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Regional Activity Centre for Cleaner Production

MINISTERIO DE MEDIO AMBIENTE

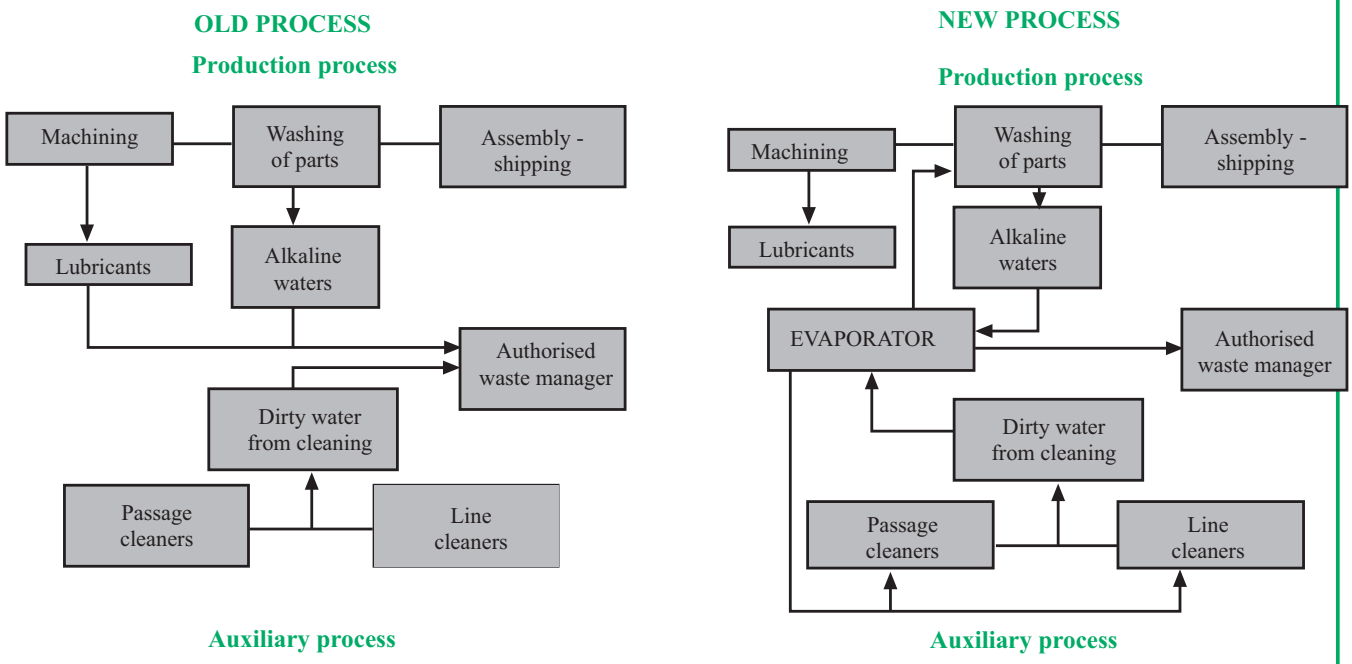
Generalitat de Catalunya
Government of Catalonia
Department of the Environment and Housing

No. 28 Pollution prevention case studies

Minimisation of waste and resource savings by recycling at source

Company	Componentes Mecánicos, SA (COMESA) (Barcelona, Spain). COMESA manufactures gearboxes and rear axles for industrial vehicles.
Industrial sector	Metallurgical. Manufacture of components for industrial vehicles.
Environmental considerations	The production system is distributed into different individual processes, each one corresponding to the fundamental parts (gears, toothed racks, axle shafts, etc.) that make up the gearbox and rear axle, so that production is not carried out in one single line, rather in groups. In summary, the parts to be treated pass through a mechanised phase, in which water and lubricants are consumed, and a phase of washing with water, prior to assembly and shipping. The aqueous residue generated during these stages of the process, along with the dirty water from the auxiliary processes of cleaning the production line and the industrial premises, is treated externally by an authorised waste manager.
Background	In line with the above, COMESA used to generate liquid residue in which water was the principal component (approximately 95%) and the remaining 5% was lubricant and oil residue. This situation led COMESA to seek solutions that would make it possible to improve both its environmental situation and its economic management. The initiative was aimed along the lines of the following principles: - Obtaining a recycling process that would allow the water contained in the residue to be reused. - Minimising the quantity of residue that would finally have to be managed externally after having separated the most aqueous part thereof. - Obtaining the aforementioned objectives by means of a quick-payback investment (two years maximum), due to which it would be necessary to obtain reductions in treatment costs.
Summary of actions	The initiative consisted of installing a vacuum evaporation unit which, after filtration, treats the following aqueous residue: lubricants, washing baths for worn parts and the dirty water from the floor and line washing. This equipment generates two effluents: a concentrated one (5% of initial volume) which is subsequently managed externally; and a distilled one, corresponding to the water contained in the residue. This water is piped to two 1,000-litre tanks where it is stored for later use in the auxiliary cleaning process and in the baths for washing parts.

Diagrams



Balances

	Old process	New process
Material balance		
Water consumption	634,000 l/year	118,000 l/year
Liquid residue to be treated	654,000 l/year	33,000 l/year
Economic balance		
Cost of water	2,193.7 €/year	781.3 €/year
Liquid waste management costs	149,363.5 €/year	7,861.2 €/year
Energy and equipment maintenance costs	—	7,843.2 €/year
Savings and costs		
Savings in water consumption		1,412.5/year
Savings in liquid waste management		141,502.3/year
Energy and maintenance costs		7,843.2/year
Total saving		135,071.6 €/year
Investment in installations		82,078.9 €/year
Payback period		0.61 years = 7 months

Conclusions

The equipment installed offers a number of significant technological advantages: low electrical consumption, high performance - as they are in continuous operation 24-hours a day, and a compact airtight system with no smoke or odour problems.

With this initiative the objectives set out beforehand have been obtained. The significant reduction of the waste to be managed (around 95%), as well as low water consumption thanks to its re-use in both production and auxiliary processes (a reduction of 81%), has allowed a quick payback.

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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