

## Cleaner Production Case Study

**Cleaner production** involves reducing the consumption of raw materials (including water and energy) and reducing the volume and toxicity of waste and other emissions.

### Industry:

Ozone laundering

### 03 Wash Pty Limited

03 Wash Pty Ltd was established for the specific purpose of introducing ozone technology and washing systems into Australian commercial laundry operations. 03 Wash imports equipment not available in Australia, facilitates the design of the washing system and oversees installation and initial operation of the equipment.

### Company characteristics

03 Wash Pty Ltd is a small start-up company with two Australian partners.

### Environmental successes

This is one of a series of case studies featuring companies that participated in the Department of Environment and Conservation (NSW) \$5 million 'Profiting from Cleaner Production' – Industry Partnership Program.

NSW companies are discovering that cleaner production not only protects the environment but also reduces operating costs, streamlines processes, boosts profits and improves staff engagement and morale.

# Ozone company cleans up in the laundry

**03 Wash has brought to Australia the benefit of American and European experience with ozone laundry technology. Ozone is an ecologically friendly chlorine alternative, which, after a short time, readily reverts back to oxygen. Ozone is widely accepted in American and European commercial laundries but was not used here in Australia. Evidence from America suggested ozone laundry systems could save 25% on chemical use, 40% in electricity and 20% in water use when compared with conventional systems.**

### What did they do?

#### Conduct a trial

Our Lady of Consolation Nursing Home at Rooty Hill in Sydney's west was chosen for a site trial. This laundry was chosen because it was relatively new and purpose-built. It was operating efficiently and had daily records of the weight and type of each load of washing.

#### Set up baselines for comparison

03 Wash installed water meters to record cold water, hot water, and water for steam generation, as well as a gas meter. All four meters were read by laundry staff on a daily basis. Systems were put in place to measure electricity data in 15 minute intervals. As well, the chemical supplier, Ecolab, provided data on the wash formulas for each type of wash load. All of this recorded data, including the wash type and weight, provided a good comparison for the 'before' and 'after' ozone case.

In addition to this data collection, the quality of the wash was checked—before the move to ozone and after the ozone was introduced—using the

Australian Wool Testing Authority's measures for laundry effectiveness.

#### Install the ozone system

Ozone has a very short life cycle so an on-demand system is the safest and most effective method of delivery. The ozone system has four main components:

##### Air delivery

An oil-free air compressor with an air dryer delivers clean, dry air. Clean, dry air is essential to ensure that no contaminants are delivered to the ozone generators.

##### Ozone generators

Four separate ozone generators pass low pressure air through a high voltage electrical field to create ozone from the oxygen in the air. The four separate generators supply ozone to four washing machines, with a control panel that allows the machines to be isolated for maintenance.

##### Controls

The controls are integrated with the existing washing machine controls to ensure that ozone is delivered at the correct time and in the correct amount. There are four separate sets of controls to allow easy isolation so there is no down time for the laundry in the event of a failure.

##### Ozone injection

Ozone is delivered to the washing process via injection. There are various methods of ozone injection depending on the washing machine type and size.

For this installation a closed-loop pumping system was selected whereby the water from the machine is drawn out through the loop via an inline strainer to remove lint. The ozone is injected directly into the discharge side of the pump and returned back into the washing machine.

## Commission the ozone system

An expert in ozone laundering was brought to Australia from the United States to set-up and commission the system. Because of the system selected by O3 Wash and the method of installation used, the entire system could be tested without any disruption to the laundry operations. O3 Wash developed changes to the wash formulas in conjunction with Ecolab, who re-programmed the machines with the new reduced formulas.

## Switch to ozone laundering

The ozone system was installed over a period of five days with no production loss to the laundry.

In essence, the staff went home one night after using the standard chemical wash and next morning started work using the ozone system, with the only noticeable change from their point of view being a different coloured program selection sheet. A very positive outcome for the staff was the lack of chemical smell when removing washing from the machines.

## Monitor performance

Data was collected after the ozone system was turned on and washing had been done using the new system. Performance monitoring included water, gas and electricity consumption as well as testing the wash quality.

## Why did they do it?

Ozone is used extensively overseas, but in Australia it had mainly been used for purifying drinking water and for some industrial applications. It was time to broaden the application of ozone in Australia.

Laundries were selected as a starting point because the cost of introducing an ozone system into a laundry can be justified by the savings generated. Also, commercial laundries have long been recognised as large consumers of energy as well as water and chemicals, most of which are discarded into our waste water systems.

## What are the costs and savings?

Annual savings for the trial laundry site, based on current production levels, are:

Water	\$2,200
Electricity	\$5,100
Chemicals	\$2,500
Linen replacement	\$1,500
Productivity	\$30,000

Total savings are conservatively in the order of \$41,300 per year. This represents a financial payback of two to three years for a typical system.

Waste water quality has improved due to reduced chemical use.

Independent tests have shown that:

- wash quality has been maintained and even improved in some areas.
- linen will last longer due to reduced chemical and mechanical action.

Productivity has improved due to the reduced time taken for each load of washing. The trial site has increased its intake of laundry from other nursing homes and has substantially boosted revenue from its laundry operations.

## Where to now?

The trial has proved that using ozone in Australian commercial laundries reduces water, energy and chemical consumption while saving time and improving linen life.

O3 Wash Pty Ltd has been able to demonstrate to the nursing home industry that this is the way of the future, and has proposed setting up a system with a large hotel chain.

## More information

Geoff Homann, Marketing Director  
O3 Wash Pty Ltd

PO Box 707

Miranda NSW 1490

Phone 0402 259 792

homanna@optusnet.com.au

Department of Environment  
and Conservation (NSW)

Business Partnerships Section

Phone 02 8837 6000

cleanind@environment.nsw.gov.au

## What are the environmental gains for the trial laundry site?

Energy reduction	62%	48,497 kW.h per year
Reduction in CO <sub>2</sub> emissions		46.5 tonnes per year
Water savings	15%	1,100,000 litres per year
Chemical savings	15%	1,250 litres per year



*Ozone specialist overseeing installation of the new washing system. The system was installed over a period of five days with no production loss to the laundry. The facility has now increased its intake of laundry from other nursing homes and has substantially boosted revenue.*



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