

Top 10 Questions About Acid Gas Removal Optimization With Aspen HYSYS®

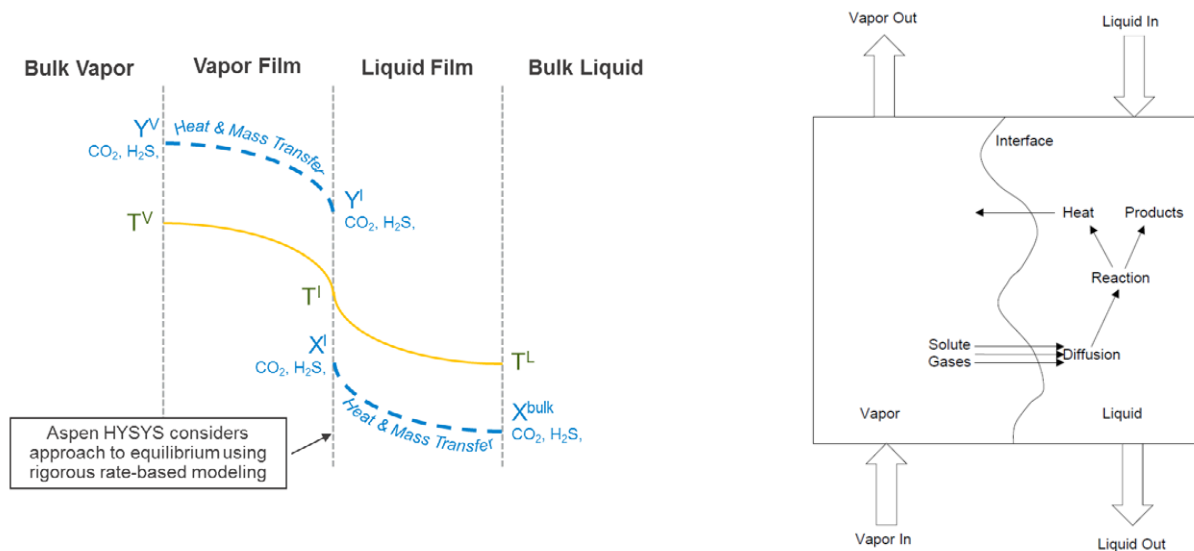
Initially released in Aspen HYSYS V8.3, the new Acid Gas technology has grown with subsequent releases. Following are answers to some of the typical questions we get about this technology.

1. Is Acid Gas in Aspen HYSYS rate-based technology? Can it help me identify and address bulge-pinned and lean-pinned columns?

Yes, Acid Gas in Aspen HYSYS accounts for not only kinetic reaction rate-based modeling, but it also accounts for mass transfer resistance. The Acid Gas technology provides Efficiency Modeling mode and Advanced Modeling mode for different levels of model fidelity.

Advanced Modeling mode can be used to identify bulge-pinned and lean-pinned absorber columns. You can plot absorber temperature by stage in Aspen HYSYS and see the corresponding efficacy of the absorption. You can just plot the partial pressure of H_2S or CO_2 by stage in the vapor vs. aqueous phases to see if the column is pinned.

Efficiency mode accounts for mass-transfer resistance at the vapor-liquid interface to calculate “rate-based” efficiencies for H_2S and CO_2 , and this mode allows the HYSIM I/O algorithm to be used in the column. The Advanced Modeling mode accounts for mass-transfer resistance at the vapor-liquid interface to calculate the flux of all components, and this mode uses the rate-based distillation directly.





2. Can Acid Gas in Aspen HYSYS analyze liquid-liquid and physical solvent systems? What solvents and components does Aspen HYSYS support?

You bet! The Acid Gas – Liquid Treating package supports solvents including MDEA, MDEA + PZ, DGA, DEA and MEA, and it is based on the eNRTL model.

The Acid Gas – Physical Solvents package supports DEPG and is based on the PC-SAFT equation of state.

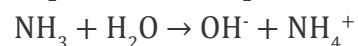
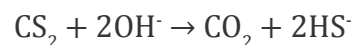
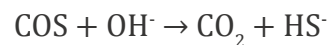
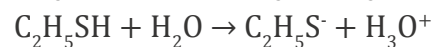
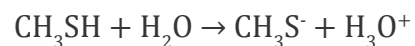
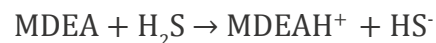
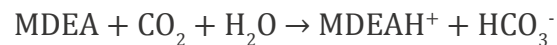
The Acid Gas – Chemical Solvents package in Acid Gas technology supports solvents including MDEA, DEA, MEA, DGA, DIPA, PZ and TEA. It also supports solvent blends including Sulfolane + DIPA, Sulfolane + MDEA, Sulfolane + MDEA + PZ, MDEA + MEA + DEA and any two chemical solvents. The Acid Gas - Chemical Solvents package is developed with the Peng-Robinson equation of state for vapor phase and electrolyte NRTL (eNRTL) for electrolyte thermodynamics.

