



MORE EFFICIENT AND PROFITABLE PRODUCTION BY ELIMINATION OF IMPORTED PACKAGING MATERIAL & HEAT CONVERSION

AT A GLANCE

Sturdy Products is a small plastics moulding company. In this project the supply of Sturdy Products primary raw material - polyethylene powder - was moved from being in disposable 20 kg bags to 1,000 kg reusable bulk containers.

Mechanical handling systems were put in place to deal with the larger containers and the mixing process was partially automated. This resulted in a major reduction in Sturdy Products waste stream, cost saving for the raw material and some labour savings. The elimination of the heavy lifting was welcomed by the plant operators and reinforced the success of the project.

The project has achieved the following:

- 45,000 disposable bags eliminated from the solid waste stream saving €2,000 waste costs.
- Switching to bulk supply saved 2.5% of material costs corresponding to €16,000.
- Annual labour savings of €3,430.
- Eliminated waste disposal costs of €2,000.

The company also installed a heat recovery system where waste heat from the rotational moulding manufacturing process is collected and used to preheat the office central heating water which has made some savings in gas usage.

Company

Sturdy Products manufactures rotationally moulded plastic products. The main market sectors in which the company trades are environment,

industrial, building construction, domestic, agricultural & equestrian and custom moulding. Sturdy Products Ltd. is a private limited company which employs approximately 50 people from its base in Blessington, Co. Wicklow.

AIM OF THIS PROJECT

The aims of the project were to convert the supply of the company's primary raw material from 20 kg bags to a bulk supply, and to implement heat recovery from the manufacturing plant to supplement the office heating system.



Photo 1 Original powder mixing tank set up

Sturdy Products uses in excess of 900 tonnes of polyethylene raw material per annum. This powder material was delivered in 20 kg bags which were manually emptied into the mixing process where other ingredients were added depending on the product being manufactured.

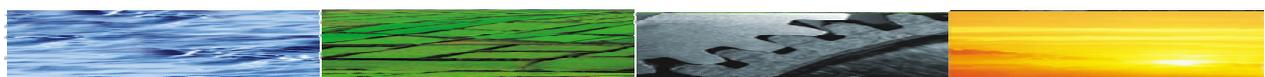
The bags were considered convenient in that it allowed for accurate measurement of raw material into the mixing process.

The main aim of this project was to eliminate the use of the 20 kg bag by switching to one tonne bulk bag supply with automated dispensing.

PROJECT DESCRIPTION

Existing structures and procedures in the production area were examined with the main areas of concern identified as handling the raw material, dispensing into the mixing tanks and adding the colour powder.

The project identified one tonne flexible intermediate bulk containers (FIBCs) as the most appropriate form of bulk supply.



The main obstruction the company faced from the change over from 20 kg to one tonne bags was dispensing an accurate quantity of powder from the FIBC into the mixing process, and to have a system capable of partially dispensing the bags.

The project involved the on-site development and testing of a prototype system. Once this system was proven, material handling systems to carry the bulk bags and an electronic control system to automate the powder dispensing process from the FIBC via a valve and load cell were installed at the site. Suitable racking was installed in the storage area to accommodate the FIBCs.



Photo 2 The new bulk handling system and mixing tank

The heat recovery element to the project involved ducting air from the moulding machines and installation of a simple heat exchanger to preheat the water of the office central heating system.



Photo 3 The two heat exchangers mounted in the ducting

The system can alternatively filter the heated air and use it directly for space heating of other areas of the production building.

ACHIEVEMENTS

The company has converted the supply of all its polyethylene powder over to the reusable FIBCs and has completely eliminated the 20 kg bags. The costs associated with their disposal have also been eliminated.

The new dispensing system is more efficient and less labour intensive than the previous method.

The successful implementation of the project has resulted in the following annual savings:

- 45,000 disposable bags eliminated from the solid waste stream saving €2,000 waste costs.
- Switching to bulk supply saved 2.5% of material costs corresponding to €16,000.
- Annual labour savings of €3,430.
- Eliminated waste disposal costs of €2,000.

The initial plan was to install one automated dispensing system in the primary mixing area of the factory, but this has been expanded to include two additional automated dispensing systems in other mixing areas of the factory.

OBSERVATIONS

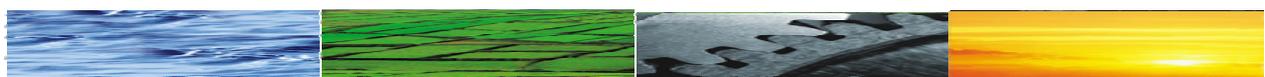
The elimination of the heavy lifting involved with the original 20 kg bag system was welcomed by the plant operators and reinforced the success of the project.

LESSONS

Much of the development and implementation of the new system, including the programming of the PLC controlling the powder dispensing process was carried out in-house with the involvement of two graduate engineers, both of whom gained valuable experience as a result while contributing much to the development of a small company.

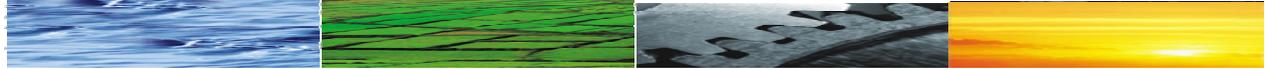
MORE INFORMATION

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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 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.

WHERE CAN I GET FURTHER INFORMATION?

This case study report is one of the reports available from the companies that participated in the second 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

Dr Brian Donlon,
Environmental Protection Agency,
Richview,
Clonskeagh,
Dublin 14,
Ireland

Or their website www.epa.ie, by selecting the link to cleaner production.

PROGRAMME MANAGERS:

The Clean Technology Centre (CTC) at Cork Institute of Technology has been appointed to manage the programme.

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.

