

**Product recovery
and the minimisation
of water use for cleaning
in the food industry
Case study**



This case study demonstrates the application of an innovative pipework clearing and cleaning system which can help many industries recover their product with minimised losses during change-overs or maintenance.

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Technology provider:

aeolus Technologies Ltd

Project background

In late 2007 Whirlwind Technologies installed its clearing and cleaning system on the site of a large national food manufacturer that operates from multiple sites and produces tomato ketchup, sauces and a host of well known brands. The project covered part of the company's production facility, which works 24/7, and has many filling lines, with frequent changes on each line, involving CIP cleaning.

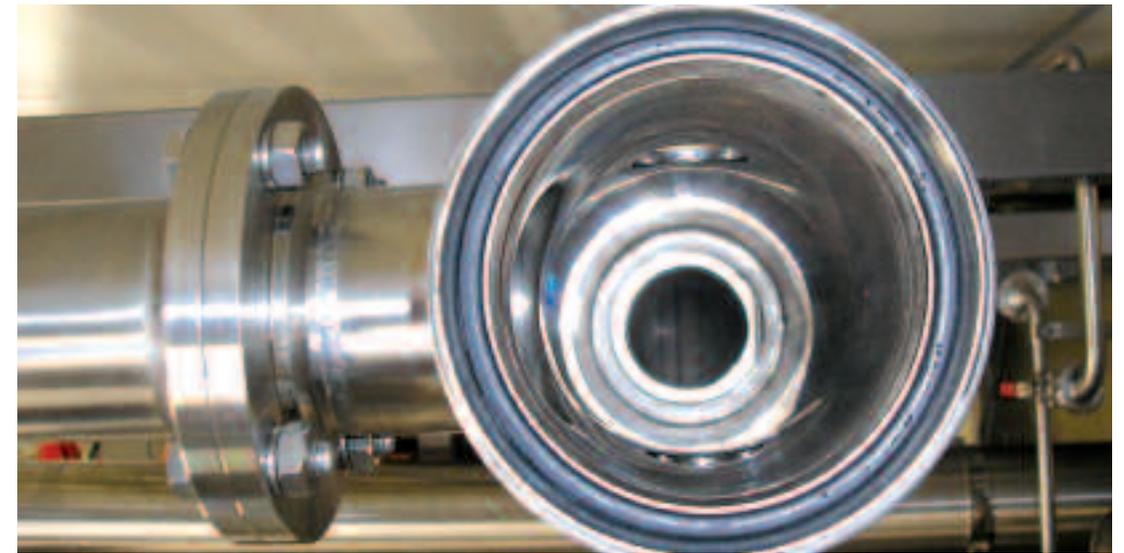
At the end of each production run the company would normally flush the product left in the pipe down the drain before using the conventional CIP cleaning system. Each year this process uses thousands of metres cubed of valuable water.

The main drivers for installing the Whirlwind technology were:

- product recovery,
- reduction of water usage and effluent concentrations
- and reduced effluent volume, treatment chemicals and energy use.



Demonstration facility: transparent viewing tubes



Open sieve chamber after Whirlwind cleaning

Technology solution

The Whirlwind LPC "Lean Phase Cleaning" CIP System provides clearing, cleaning and drying in an automatically controlled manner without the use of chemicals. The system uses blowers that supply finely filtered air or gas into a pipe under the precise control of a PLC. Immediately after the product pump stops at the 'low supply' tank level the Whirlwind system continues the pumping action through to the next tank or the filling machine, evacuating the product transfer pipework for use, with minimal waste.

Following the Whirlwind two-stage clearing process the LPC - CIP cleaning begins. Measured droplets of cold water are carried in a vortex, or whirlwind, to carry out a physical clean to microbiological levels with high speed. The system is able to clean pumps, valves, filters and heat exchangers used for both heating and cooling. The final swirl stages of the Whirlwind system clear the water droplets, and then gentle adiabatic heating of the air completely evaporates the residuals leaving all surfaces in a dry and clean state.

The Whirlwind technology is suitable for processes that involve batch or continuous production such as those used in the beverage (both soft and alcoholic drinks), pharmaceutical, toiletries, chemical and petrochemical industries.

Project benefits

Within less than six months the system has already delivered significant savings for the client.

The main benefits for three production lines were assessed and are summarised below:

- Product saving: estimated at least 3,000 cu metres per year
- Water usage reduction: estimated at 65,000 cu metres per year and c£65k per year
- Effluent volume reduction: estimated at 68,000 cu metres per year and c£200k per year
- Reduced change-over time: estimated one hour per product changeover
- Reduction in tanker disposal of product waste: estimated at c£30k per year.

In addition to the figures quoted above, further benefits of the new Whirlwind system include:

- Reduced energy usage (no pumping or steam required to clean the pipes) c£50k per year
- Reduction in chemical costs estimated at c£10k per year
- Eliminating the risk of product cross contamination - Quality Assured.

The Whirlwind system can be installed anywhere. In this instance it was installed externally, adjacent to the product manufacturing hall, and connected to the production lines via a stainless steel pipe. The system will be extended to other parts of the factory as new production equipment is installed.



Pipe Clearing Unit (PCU) and Lean Phase Cleaning Unit (LPCU)



Demonstration unit at Munich Exhibition

Useful links

www.eca-water.gov.uk

The Enhanced Capital Allowance Scheme enables businesses to write off the whole cost of their investment in technologies and products that encourage sustainable water use against their taxable profits of the period during which they make the investment. This website lists all eligible water saving products and technologies.

www.environment-agency.gov.uk

The Environment Agency is the leading public body for protecting and improving the environment in England and Wales. It is responsible for managing the water resources, setting water quality standards, issuing abstraction licences and effluent consents and enforcing environmental regulation.



PCU for food dips products

www.environmentconnect.co.uk

Environment Connect is the single point of contact to access a host of environmental business services available through regional and national support bodies. The service is available free to all Northwest businesses.

www.envirowise.gov.uk

Envirowise is a government funded programme dedicated to putting the sustainable use of resources at the heart of UK business practice, offering companies of all sizes and sectors a wide range of free, independent and practical advice.

www.netregs.gov.uk

NetRegs provides free guidance for businesses in the UK to comply with environmental legislation and protect the environment.



Drinktec, Cologne

Whirlwind Technologies

Whirlwind Technologies develops and supplies an innovative system to clean and clear pipes and pipelines for a wide variety of industrial applications.

The system overcomes the limitations of older established methods for pipe clearing and pipe cleaning, such as pigging, water or product flushing and traditional CIP systems.

The Whirlwind pipe cleaning system is fully patented and is generating major benefits for a rapidly growing number of customers in a range of industries.

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Envirolink Northwest

Envirolink Northwest supports the development and growth of the environmental technologies and services (ETS) sector in England's Northwest. Its role, amongst others, is to work with companies who develop, manufacture and supply products and technologies to the water industry or large industrial water users and help them improve their competitiveness and productivity and stimulate innovation.

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