

# Mediteranean Clean Propre Limpio



No. 133

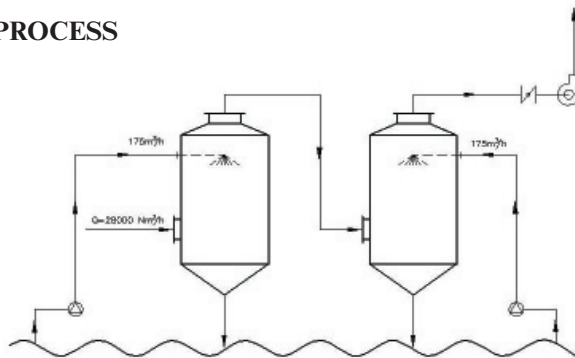
## Pollution Prevention Case Studies

### Water Consumption and Air Pollution Reduction

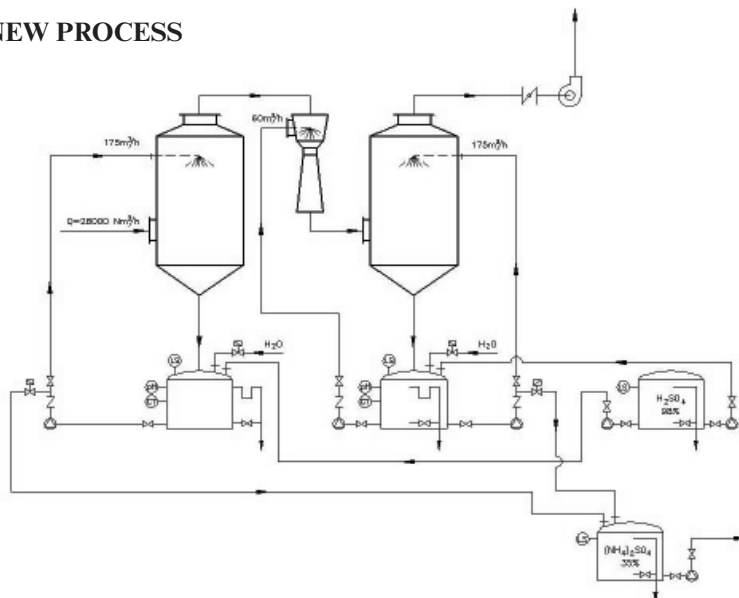
<b>Company</b>	FERTIAL SPA (Annaba, Algeria)
<b>Industrial sector</b>	Manufacture of basic chemicals. Manufacture of fertilizers and nitrogen compounds ISIC Rev. 4 no. 2011 & 2012 (International Standard Industrial Classification of All Economic Activities).
<b>Environmental considerations</b>	Protecting the environment is one of the priorities of Fertial. The company decided to implement and certify an environmental management system (Standard ISO 14001:2004). As a result, many actions and investments have been made in order to preserve the environment and minimize impacts, such as revamping certain production units, disposing of hazardous waste and wasted catalysts, recovering condensates, installing automatic samplers and sensors for the accurate analysis of waste, etc.
<b>Background</b>	<p>The Annaba site produces ammonia, nitric acid, ammonium nitrate, ammonium urea, calcium ammonium nitrate, phosphate fertilizers and Sulfazot (urea + ammonium sulphate).</p> <p>The production of binary and ternary complex fertilizers (NPK) generates diverse emissions into the atmosphere. The old abatement system consisted of a system with 2 wet cyclones that were injected with seawater from the top, which was directly discharged into the sea. The revamping of the unit has reduced the discharge of liquid pollutants into the sea and increased efficiency in terms of particulate and ammonia abatement.</p>
<b>Summary of actions</b>	<p>The project consisted of installing 2 tanks for effluent recirculation (175 m<sup>3</sup>/h) in each cyclone and a Venturi scrubber system at the connection point between the 2 existing cyclones.</p> <p>Now, with these new tanks, the effluent from the cyclones can be reused in a closed circuit until the suspended solid concentration is saturated, at which time the purging of effluent starts.</p> <p>The new Venturi system enhances emission abatement and operates using an inlet flow of 60 m<sup>3</sup>/h of effluent that comes from the recirculation tank of the second cyclone.</p> <p>For NH<sub>3</sub> abatement, phosphoric acid (H<sub>3</sub>PO<sub>4</sub>) is automatically added to the washing stream. The resulting product is ammonium phosphate ((NH<sub>4</sub>)<sub>3</sub>PO<sub>4</sub>), which can be concentrated by up to 30% to avoid its precipitation and, therefore, pipe clogging.</p> <p>A tank to store 30% (NH<sub>4</sub>)<sub>3</sub>PO<sub>4</sub> has also been installed to allow an autonomy of one week. The ammonium phosphate then returns to the process.</p> <p>The process revamping required the installation of the following equipment:</p> <ul style="list-style-type: none"> <li>1 Venturi system</li> <li>2 recirculation pumps (175 m<sup>3</sup>/h)</li> <li>2 recirculation tanks</li> <li>1 storage tank (NH<sub>4</sub>)<sub>3</sub>PO<sub>4</sub> (purge)</li> </ul>

**Diagram**

**OLD PROCESS**



**NEW PROCESS**



**Balance**

	OLD PROCESS	NEW PROCESS
<b>Water consumption</b>	350 m³/h	0
<b>Water characteristics</b>	N total 150 mg/l SS 100 mg/l	-
<b>Air pollution</b>	Fluorine 12 g/Nm³ NH <sub>3</sub> 2 g/Nm³ Particulate matter 5 g/Nm³	Fluorine < 5 mg/Nm³ NH <sub>3</sub> < 50 mg/Nm³ Particulate matter < 50 mg/Nm³
<b>Investment</b>	€120,000	
<b>Return on investment</b>	3 years	

**Conclusions**

The results obtained with this action are seawater consumption savings (350 m³/h) and a reduction in air pollution (fluorine, NH<sub>3</sub> and particulate matters).

**NOTE: This case study seeks only to illustrate a pollution prevention example and should not be taken as a general recommendation.**



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