TUNISIA

Mediterraneum Clean Propre Limpio

Autonomous Government of Catalonia
Ministry of the Environment
Centre for Cleaner Production Initiatives

UNEP

Ministry of the Environment
Spain

n.1 Pollution prevention case studies

Cleaner production assessment in a car battery manufacturer

Company background

This Tunisian company manufactures starting, lighting and ignition batteries used in cars and trucks. Most of the batteries are sold domestically, although 20% is exported. The facility operates one, two or three 8-hour shifts and employs 220 people. In 1993 they sold 231,000 batteries.

Enviromental considerations

There were a number of pollution problems at the facility, among them: waste acid from the recycled batteries; uncovered lead slag and dust piles; excessive use of energy in smelting ovens, curing rooms and tank formation process; excessive generation of wastewater in the grid pasting and washing processes; excessive use of virgin lead.

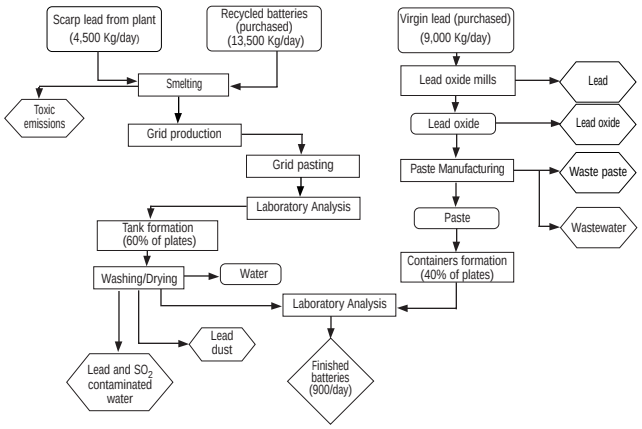
Summary of actions

As a result of all the pollution problems, the company decided to make a cleaner production assessment to identify actions that would: reduce the quantity of toxic raw materials, reduce the energy used in the manufacturing process, demonstrate the environmental and economic value of pollution prevention methods to the sector and improve operating efficiency and product quality.

The assessment was performed by an Environmental Pollution Prevention Programme (EP3) Tunisia team comprised of an expert in battery production and a pollution prevention specialist.

Diagram of the process

Battery Manufacturing Process



Pollution prevention opportunities This assessment detected nineteen pollution prevention opportunities that could address the identified problems and produce significant economic benefits, some of them are:

Pollution prevention opportunity	Benefits	Cost (US$)	Financial Benefit (US$/year)	Payback Period
Temperature monitoring instrument to adjust oven	Reduces toxic emissions, slag and energy	1,000	1,000	1 year
Improve design of molds	Reduces waste quantity, energy and steps in the process	100,000	seen in plate cutting	seen in plate cutting
Liquid lead atomization mill	Improves efficiency and reduces emissions of lead oxide powder	200,000	quality	not applicable
Shovel spilled paste back into paste hopper rather than into the smelting oven	Less lead purchases, less volume of wastewater and energy saving	0	479,546	immediate
Reduce water flow to the finishing roller on paste machine	Reduces water use and volume of wastewater	0	2,000	immediate
Buy a moisture analysis oven	Better lead oxide and energy saving	1,000	500	2 years
Analyse the free lead content after 12 hours of curing	Extends battery life and saves energy	0	depends on curing	immediate
Eliminate the cutting process	Reduces scrap and saves energy	100,000	70,956	<18 months
Recycle drops to the strap casting pot rather than to the smelting oven	Saves lead and energy	0	20,520	immediate
Eliminate the process of tank formation	Less worker exposure to acid and lead dust, water and natural gas savings and reduction of wastewater volume	100,000	683,000	<3 months
Stop washing plates immediately	Reduces wastewater	0	125,000	immediate

Conclusions

The nineteen detected opportunities involve a total cost of **522,500 US$** with a financial benefit of **1,531,206 US$/year.**

The facility has already implemented many of the low/no cost recommendations including covering recycled lead piles, recycling dropped virgin lead into the lead oxide mill, recycling waste paste into the hopper and maintaining optimal temperature and humidity in the curing room. In addition, the facility has also begun to implement several capital intensive changes. All these changes have permitted to reduce employee exposure to lead dust, reduce energy and water unit output, reduce the amount of lead purchased, reduce the quantity of wastewater and improve product quality.

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

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