

Raymond Limited (Textile Division-Chhindwara)

Unit Profile

Raymond Limited under the flagship of **JK Group** (Western Division) is undoubtedly Numero Uno in the Indian Textile Industry comprises of four units. **Textile Division-Chhindwara** The plant is at a distance of 57 kms. From “**Orange City**” Nagpur and 70 kms. From Chhindwara on Nagpur-Chhindwara road. The 100-acre plot stands as a pioneer in the socio-economic development of this region. is situated at Boregaon Industrial Growth Center, which became operational in April 1991. A composite plant manufacturing high quality, up market fabric in polyester-wool and polyester-viscose blends. It also has a subsidiary unit manufacturing furnishing fabrics. Unit has achieved 95.9% capacity utilisation in the year 2001-02 which is considered very high in the Textile sector. The company's flourishing presence in this region is a tribute to the cooperation of the people here. The success has promoted other projects in this region and improved the quality of life in general. This all round growth is an ongoing process at RAYMOND.

ENERGY CONSUMPTION

With the help of regression analysis i.e. benchmarking and historical analysis, inspite of increase in non-productive connected load we have achieved better specific energy consumption. The specific energy consumption for the year 2000-2001 is 4.53 the increase in specific consumption was due to increase of non-productive connected load by 999 HP. For this year with judicious & effective use of energy, we have minimized the specific consumption to 3.65.

Description	Unit	2002 - 03	2003-04	2004-05
Electrical energy	kWh/mtr	4.00	3.72	3.65
Thermal energy	Kcal/mtr.	4915.28	4787.89	4564.09
Total manufacturing cost	Rs. Lakhs.	18805.97	19199.30	23203.32
Total energy bill	Rs. Lakhs.	2614.89	2661.49	2513.252
Energy as % of total cost of production.	%	13.90%	13.86%	12.15%

Energy conservation commitments, policy & setup

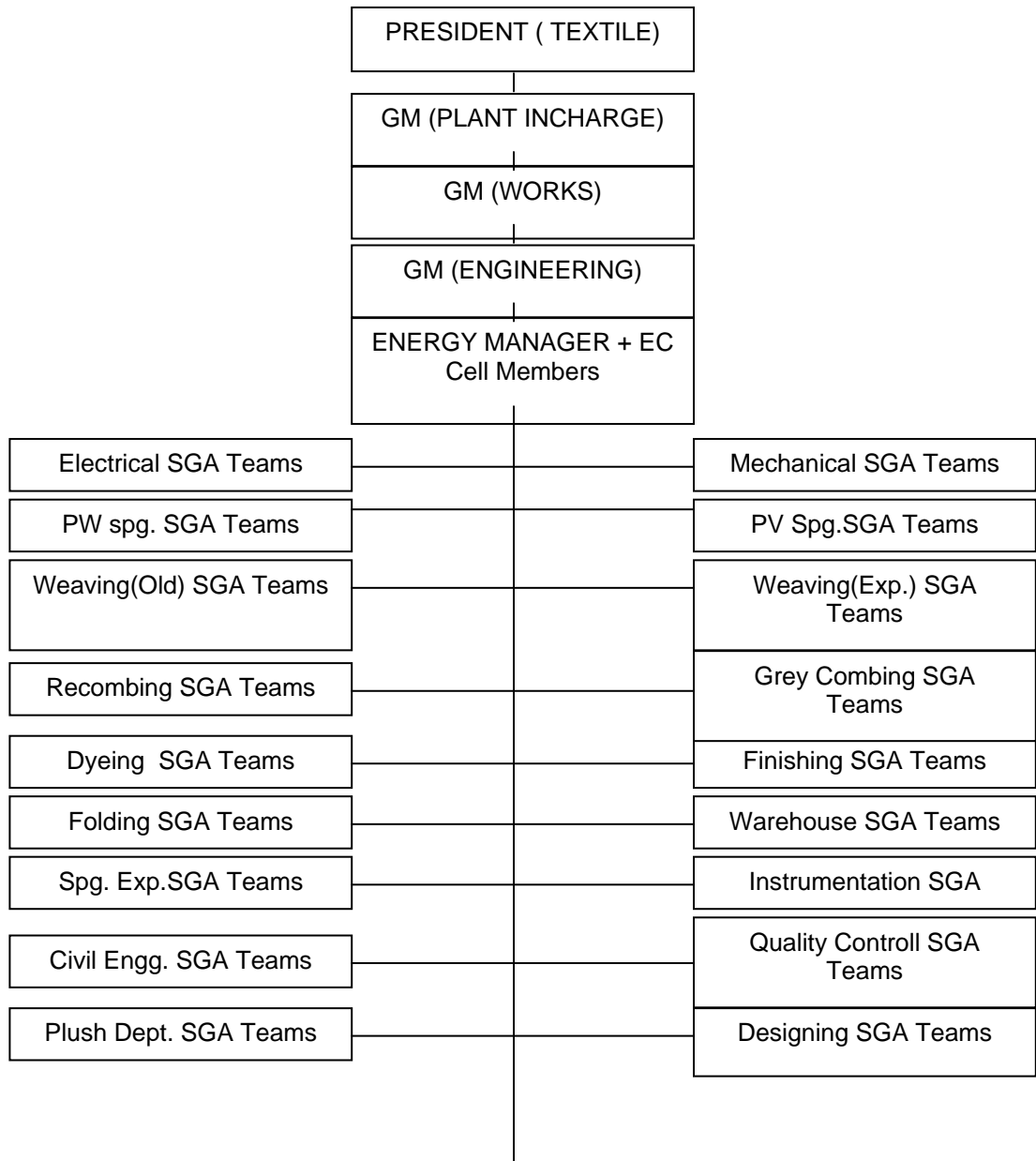
Section & equipment wise specific consumption is regularly monitored to know how much we are consuming & where. For this we are providing metering equipment in each of the utilities wherever possible to keep close watch on consumption pattern to avoid inefficiencies. In an unending venture to improve energy efficiency & optimization of all resources study and audits are carried out on every energy consuming equipment on its each aspect for conservation of energy. Different training programmes, seminars, are arranged for plant personnel for making them energy conscious which helps to keep a check on energy consumption. We have released a Energy Management Policy & Environmental Policy 1st June 2002 for different commitments towards the organizational as well as national interests.

