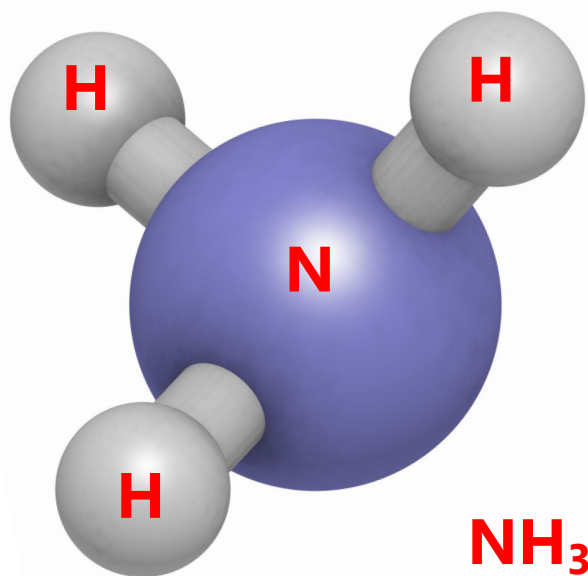


Ammonia has increasingly become more of a regulatory concern. Ammonia emissions into the atmosphere have been linked to the formation of fine particulate matter, while ammonia emissions in wastewater are restricted because of the negative affect the chemical has on rivers, lake, and aquifers.

Many sources of biofuels contain ammonia or can create ammonia during processing.

The following case study describes how Catalytic Products International solved an ammonia discharge problem for a leading refinery.



The Problem

A wastewater stream in a bio-refinery contained significant amounts of ammonia, Volatile Organic Compounds (VOC) and mercaptans. The water had been used in the facility's boiler trains. The corrosivity of the wastewater was damaging the boiler trains, resulting in unplanned outages and costly repairs. Management decided another means of treating the wastewater stream was required; one that ensured the contaminants were destroyed and that offensive odors associated with the waste stream were eliminated. Further, the new control system needed to be simple to operate and both capital and O/M costs should be minimized. Further complicating the application is the fact that gaseous fuels were not available at the facility.

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Accordingly, the only energy source that could be used was electricity.





The Solution

Catalytic Products International designed a unique, integrated solution that started with a countercurrent stripping tower to remove VOC, ammonia, and mercaptans from the wastewater stream. After stripping, the gases flow into a custom-designed, electric catalytic oxidizer. A special catalyst that oxidizes both VOCs and ammonia is used. VOCs are converted to carbon dioxide and water, while some – but not all – of the ammonia is converted to nitrogen oxides (NOx).

The exhaust gas stream is then directed to a second catalyst. Residual ammonia and NOx react on the catalyst surface to form elemental nitrogen (N₂) and water. Thus, both ammonia emissions and NOx emissions are minimized. Both catalyst beds are protected from sulfides (which accompany mercaptans and which can damage the catalysts used) through the use of a disposable “guard bed” that precedes the two catalysts.

The system met all performance criteria. The wastewater stream met local discharge requirements and the exhaust gas from the process met all permit and regulatory limits. Further, objectionable odors were eliminated. As ammonia discharges continue to attract the attention of regulators and policy-makers, these kinds of innovative solutions will become even more important as bio-fuel markets grow.

As bio-fuel markets grow and the new technologies needed to fill demand continues to evolve, count on Catalytic Products International to help you find solutions to your most challenging emission control, engineering, and compliance needs.



Emission Control

An established leader in emission control, Catalytic Products International specializes in custom-designing robust control systems for the most unique applications imaginable. High temperature – large particulate loadings – variable loads – highly toxic exhaust streams; these are just a few examples of the kinds of challenges that Catalytic Products International has overcome for industries like petrochemical, natural gas, electronics and a wide variety of others. As the bio-fuel industry has grown, we've applied our unique expertise and experiences to help the innovators working to find new ways to produce fuels domestically.

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A few things we can do for you:

- * Control emissions from conventional "criteria" air pollutants such as VOCs, NO_x, and CO;
- * Help clean wastewater stream and reduce disposal costs;
- * Control emissions of Hazardous Air Pollutants; and
- * Help reduce greenhouse gas emissions associated with a production process.

Engineering Expertise

Sometimes, all that's needed to push a great idea across the goal line is that one little tweak. Because of our extensive experience involving such a wide variety of industries and processes, Catalytic Products International is uniquely qualified to provide you with the kind of specialized engineering expertise you need to take your business to the next level.

Our decades of experience in designing control systems have taught us to move gas streams most efficiently, to use energy most economically and to squeeze every last dollar out of operational costs. We've been pleased and proud to partner with companies involved with bio-fuel technologies in order to improve their processes and enhance their bottom lines. From ethanol to gasification to all kinds of emerging bio-refining, Catalytic Products International can be your partner in innovation.

Compliance Assistance

Being involved in developing green technologies doesn't necessarily keep you from running afoul of exacting EPA requirements. Catalytic Products has extensive experience dealing with EPA at both state and national levels. We can help to ensure you have the tools you need to reach compliance economically.

Please contact us for more information about our expertise in cost effective abatement of VOC, CO, and NO_x

Thermal Oxidizers, Regenerative Thermal Oxidizers, Catalytic Oxidizers, Heat Recovery Systems, Energy Conservation, Repair and Retrofit Services, Maintenance Services, Engineering

