

**ARVIND LTD**  
**Khatraj, Dist. Gandhinagar (Gujarat)**

**Unit Profile**

Arvind Limited is a textile manufacturer and the flagship company of the Lalbhai Group. Its headquarters is in Naroda Road, Ahmedabad, Gujarat, India

The year 1930 was when the world suffered the great depression. At about this time, Mahatma Gandhi championed the Swadeshi Movement and at his call, people from all across India began boycotting fine and superfine fabrics, which had so far been imported from England. In the midst of this depression one family saw opportunity. The Lalbhais reasoned that the demand for fine and superfine fabrics still existed. And any Indian company that met this demand would surely prosper. The three brothers, Kasturbhai, Narottambhai and Chimanbhai, decided to set up a mill to produce superfine fabric. Next they looked around for state-of-the-art machinery that could produce such high quality fabric. The best technology of that time was acquired at a most attractive price. And a company called Arvind Limited was born.



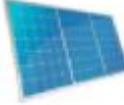
In 1997 Arvind set up a state-of-the-art shirting, bottom weights and knits facility, the largest of its kind in India, at Santej. With Arvind's concern for environment a most modern effluent treatment facility with zero effluent discharge capability was also established.

Arvind has carved out an aggressive strategy to verticalise its current operations by setting up world scale garmenting facilities and offering a one-stop shop service, by offering garment packages to its international and domestic customers. With their growing global footprints, Arvind has carved a niche with brand names like Arrow, Flying Machine, USPA, New Port, Mega Mart and The Arvind Store.

Today, Arvind has diversified into other major segments like Fabrics, Garments, Advanced Materials, Chemicals & Dyes, Retail, Engineering, Real Estate, Sustainable Agriculture and Telecom. **The unit is certified with ISO 50001:2011, ISO 14001:2015, ISO 9001:2008 and OHSAS 18001:2008**

**The company is committed to sustain & improve its performance at all levels. At present, the unit has 71% Higg validated score on Sustainable Apparel Coalition (SAC) dash board.**

### Arvind's leading practices to ensure environmental sustainability

 <p>Water</p>	 <p>One of the largest <b>Zero Liquid Discharge</b> plant in Asia at shirting unit</p>	 <p><b>Use of Sewage water</b> from nearby communities as process water at Volles plant</p>	 <p><b>100% process water</b> from recycled water at Denim laundry facility</p>
	 <p><b>India's most energy</b> <b>efficient</b> textile unit, awarded two years in a row</p>	 <p>One of the <b>largest solar</b> <b>roof-top plant</b> in Gujarat under installation</p>	 <p>Specific <b>energy</b> <b>consumption reduced</b> <b>by 20%</b> over last four years</p>
	 <p><b>Robust quality check</b> established for incoming chemicals</p>	 <p><b>In house state of the</b> <b>art IQC lab</b></p>	<p><b>Ø ZDHC</b> <b>Globally first textile mill</b> to sign a pact towards zero discharge of hazardous chemicals</p>

