BEST PRACTICES & ENERGY CONSERVATION AT RAYMOND TEXTILE
State of the Art - designing & manufacturing facilities

Award Winner for best Energy Efficient methods

Design & Manufacture of all wool, wool blends, polyester viscose blended fabrics involving best energy efficient system for production process.
Raymond Limited

With a capacity of 38 million meters in wool & wool-blended fabrics, Raymond commands over 60% market share in worsted suiting in India and ranks amongst the first three fully integrated manufacturers of worsted suiting in the world. We are perhaps the only company in the world to have a diverse product range of nearly 20,000 design and colors of suiting fabric to
Energy Conservation Award Chhindwara

2017
AEE Western India Chapter - 2017
(for Certificate of Excellence in Corporate Energy Management)

2016
SEEM National Energy Management Award 2016

2016
Energy Management leadership Award 2016

National Energy Conservation Award from Govt. of India 1999 & 2002


Energy Conservation Award Vapi

2013
Second Prize National Energy Conservation Award from Ministry of Power, Govt. of India

2010
Second Prize National Energy Conservation Award from Ministry of Power, Govt. of India

Energy Conservation Award Jalgaon

2016
National Energy Conservation Award – Second 2016

2012-13
Maharashtra State Level Award for Energy Conservation - Second

2011-12
Maharashtra State Level Award for Energy Conservation – Third

2009-10
National Energy Conservation Award – First 2010

2008-09
Maharashtra State Level Award for Energy Conservation
Energy Efficient Management

Management
- Goals
  - Planning
  - Energy Accounting

Team Work
- Staffing
  - Training
  - Outsourses
  - Partnership

Resources
- Documentaion Tool
  - Assessment

Energy efficient O&M
- Tune ups
  - Automatic Controls
  - Tracking
  - Preventive O & M
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*Best Practices*
Centralized Cross Functional Team

A cross functional team is formed by the top management across the three units of Vapi, Jalgaon and Chhindwara

- To share views and best practices across the units keeping energy conservation as the main motto
- Quarterly meetings are held in rotation in any one of the units and further action plans are listed out.
- To carry Audits (Members of other units) and find out more scope for Energy Conservation. Also third party audit is done.
- Internal audit of Energy Management System

This has fostered an environment of collective growth and improvement with specific focus on energy conservation.
New Technology Adoption & Innovative Ideas

- Installation of Solar Power Plant / Solar Water heaters
- Utilizing Energy Efficient LED, Induction Lighting Technology.
- Installation of Variable Frequency Drives at various applications
- Automation at various places
- Permanent Magnet Motor in Cooling Tower Fan
- Waste Heat recovery System aligned with air compressor
- Implementation of nature switch/motion switch
- Installation of sky pipes for day light harvesting.
- Replacement of old production machineries with new technology energy efficient machines.
- Utilization of heat of compression dryers.
BEST PRACTICES ADOPTED FOR ENERGY CONSERVATION

STEAM/THERMIC FLUID LINE
Close monitoring of the consumption patterns of all the applications so as to minimize the specific consumptions. Minimum pressure/temperature required at plant to be maintained at boiler. Maintaining minimum permissible stack temperature and excess air. Regular Insulation Audits for Steam as well as Thremic Fluid Line insulation for minimizing the losses by Thermography. Proper sizing of the steam line & condensate line. Regular Steam Trap Audits are conducted for Steam line. Machine Return water is used for process heating. Condensate Waste Heat Recovery. Installation of Flow Control Valve on

ELECTRICITY/POWER
Thermal imaging carried regularly for detecting hot spots for reducing electrical losses & Maintenance cost. Improving Power Factor by installing Capacitors at various applications. Replacement of Old Inefficient motors with Energy efficient motors. Replacement of Tube lights with LED Fittings which consume less power. Installation of VFDs at various locations for reducing power consumption. Use of controllers- Level, Temperature, Motion etc. Regular Energy Audits are conducted in-house as well from external parties. Monitoring of Harmonics.
BEST PRACTICES ADOPTED FOR ENERGY

COMPRESSED AIR SYSTEM

Capacity Tests are conducted for individual compressors for improving output & Leakage Test for the plant
Proper sizing of air piping according to pressure drop.
Regular audits conducted for checking leakages. Installation of Flow Controllers at sections with lower air pressure requirement.
Installation of Flow Controller on Cleaning Air Line (Separate from Process Line) at 3.0 kg/cm2.
Installation of Compressors with VFDs thereby reducing consumption accrued during NO-LOAD condition as in case of Constant Load Compressors.
Installation of air flow meters.
Reduction in the generation of compressed air pressure
Initially the micro filters were located at the outlet of each compressor. They are repositioned to a common filter bank at the outlet of receiver tank. This leads to the uniform loading of compressors and saves a lot of energy.

WATER CONSUMPTION

Machine Return Water taken back into process.
Reutilization of Treated Effluent for process through RO Plant.
Regular Checking for Leakages & arresting the same.
Installation of new water efficient machines which consume less water.
Rain water Harvesting during rainy season accounting for around 70 Lac liters in a season.
Water Audit is conducted from external agency for looking in for optimum utilization.
LED Lighting

Light pipe

Heat Recovery System from compressor

Solar street light

Solar Water Heater
Raymond as responsible corporate, promote small group activities with teams of 5-6 members who are made to select the problems.

Our Small group activities has received many laurels at different forums. Few Small group activities are listed below:

- Installation of steam ejector in direct heating systems.
- Installation of JUMBO FILTER(Ingersoll Rand NL Module).
- Power saving by changing delta to star connection in ring frame machines.
- Replacement of pumps with high efficiency pumps.
- Replacement of 36W 6000 fluorescent tube light in plant with 18W LED tubes,
- Conversion of DC to AC mangle motor with VFD on stenter machine in finishing dept.

