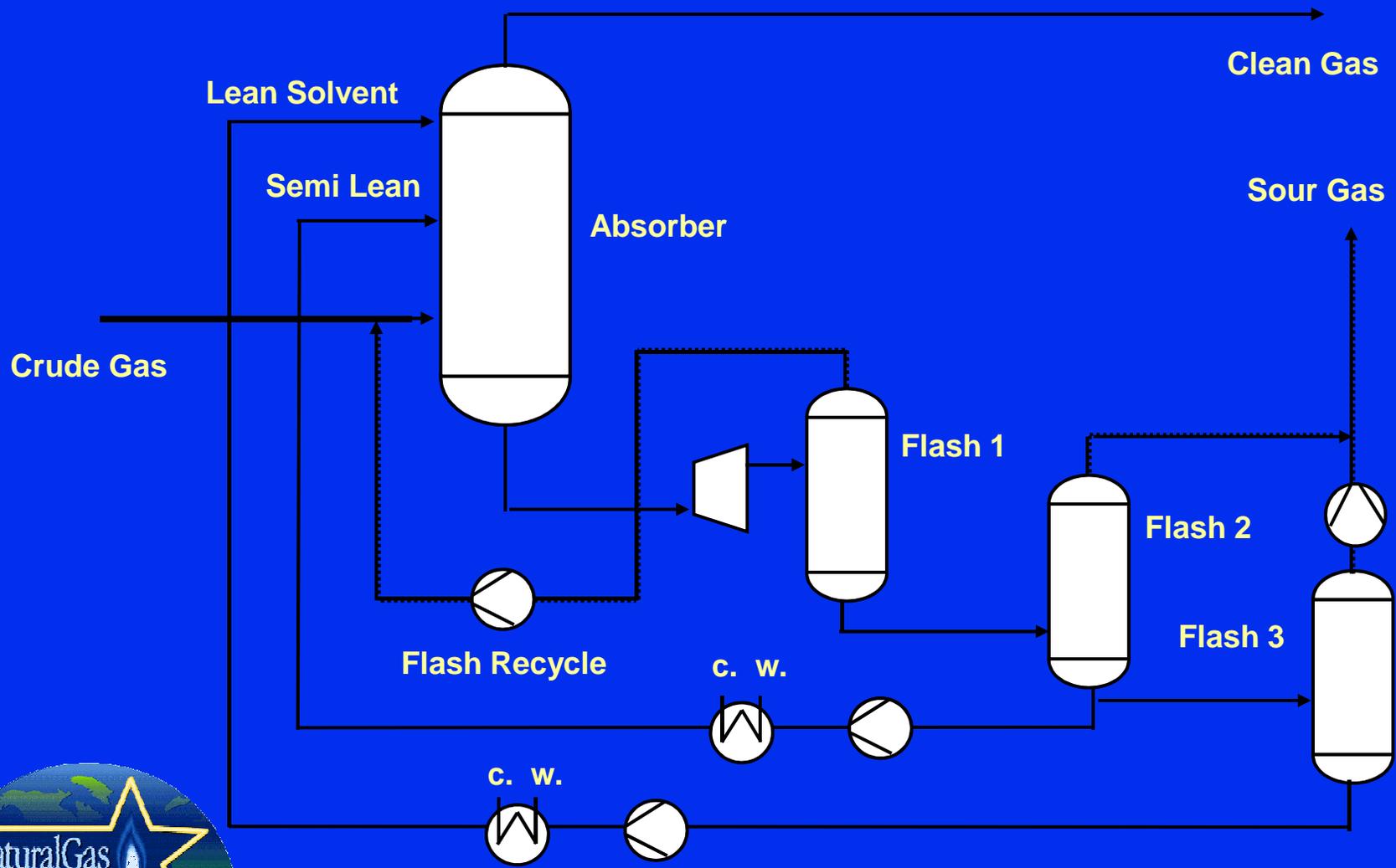
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Typical Amine Process



Morphysorb[®] Process

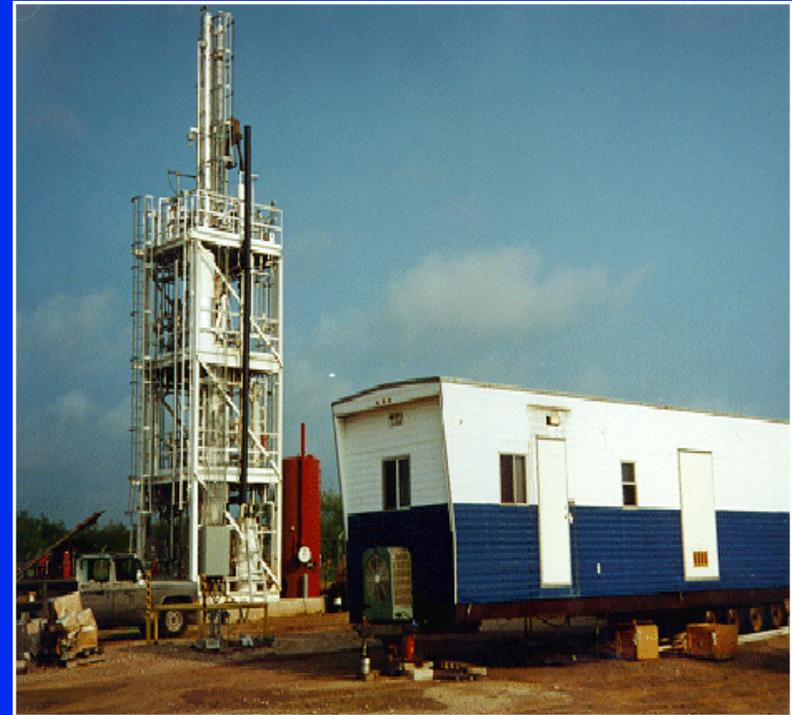


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Morphysorb[®] Field Test Unit

