

# MedClean Propre Limpio



Regional Activity Centre  
for Cleaner Production



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

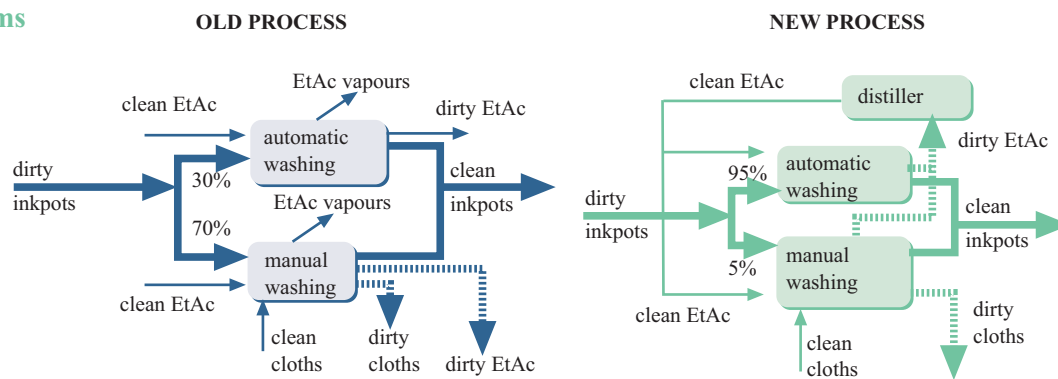
No. 59

Pollution prevention case studies

## Minimisation of ethyl acetate consumption in a washing process

<b>Company background</b>	HUECOPACK, S.A. (Castellar del Vallès. Spain)
<b>Industrial sector</b>	Printing industries (Rotogravure printing).
<b>Environmental considerations</b>	<p>The industrial process performed by HUECOPACK, S.A. consists of a printing phase in which the support to be printed is circulated through the various units (a different colour for each unit) that form the printing machine. Then comes a <i>laminating</i> phase which consists of fixing the printed support to the other layers of material necessary to form the final packaging. And lastly, the <i>rewinding</i> phase in which the material is prepared to be packed and delivered to the customer.</p> <p>The operation of washing inkpots and other parts of the printing machines is carried out in an automatic tunnel by sprinkling ethyl acetate, without gas recovery or the possibility of reusing the dirty solvent, as well as manually using brushes and cloths.</p>
<b>Background</b>	<p>HUECOPACK, S.A. carried out various actions to improve its environmental management and reduce the associated costs, while maintaining the quality required by its customers. The company carried out a Minimisation Opportunities Environmental Diagnostic (MOED) in which, among others, it was suggested to install an automatic washing tunnel for inkpots, deposits and other items (with a larger capacity than the current one), as well as a distiller to recover the cleaning solvent used.</p> <p>The company had an opportunity to reduce the significant important consumption of ethyl acetate, the only solvent used throughout the entire production process, both in the ink preparation and the inkpot washing phases. The factors that led the company to implement a minimisation programme were linked to the foreseeable variations in the regulations concerning volatile organic compounds, the presence of ethyl acetate in the work area, the wish to seek alternatives to reduce potential risks when handling the solvent and to minimise its consumption.</p>
<b>Summary of actions</b>	<p>Generally, the washing tunnel consists of a compact unit in which the parts that need washing are placed manually on wire guides allowing them to move around, allowing for a more efficient washing. The cleaning solvent is supplied through a pipe and distributed by sprinklers. The washing tunnel is equipped with a Venturi system on the upper part incorporating an absorption tower, a gas recovery system and a cooling tower, that condenses the ethyl acetate vapour. This solvent returns to the washing tunnel through a collector.</p> <p>The dirty solvent is sent directly through a pipe to the distiller, where it is recovered for reuse in the washing system.</p>

## Diagrams



EtAc = Ethyl Acetate

## Balances

	Old process	New process
<b>Balance of materials</b>		
Ethyl acetate consumption (l/y)	83,330	20,833
Management of dirty ethyl acetate (l/y)	16,556	4,139
Cleaning cloths (u/y)	14,520	3,630
Distilling sludge (t/y)	0	10
<b>Economic balance</b>		
Cost of ethyl acetate purchase (€/y)	75,123.51	18,781.33
Cost of dirty solvent management (€/y)	12,935.46	3,233.87
Cost of cleaning cloths management (€/y)	11,344.70	2,836.18
Cost of sludge management (€/y)	0	9,015.18
<b>Savings</b>		
Saving on ethyl acetate purchase (€/y)		56,342.18
Saving on dirty solvent management (€/y)		9,701.60
Saving on cloth management (€/y)		8,508.53
<b>Total savings (€/y)</b>		65,537.12
<b>Investment in installations (€)</b>		86,245.24
<b>Payback period</b>		1.1 years

## Conclusions

The implementation of an automatic washing system with sufficient capacity for the company's needs has led to a saving of approximately 75% on solvent (due to a minimisation in ethyl acetate emissions to the air, a rational use of the solvent during washing and reuse of the acetate in the distiller) and, by replacing the manual operations of inkpot washing contributes to an important reduction (75%) in the use of cleaning cloths, and their eventual treatment. Currently, manual washing is only used for those instruments having some part difficult to clean automatically.

Although a new waste requiring treatment is generated (the sludge produced from the solvent distillation), the entire process and management are more efficient both economically and environmentally than before these new modifications were implemented.

These actions are added to other MOED recommendations such as the installation of a IN-PLANT system to make the preparation of paints automatic and the construction of a underground reservoir to store ethyl acetate.

This example shows that a technological improvement can lead to environmental improvement as well as to important economic savings for the company.

**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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