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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. 57 Pollution prevention case studies

Recycling of polypropylene waste

Company background	TECSEAL, SA. (Terrassa, Spain)
Industrial sector	Food industry. Production of sweets, chocolate and biscuit products.
Environmental considerations	The firm TECSEAL, SA manufactures weathertight seals from polypropylene yarn for the construction industry. Polypropylene is the raw material used in the whole seal manufacture process. This process consists of three phases. First, a fabric support is prepared on which the filaments are affixed simultaneously. In the second phase, the base is plastified to offer the necessary thickness and consistency. Lastly, the required width is cut according to the customer's specifications. There is a range of approximately 3,000 products and the production capacity is around 100 million metres annually. During the manufacture process a lot of waste is produced due to testing, machine adjusting and the surplus of approximately one millimetre width, to guarantee the exact size requested by the customer.
Background	During the manufacture process, TECSEAL, SA generated polypropylene waste from the production of weathertight seals, which was recovered as a by-product. The amount of waste generated in the year 2000 was 64 t, and the forecast for 2001, the year in which the actions were carried out, was of 70.5 t. The objective of the company was to: • Reduce waste generation at source. • Save on the purchase of raw material.
Summary of actions	Actions consisted of installing a polypropylene waste extrusion and grinding system, in order to reuse the recycled surplus as raw material. With these actions it is possible to recover 100% of polypropylene waste, which can then be reused in the plastification operation, in specific proportions with regard to the virgin polypropylene. These actions included the following phases: • Storage of polypropylene waste in a bin. • Force feeding of waste into the extruder. • Melting of waste. • Grinding of polypropylene in a mouth with rotating knives. • Cooling of regrind using water in a closed circuit. • Hot air drying of recycled polypropylene regrind. This installation currently runs at a reuse cycle of 30 kg/hour, although it is designed for a capacity up to 100 kg/hour, to meet future requirements.

Photograph of the installation

Balances

	Old process	New process
Balance of materials		
Reused polypropylene (t/y)	0.0	70.5
Polypropylene waste recovered (t/y)	70.5	0.0
Economic balance		
Recycling costs (labour, energy, etc) (€/y)	0	12,720
Reused polypropylene recovery (€/y)	12,690	0
Raw material saving (€/y)	0	65,565
Total savings (€/y)		40,155
Investment in installations (€)		141,599
Payback period		3.5 years

Conclusions

The implementation of this project in the first half of 2001 led to the recovery of 35,235 kg of polypropylene waste, which is reused as raw material by mixing it with virgin polypropylene in a specific proportion. A reduction of waste is obtained, equivalent to 100% of the volume of waste generated.

These pollution prevention measures at source are the result of the firm's environmental policy and are included in the continual improvement programme that was started in 1997.

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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