- The process is ready for commercial-scale application
- One field test unit at Shell's Exploration and Production facilities in Fandango, Texas, USA
- Feed capacity: 1 MMscfd

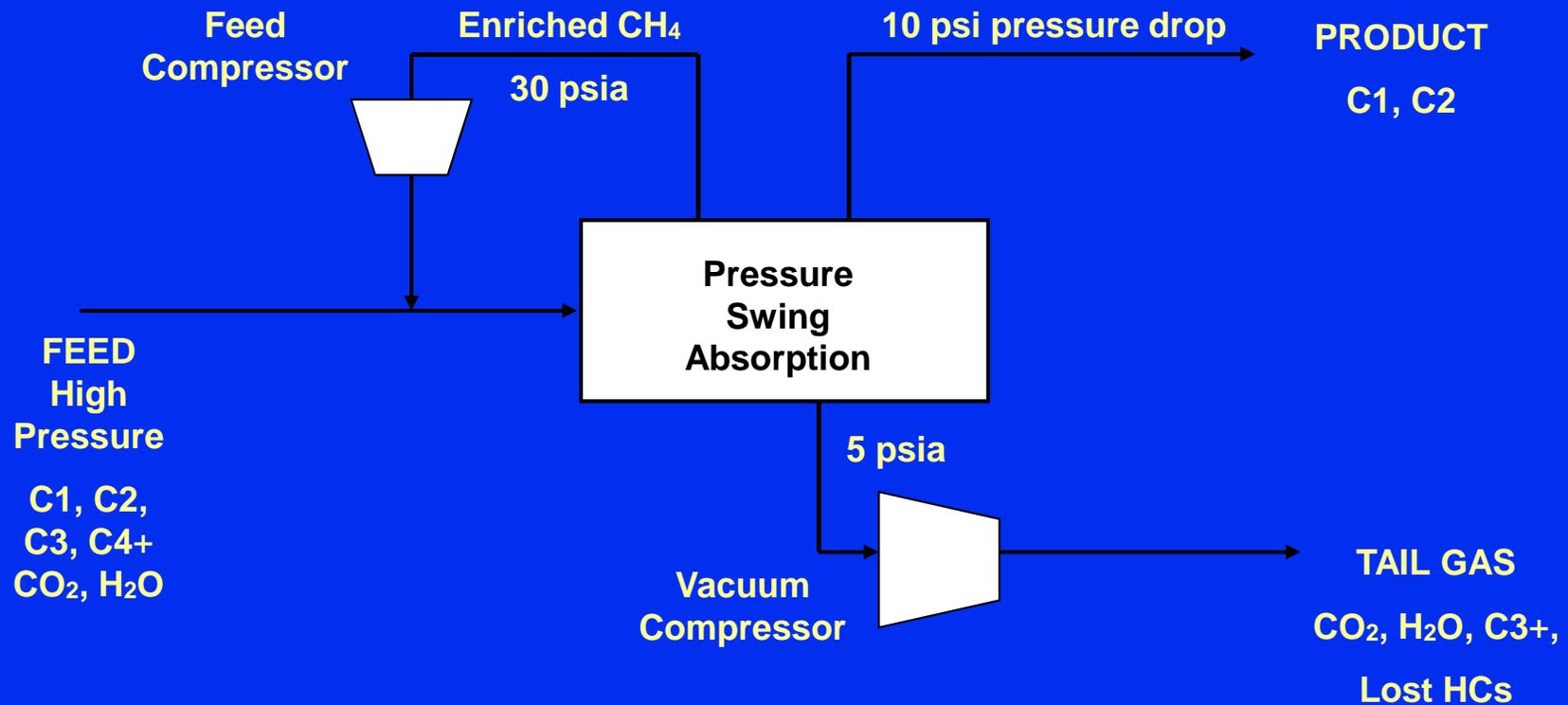


Source: Morphysorb[®] Process.
IGT & Uhde Technology Profile



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Molecular Gate[®] CO₂



Tidelands Molecular Gate Unit

- ❑ First commercial unit started on May 2002
- ❑ Separate recycle compressor is required
- ❑ No glycol system is required
- ❑ Heavy HC removed with the CO₂
- ❑ Tail gas used for fuel is a key optimization
- ❑ 18% CO₂ removed to pipeline specifications
- ❑ C₂ + losses makes the applicability site specific



Source: <http://www.Engelhard.com/documents/CO2%20Removal-1.pdf>



Comparison

	Amine Process	Morphysorb® Process	Molecular Gate® CO₂
Absorbent or Adsorbent	Water & Amine	Morpholine Derivatives	Titanium Silicate
Regeneration	Reduce Pressure & Heat	Reduce Pressure to Vacuum	Reduce Pressure to Vacuum
Primary Operating Costs	Amine & Steam	Electricity	Electricity



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