

# Med *Clean* *Propre* *Limpio* *Mediterranean*


**No. 38**
**Pollution prevention case studies**

## Modifying an established production process to generate less waste

**Company** Luxembourg Industries (Pamol) LTD (Arad, Israel) is a producer of diverse crop protection chemicals and chemical intermediates for the pharmaceutical and biotechnology industries.

**Industrial sector** Chemical industry.

**Environmental considerations** During the purification stage of high-grade cacodylic acid, removal of chloride salt is related with usage of isopropanol. The chloride salt is a waste. The chloride salt is saturated with both cacodylic acid and alcohol. This chloride salt cake is treated with water to recover the cacodylic acid and alcohol. The water is evaporated to recover the acid and the cacodylic acid. The treated chloride salt is then sent to a chemical waste site.

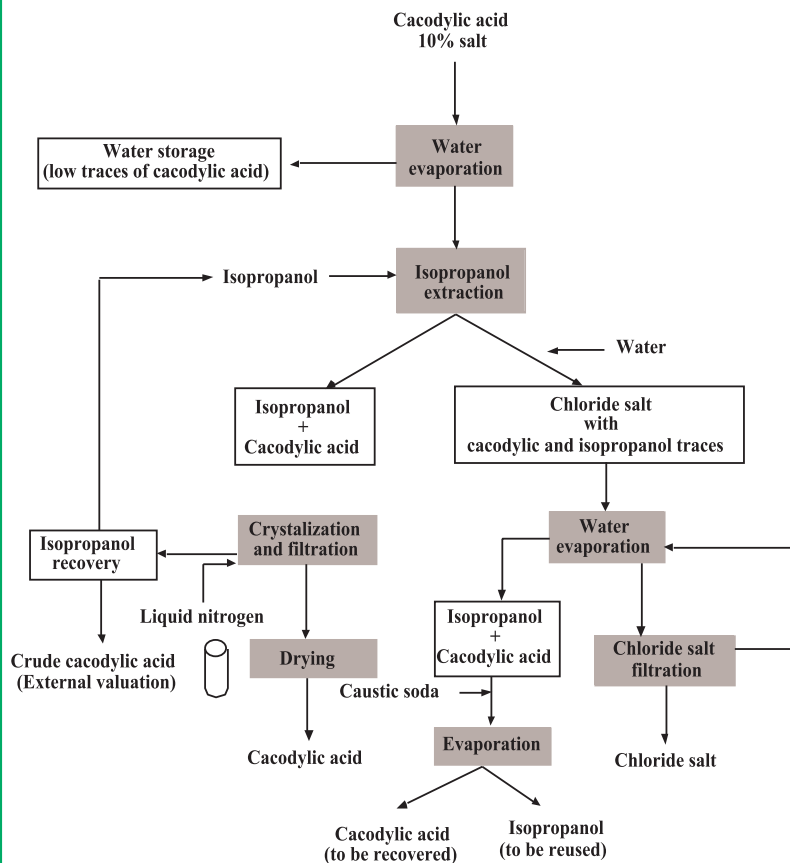
**Background** The yield of the current process is approx. 50%. Although the cacodylic acid is recovered, there is a considerable work-up and losses of alcohol. The additional water to treat the chloride salt has to be evaporated. Thus, there is an additional operational and energy cost.

**Summary of actions** A totally new approach to remove chlorides from the cacodylic acid aqueous solution feed has been implemented. Separation of chlorides is carried out by electro dialysis.

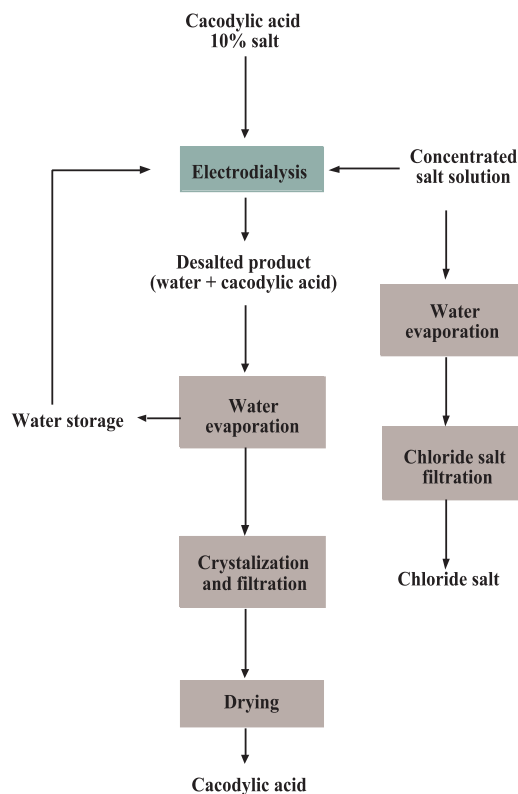
Removal of chlorides from the cacodylic acid aqueous solution feed eliminated the use of alcohol and the need to add water to the chloride salt. Process (acid) yield is around 95-98%.

## Diagrams

### OLD PROCESS



### NEW PROCESS



## Balances

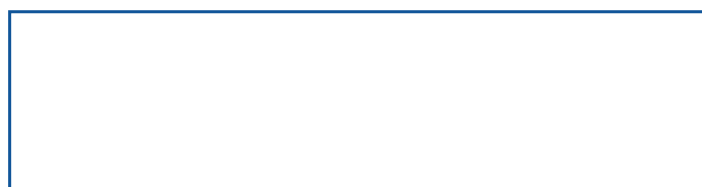
	Old process (tonne/y)	New process (tonne/y)	Savings (€/y)
Consumption of liquid nitrogen	7.2	0	3,636
Losses of cacodylic acid	0.5	0.05	6,464
Consumption of isopropanol	8.2	0	10,100
Operational costs (energy, salary, etc.)			30,300
<b>Annual savings (€/year)</b>			<b>50,500</b>
<b>Total investment (€)</b>			<b>59,388</b>
<b>Payback period</b>			<b>14 months</b>

## Conclusions

A new technology, which is traditionally used for water desalination, was used successfully as a waste reduction procedure. The most significant saving is the operational one due to rework required on the chloride salt, but no less important is the fact that safety is increased by eliminating the use of alcohol. Most of the investment needed is related to extensive R&D work at the Ben Gurion University, Beer Sheva, Israel.

**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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