A clear-cut strategy has been formulated and full-fledged Energy Conservation Cell has been formed at corporate level & at unit level also. The Energy Conservation Cell is being well equipped with measuring instruments like Digital Load Manager, Flue Gas Analyzer, Pyro Meter & See-Tech Software package, Hygro Meter, Anemo Meter, Digital Energy Meter, Lux Meter Digital calibration meter etc. The implementation of energy conservation scheme through Energy Conservation Cell is given the highest

priority. Based on the recommendation made by EC Cell and reviewed by various level committees, the decisions are taken for implementation of energy conservation programmes.

The Energy Conservation Cell at Raymond Ltd., Chhindwara is headed by General Manager (Engg.), who is reporting directly to Vice President (Textiles) & GM Plant Incharge. to carry out energy audit and find out potential areas where energy can be saved.

ENERGY CONSERVATION CELL STRUCTURE



Energy conservation achievements

“Knowing how much we are consuming where” is first step towards energy conservation

It is evident from the graph that specific energy consumption is showing declination (line AB & DE) whenever the connected load is constant. In case of increase of connected load the specific consumption has gone up but not in the same proportion of increase in connected load. This is because of the continuous efforts towards measuring, monitoring & implementing innovative projects and technologies for the conservation of energy as tabulated below.

ENERGY CELL ACTIVITIES OVER THE YEARS

ENERGY CELL ACHIEVEMENTS & INVESTMENT DETAILS OVER THE YEARS			
YEAR	ENERGY SAVING PER ANNUM		INVESTMENT RS. In Lakhs
	(Lakhs kWh)	Total Saving (Electricity + Fuel) Rs. In Lakhs	
2002 – 2003	35.52	179.02	53.49
2003 – 2004	37.87	183.90	67.31
2004 - 2005	18.50	82.29	67.60
TOTAL	91.89	445.21	188.40

“ BY- PRODUCT OF ENERGY CONSERVATION IS CLEANER ENVIRONMENT ”

