

# AmiPur<sup>®</sup> -CCS

*Amine Purification System for CO<sub>2</sub> Capture*



*Proven Heat Stable Salts Removal Technology  
For Amine Circuits*



## Carbon Capture and Amine Purification

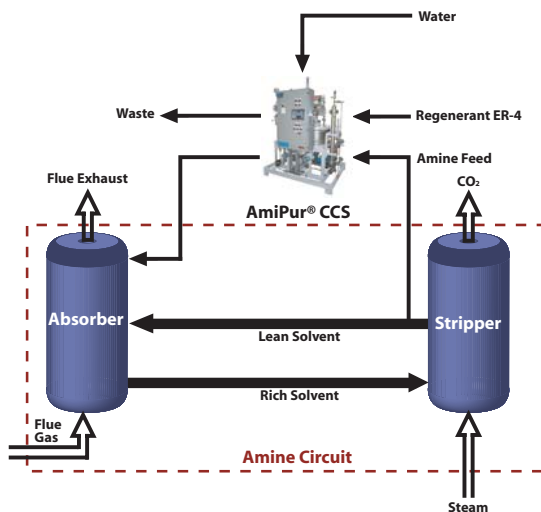
The use of amine solvents is emerging as the leading technology being considered for capture of CO<sub>2</sub> from flue gas generated in coal-fired power stations, as part of a Carbon Capture and Storage (CCS) solution to global warming.

Amine solvent technology has been widely used for many years to capture CO<sub>2</sub> and H<sub>2</sub>S in oil refineries and gas processing plants in order to meet fuel quality standards. Operating experience with such amine circuits has shown that a class of contaminants are formed known as Heat Stable Salts (HSS). Increased concentrations of HSS are known to result in operational problems such as:

- corrosion of process equipment
- reduced amine absorber performance due to foaming of the amine solution
- reduction in available amine capacity
- increased maintenance costs

These problems are eliminated or greatly minimized by purification of the amine solvent to remove HSS contamination.

Eco-Tec is the global leader in providing continuous amine purification systems to oil refineries and gas processing plants worldwide.



### AmiPur<sup>®</sup>-CCS - What is it?

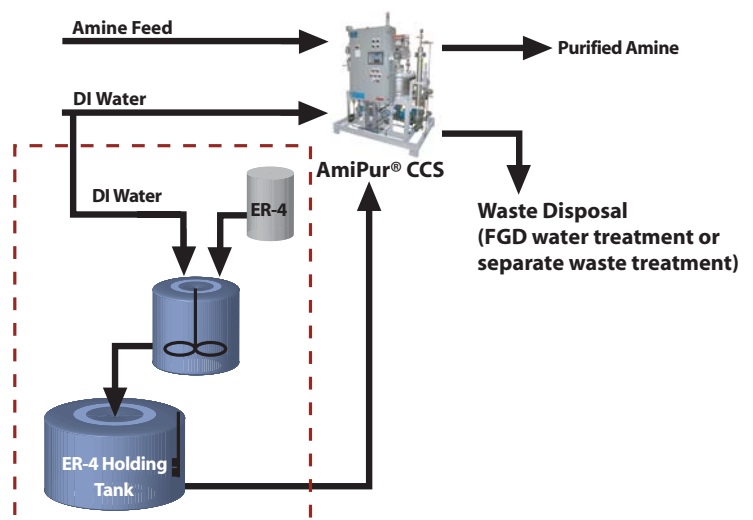
AmiPur<sup>®</sup>-CCS is a version of Eco-Tec's successful, proven AmiPur<sup>®</sup> product which has been designed specifically for the requirements of amine purification in circuits designed for CO<sub>2</sub> capture in the flue gases. The Eco-Tec AmiPur<sup>®</sup>-CCS is a compact, automated, skid-mounted equipment package which is integrated into the amine circuit. It operates continuously treating a slip stream after the lean amine cooler and filter in order to remove HSS from the circuit at a sufficient rate to offset the incursion rate (build-up) of HSS. This keeps HSS at a constant low level.

