

Case Study: Energy Efficiency Best Practice Process Heating Systems

Princes Laundry Preston

Improving performance and saving energy

By recovering waste heat from the exhaust of gas-fired driers, Princes Laundry saved over 33% of their total gas use, abated 260 tonnes of carbon per annum and gained a 100% return on investment in 5.3 years.

The opportunity: save money and energy

Based in Mentone, Princes Laundry provides professional operation commercial linen services to major hospitality and healthcare customers in Victoria and Queensland.

Having already cut its water use by 40%, Princes Laundry turned their attention to energy usage as part of its commitment to best practice in resource efficiency.

The company has an integrated approach to saving energy and water. It uses continuous, direct-fired gas dryers and washing machines with integrated waste heat recovery and water recycling to maximise resource efficiency.

Princes Laundry management decided to go to the next step to further improve dryer efficiency. Drying of linen is an energy-intensive process, typically utilising around 65% of the total energy consumed at a site. For example, a batch load of wet laundry contains about 50% water, which needs to be evaporated to effectively dry the laundry.

The solution: review and upgrade the current system

An energy and production audit of the steam generation and distribution system was undertaken to confirm usage and identify inefficiencies.

Four Reco Cross air-to-air heat exchangers were fitted onto their Jensen Senking DT120 dryers to preheat incoming air to the dryers. The exhaust from each dryer takes warm, moist air from the dryer chamber and passes it via the Reco Cross heat exchanger through the roof to be exhausted from the system.

Incoming air to the dryer passes through a second duct via the other side of the Reco Cross heat exchanger and into the air heating chamber of the dryer. This incoming air is heated in the heat exchanger as it extracts heat from the hot exhaust gases. The heat exchanger lifts the heat of the air entering the dryer by about 30 to 35 °C. If the ambient temperature is 15°C the air transferred to the dryer is typically 45 to 50°C.

The Jensen Senking DT120 dryers are also a key part of the best practice solution – they are efficient in design and utilise electronic process control and modulating burners to optimise heat transfer and drying effectiveness. The burners on these dryers work in conjunction with an inverter drive to the dryer drum that allows a wide range of heat programs to be delivered for various batch types and weights.

The benefits: leaner, greener production

The project cost of \$100,000 is expected to reap a 100% return on investment in 5.3 years at the heater's current output (based on an energy saving of 4084 GJ or \$18,737 per annum).

The review and upgrade also reduced natural gas consumption by 33% or 4084 GJ of natural gas per year (compared to a dryer of similar design that does not have Reco Cross heat exchanger installed). At current gas prices, this represents a saving of \$17,500 per annum.

The upgrade has resulted in a reduction of 260 tonnes of carbon per annum.

For more advice

The **Energy Efficiency Best Practice Guide to Steam Systems, Hot Water Systems and Process Heating Systems** is a step-by-step guide to gaining maximum efficiency from your heating system.

The ResourceSmart Business program helps businesses across Victoria improve resource efficiency and manage the risks and opportunities presented by climate change. For further information on making your business ResourceSmart, visit www.resourcesmart.vic.gov.au or call 1300 363 744

"When we chose our new dryers, we knew that microprocessor controlled, direct natural gas fired units would be the way to go. We then took the opportunity to install waste heat exchangers, offered as an extra enhancement by the dryer manufacturer. Whilst the initial capital for these units was relatively high, we took the view that the increase in cost of the dryers when fitted with waste heat exchangers compared to the standard units would more than pay for itself over the life cycle of these new dryers. When you consider the total life of the dryers and likely future impacts on energy and carbon costs, we believe we have made a wise decision. If we can save energy costs in doing so, it improves our future sustainability."

Warwick Brown, General Manager, Operations

"The new driers are performing very well and have allowed us to increase the capacity of the laundry and at the same time improve our overall energy performance."

Matthew Smith, Operations Manager, Preston