

Successful Ammonia Removal from Wastewater Using Liqui-Cel® Membrane Contactors at a European Manufacturing Facility

Ammonia is widely used in the Chemical Industry as a cleaning and bleaching agent in the production of fertilizers, plastics, and explosives just to name a few. As a result, large quantities of wastewater containing ammonia are produced and many industries now have to treat the wastewater to remove the ammonia so that it is not discharged back into the environment.

There are many conventional ways to remove ammonia from water but most of them produce a secondary waste stream that can cause a whole list of other problems. Membrane Contactors offer a superior solution for stripping Ammonia because they provide a large surface area that facilitates fast separation of the ammonia from the wastewater.

Liqui-Cel® Membrane Contactors offer a great alternative for treating ammonia byproducts in wastewater by extracting it from water and converting it into a ammonium salt, which has some commercial value. Additionally, there is a large cost savings that is realized when using Liqui-Cel® Contactors because there is a reduction in the ammonia load on the wastewater treatment system.

The extraction process uses Liqui-Cel® Membrane Contactors. Contactors have been in service for over 10 years in many different applications and are proven to be durable and reliable.

For ammonia removal, wastewater will flow through the shell side (outside of the hollow



Liqui-Cel® Contactors efficiently treat ammonia wastewater in European facility

fibers), while an acid solution will flow countercurrent through the lumen side (inside of the hollow fibers).

The composition of the ammonium salt at the end of the process will depend on the acid used in the stripping process. For example, a sulfuric acid extractant stream will convert ammonia into ammonium sulfate. Ammonium sulfate is widely used as a fertilizer and it could be sold with commercial value.

A commercial ammonia removal system has been operating in Europe since 2002. This system has the capacity to process a 10 m³/hr (44 gpm) wastewater stream with an incoming ammonia concentration of 1100 mg/L.

The reduction goal at the plant site was 91% ammonia removal and the system performance has surpassed expectations with a 95% removal rate. A planned future expansion will increase the wastewater stream to 30 m³/h (132 gpm). This will save the company several hundred thousand Euros.

Process parameters such as wastewater pH, water temperature, acid concentration and the wastewater/acid ratio, correlate to the system's removal efficiency.

The Liqui-Cel® Membrane Contactor System is capable of removing 95% or more of incoming ammonia.

Liqui-Cel® Contactors are ideal for ammonia removal where the concentration of NH₃ is > 500 ppm and the temperature is > 35°C.

We will work with you to provide a better understanding of the system economics for your situation.

For additional information, please contact your Membrana representative or visit us on line at www.liqui-cel.com.

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