MEDIGLOVES LIMITED

COMPANY DESCRIPTION

Medigloves Limited was established in 1985 in Thailand and produces more than 70 million pairs of quality surgical and cleanroom latex gloves per year. A total of 640 staff work in three 8-hours work shifts. The company is certified to a number of ISO standards, namely ISO 9001 (quality management system), ISO 13485 (quality system for medical devices production), ISO 14001 (environmental management system), ISO 17025 (competence of testing and calibration laboratories). Its medical gloves range also meets the EN 46001, CE mark, RWTuV-Bauart, and U.S.FDA requirements. This reflects the company's policy to design and produce gloves to the highest requirements of domestic and international customers.

Medigloves participated in the GERIAP project to

- Build capacity of the company's staff in improving energy efficiency and environment management through training and assessments carried out as part of the project
- Improve the company's environmental and social performance through the application of the methodology to improve energy efficiency based on cleaner production
- Maintain the company's competitiveness by reducing costs through energy savings

To achieve this, the Team from Medigloves and TISTR (organization in Thailand implementing the GERIAP project with Thai companies) received full support from top management.

PROCESS DESCRIPTION

A brief description of latex gloves production is as follows *(note: for commercial confidentiality reasons it is not possible to provide a detailed process description)*:

- A latex compound is prepared by mixing chemicals with natural rubber latex
- The latex mixture is cured in molds to form latex gloves
- The surfaces of newly formed gloves are treated via washing and drying processes
- The gloves are tested and inspected for leakage and strength, to meet customer quality requirements
- Various kinds of surgical and cleanroom gloves are packed separately and sterilized with gamma rays before they are sent to customers

The production processes at Medigloves are energy and material intensive. As a result, thermal energy (in the form of steam), electricity and water are responsible for the majority of the production cost.

METHODOLOGY APPLICATION

The draft Company Energy Efficiency Methodology was used as a basis for the plant assessment to identify and implement options to reduce energy and other materials and wastes. Some of the interesting experiences are:

- ***Task 1a – Meeting with top management***

Immediately at the start of the GERIAP project it was clear that top management of this company is truly committed to improving energy efficiency. Throughout the project the plant's Team and external facilitators were given total support and trust by top management, and this inspired them enormously to do whatever they could to save the company energy, GHG emissions and money. This greatly contributed to the success of the project at Medigloves.

Lesson learnt: Top management's commitment, support and trust are key ingredients for a successful assessment and implementation of options.

- ***Task 1b – Form team and inform staff***

The external facilitators for the GERIAP project in Thailand and the plant's Team members worked together as a real Team. The external facilitators came to the plant with a fresh perspective and therefore were able to ask critical questions and come up with original suggestions to improve energy efficiency. The plant's Team members were very open to suggestions made but because they knew the plant and production process inside out they were able to provide a reality check. The active interaction between the two groups provided the basis for the implementation of successful options.

Lesson learnt: The best results are achieved when external facilitators and plant staff work together as a true Team, whereby each group provides their own unique input into the assessment

- ***Task 4c – Prepare implementation and monitoring proposal for top management***

This company is relatively small and manufacturing peaks are dependent on the orders of clients. While energy efficiency is a priority of the plant, the timing of implementation of new options needs to coincide with downtime in manufacturing. During the project a new type of glove was launched and a client placed a major order. This had to be taken into consideration for the planning of the implementation of options.

Lesson learnt: Keep in mind that the customer is king! Sometimes the implementation of options will need to be planned around the launch of new products or major orders by clients

- ***Step 5b –Evaluation meeting with top management***

The *Energy Management Matrix* was used to evaluate with top management the company's management of environmental and energy issues before and after the GERIAP project. It was found that Medigloves' energy and environment management policy did not have much scope for improvement. However, the level of staff training and awareness about energy and the environment increased significantly during the project, especially of members of the Team. In addition, employees are encouraged through either monetary rewards or recognition from top management to initiate cleaner production and energy efficiency options. Medigloves therefore has the management structure in place to continue improvements.

