



## NITROGEN REMOVAL PROCESS FOR HIGH-CONCENTRATED WASTEWATER STREAMS

**The DeAmmon process is developed for nitrogen removal from high-concentrated streams such as sludge dewatering supernatant from digested wastewater sludge, and industrial wastewater. The great advantages of the process compared to conventional nitrogen removal is the significantly lower oxygen consumption and conversion to gaseous nitrogen without organic carbon. The process can easily be installed in existing facilities.**

Features:

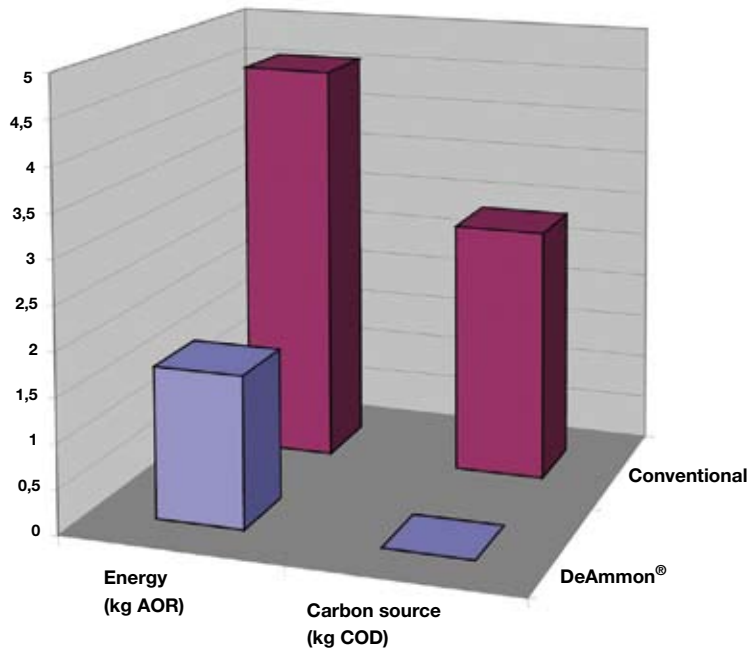
- Low operation costs
- No addition of external carbon source, e.g. methanol or ethanol
- Guaranteed performance
- 80 % removal of nitrogen
- Low sludge production



## DeAmmon<sup>®</sup>

Since the late nineties, Purac has worked on developing and optimizing the DeAmmon<sup>®</sup> process. The work has been done in close co-operation with the University of Hanover (ISAH) and included pilot tests in Germany. This resulted in the building of a full-scale plant in Hattingen, Germany.

To reduce 1 kg Nitrogen



The DeAmmon<sup>®</sup> process can be divided into two stages.

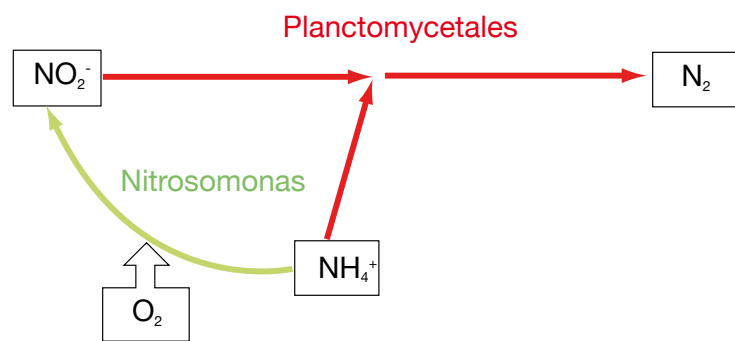
During the first stage ammonia is nitrified to nitrite with oxygen.

Nitritation:



During the second stage ammonia is oxidized with nitrite to gaseous nitrogen.

Deammonification:

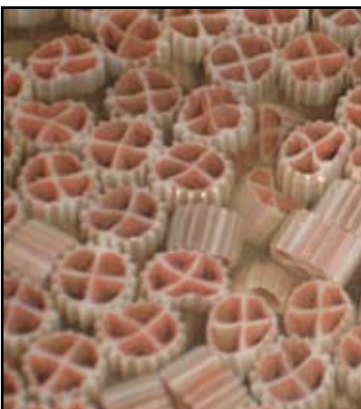


The following conditions are of importance for the process:

- Wastewater temperature above 20° C
- Ammonia concentration higher than 300 mg/l
- High sludge age

**The DeAmmon<sup>®</sup> process has unique features and a wide range of applications:**

- Increase of nitrogen removal capacity when mainstream treatment is limited
- Nitrogen removal at sludge treatment centres
- Treatment of industrial process wastewater with high nitrogen concentration
- Nitrogen removal at anaerobic biogas plants
- Easy to adapt to existing WWTP facilities



The DeAmmon<sup>®</sup> process uses plastic suspended carriers to ensure a high sludge age. The carriers are kept in suspension by constant mixing with specially designed agitators. The plastic carriers are kept in the basins by sieves installed at the outlet.



The DeAmmon® process has been developed in co-operation between Purac, Ruhrverband, and ISAH, the University of Hanover, Germany.

A fullscale plant in Hattingen, Germany has been in full operation since 2003. The plant is designed for a loading of 120 kg N/d and is operated at 180 kg N/d with a reduction above 80 %.

In Sweden, a DeAmmon® plant was taken into operation in 2007 at SYVAB in Stockholm. SYVAB is one of the biggest WWTP plants in Sweden. The DeAmmon® plant is designed for a nitrogen loading of 600 kg/d.

Purac is a part of Läckeby Water Group, an independent, privately-owned Swedish group, which offers contracting, products and servicing for water and wastewater treatment and biogas production. We are established on three continents and have to date completed contracts in 70 countries worldwide. With sales of around EUR 70 million, Läckeby Water Group is a leading company in its field.

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