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CGPP Report 2004/1

CGPP

Cleaner Greener Production Programme

INVOLVEMENT IN CGPP PROJECT HELPS COMPANY TO ACHIEVE A 30% REDUCTION IN SOLVENT USAGE AND AN 85% REDUCTION IN THE AMOUNT OF PLASTIC FILM WASTE SENT TO LANDFILL

AT A GLANCE

During 2000, Alert Packaging Ltd purchased 90.3 tonnes of solvent, almost 50% of which was used to dilute solvent-based inks. The remaining 44 tonnes were lost to evaporation during plant and equipment cleaning processes; during decanting procedures; in accidental spillages by plant personnel; and in evaporation from open-top containers.

The management team made a number of calculations, which showed that almost 60% of all solvents purchased by the company were utilised in various non-printing related activities and processes. In addition to the problem of solvent losses, Alert Packaging was experiencing a significant on-site waste production problem: this resulted in the disposal of substantial quantities of laminated plastic raw material in landfill sites on a regular basis. In 2000 alone, Alert Packaging disposed of some 130 tonnes of waste in landfill. These waste consignments were mainly composed of plastics, board and wood, but they also included some paper.

ALERT PACKAGING LTD

Alert Packaging is a privately owned company specialising in the manufacturing of bags, and the printing and laminating of packaging. Its clients are predominantly in the food processing sector.

The company, which employs 45 people at its plant in Bray, Co Wicklow, uses solvent-based inks to print a variety of plastic packaging materials such as polyethylene, polypropylene, polyester, nylon and cello.

Alert Packaging

Figure 1: Alert Packaging Ltd

AIMS OF THIS PROJECT

The main aims of this project were to:

- Reduce on-site solvent usage by 20%. This was to be achieved through the introduction of a range of on-site operational improvements. Based on production figures for 2000, it was estimated that it would be possible to achieve savings of at least €20,000 a year on solvent expenditure as a result of implementing these measures.
- Reduce the amount of waste disposed of in landfill annually i.e. reduce this from 130 tonnes to 110 tonnes as a direct result of introducing on-site waste segregation practices and sending waste for recycling.
- Reduce the evaporation of solvent vapour. This was to be achieved by using a sealed process to deliver solvent flow to the printing presses.

PROJECT DESCRIPTION

Phase One of this CGPP project focused on combating the problem of solvent vapour evaporation.

As a result of recommendations made by the CGPP project team, the company introduced a practice whereby the most frequently used solvents are now delivered to the plant in a sealed 200 litre drum, which is fitted with a hose and a fuel gun and loaded onto a trolley. Less frequently used solvents are delivered in sealed five litre and ten litre containers fitted with small sealed nozzles.

Figure 2: Closed piping system

Historically, rags soaked with solvent were used to clean most plant equipment: this practice accounted for a significant volume of solvent loss. The CGPP project team recommended an alternative approach involving the use of covered soak tanks and plunger cans.

Figure 3: Dispensing solvent from sealed drum

Phase Two of this CGPP project focused on making alterations to the pumps on the printing presses.

Prior to the company's involvement in this CGPP project, the printing press was run in accordance with the equipment manufacturer's design specification, whereby the ink was pumped into the centre of a sealed chamber. From there, it exited at either end of the chamber into an open tray and flowed along the tray to a return pipe, which carried it back to the pump reservoir. Although the ink chamber was tightly sealed, solvent vapours still managed to escape while the ink was flowing through the open tray.

Figure 4: Before: Ink flowing through open tray

Among the changes proposed by the CGPP project team to address this particular problem was a suggestion that the pumping system be modified to make it completely airtight. This was to be achieved by pumping ink both into and out of the ink chamber. As a result of adopting this approach, the open tray would be dispensed with permanently.

Figure 5: After: tray now empty as ink is pumped directly to reservoir.

This measure was introduced successfully, and fugitive emissions have been greatly reduced.

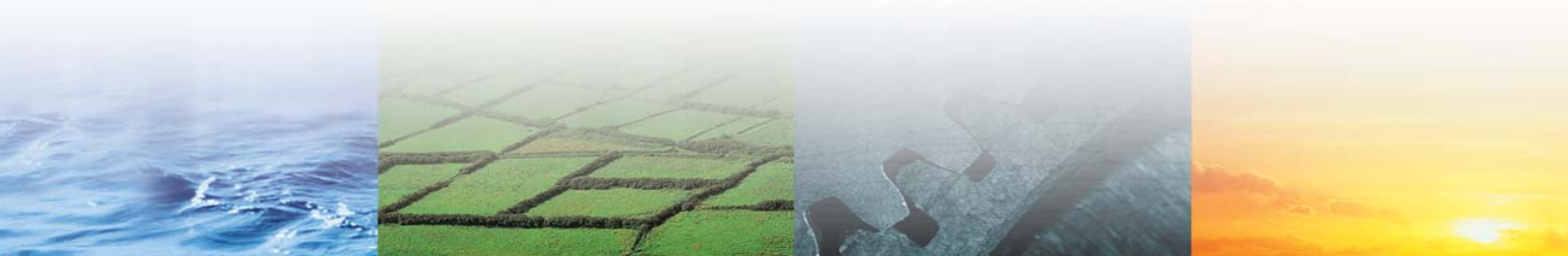
Phase Three of the project focused on training the Alert Packaging workforce to implement a number of new work practices and operating procedures. Specifically, the company needed to implement a major organisational culture change programme, and create positive attitudes to a range of on-site waste management issues.

