

Perfetti Van Melle India Pvt. Ltd. Chennai Unit

Unit Profile:

Perfetti Van Melle India Pvt. Ltd. (PVMI) is a 100% subsidiary of an Italian Multinational Company. The company has two units in India, one at Manesar in Gurgaon and the other unit at Chennai. The company is a market leader in sugar boiled confectionery products in India. The Chennai unit commenced production from Jan 2001 and has a capacity to manufacture 10,000 tons annually. Some of the global brands manufactured here are Mentos, Alpenliebe, Fruittella etc.

Energy Conservation Process and Set Up:

The unit has energy conservation team headed by the Factory Manager. He is assisted by Sr. Executive (Engg & Projects) with 3 technicians working in the Utility area. The team focuses constantly on the ways and means of conserving energy in the factory. The team also encourages active participation from other employees in providing suggestion for conservation. Good suggestions received from the employees and implemented, are duly recognized and rewarded. There is no minimum level of conservation or savings, all implement able suggestions are accepted and reviewed by the team. The team also focuses on alternate source of energy apart from conservation. Energy conservation awareness programs are also conducted for the employees.

Safety, Health and Environment Policy (SHE):

The unit has SHE policy which enumerates in detail various aspects of good practices to be followed by the employees, contract workmen, visitors etc with respect to safety, health and environment.

Safety :

PVMI, Chennai has a safety committee, comprising of employees from cross functions , to ensure that safety measures are strictly followed by one and all. The team is also well supplemented by a reputed safety consultant. The inputs from the consultant are taken into account in executing various safety measures in the factory. Frequent training is also imparted to the employees on fire hazard, first – aid .etc.

Health & Hygiene:

Being a food industry, high importance is given to Health and Hygiene aspect. Special training is provided to the contract workers to create awareness and importance of the same. HR department plans a major role in organizing various awareness programs to the employees. The company is also on the verge of obtaining certification for Hazard Analysis and Critical Control Points (HACCP) and Safe Quality Food-2000, from a reputed institution.

Environment:

The unit apart from being ISO 9001 certified, its Environment Management Systems is also certified for ISO 14001, which was obtained in 2004. There are many environmental objectives laid for the year. As a part of corporate social responsibility (CSR) many initiatives have been taken to protect the environment in and around the factory. The unit also won the Best Industry Award in Tamil Nadu for creating HIV/AIDS awareness among the employees and in the surrounding villages.

1. Jacket Water Recovery:

Background:

To utilize the high temperature hot water of the Jacket water of Diesel Generator Set for Vapour Absorption machine (VAM) to make chilled water.

Observations:

The Engine rejects approximately 30% of the Input fuel energy in Jacket water-cooling circuit to the cooling tower water, which is going to atmosphere as waste heat.

Technical Analysis:

As system of recovering the heat using a plate heat exchanger was installed in which the primary side has Jacket water of the engine and the secondary side water is passed through the hot water VAM to generate chilled water at 7° C for Air-conditioning application

Jacket Water Recovery



Financial Analysis:

Chiller capacity - 64TR

Steam requirement for the same $64 \times 4.5 = 288$ kg/hr (in case of steam VAM)

1 Ltr of F.O gives 12 kg of steam

for 250days 24 hours operation= $(64 \times 4.5 / 12) \times 250 \times 24 = 144$ KL
Investment Rs 10 Lakhs

Impact of Implementation:

Reduction of steam demand by 288kg/hr and savings of 144 KL of F.O equal to 18.72 lakhs

2.Desiccant Based Rotor system for Dehumidification:

Background:

To utilize the desiccant property of water absorption to reduce chiller capacity

Observations:

Confectionery manufacturing process requires Particular Low air temperature & RH for proper Drying. To make that condition instead of using Direct Compression based chiller, we installed Desiccant Based Rotor system for Dehumidification

Technical Analysis:

The air conditioning for the process air requires dehumidification to 20% R.H. In the normal traditional system of cooling a chilling capacity of 66TR is required. With the Installation Desiccant based system, the chilling capacity requirement is only 40 TR.



Financial Analysis:

The total electricity saved (1kw/1TR) is 26KW

Total year saving- 187200 KWhr

Total cost saving- Rs 14.97 lakhs

Investment Rs 14 lakhs

Impact of Implementation:

Reduction of 187200 Kwhr of annual units.

3.Other Major Energy saving activities carried out in the Plant during 2004-05:

- 1) Conversion of Furnace Oil Based Boiler to Briquette Fuel based Boiler-Savings of Rs 20Lakhs/year.
- 2) High efficiency Electronic Diesel Generator 1500 KVA with SFC of 3.7 units/ltr. Leads to 79KL of HSD saving.
- 3) Installation of overhead water Tank for water supply leading to 0.28 lakhs Kwhr of electricity- Investment of Rs.50000.
- 4) High velocity air curtain in Process area open to outside to avoid contamination entry from shutter.. The limit switch control of opening was linked to the opening and closing periods of Shutter. Savings of 0.9 lakhs KWhr.
- 5) Impeller Trimming of Cooling tower Pumps and optimization by Parallel Operation 0.6 lakhs KWhr Investment Rs 5000
- 6) Process Drying time reduction leads to lower space requirement and hence the energy for drying room is reduced. Reduction of 0.47 lakhs KWhr/year. Investment Rs 50,000/
- 7) Air Pre-heater in the 4 ton/hr Boiler gives 2% efficiency improvement leading to 24 KL of oil savings Investment of Rs 3 lakhs
- 8) Economiser in the wood fired Boiler gives 1% efficiency improvement. This has reduced fuel consumption by 7.2 KL. Investment involved Rs 1lakh

Perfetti Van Melle India - Trend Setter in Food Industry

Trend setting Project:

Heat Pump-First time in Indian Food sector

BackGround:

To explore the possibility of reducing steam consumption and reduce water usage, Heat Pump was considered. Heat Pump is a device that pumps heat from the lower temperature to Medium Temperature using high- grade energy . This heat is used for making hot water.

NOTE: For more details, Please Refer Annexure-3 (power point presentation)

Observations:

We observed that the Cooling water from process has a temperature of 38° C and flow of 70 cmh. The higher the temperature of return, higher will be the make up water and losses. (evaporative cooling towers). The return water before entering the cooling tower is passed through a Heat Pump, which absorbs the low- grade heat from the water. The temperature of the water going to cooling tower is lower by 1 degc and this results in less usage of water for make up and evaporation

HEAT PUMP:



Technical analysis:

Actual steam consumption using shell and tube type heat exchanger for 75 degc	-240 kg/hr
Steam consumption after Heat Pump installation	- 120 kg/hr
Steam saving	- 120 kg/hr
Cooling tower temperature reduction 1 degc for 70 cmh	
Energy recovered	- 70000 kcal/hr

Make up water Gain - 6KL/day

Financial analysis:

12 kg of steam /liter of furnace oil.

No of days operation in a year 250 days

Fuel recovered = $(120/12) \times 24 \times 250 = 60$ KL

Price at Rs 13/kl = $60 \times 13 \times 1000 =$ Rs 7.8 Lakhs

Price for Water = $6 \times 250 \times 46 =$ Rs. 0.69 Lakhs

Total Saving = Rs 8.49 Lakhs

Investment = Rs 15.73 Lakhs

Pack Back = 1.85 Years

Impact of Implementation:

Reduction of 60kl of fuel and recovery of water 1500 KL/year.