AmiPur<sup>®</sup>-CCS is available in a range of standard models matched to provide the HSS removal capacity requirements for any site. Model selection and capacity requirements are determined by Eco-Tec based on data provided by the client in an engineering survey form.

### How it works

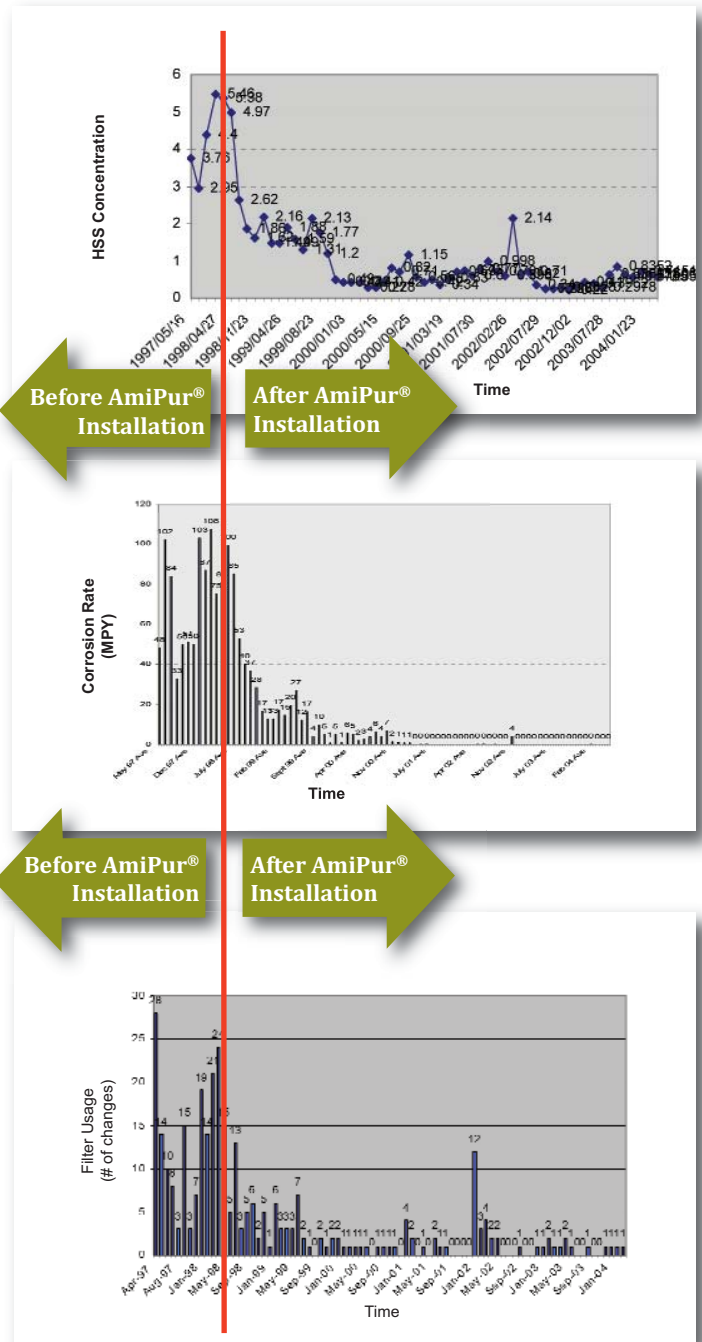
AmiPur<sup>®</sup>-CCS uses a proprietary, highly-efficient ion exchange process known as Recoflo<sup>®</sup>. Amine solution from a slip stream passes through a cartridge filter and ion exchange resin bed on the AmiPur<sup>®</sup> equipment skid.