Arvind

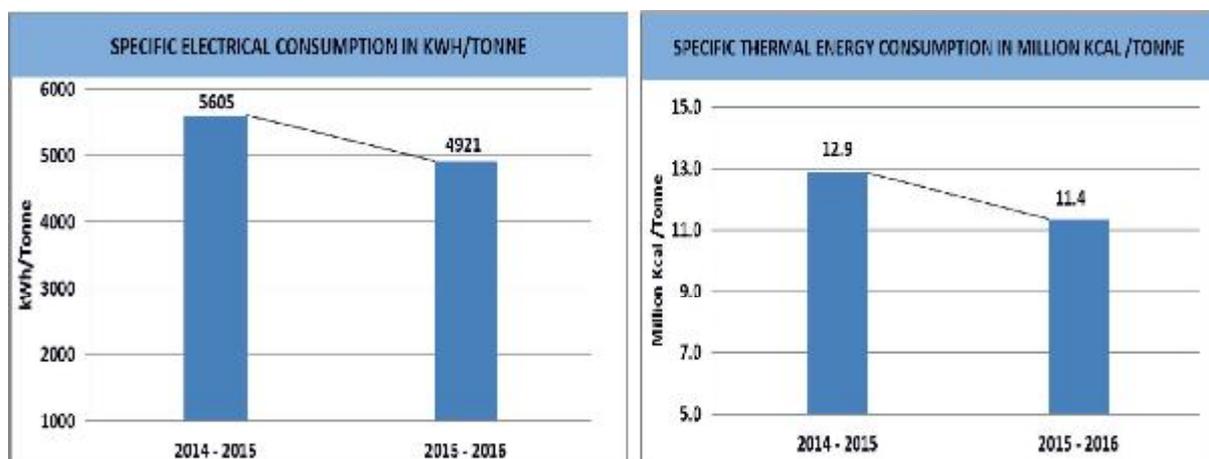
## Energy Consumption

As an effect of various energy conservation measures implemented so far, the plant has achieved savings in Specific Electrical energy up to 12.19% and up to 11.80% saving in Specific Thermal energy consumption for the year 2015-16.

Year	Product	Specific Electrical Energy Consumption kWh/ tonne	% Reduction over 2014 - 2015	Specific Thermal Energy Consumption Million kCal/ tonne	% Reduction over 2014 - 2015
2014 - 2015	38111	5605	--	12.88	--
2015 - 2016	42583	4921	12.19	11.36	11.80

## Specific Consumption

The Specific Electrical energy consumption & Thermal Energy consumption data for last two years is shown as below:



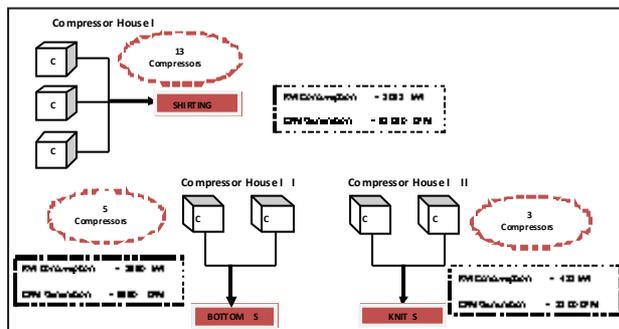
## Energy Conservation measures implemented

In textile industry, energy cost is a vital component of the product manufacturing. In composite plant, energy cost related with electrical, steam, air & water are very high. To be competitive in the market, it is imperative that energy cost should be as low as possible at the design stage itself.

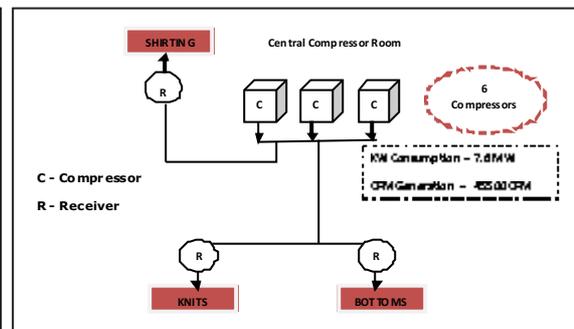
## 1. Air Compressors

Compressor system ranks fourth in terms of power consumption, which makes it all the more important for any textile unit to work towards energy conservation and energy management. In line with the above, the following initiatives were taken:

- Old screw compressors were replaced with energy efficient Centrifugal compressors which led to reduced specific power consumption.
- Manual air drain valve of Air compressors cooler were replaced with Pneumatic no load drain which avoided compressed air wastage.
- Non – lub screw compressors were replaced with lub screw compressor in spinning department, which led to reduced compressor specific power consumption.



*Schematic diagram of decentralized screw air compressors*



*Schematic diagram after modifications: centralized air compressor*

## 2. AC Variable Speed Drive (VFD)

There are many type of equipments which are operated for different process conditions like variable pressure/ flow requirement of fluid/ solids and the speed of the motor varies as per the requirement. In order to match the adequate requirement of various processes, AC drives were installed at the following equipment/ machines:

- Raw water supply where water requirement is always fluctuating.
- Aerators in Central ETP
- Waste collection system fans of blow room areas in spinning plant.
- Pressure dryers blowers in yarn dyeing area

## 3. Energy Efficient Pumps

Dramatic energy and cost savings can be achieved in pump systems by applying best energy management practices and purchasing energy-efficiency equipment. In line with this, an exhaustive exercise was carried out to assess the performance of pumping system with the help of external as well internal team. In this exercise,

the low performance pumps were replaced with energy efficient pumps and under the selection category, the high performance & energy efficient pumps were chosen for further installation.