Clearly, the correct segregation of on-site waste materials was of paramount importance. For that reason it was essential to ensure that staff were sufficiently well trained to be able to correctly identify the different types of plastic materials used on the site i.e. polyethylene, polypropylene, polyester, nylon and cello. To further assist the identification and waste segregation process, a category-coding system was introduced: these codes were incorporated into all instruction sheets and other information materials used by on-site personnel.

Waste segregation areas for each type of plastics waste were marked out. Cages and wheelie bins (all clearly labelled with the relevant waste materials type) were installed in each area. A system of continuous inspections and policing was put in place to prevent staff making errors and inadvertently mixing different types of plastics.

ACHIEVEMENTS

While the CGPP project team had originally set out to reduce solvent usage by 20%, a reduction of approximately 30% was actually achieved in 2002. In economic terms, this



represents a saving of €12,900 a year to Alert Packaging. However, had the solvents-reduction system been fully operational in 2000 (a period when the company was processing substantial amounts of printing work for its clients), then it would have been possible to reduce solvent usage by 30%. In financial terms, this would have equated to a saving of €29,700.

Table 1: Solvent usage reduction

Solvents	2000	2002
Solvents purchased	90 tonnes	39 tonnes
Dilution	45%	75%
Cleaning and losses	55%	25%

Achievements in relation to the reduction in waste plastic film sent to landfill were as follows:

Table 2: Reductions in waste plastic sent to landfill

Waste	2000	2002
Waste generated on site	137 tonnes	107.5 tonnes
Waste sent to landfill	100%	21%
Recycled	0%	79%

Alert Packaging succeeded in generating sales of 18 tonnes of polyethylene waste at €214 per ton. When carriage costs of €128 per ton were deducted, the company made a net profit of €86 per ton of waste. Total profit on these sales in 2002 was €1,548.

The company sold five tonnes of orientated polypropylene (OPP) waste at €128 per ton, but as carriage costs also totalled €128 per ton, this particular marketing initiative did not generate any profits. It did, however, save the company about €500 on transport costs.

Mixed plastics waste (comprising laminated waste film predominantly) was dispatched to a recycling company, which in turn sent it to the Far East for recycling. By arranging to have this mixed plastics waste recycled abroad, Alert Packaging eliminated annual landfill charges of approximately €6,000 in 2002.

OBSERVATIONS

Alert Packaging's success in achieving the various objectives of this CGPP project was almost wholly dependent on securing the commitment and co-operation of its workforce. The implementation of a major organisational culture change programme in relation to various waste management issues proved to be particularly challenging. It required regular supervision and spot-checking, and the delivery of ongoing staff training and encouragement.

LESSONS

- The process of ensuring the correct segregation of the various types of plastics waste has proved to be far more complicated than was anticipated at the outset of this project. In addition, the CGPP project team underestimated the amount of time that they would need to invest in the ongoing training of on-site personnel.

- The CGPP project team delayed the purchase of a compacting baler until the end of the project period. This delay proved costly as since the purchase went ahead, savings on transport of waste of the order of €12,000 a year are being achieved. The cost of the baler was €9,000.

MORE INFORMATION

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CLEANER GREENER PRODUCTION IS...

the application of integrated preventive environmental strategies to processes, products, and services to increase overall efficiency and reduce risks to humans and the environment.

- Production processes: conserving raw materials and energy, eliminating toxic raw materials, and reducing the quantity and toxicity of all emissions and wastes
- Products: reducing negative impacts along the life cycle of a product, from raw materials extraction to its ultimate disposal.
- Services: incorporating environmental concerns into designing and delivering services.

CLEANER GREENER PRODUCTION REQUIRES...

new attitudes, better environmental management, and evaluating available technology options. We need to take good environmental practice to the stage where it is an inherent part of any business operation.

HOW IS CLEANER GREENER PRODUCTION DIFFERENT?

Much of the current thinking on environmental protection focuses on what to do with wastes and emissions after they have been created. The goal of cleaner, greener production is to avoid generating pollution in the first place.
This means:

- Better efficiency
- Better business
- Better environmental protection
- Lower costs
- Less waste
- Less emissions
- Less resource consumption

WHY IS THE CLEANER GREENER PRODUCTION PROGRAMME BEING RUN?

The Irish Government, through the National Development Plan 2000 - 2006, has allocated funds to a programme for Environmental Research, Technological Development and Innovation (ERTDI).

The Department of the Environment and Local Government asked the Environmental Protection Agency (EPA) to run the CGPP as part of the ERTDI programme. With the programme continuing to 2006 about 60 businesses will be supported to implement cleaner greener production and to demonstrate their achievements to the rest of Ireland.

The long-term goal is to ensure that cleaner, greener production becomes the established norm in Ireland. The programme seeks to promote environmentally friendly business through increased resource productivity, waste reduction, recovery of materials, improved efficiency in a product value chain, energy management, and a change of culture within organisations.
The programme aims are focussed on avoiding and preventing adverse environmental impact rather than treating or cleaning up afterwards. This approach brings better economic and environmental efficiency.

PROGRAMME MANAGERS:

The Clean Technology Centre (CTC) at Cork Institute of Technology was appointed to manage the programme in association with O'Sullivan Public Relations Ltd, and Energy Transport Actions Ltd, (ENTRAC).

The CTC was established in 1991 and is now nationally and internationally regarded as a centre of excellence in cleaner production, environmental management and eco-innovation across a range of industrial sectors.

WHERE CAN I GET FURTHER INFORMATION?

This case study report is one of 29 reports available from the organisations that participated in the first phase of the Cleaner Greener Production Programme. A summary of all the projects and CD containing all the reports are also available. More information on the Programme is available from the Environmental Protection Agency

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select link to cleaner production.

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