HSS are removed from the amine solution and exchanged onto the resin, while the purified amine solution is returned to the circuit. After treating a fixed volume of solution, the unit automatically starts the regeneration step and proprietary regenerant ER-4 is used to removed HSS from the resin. Once the regeneration sequence is completed, the unit resumes treating amine solution.



## Features & Benefits

Features	Benefits
Advanced ion exchange technology	<ul style="list-style-type: none"> <li>Highly efficient HSS removal</li> <li>Reduce corrosion, maintenance</li> </ul>
Proprietary regenerant	<ul style="list-style-type: none"> <li>Low operating cost</li> <li>On-site regenerant make-up system</li> <li>No Na cross contamination</li> </ul>
Comprehensive process design	<ul style="list-style-type: none"> <li>Reduced water consumption</li> <li>Reduced waste generation</li> <li>Consideration of different amine solvents</li> </ul>
Variety of amine solutions: DEA, MDEA, MEA and amine mixture	<ul style="list-style-type: none"> <li>Provide the best solution to HSS problems for all amine solvents</li> </ul>
Removes all common HSS: <ul style="list-style-type: none"> <li>formate</li> <li>carbonate</li> <li>phosphate</li> <li>thiocyanate</li> <li>thiosulfate</li> <li>acetate</li> <li>sulfate</li> <li>chloride</li> <li>bicine</li> <li>oxalate</li> </ul>	<ul style="list-style-type: none"> <li>One system does all</li> </ul>
Fully automatic, continuous reliable operation	<ul style="list-style-type: none"> <li>Minimal operator attention</li> </ul>
Pre-tested/ skid-mounted configuration	<ul style="list-style-type: none"> <li>Fast installation</li> <li>Small footprint</li> </ul>



Actual client data (US refinery) indicates that a reduction in HSS (from about 5% to about 0.5%) results in 90% reduction in filter changes and corrosion rate (from about 100 mpy to < 10 mpy).

# 51 AmiPur Amine Purification Systems In Global Markets

## USA (22)

Pasadena Refining System Inc.  
 Shell Opus  
 ConocoPhillips  
 Sunoco Mid-America  
 Kinder Morgan  
 -Snyder, Texas  
 -St. Elmo, Illinois  
 Duke Energy - Wilcox Plant  
 Marathon Ashland Petroleum LLC  
 -Garyville, Illinois  
 -Robinson, Illinois  
 Tampa Electric - Polk Power Plant  
 Lyondell-CITGO Refining Company  
 La Gloria Oil and Gas Company  
 Praxair Inc.  
 Enbridge Pipelines LP  
 Vintage Petroleum Inc.  
 PXP/DCOR  
 Williams Field Service  
 Chevron Products Co.  
 Marathon Petroleum Company  
 Bear Paw Energy  
 OXY USA  
 CITGO

## Mexico (6)

PEMEX Gas y Petroquimica Basica  
 -Cactus (2)  
 -Nuevo (4)

## Aruba (1)

Valero Aruba Refining

## Venezuela (1)

Petocedeno

## Columbia (1)

BP Gas Cusiana

## Chile (1)

Petrox S.A.

## Portugal (1)

GALP Energie

## Italy (1)

San Nazzaro Gasification Plant

## Netherlands (1)

Nerefco - Europort

## Pakistan (2)

Oil & Gas Development  
 Company LTD (OGDCL) (2)

## India (3)

Reliance Petroleum Industries (2)  
 Essar Oil

## China (7)

Sinopec Refineries  
 -Zhenhai (3)  
 -Anqing  
 -Jiu Jiang  
 -Jingmen  
 -Gaoqiao

## Singapore (1)

Shell Eastern Petroleum Ltd.

## Indonesia (2)

Karaktau Steel  
 PT. Arun LNG

## United Arab

## Emirates (1)

Amoco (BP) Sharjah Oil Company

## Other Eco-Tec Products

### Water Softening and Demineralization

High performance water treatment systems for boiler water, produced water and other process water applications.

**For more information, or to request a proposal, visit our website or contact:**

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