#### 4. Heat Recovery System

The company identified high potential area for heat recovery and installed Heat recovery system in effluent water which was drained at 70 deg. C, which thereby helped to reduce the thermal load in the processing area. Company has also installed Air preheater at 20 TPH & 30 TPH steam boiler.

#### 5. Loom sphere Concentrated Humidification Plant

The company has replaced the Conventional humidification plant with the Loomsphere Concentrated Humidification Plant. With this modified design of loom focused humidification, power required per loom for humidification is now reduced to half.



*Installation Loomspahare concentrated Humidification plant in place of conventional*

#### 6. LED lights

Installed 18W X2 nos. LEDs fitting in place of 36 W X 2 nos. in Loomshed, Rewinding & processing area where lighting load is major contributor on total power share. This installation helped the plant to reduce the power consumption drastically.

#### 7. Mechanical Vapour Recompression Evaporator (MVRE) in ZLD plant

Installed MVRE in Zero discharge plant & reduce the load on MEE, which resulted into huge steam saving.

#### 8. Use of Natural day light

In order to reduce the lighting load, the translucent sheets were installed in process shed of bottomweight, knitswear, shirting, inspection & ware houses.

## 9. Turbo ventilators on the Roof

To exhaust out the hot air from production area, generally motor operated exhaust fans are installed which are highly inefficient. The plant went ahead and installed turbo ventilators on the roof to exhaust out the hot air. This system uses the speed of wind for spinning of vanes. The vanes move at the slightest push and continue even when the breeze has stopped due to the flywheel effect using the dynamic body weight. This facilitates the exhaust system to work round the clock without any expenditure on electricity.

## 10. Energy Enhancement Coating

Special insulation painting was done in steam pipes to reduce radiation loss in Karl Mayer Dyeing machines.

## Energy Policy

**ARVIND**

**ARVIND LIMITED**  
**ENERGY POLICY**

Arvind Ltd, Santej plays a leading role in national & global economy by providing quality textiles.

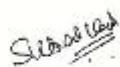
**Our mission is :**

- To become the most energy efficient textile mill in India.
- To minimize the adverse impact of our operations on the environment.

**We shall achieve this through:**

- Integrating energy management with the business management and establishing performance driven goals.
- Upgrading hardware, deploying new technologies and improving our practices to increase energy efficiency, reduce greenhouse gas emissions and minimize environment impact.
- Optimizing specific energy consumption by implementing energy conservation projects, innovations and incorporating new energy efficient technologies, products and services.
- Setting and reviewing objectives & targets for continual improvements related to energy performance.
- Promoting energy conservation awareness among all members of the Arvind Family and community at large through trainings, workshops and seminars.
- To encourage the procurement of energy efficient products & services and consider energy efficiency in future designs.

Date: 1<sup>st</sup> August 2016  
Place: Ahmedabad

  
**Susheel Kaul**  
 CEO - Life Style Fabric  
 (Shirting, Khakhi & Knit Wear)

**TRIDENT LIMITED**  
**(Home Textile Division)**  
**Budhni (Madhya Pradesh)**

**Unit Profile**

Trident Group is a leading diversified group of businesses. Trident Limited (Trident) is the flagship company of Trident Group, a USD 1 billion Indian business conglomerate and a global player. With the establishment of the state-of-the-art manufacturing processes and systems coupled with appropriate human capital and credentials, Trident has frequently received accolades from its patrons in recognition for delivering high quality standards and for its customer-centric approach.

With a modest beginning of 17,280 spindles of yarns, the group today exports to over 100 countries emerging as one of the largest integrated home textile manufacturer in the world.