All three packages have been extensively validated with customer data and available literature sources. We have published a subset of these analyses in three validation papers that cover [amine solvents](#), [physical solvents](#) and [liquid-liquid systems](#).

	Gas-Liquid Treating	Liq-Liquid Treating	Physical Solvent
DEA	✓	✓	
MEA	✓	✓	
MDEA	✓	✓	
DGA	✓	✓	
DIPA	✓		
PZ	✓		
TEA	✓		
DEPG			✓
Amine Blends	All 2 system MDEA + MEA + DEA Sulfolane + MDEA + PZ		MDEA + PZ

3. I am not an expert in acid gas removal modeling. Does Aspen HYSYS provide any guidance for setting up analysis?

Acid Gas in Aspen HYSYS will automatically generate the reaction sets for you based on the components selected, which you can then edit to your liking.



Example of automatically generated gas treating reactions modeled in the Acid Gas fluid package

This technology has undergone usability analysis multiple times with experienced and new users. The workflows for designing and rating acid gas treating units, including adding information and analyzing results, were modified to better fit the expectations of the average user. We have heard great feedback about the usability of this technology from both experienced and new Aspen HYSYS users.

4. Can I consider heat-stable salts?

Yes, absolutely. Acid Gas in Aspen HYSYS supports modeling of several heat-stable salts (HSSs) to model the extent of their presence and their effects on the column performance.

The supported HSS includes sodium, chloride, formate, acetate, sulfate, thiosulfate, thiocyanate, phosphate, hydronium and hydroxide.



5. Is Acid Gas in Aspen HYSYS validated? Who has tested it? Who uses it?

Yes, we have validated this technology extensively against proprietary customer data and available literature sources. We have published a subset of these analyses in three validation papers that cover [amine solvents](#), [physical solvents](#) and [liquid-liquid systems](#).

Over the past five years, more than 30 users across some 20 companies have rigorously tested the Acid Gas in Aspen HYSYS. They have provided feedback on the accuracy and reliability of the technology, as well as its ease of use. Usability has been a top concern regarding the Acid Gas technology, and we feel that it is the easiest-to-use technology of its type available in the market.

About 300 companies across the globe use the Acid Gas technology, including top EPCs and energy companies. We expect that number to continue to grow.

6. Is this the same technology that has been available since V7?

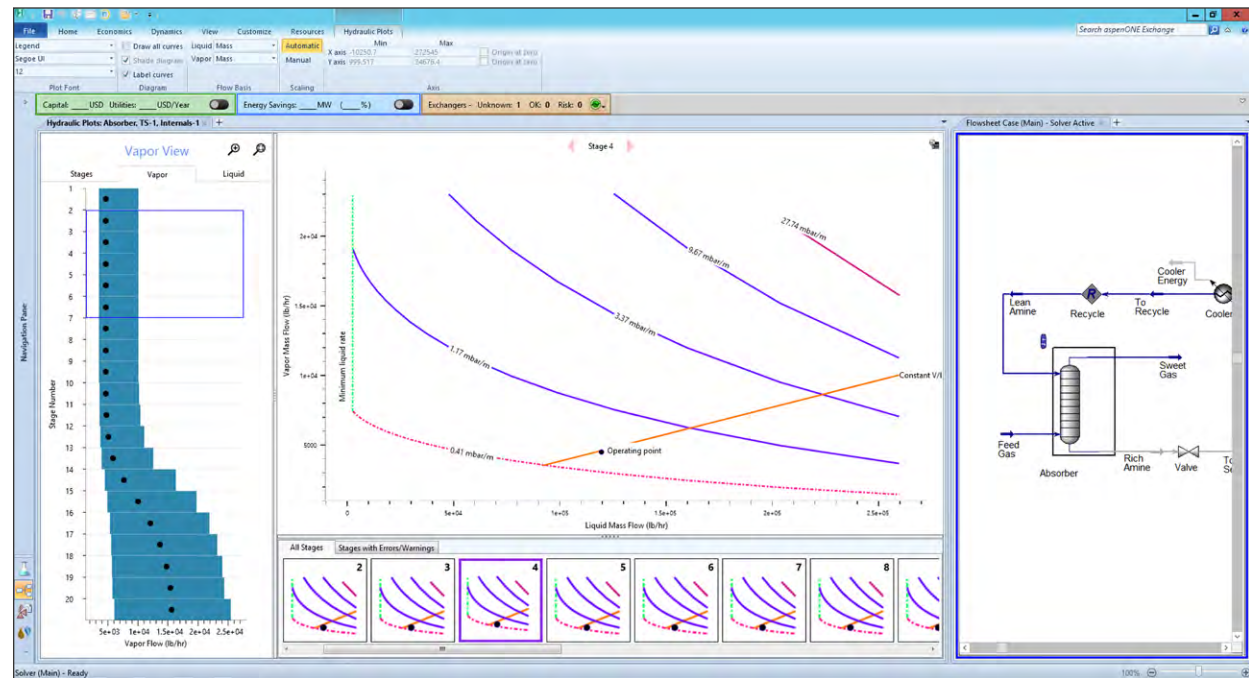
No, the Acid Gas technology was released with Aspen HYSYS V8.3 and has improved with subsequent releases. HYSYS Amines, also known as DBR Amines or the Amines package, is a technology available from Schlumberger and was available in V7 before the release of the new Acid Gas technology.

