

Top Hat Drycleaners

Energy Efficiency improvements through improved equipment layout and better operating practices

Background

Top Hat Drycleaners is a South Perth based business whose proprietors have 26 years experience in the drycleaning industry. Top Hat relocated to its current location in January 2001. In addition to the retail service, the company has two agencies (down from 48 agencies) through which it pick ups and delivers cleaned garments. The company cleans over 1000 garments each week and operates from 6am - 6pm on weekdays and from 7am – 5pm on Saturdays.

The company is committed to improving its environmental performance and is participating in an Industry Best Practice Program for the Western Australian Dry Cleaning Industry. This joint initiative of the Drycleaning Institute of Australia (DIA) and the Centre of Excellence in Cleaner Production of Curtin University of Technology is benchmarking the environmental and financial performance of the local industry and providing information on how performance can be improved.

Top Hat recognised an opportunity to introduce Cleaner Production improvements to their operation when they made the decision to relocate their business. Reduction of energy consumption is one of the key issues for the company and improvements are being continuously investigated.

The Process

The company operates a typical dry cleaning operation. Once a garment is received from a customer the need for special care or particular cleaning requirements (eg stains or spots) is assessed. Any stains are treated appropriately and then garments are sorted on the basis of colour, fabric and the like. Pre-spotting is only undertaken on white or light coloured garments and dark items that have obvious stains such as: blood, paint, ink or large areas of water-soluble soil.

The garments are then loaded into a computerised 16kg drycleaning machine, in which they



Proprietor Laurie Metropolis operates a drycleaning machine

are immersed in perchlorethylene (a solvent). During the first wash, which takes 3 minutes, any grease and oil are dissolved by the perchlorethylene (perc) and soaps. The solvent is then removed and reprocessed in a still, where evaporation followed by condensation recovers most of the perc for reuse. This process also produces a liquid waste residue that has to be disposed of.

A second wash then takes place using recycled perc to ensure that the garments are clean. Again the solvent is reprocessed to be used in subsequent washing cycles. Following this second wash the garments are dried. The temperature used to dry the garments is dependent

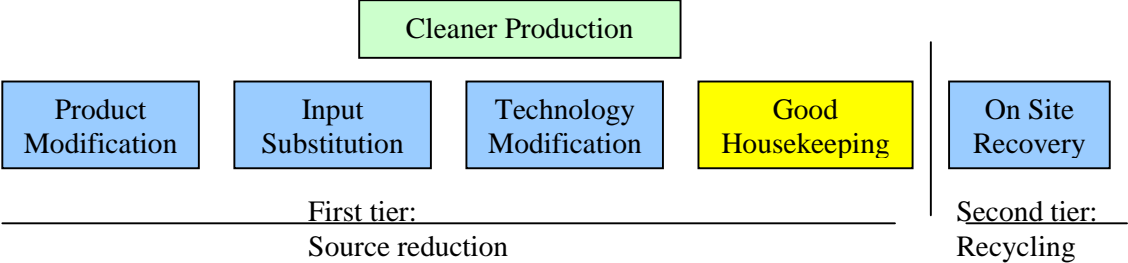
on the fabric of the garments and takes 16 -23 minutes. As the garments dry the air in the machine is passed over cooling coils so that the contained perc can be recovered, and removed from the garments.

Garments are then checked to ensure they are clean, with residual stains removed on the spotting table. The garment are then steam formed and conditioned to soften the fabric, give it body and shape and remove any wrinkles. Machine pressing or hand ironing then takes place, and the garment is wrapped in preparation for collection by customers.

Cleaner Production Initiative

Through a variety of good housekeeping measures taken during and since the relocation of Top Hat Dry Cleaners to its new premises, several improvements, particularly in energy efficiency, have been achieved. The company has moved into significantly smaller premises so planning the layout of the new store was a critical activity and offered opportunities for introducing efficiency improvements.

Cleaner Production: Prevention Practices



Equipment was organised so as to make operations as efficient as possible. This also allowed steam and condensate pipe lengths to be minimised to reduce heat loss. To further reduce heat losses from the pipes, and to reduce the risk of burns from contact with the pipes, the pipework is also being insulated, with about 50% currently complete.



At the previous premises steam pipes were uninsulated and very long.

A new boiler was purchased for the new location, and an assessment of steam requirements enabled the company to reduce the size of the boiler by 50%. The company used a 40hp boiler in the old premises but was able to comfortably downsize to a 20hp boiler, despite an increase in the number of garments cleaned each week. In addition, Top Hat is currently experimenting with different operational modes of the boiler to determine which is the most efficient. Daily readings of the gas meter are helping in their assessment.

Top Hat have adopted the practice of not pre-spotting the bulk (75%) of their throughput; only white, light coloured and obvious stains garments (about 25% of throughput) are routinely pre-spotted. The remainder are only post spotted if required. This practice reduces

the use of spotting agents and improves the efficiency of the distillation process in the drycleaning machine.

Another operational practice Top Hat is investigating is the relative benefits of running the perc still on electricity or steam (generated by the gas-fired boiler). The still is currently powered by electricity which means that the boiler does not have to be started first thing in the morning to run all day. The company intends to start operating the still on steam but will investigate whether the extra operating time for the boiler makes this a more efficient option than operating on electricity.

The load on the boiler and the time it is in operation is also reduced by only turning on the company's shirt machine (used for forming and conditioning the fabric) when required. The shirt machine consumes 25% of the steam generated by the boiler, so reducing its running time is expected to deliver significant savings.

Energy efficiency is not the only area in which the company has been investigating Cleaner Production options. Reducing the consumption of perc is also a priority. Recently introduced, improved maintenance practices for the drycleaning machine are expected to bring about significant improvements in this regard.

Advantages of the Process

Since the company has moved into its new premises the number of garments cleaned each week has increased by over 40%. Despite this increase, energy consumption has increased by only 25%. This has meant the company's energy cost per garment cleaned has already fallen by 9% and further improvements are expected when such projects as the lagging of all steam pipes are completed.

Without the energy efficiency improvements that have been achieved, the company would be paying an extra \$2,200 on its energy bills and consuming an extra 14,000kWh in order to clean the increased number of garments each year.

Table 1. Financial and Environmental Benefits

Annual Energy Savings	~ 14,000 kWh (11%)
Annual Energy Cost Savings	~ \$2,200
Annual Greenhouse Gas Emission Reductions	~ 13 tonnes CO ₂ equivalent

Cleaner Production Incentive

Top Hat Drycleaners are committed to improving all aspects of their business and introduced Cleaner Production practices into their operations in order to improve both the environmental and financial performance of the company.

Barriers

The main barrier to the implementation of the Cleaner Production options has been a lack of resources. As in most small businesses, time is a precious commodity and it is primarily dedicated to running the business and satisfying customer requirements. Projects such as the lagging of pipes and assessing the performance of equipment has to be squeezed in around these priorities so are difficult to complete within the timeframes the company would like.

Contact

Laurie Metropolis
Top Hat Drycleaning
65a Angelo St
South Perth WA 6151
Ph: 61-8-9367 1715

This case study has been developed by the Centre of Excellence in Cleaner Production, Curtin University of Technology with financial support from the Alternative Energy Development Board.
Last revised: August 2001