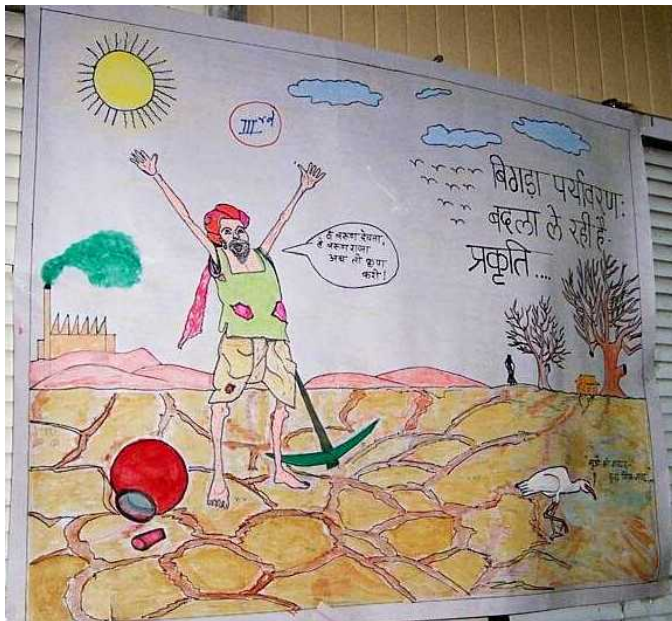
Energy Conservation Plans and Targets

For Specific Consumption-

Year	Electrical kWh/Meter	Thermal kcal/Meter	Reduction over the year 2004-05	
			Electrical %	Thermal %
2004 – 2005 (Base Year)	3.65	4564.09		
2005 – 06	3.61	4518.45	1	1
2006 – 07	3.58	4472.81	2	2
2007 – 08	3.54	4427.17	3	3

Awareness Among the Citizens near by Factory Premises

To create awareness among the citizens of near by Township a lot of activities were carried out. The main among these were distribution of Pamphlets Full of tips on Cutting down the electric bills, demos on energy efficient appliances, and various low cost solutions to fight with Electric Load shadings/ use of gas geysers instead of electric heaters. Also the Demos were organised for attention of Common peoples to use Branded energy efficient products instead of low cost high energy consumable unbranded products. Also the awareness was created to discourage the peoples for using the Fossil Fuels creating the pollution and affecting Environment.



SAVING AFTER INSTALLATION OF AUTOMIZER

Initially two pumps were running at 25 MLC. After installation of atomizer only one pump is running at 32 MLC (during winter and rainy season).

Energy Consumption details before installation of Automizer : 5.67 Kwh/Hr

Energy Consumption details after installation of Automizer : 4.88 Kwh/Hr

Considering both the cases for Pump operation

A) When Both Pumps in running condition (Dry Whether)

Power saving = 3160 kwh per annum

Saving in Rs. = 12640 per annum

B) When One Pump is stopped (Wet Whether)

Power saving = 13608 kwh per annum

Saving in Rs.= 54432/- per

Total saving A+B = **Rs. 67072 per annum**

Total investment for procuring of Automizers = **Rs.1,05,000/-**

Pay back period = 18 Month

ENERGY SAVING ON CARDING M/C BY REMOVING SUCTION FAN MOTOR (2.5 HP)

Previously Suction fan 2.5 HP is provided in the M/c for waste collection. Now Drive given for suction fan through Main Motor by making modification in the system and saving is achieved.

Unit Consumption Before Modification : 4.65 Kwh/Hr

Unit Consumption After Modification : 3.89 Kwh/Hr

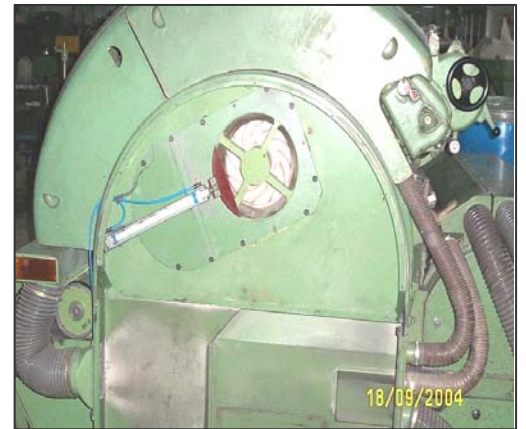
Project implemented for 10 Nos. M/c's

Energy Saving /Annum for 10 Nos. M/c' = 55175

Saving /Annum for 10 Nos. M/c's in Rs = 220700/-

Investment: Rs.175000/-

Payback- 8 Months.