These technologies are both included in versions of Aspen HYSYS through V10. After V10, DBR Amines will no longer be available. A converter is available to assist migration and comparison in Version 8.3 through Version 10 of Aspen HYSYS.



7. Is the Column Hydraulic Analysis in Aspen HYSYS compatible with Acid Gas in Aspen HYSYS?

Yes, the Column Hydraulic Analysis capability introduced in Aspen HYSYS V9 is compatible with the columns using Acid Gas packages. With the new Column Hydraulics Analysis capability in Aspen Plus® and Aspen HYSYS, the underlying code related to tray and packing hydraulics has been extensively reviewed and updated. A greater range of tabulated results are now available, and they are in much closer agreement with experiments and industry-standard design/rating software such as KG-TOWER® (publicly available from the vendor Koch-Glitch) and Sulcol™ (publicly available from the vendor Sulzer ChemTech). With new insight into the hydraulic performance of trays and packing, you can make better decisions for more efficient column design, operation support and troubleshooting.

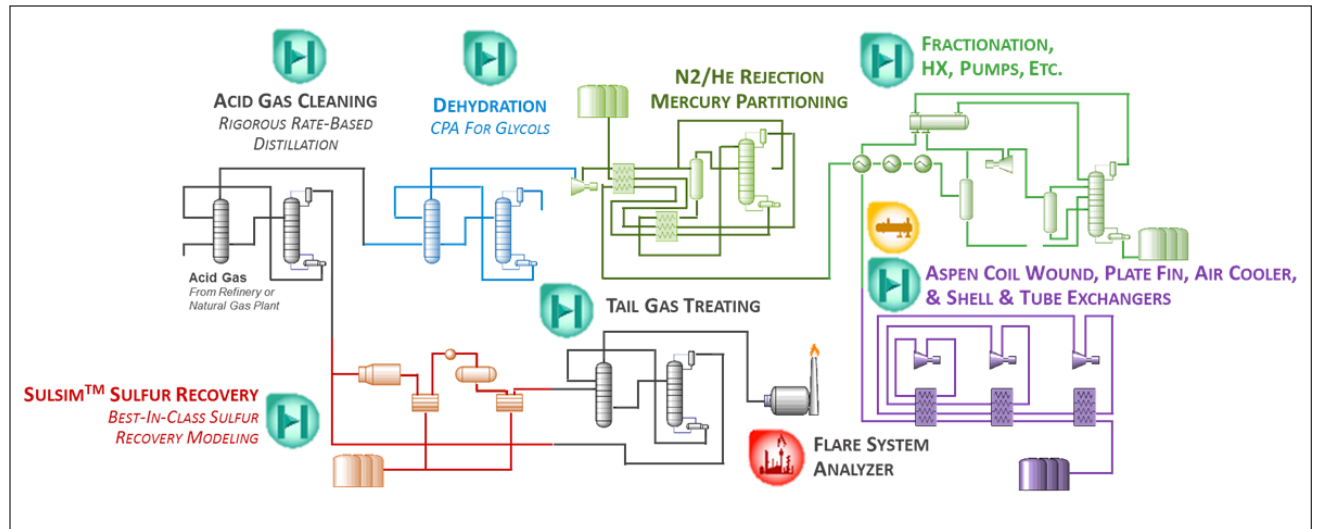


If you would like to try out this solution with the Acid Gas technology, register for our [Aspen HYSYS Online Trial](#). To learn more about the Column Hydraulic Analysis capability, read this [validation paper](#).



