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Regional Activity Centre
for Cleaner Production



Generalitat de Catalunya
Government of Catalonia
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and Housing

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Pollution prevention case studies

Recycling at source of process water by atomisation

Company background

BASF Curtex S.A. (L'Hospitalet de Llobregat, Spain)

Industrial sector

Manufacture of chemicals for the leather, textile and plastic industries.

Environmental considerations

The company specialises, among other activities, in the manufacture of a variety of products for the leather tanning industry.

One of the production lines consists of the manufacture of sulphonated lubricants, a two-stage process. In the first stage, sulphonated oil is obtained by adding sulphuric acid. In the second stage, reagents are added to the sulphonated oil to separate the excess sulphuric acid. Finally, the liquid is allowed to settle, the sulphonated oil is removed, and the aqueous phase is neutralised with soda. Once neutralised, this aqueous phase contains high concentrations of these small remnants of oil and sodium sulphate, and must be managed as a liquid waste, because wastewater treatment is not feasible.

The company also manufactures products consisting of blended raw materials (including sodium sulphate) in powder form for the same industry.

In addition, the company manufactures liquid products, which it atomises and markets in powder form.

Background

The actions described were carried out by the company for the following reasons:

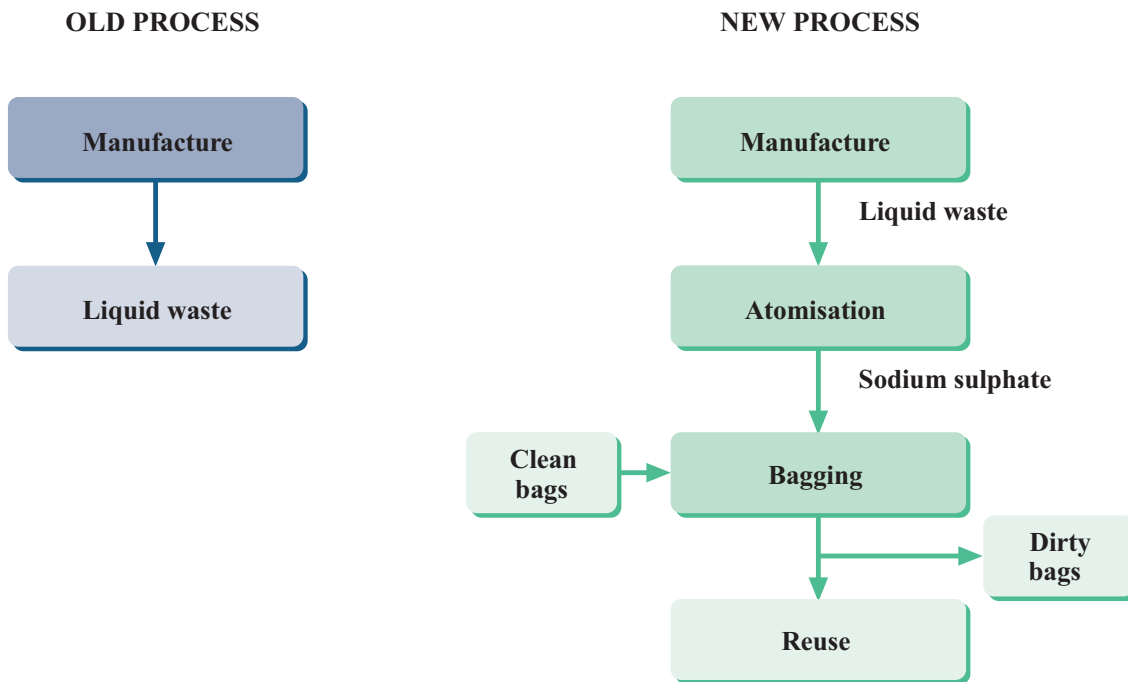
- Reduction in cost of treatment for saline waste steam.
- Reduction in raw materials costs.
- Possibility to use the full capacity of the atomisation equipment.

Summary of actions

The approach taken by the company consisted of diverting the highly briny liquid waste toward the atomisation line to obtain sodium sulphate for being reused in the manufacture of blended raw materials in powder form. In the atomisation process, the liquid substance comes into contact with a stream of hot air (210-220°C) that evaporates all the water to yield a powder. In order to perform the process, an empty tank owned by the company was refurbished as an air plenum tank for feeding the atomiser. Once the sodium sulphate has been atomised, it is bagged for its transportation to the powder manufacturing plant. Once empty, the bags are disposed of as solid waste.

This has achieved all the foreseen objectives. However, new waste (empty, dirty bags with sodium sulphate) is created.

Diagrams



Balances

	Old process	New process
Material balance		
Sodium sulphate consumption (t/year)	378.4	353.7
Bag consumption (units/year)	0	1,235
Liquid waste generated (t/year)	164.0	0.0
Solid waste (dirty bags) generated (t/year)	0.0	0.33345
Economic balance		
Sodium sulphate consumption (€ /year)	37,840	35,370
Bag consumption (€ /year)	0.00	926.25
Outside management of liquid waste stream (€ /year)	62,287.24	0.00
Outside management of solid waste (dirty bags) (€ /year)	0.0	30.11
Atomisation and bagging costs (€ /year)	0.0	4,569.50
Total savings (€ /year)		59,231.38
Investments in facilities (€)		0
Payback period		Immediate

Conclusions

The action taken by BASF Curtex, SA was possible for several reasons:

- the generation of a saline waste (waste stream with sodium sulphate) with the potential for recycling or reuse,
- the availability of a process in which sodium sulphate can be reused as a raw material,
- the availability of unused atomisation equipment. Had a new atomiser (estimated cost: 120,000 €) been purchased to process the above saline waste stream, the payback period would have been around two years, a period still consistent with the viability of the project.

The above has made sodium sulphate reuse possible, leading to environmental benefits through the elimination of a saline waste stream.

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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