POWER SAVING BY INSTALLING INVERTER ON TURBO PUMP OF TOP DYEING MACHINE

Background of Project : To regulate the flow most of the timing throttle valve is used. Instead of Regulating the Flow with throttle Valve use of invertors is more economic.

Observation: In top Dyeing M/Cs Turbo Pump is used for recirculation of Liquor in Tops Dyeing Process. According to Quality and Quantity of tops the flow is regulated with throttle valve. So instead of throttling the valve Invertors can be Installed to regulate the flow and electrical energy can be saved considerably.

Power consumption for 20 hp turbo pump motor of top dyg.100 kg. No. 8 without inverter : 10.32 kwh /hr
 Power consumption for 20 hp turbo pump motor of top dyg.100 kg. No. 8
 With inverter : 4.93 kwh/hr
 Energy Saving Per Annum = 26939 Kwh / annum
 Saving in Rs. Per Annum = Rs.107756 per annum
 Total 3 No. machines modified
 Energy Saving for 3 M/cs = 80817 Kwh / annum
 Saving in Rs. For 3 M/cs = Rs.323268 per annum
 Investment = Rs3,60,000/- (Cost Of 20 HP invertors)

Simple payback = 1.2 Year



POWER SAVING ACHIVED BY REMOVAL OF 2 HP SUCTION FAN MOTOR BY PROVIDING STOP MOTION SENSOR ON SPEED FRAME IN P/V SPINNING DEPT.

Old machines used suction Fan for collection of Slivers in case of breakage as no electronic sensors were not provided for stop motion
 Instead of sucking the broken slivers, to stop the machine and reconnect the Sliver is better option.
 Also due to this wastage of Energy as well as material can be reduced.

Unit consumption before installation of stop motion sensor : 5.40 kwh/hr
 Unit consumption after installation of stop motion sensor : 4.51 Kwh/Hr
 Energy Saving Per Annum = 4699 Kwh
 Saving in Rs. Per Annum =Rs.18796/-
 Total 2 No. machines modified
 Energy Saving Per Annum for 2 m/cs = 9398 Kwh
 Saving in Rs. Per Annum for 2 M/cs =Rs.37592/-
 Investment : **Rs.16000/-**
 Payback : **9 Months**



ENERGY SAVING ON WORSTED SPINNING RING FRAME M/C BY REMOVING ONE NO. SUCTION FAN MOTOR BY MAKING MODIFICATION IN DUCT

In Textool Ring Frame machine there were 2 suction fan motor s with independent duct for two sides of machine.

In house trial was conducted on pilot Ring frame m/c by providing common motor by modifying double duct to single duct with high efficiency impeller, found there was no change in suction pressure through out the operation.

After successful trial of one month we have implemented this project for 30 machines.

Unit Consumption Without Modification (with two Nos. 4 HP Motors) : 5.69 Kwh /Hr

Unit Consumption With Modification (with One 4 HP Motors) : 3.19 Kwh /Hr

Unit saving per hour for one M/c = 2.46 KWH / Hr.

Unit saving per Annum =19680 KWH / Annum

Project Completed for 11 Nos. of m/cs

Saving in kwh per annum (for 11 M/cs.) : 216480 kwh per annum

Saving in Rs. (for 11 M/c.) :865920 Rs. Per annum

Investment : Rs. 440000

Payback : 6 Months



Energy saving by Splitting and addition of Textool WS/90 Ring frame from 456 to 528 spindles resulting of stopping 1 No. Ring Frame machine.

Average Energy consumption of Ws-90 Ring Frame m/c with 456 Spindles before modification 9.7 KWH.

By splitting and addition of Textool Ring Frame we have converted it from 456 spindle to 528 spindles which resulting complete stoppage of One Ring Frame for modification in Six Ring Frames. And there is no change in Per Hour unit consumption in Ring Frame M/c

After Modification by maintaining same Speed and Count Due to modification Saving observed as below.

