

# MedClean Propre Limpio



Regional Activity Centre  
for Cleaner Production



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

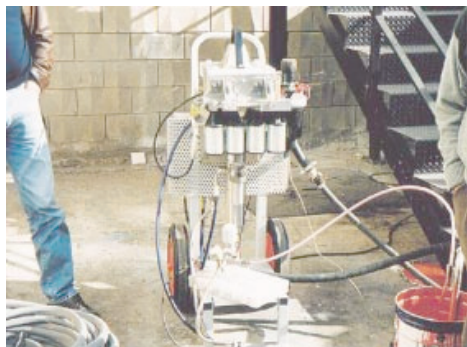
No. 68

Pollution prevention case studies

## Changing of a paint application installation

<b>Company</b>	Unión Naval Barcelona, SA, Barcelona (Spain).
<b>Industrial sector</b>	Ship building and repair work.
<b>Environmental considerations</b>	<p>The company Unión Naval Barcelona, SA is specialised in the repair and cleaning of large merchant vessels, ferries, etc.</p> <p>During the repair process, the hulls of the vessels—or possibly metallic parts—first go through a stripping (sandblasting) process after which the paint is applied. This last coat is applied using aerographic guns and a solvent-based paint. Then the painted parts are left to dry naturally. This painting operation can be repeated until the desired finish is achieved.</p> <p>The products used during the painting stage are solvent based and the machine is batch operated, which makes it necessary to always have a minimum amount of paint to achieve a homogenous application. Once the product has been applied to the hull or to the parts of the vessel, the spray guns and circuits are cleaned using solvents.</p> <p>This technology involves the emission of volatile organic compounds (VOC) and the generation of waste from excess paint, dirty solvents and containers.</p>
<b>Background</b>	<p>In 2002, the company decided to minimise the generation of this waste while implementing modifications aimed at improving its production process.</p> <p>Actions focused on the following aims:</p> <ul style="list-style-type: none"> <li>• Reducing paint consumption.</li> <li>• Reducing solvent consumption.</li> <li>• Reducing the amount of paint, solvent and container waste.</li> <li>• Eliminating VOC emissions to air.</li> </ul>
<b>Summary of actions</b>	<p>The project consists in the installation of three guns and an electrostatic paint line to replace the airless-type guns.</p> <p>The use of this type of electrostatic gun presents many advantages compared to the traditional airless type and solvent-based systems, as the electrostatic system incorporated reduces the paint dispersion from the nozzle of the gun, making it possible to: increase the paint application performance and minimise the amount of paint used; reduce the use of solvents and make drying times for vessel hulls or parts much shorter. In addition, better product quality and regularity are achieved while minimising the generation of waste and VOC emissions to air.</p>

## Photograph of the installation



### Balances

	Old process	New process
<b>Balance of materials</b>		
Paint consumption (t/y)	385	238
Solvent consumption (t/y)	3.8	3.1
Paint container waste (t/y)	24.6	8.82
Solvent waste (t/y)	1.08	0.7
Solvent container waste (t/y)	2.1	1.94
<b>Economic balance</b>		
Raw material cost (€/y)	2,887,500	1,785,000
Management cost of paint container waste (€/y)	3,247.2	1,985.50
Management cost of solvent waste (€/y)	846.16	764.12
Management cost of container waste (€/y)	9,597.52	8,409.14
<b>Savings and expenses</b>		
Savings in raw materials (€/y)		1,102,500
Savings in the management of paint waste (€/y)		1,261.7
Savings in the management of solvent waste (€/y)		82.04
Savings in the management of container waste (€/y)		1,188.38
<b>Total savings (€/y)</b>		1,105,032.12
<b>Investment in installations (€)</b>		41,312.39
<b>Payback period</b>		< 1 month

### Conclusions

The implementation of the project has led to a reduction of 15.78 t/y in paint container waste, 0.38 t/y in used solvent waste, 147 t/y in raw material consumption, 0.16 t/y in solvent container waste while eliminating around 100% of the VOC emissions to air.

This at-source pollution prevention action is the result of the company's environmental policy and is included in the continual improvement programme started in year 2000. The company has also carried out a Minimisation Opportunities Environmental Diagnosis (MOED), aimed at identifying at source waste minimisation opportunities.

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



Regional Activity Centre  
for Cleaner Production

Dr. Roux, 80  
08017 Barcelona (Spain)  
Tel. (+34) 93 553 87 90  
Fax. (+34) 93 553 87 95  
e-mail: [cleanpro@cprac.org](mailto:cleanpro@cprac.org)  
<http://www.cprac.org>