

# MedClean Propre Limpio Mediterranean



Regional Activity Centre  
for Cleaner Production



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

**No. 89**

**Pollution prevention case studies**

## Minimisation of the waste generated in cleaning pans and on tools in the manufacture of silicone and sealants

<b>Company</b>	OLIVÉ QUÍMICA, S.A. Gavà (Barcelona).
<b>Industrial sector</b>	Chemical manufacture of silicone and sealants.
<b>Environmental considerations</b>	<p>OLIVÉ QUÍMICA, S.A. manufactures silicones and sealants for the construction industry and for other industrial sectors. These products are manufactured using water-insoluble raw materials that are blended in different proportions in the mixing reactors. As these raw materials and the manufactured products are insoluble in water, pans and auxiliary tools used in handling and transporting them must be cleaned with solvents.</p> <p>The manufacturing and associated cleaning process generates dirty solvent waste with traces of silicones. Management of this waste is external so that once the waste solvent+product has been treated by distillation, the recovered solvent can be returned to the company to be reused in cleaning.</p> <p>When the product has been obtained, before proceeding to packaging, the pan is covered with a plastic film to prevent the product from reacting with the air. This film is impregnated with silicone that becomes waste once dry.</p>
<b>Background</b>	<p>The cleaning of the reactors and tools used in the manufacture of silicone and sealants is done manually, which means neither the mixing pans nor the tools are always cleaned completely. This cleaning system required large quantities of solvent, which became special waste and led to problems of quality in subsequent manufacturing processes.</p> <p>The pans in which the products were manufactured had a capacity for 340 kg of manufactured product. Due to the physical characteristics of the products, a large quantity thereof would stick to the walls of the pan, despite attempts to recover as much manufactured product as possible. Cleaning thus generated a large quantity of waste solvent+product.</p> <p>The measure was thus geared to minimising this waste at source.</p>
<b>Summary of actions</b>	<p>As described above, the company carried out the following measures:</p> <ul style="list-style-type: none"> <li>– The installation of an automatic machine to clean the solvent mixing pans using less solvent. The machine also has an earth filter that treats the solvent so that it may be reused more than once before being managed externally.</li> <li>– Replacement of the mixing pans with others of greater capacity. These mean a greater quantity of silicone is manufactured and less product sticks to the walls and to the plastic film. There is also a reduction in waste that needs to be cleaned and managed. The ratio of kg of waste to kg of manufactured product may therefore be reduced, which enables minimisation of waste generated with respect to the previous situation.</li> </ul>

## Outline of the process



### Balances

#### Balance of materials

	Old process	New process
Quantity of clean solvent	33.20 t/year	331.86 t/year
Quantity of waste silicone + plastic	28.05 t/year	14.24 t/year
Quantity of waste solvent + product	61.35 t/year	59.40 t/year

#### Economic balance

	Old process	New process
Cost of clean solvent	7,031.70 €/year	6,562.92 €/year
Cost of finished product	81,345.00 €/year	41,296.00 €/year
Cost of managing the waste silicone + plastic	2,019.60 €/year	1,025.06 €/year
Cost of managing the waste solvent + product	20,105.68 €/year	18,284.56 €/year

#### Savings and expenses

Net saving in cleaning solvent	468.78 €/year
Income from the sale of product	40,049.00 €/year
Saving in the management of silicone + plastic waste	994.54 €/year
Saving in the management of waste solvent + product	1,821.12 €/year

**Total savings** 43,333.44 €/year

#### Investment in facilities

Automatic solvent cleaning machine	€50,215
Change of pans and facilities	€525,130

**Payback period** 13,3 years

### Conclusions

Although the payback period of 13.3 years is long, the change of process substantially improved the production process and working conditions. This measure enabled a change in the cleaning process from manual to automatic and a reduction in product manufacturing time. The company therefore achieved its target of minimising waste at source and protecting the environment while increasing its response capacity.

This measure arose from a MOED from the year 2000, in which different minimisation alternatives were studied. The company has also initiated a plan to reduce hazardous waste.

**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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