Energy Saving Per Annum : 64020 kwh per annum

Saving in Rs. Per annum : 256080 Rs. Per annum

Investment : 30,000 Rs.

Pay back : One Month



ENERGY SAVING ON COOLING BLOWER MOTOR BY PROVIDING INTERLOCKING WITH GAS SINGEING MACHINE AT FINISHING DEPT.

In spite of m/c. is stopped auxiliary units were running continuously.

Previously 5 HP cooling blower motor running continuously even after the m/c. stopped. Now Blower motor interlock with m/c and saving is achieved.

Energy Consumption Before Interlocking : 20.40 Kwh/Hr
 Energy Consumption After Interlocking : 13.6 Kwh/Hr
 Saving in kwh / Annum : 2428 kwh per annum
 Saving in Rs. per annum : 9712 Rs.
 Per annum
 Investment : Nil



ENERGY SAVING ON LAFER SHEARING No.2 BLOWER MOTOR BY INTERLOCKING WITH MAIN MOTOR

In spite of m/c. is stopped auxiliary units were running continuously. Previously 3 nos. 20Hp . Blower Motors are running continuously even when main drive is off. Now Interlocking is provided with main drive to avoid idle running of blower motor and saving is achieved. Trial was taken by providing interlocking with Machine to avoid idle running of Blower Motor.

Per Hour Consumption Of Blower : 28.29 Kwh /Hr
 Blower Motor Running Hours Before Interlocking : 16.81 Hr/Day
 Blower Motor Running Hours After Interlocking : 13.45 Hr/Day
 Saving Hours Per Day : 3.36 Hrs /Day
 Saving in kwh per annum : 65.05 x 357 = 33932 kwh per annum
 Saving in Rs. Per annum : Rs. 135731/- per annum
 Investment : Nil



Comparison Study For Air Washer Tower -Existing 10 HP Pump Motor With High Energy Efficient 10 HP Pump Motor

Previously 10 HP Becon make Monoblock pump was installed in the AWT. We have taken trial by installing coupled pump in place of Mono block pump for less maintenance point of view and failure. After installation of coupled pump it is observed that this gives power saving with less change in delivery which is not effective for the process.

UNIT CONSUMPTION FOR 10 HP WATER PUMP (BECON MAKE) AT AWT NO. 7 = 8.30 Kwh /Hr

Unit consumption for 10 hp water pump (Kirloskar make) at awt no. 7 = 6.45 Kwh/Hr
 Energy saving per Hr. = 1.85 Units/Hr
 Saving per annum = 14529 Units / Annum
 Saving in Rs. per Annum = 58116 Rs.
 Saving per annum for 10 no Pumps.= 145290 Units / Annum
 Saving in Rs. per Annum for 10 no. pumps = 581160 Rs.

Investment (Including Pump with Motor and installation cost) = 400000
 Payback - 8 Months



Energy Saving in R.O. Plant by replacing 20 HP Conventional Pump with 15 HP High Pressure Energy Efficient Pump

Previously 20 HP Conventional pump was installed in RO Plant This pump was Old horizontal multi stage pump.
 We have taken trial by installing high pressure Energy Efficient vertical multi stage 15 HP pump in place of Conventional pump. Since the efficiency of this pump is higher by almost 8 % . Considerable saving was achieved.

UNIT CONSUMPTION R O PLANT H. P. PUMP (20HP)	
CONVENTIONAL PUMP :	11.58 Kwh / Hr
UNIT CONSUMPTION R O PLANT H. P. PUMP (15HP)	
ENERGY EFFICIENT VERTICAL PUMP :	8.98 Kwh / Hr.
Saving Per Hour	= 2.6 Kwh /Hour
Saving Per Annum in KWh	= 20800 Kwh
Saving per Annum @4Rs per Kwh	= Rs. 83200/-
Investment	= Rs. 113000/-
Payback	= 16Months



ENERGY SAVING THROUGH REARRANGEMENT OF LIGHTING IN WORSTED SPINNING DEPT/ UTILITY AREA

Previously Twin Tube fittings were provided for passage/utility area without reflector.
 Rearrangement of lighting, Providing Single Tube Light in place of Twin Tube Fitting with Reflector and Lumilux tube is done for W/SPG Dept Ring Frame Preparatory area ,Ring frame Yarn area, Autoconer M/c area , TFO Yarn area, Ply winding area, and in T1, T2, T3 shed , DG Room area, Compressor area, Toilets in W/Spq.

