



GENERAL AMINE RECLAMATION PRESENTATION

# Industries We Serve

Refining

Gas Processing

Petrochemical



# Customers



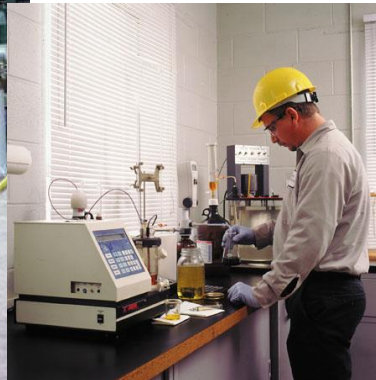
*The miracles of science™*



# Chem Group



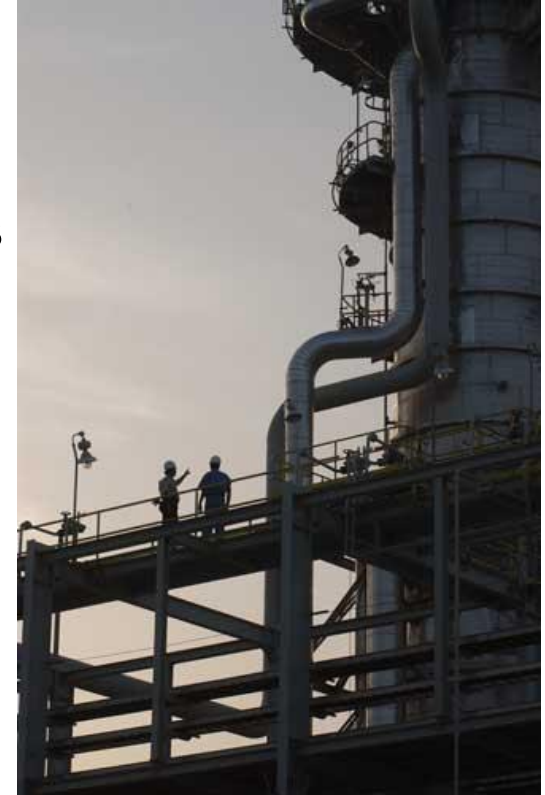
- Chemical Toll Processor
- Over 35 Years Of Distillation Experience
- Developed and Implemented Technology and Processes for the Recovery and Purification of Chemicals
- Provide All-Inclusive Reclamation Services and Chemical Maintenance Programs.





# Chem Group Services

- Formed in 2003
- Utilizes core technology (vacuum distillation)
- Applied to Petrochemical, Oil & Gas Industries
- Provides professional custom distillation services, high quality products and reclamation projects that are all-inclusive and transparent.
- Provides technical, economic and environmentally sound solutions to its customers by purifying and reclaiming gas treating chemicals used by refineries and gas plants.



# Custom Tailored Services

CHEM Group has the resources and determination to deliver innovative solutions that will exceed expectations and positively influences the bottom line.

CHEM Group provides a broad range of chemical processing services



- Recycle Return
- Chemical Maintenance Programs
- Project Management
- Reliable Analytical Services
- Environmental Stewardship

# Amine Experience

*Ethanolamines are used for acid gas removal systems in Natural Gas Processing and Refinery applications*

- Amine Distillation Operations Since 1996
- Proven Technology / Proprietary Know-how
  - Multi-Purpose Reclamation Technology
- Success With All Amine Varieties
  - Primary (MEA, DGA) Secondary (DEA) Tertiary (MDEA)
- Recycle/Return Reclamation Projects
- Chemical Maintenance Programs



# Amine Contamination

- Amine Hygiene Increasingly Significant to Producers/Refiners.
- Contamination is a major cause of operating problems.
- Foaming, corrosion and degradation can severely impair the amine's ability to absorb acid gases or cause mechanical failures.
- Contaminants reduces amine unit reliability and increases amine unit operational costs measured by
  - H<sub>2</sub>S exceedences / upsets to other processing units
  - amine losses / equipment maintenance
  - filter changeouts / regenerator heat input.





# Amine Hygiene Balance

Amine Contamination can be expressed as  
“Performance Barriers”

As the level of contaminants increase,  
the performance of the amine solution decreases,  
causing operational problems



# Typical Contaminants Removed

- Amine Degradation Products
- Heat Stable Salts (HSS)
- Non-volatile Contaminants
- Solids (TSS) & Particulates
- Hydrocarbons & Foam Enhancers
- Metals and Residues



# Implications of Contamination

- Plant Capacity
  - Total Amine concentration is reduced thereby reducing effectiveness – Water Balance
  - Circulation rates can be increased to compensate but can affect the reboiler heat duty, product gas composition, and total H<sub>2</sub>S and CO<sub>2</sub> removal
- Stability of Plant Operation
  - ↑ Contamination ➡ increased viscosity
  - ↑ Viscosity ➡ off spec product gas / foaming tendency
- Corrosion

# Chem Group Reclaimer Technology

## **Meeting the Customer Needs:**

- Proven Distillation Process
- Full Contaminant Removal and Solvent Loss Control
- Improved Solvent Quality Control for Plant Optimization
- Foaming Agent Reduction
- Cost Effective
- Full Service Technical Support Available

# Knowledge & Experience

Technical staff includes chemists, chemical engineers, technicians, and process experts. Technical expertise includes:

- new process development
- process optimization
- physical and analytical chemistry
- environmental health and safety
- process scale-up and product commercialization

## Sales and Marketing Staff

- Take pride in providing attentive and friendly customer service with the support of product, process, and project engineers responsible for ensuring that all materials manufactured, handled, and processed by CHEM Group consistently meet the highest quality and performance standards.



# Products

CHEM Group products represent a unique array of industrial and specialty chemicals manufactured and distributed to exceed the highest standards of our customers.

## High Quality Refined Chemicals

- petrochemicals
- heat transfer fluids
- secondary plasticizers
- reclaimed glycols
- specialty amines
- recycled solvents
- specialty lubricants



# Reclaimer Benefits

- Improved Contaminant Removal
- Total Solvent Quality Control
- Simple Continuous Design
- Proven, Dependable Equipment
- Technical Assistance & Support provided
- Reduced Maintenance and Equipment Cleaning Costs
- Amine Losses and Expenditures Reduced

*Proven, simple reclaimer technology and services that deliver optimum amine unit operations and reliability.*





Delivering Cost-Effective Solutions