

Nitro technologies: N₂O abatement



N₂O abatement in a medium pressure nitric acid plant

Emissions reductions using Yara 58-Y1 N₂O abatement catalyst in a medium pressure operation

Nitric acid and caprolactam production are amongst the biggest industrial sources of N₂O, a gas with a greenhouse effect 298 times that of CO₂. Utilising Yara 58-Y1 abatement catalyst allows for a stable, sustained reduction of N₂O in the stack in both.

A medium pressure plant in Europe was looking for an abatement system to reduce their emissions. Johnson Matthey (JM) assessed their operating parameters and our Engineering team travelled to the customer site to inspect the condition of the burner basket, with the aim to tailor a secondary abatement solution to the plant's specific requirements.

The Yara 58-Y1 secondary abatement catalyst is the proven N₂O emissions reduction technology exclusively marketed by JM. Key characteristics of this product are:

- intrinsically capable of achieving 100% N₂O abatement,
- mechanically and thermally stable, with limited attrition and reduced tendency to doming and bypass
- high geometric surface area and subsequent high activity yet low pressure drop, and
- no impact on oxidation reaction or contamination downstream of the burner.

It was identified that, together with a new containment system, modifications would need to be made to the existing beams for the structure to support the combined weight of the catalyst and containment under the gauzes. JM worked closely with the plant stakeholders to deliver our proprietary containment design and to determine an abatement capacity that was both financially sound and able to meet applicable environmental regulations.

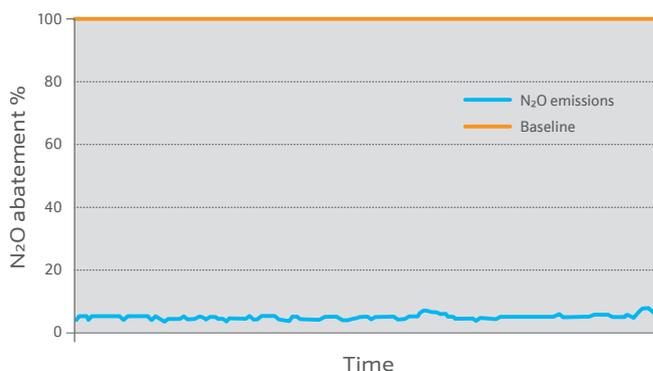


Figure 1: N₂O emissions abatement in medium pressure plant

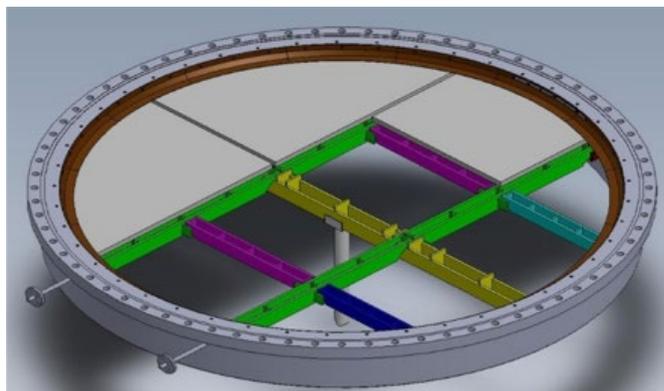


Figure 2: Modifications to the existing containment system were identified