Total No. of fittings Removed after Rearrangement : 300
 Energy saving per day = 259.00 Kwh/day
 Energy Saving per annum : 92463 Kwh/Annum
 Saving in Rs. per Annum : 369852 Rs. Per Annum



ENERGY SAVING BY STOPPING AIR WASTAGE ON PICANOL LOOM BY INSTALLING SOLENOID VALVE

Previously When Picanol loom is not in operation, there is process air loss occurs through the m/c system.

Now we have provided solenoid valve which operates when m/c is in stop condition and saves the process air loss.

Air loss per day per M/c is for 1 Hr Approx.

Energy loss Per Annum Per M/c = 6521 Kwh

Energy Loss for 15 M/cs per Annum = 97815 Kwh

This Gives Saving in Rs. Per Annum = 391260 Rs



ENERGY SAVING BY REDUCING THE SUPPLY VOLTAGE OF STREET LIGHT

Previously streetlights of B-Line Pole were running on Voltage 420V,
So by reducing the Voltage by 5% i.e. transferring the Load on Lighting Transformer. Saving is achieved.

Energy Consumption Before Modification :76 Kwh /Day
Energy Consumption after Modification : 56 kwh/Day
Saving Per Day : 20 Kwh/Day
Saving in Kwh per annum – 7300 Kwh/ Annum
saving in Rs. Per annum =Rs.29200/-
Investment – Rs.2000/-



ENERGY SAVING IN RING FRAME M/C BY REMOVING 1 NO. SUCTION MOTOR IN PW SPG. DEPT.

In PW Spg. Ring Frame machine there were 2 suction fan motor s with independent duct for two sides of machine.

In house trial was conducted on pilot Ring frame m/c by providing common motor by modifying double duct to single duct with high efficiency impeller, found there was no change in suction pressure through out the operation.

Unit Consumption for P/W Spg. Ring Frame No. 13 With 2 nos-4HP Suction Fan Motor : 5.81 Kwh /Hr

Unit consumption for PW Spg. Ring Frame No. 13 with 1No-4HP Suction Fan Motor : 3.80 Kwh/Hr

Energy Saving per Hr. = 2.01 Unit /Hr.

Energy Saving per annum = 16080 Units per Annum



Energy saving in Humidification and Air Conditioning for the Year 2004-05 in comparison with the year 2003-04 By doing automation of Humidification Plants in Worsted, Plush, Combing, Grey Combing & Close Monitoring

Humidification plants and Air conditioning are designed for optimum requirement and extreme weather condition. At our location temperature in winter Season goes down 10°C minimum. It was observed that by regulating airflow and water spray lot of energy can be saved without disturbing the required condition. After the automation at Humidification Plant for S.A.F. & R.A.F. Setting of inverters done as per ambient condition automatically and close monitoring.

To reduce the wastage of conditioned airflow during Man / Material movement from humidified / Air-conditioned area to non-humidified / Air-conditioned area provided Automatic doors and Air curtains. Done the automation for some Humidification plant and provided partition wall between working area / Non working area increase the efficiency of Humidification plant.

Winter season ambient temp. become less. It was observed that by regulating airflow, required condition could be maintained. Setting of inverters done as per ambient condition, also by close monitoring setting was altered time to time.

Energy saving in Total Humidification and Air Conditioning load is (Comparing Consumption for the year 2004-05 with the year 2003-04) = 858587 - 7632978= 952893 KWH