8. Can I look at the whole gas plant with Aspen HYSYS? What about dehydration, sulfur recovery, tail gas treating, NGL recovery and nitrogen rejection? What about refinery reactors?

You can model the whole plant model in Aspen HYSYS, including dehydration, sulfur recovery, tail gas treating and LNG units. You can also model the rigorous refinery reactors within Aspen HYSYS.



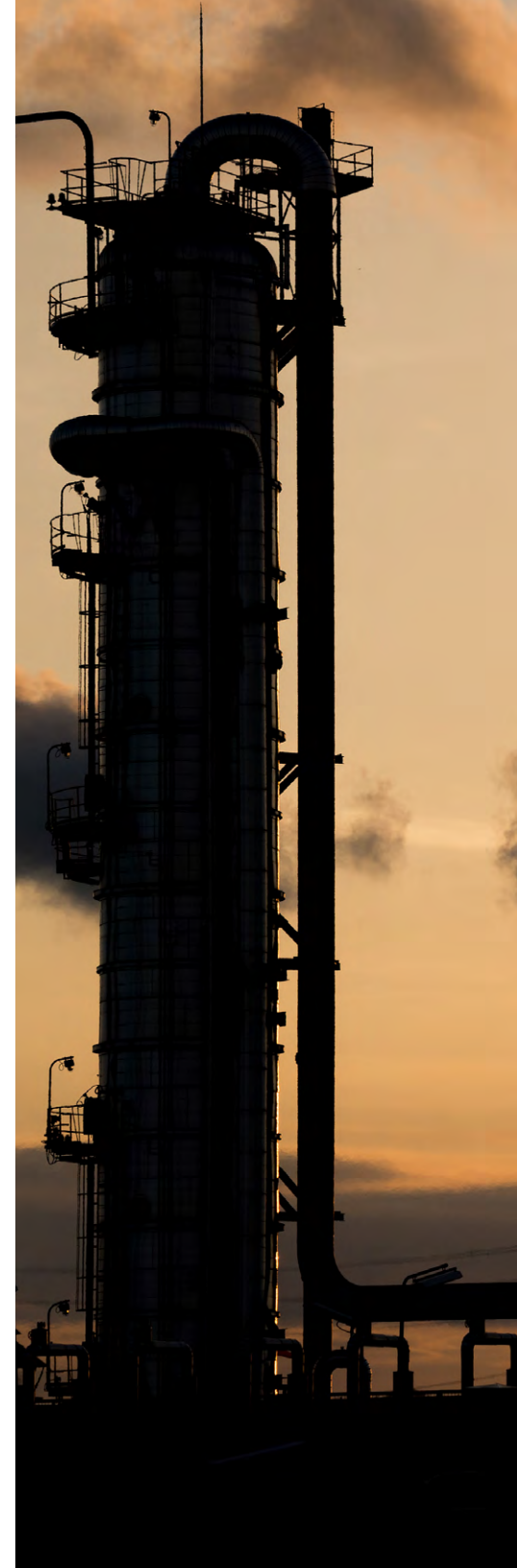
9. Is this technology compatible with the activated workflow in Aspen HYSYS, including energy analysis, economic analysis and exchanger design and rating?

Yes, the Activated Analysis Tools are compatible with the Acid Gas technology. Activated Economic Analysis makes it easy to access key results from Integrated Cost Estimation, Activated Energy Analysis allows the user to optimize the energy consumption of the process, and Activated Exchanger Design and Rating takes advantage of AspenTech's advanced Exchanger Design and Rating program to examine the thermal and mechanical design specifics of certain Aspen HYSYS heat transfer models in the context of the whole flowsheet.

10. How do I get started using this technology?

We have a number of resources to help you get started:

- 23 example files — under the Resources tab in Aspen HYSYS
- [Acid Gas in Aspen HYSYS jump start guide](#)
- [Acid Gas in Aspen HYSYS webinar](#)
- [Aspen HYSYS online trial](#)
- [Example of rigorous rate-based Acid Gas technology and Column Analysis in Aspen HYSYS](#)
- Additional application examples and knowledge base items on the [AspenTech Support site](#)



AspenTech is a leading software supplier for optimizing asset performance. Our products thrive in complex, industrial environments where it is critical to optimize the asset design, operation and maintenance lifecycle. AspenTech uniquely combines decades of process modeling expertise with machine learning. Our purpose-built software platform automates knowledge work and builds sustainable competitive advantage by delivering high returns over the entire asset lifecycle. As a result, companies in capital-intensive industries can maximize uptime and push the limits of performance, running their assets faster, safer, longer and greener.

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