- Energy saving by installation of VFD on speed frame machine at PV Spg.
- Energy saving by conversion of DC to AC drive on stenter no.4 at finishing dept.
- Energy saving in compressed air system by reducing generation of air pressure.
- Biogas generation from sizing mix waste.
- Replacement of Exhaust Fan by Turbo Ventilator.
Department wise power, water & steam consumption monitoring with analysis of variation in data. Leakage Audits for air, steam & water.

Regular Insulation Audits for Steam as well as Thermic Fluid Line for minimizing the losses. Steam Trap Audits.

Close monitoring of the consumption patterns of all the applications so as to minimize the specific consumptions.
Installation of Heat Recovery System on Air Compressors

Prior to installation of heat recovery system, we were using cooling tower for cooling lubricating oil of compressor unit. This cooling tower was connected load of 8 kW & running 24 hrs/day. In this existing system heat was wasted & it can not reuse up to the date. By installation of heat recovery system we achieve the following benefits

1) Waste Heat recovery in compressor in terms of heated water at 80c which is used for our Dyeing M/c’s. This has reduced steam required for heating water from 30°c to 80c

2) Cooling Tower load reduces by 50%, thus achieved the saving in electrical energy.
Replacement of AWT fans with High efficiency aerodynamic FRP fan in Air Washer Tower

Project Description:

Replacement of existing fan with increased CMH by using Aerofoil Fan for enhancement in department working condition.

Newly installed fan delivered 186330.40 CMH by using the power consumption is of 23.93 kW/hr were as earlier FRP fan delivering the 105407.16 CMH with the same power consumption.

Total Investment : 3.64 Lacs

Energy Saving per annum: 67284 kWh

Energy Cost Saving per annum: Rs 6.410 lacs
Replacement of Screw Compressor Motor (150HP) by IE 3 motor

Project Description:- In our compressor room, on compressor no 2, We have replaced existing 150 HP motor with high efficiency motor IE 3, here we have achieved saving of 9.49 units per hour and 81082.56 units per annum.

Thus achieved cost saving of Rs. 4.86 Lacs per annum.
Free float traps in chillers & m/c

In all the five VAM chillers, Wool scouring, Formula and CIMI the conventional traps have been replaced with new free float traps.

These traps are designed to reduce thermal energy consumption.

An estimated saving of 2300MT of steam will be saved annually through this initiative.

Savings as of Jan-18

In units: 1250 MT of steam

In Rs: 14.38 lacs
Replacement of Old inefficient motors with High Efficiency Motors in Air Washer Towers

We have replaced total 7 nos. of high efficiency motors in Air Washer Towers

Annual energy consumption before = 108508.75 KWh
Annual energy consumption after = 91420.75 KWh
Annual energy saving = 17088 KWh (for 1 nos. motor)
Annual Cost saving = Rs. 0.98 Lacs (for 1 nos. motor)
( Per unit rate = Rs. 5.75 )
Annual total cost saving for Lacs = Rs. 6.87
7 nos. motor
Installation of VFD on 110 KW motor of Cooling water pumps at CPP

We have installed VFD on 110 KW motor of cooling water pumps at CPP.

The achieved energy saving data analysis is as

Annual energy consumption before  = 434035 KWh
Annual energy consumption after    = 365683 KWh
Annual energy saving              = 68352 KWh
Annual Cost saving                = Rs. 3.93 Lacs
Compressor monitoring & controlling system

We have a compressor monitoring & controlling system. It has been used to monitor all compressors & we get all the data like speed, alarm, running hours, pressure, Temp. etc. The system uses microprocessor control & high accuracy electronic pressure detection device (including single pressure band control) to reduce the operating pressure of individual compressors within the system.
AIR MONITORING SYSTEM

• Compressed Air is a major contributor to electrical power consumption.

• Air monitoring system is used to monitor the air consumption in each department. With the help of this system, the department reports of Daily air consumption, inlet air, outlet air consumption can be viewed.
TFO MACHINES SPEED AUTOMATION

(From Individual Machine to Centralised Software System)

Installation of 2 nos. of HMI’s, in which drives of all TFO Machines are interfaced with PLC so that the speed & power status can be monitored and controlled.

FEATURES AND ADVANTAGES

➢ Found Easy for analysis of all TFO machines.
➢ Status of Power Consumption on daily basis is monitored.
➢ Remote Speed change of machines can be done.
➢ Alarm Records i.e. Last Fault Code analysis.

In Future, we will add the RPM Trends Analysis of machines so that lot changing time, stoppage time as well as breakdown time can be monitored.
INSTALLATION OF SOLAR POWER PLANT AT VAPI PLANT

Installation of Solar roof top power plant of **640 kW** at Sampling, Recombing and Grey Combing Roof.

<table>
<thead>
<tr>
<th>MONTH</th>
<th>UNITS GENERATED</th>
<th>Approximate Savings in Rs. (At 7.5Rs/unit)</th>
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<tbody>
<tr>
<td>DECEMBER 2017</td>
<td>42531</td>
<td>318982.5</td>
</tr>
<tr>
<td>JANUARY 2018</td>
<td>60511</td>
<td>453832.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>103042</td>
<td><strong>772815</strong></td>
</tr>
</tbody>
</table>
Summary

The Energy Efficiency Activity helps to:

- Save energy
- Reduce costs
- Protect the environment

Now and in the future!
THANK YOU