Energy Consumption for the year 03-04 Before Automation : 858587 Kwh / Annum

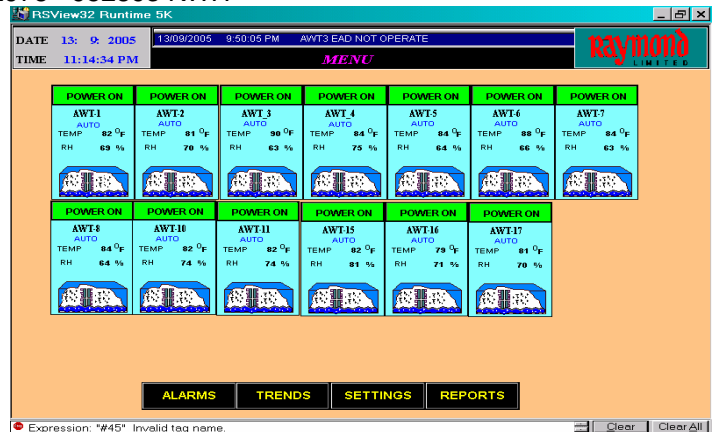
Energy Consumption for the year 04-05 After Automation : 7632978 Kwh / Annum

Energy Saved Per Annum : 952893 Kwh / Annum

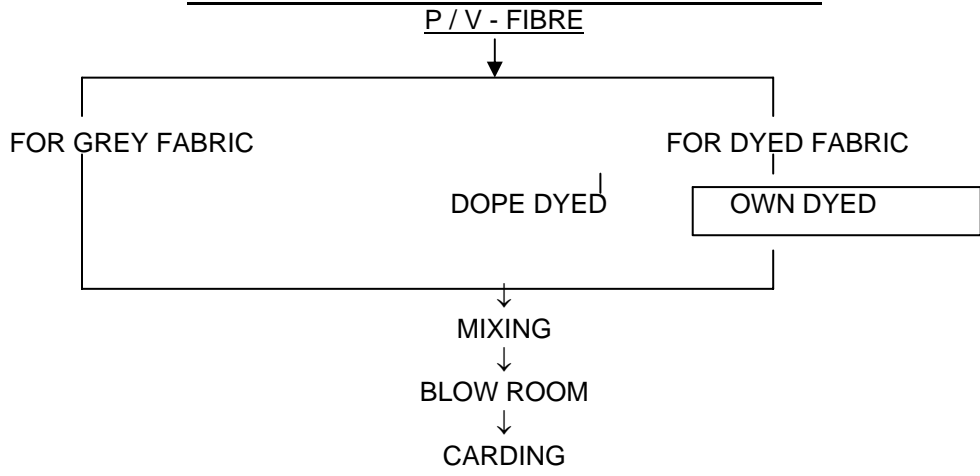
Saving In Rs = 38,11,572 Rs./ Annum

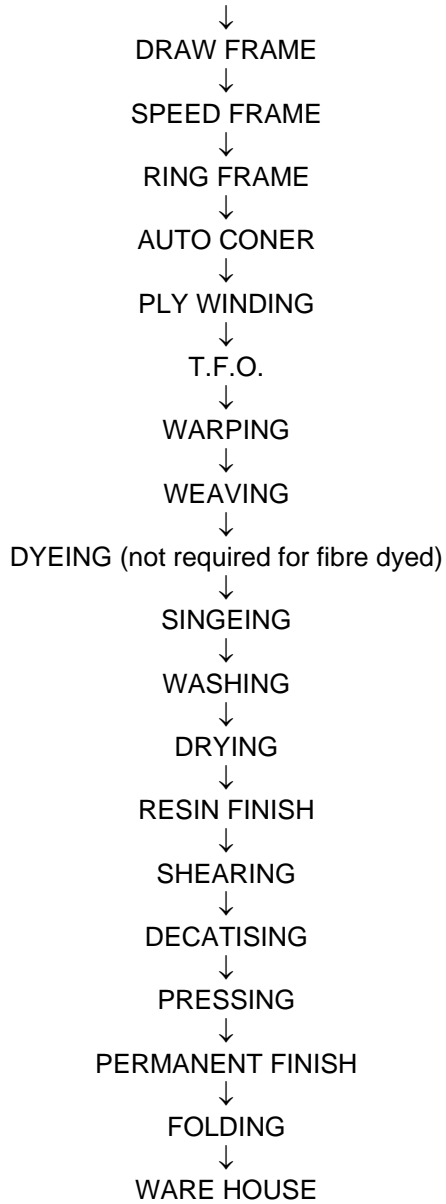
Investment : 45,000,00/-Rs

Pay back : 14 Months



POLYESTER VISCOSE FABRIC PROCESS CHART





POLYESTER WOOL FABRIC PROCESS CHART