- ***Step 6 – Continuous improvement***

The market for medical gloves is very competitive, especially since the growth of manufacturers of inexpensive gloves in China. Medigloves therefore has to do everything it can to remain competitive, which it tries in several ways such as improving product quality, developing new products, targeting new markets and reducing production costs so that the sales prices for gloves can stay low. Energy efficiency is one way of reducing production costs and for this reason the company will continue to investigate ways to improve energy efficiency. The staff at Medigloves know that their jobs depend on whether the company can maintain its position in the gloves market and therefore are motivated to help top management in every way they can.

Lesson learnt: Energy efficiency is one way of reducing production costs and thereby can play an important role in ensuring the company remains competitive

OPTIONS

The main results include:

- The focus areas selected were the compressed air system, water consumption, cooling/chiller system, and steam system.
- In total nine options were investigated, of which four were implemented, two are under investigation, and three were found to be unfeasible. The results were quantified for three implemented options
- Financial results for three implemented options are US$ 8,000 investment, US$ 19,244 annual savings, and a payback period of about 5 months
- Annual environmental savings for three implemented options are 165,682 kWh, 17,078 liters of oil, 14,330 m^3 of water and more than 23.9 million ft^3 compressed air
- Greenhouse gas emission reductions are 153 tons of CO_2 per year

The results of three options implemented by the company are summarized in the Table below. Since the energy assessment as part of the GERIAP project, the company's Team has identified and implemented several more options to improve energy efficiency.

It was evident that these financial benefits in combination with management support to improve environmental and social performance will ensure the continuation of improvements at Medigloves for years to come.

Table 1: EXAMPLES OF OPTIONS IMPLEMENTED

FOCUS AREA/ OPTION	CP TECHNIQUE	FINANCIAL FEASIBILITY	ENVIRONMENTAL BENEFITS	COMMENTS
Compressed air system / Compressed air leak repair and reduction of intake air temperature *(see case study)*	Good housekeeping Process/ equipment modification	▪ Investment: US$ 1,500 ▪ Cost savings: US$ 7,450 /yr ▪ Payback period: 2.5 months	▪ Electricity savings: 129,573 kWh /yr ▪ Compressed air savings: 23.95 million ft^3 /yr ▪ GHG emission reduction: 80 tCO_2 /yr.	
Water consumption / Recovery and reuse of water and chemicals from dipping processes *(see case study)*	On-site reuse / recovery	▪ Investment: US$ 1,250 ▪ Cost savings: US$ 6,388 /yr ▪ Payback period: 2.3 months	▪ Electricity savings: 11,564 kWh /yr ▪ Fuel oil savings: 17,078 liters/yr ▪ Water savings: 4,586 m^3 water/yr ▪ GHG emission reduction: 58 tCO_2 /yr	Additional water reuse options are being investigated
Water consumption / Recovery and reuse of drainage from wash and chlorination process *(see case study)*	On-site reuse / recovery	▪ Investment: US$ 5,250 ▪ Cost savings: US$ 5,406/yr ▪ Payback period: one year	▪ Electricity savings: 24,545 kWh /yr ▪ Water savings: 9,744 m^3 /yr ▪ GHG emission reduction: 15 tCO_2 /yr	Additional water reuse options are being investigated

FOCUS AREA/ OPTION	CP TECHNIQUE	FINANCIAL FEASIBILITY	ENVIRONMENTAL BENEFITS	COMMENTS
Other identified options included: ▪ Steam system-utilization/ Steam leak survey and leak repair (implemented, *see case study*) ▪ Steam system: Recovery of steam condensate from dryer and reuse as alternative source of hot water in dipping process (under investigation, *see case study*) ▪ Steam system: Installing an electric heater to make hot water instead of using steam (unfeasible) ▪ Steam system: The modification of condensate tank for reducing flash steam loss (unfeasible due to low amounts of flash steam) ▪ Water consumption: Reusing of water from leaching tank in dipping process (under investigation) ▪ Cooling system: Installing an air purger for removing moisture from refrigerant in the chiller (unfeasible)				

FOR MORE INFORMATION

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