- Business interests in Home Textile, Yarn, Paper & Chemicals and Energy
- World’s largest manufacturer of Terry Towel with World’s Largest Towel Manufacturing Unit Budhni with Production Capacity of 146 TPD.
- One of the largest manufacturer of wheat straw based paper
- One of the top 10 yarn manufacturers in India



### **Energy consumption of last two years**

<b>Year</b>	<b>Specific Energy Consumption Electrical kWh / T towel</b>	<b>Specific Thermal Energy consumption million kCal/T towel</b>
<b>2014-15</b>	3310	9.53
<b>2015-16</b>	2849	8.4

### **Major Energy Conservation project completed**

#### **Project 1 - Compressor SEC Reduction from 0.172 to 0.160 KWH/CFM.**

Sub steps taken to achieve milestones are;

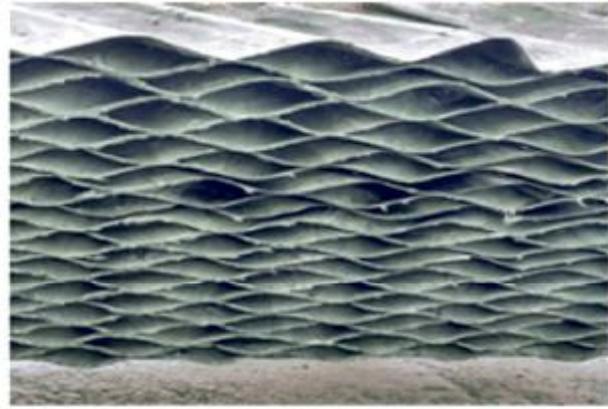
1. Towel Unit was previously supplied compressed air at a pressure of 8 Bar which was optimized to 7.5 Bar.
2. SEC of Compressor further improved with improved maintenances, CLRI & Autonomous Maintenance of Inlet Filters which reduced Inlet Air DP.
3. Installation of Two Energy Efficient Centrifugal Compressors
4. Proper Planning also done for full utilization of Compressors & to prevent Compressor from operating in Air Bypass Mode.

Electrical Energy saving: 20 Lakh KWH

#### **Project 2 – Power reduction at Biological Treatment unit**

Sub steps taken to achieve milestones are;

1. Stopping mist pump by reducing effluent inlet temperature and improving cooling tower effectiveness.
2. Installation of VFD at Feed pump
3. Stopping one cooling tower fan (11 KW) during winters and during night shifts.
4. CT motor load reduction by optimizing fills spacing and changing nozzles
5. Increasing cleaning frequency of feed tanks to avoid choking.
6. Providing strainers in CIP pit and MEE feed pump suction line to avoid any choking in the feed of PHE which could possibly obstruct the feed flow.



Electrical Energy saving: 15.5 Lakh KWH

**Project-3 HRU Installation at Compressor:**

Process House in Towel Unit was supplied Fresh Water at ambient temperature where water temperature is raised to 80°C or 110 C by steam. Heat Recovery Unit is installed with Compressor during Expansion in place of Simple Compressor. Waste heat from compressor is recovered and water temperature is increased to 70°C. Fuel (coal) saving is 805.6 Tons per year

**Project -4 Flash Steam recovery through Heat Exchanger & Flash Vessel:**

Flash steam from Steam Condensate from PTR Machine is recovered by installing flash tank and generating hot water. Fuel (coal) saving is 348.7 Tons per year



Project-5 Flash Steam recovery from Process house steam condensate tank:

Heat Exchanger is installed near CRP Area to recover flash steam from Condensate of Process House Steam, Fuel (coal) saving is 739.8 Tons per year



### List of ENCON projects

Initiative	Savings, Lakh kWh
Preventing idle running of Looms	1.21
VFD installation on 18.5 kW Pump in Weaving H-plant,	0.72
Preventing idle running of Fan Motor in Anglada Machine	1.63
Controlled running of recirculation pump at PTR	0.32
Controlled running of recirculation of washer	0.02
Automation of Lighting in non working area of CSP	1.22
Utilization of filter water pump head for Softener feed and stopping softener pump.	0.50
Installation of VFD at BFP at Boiler	2.25
Preventing Blower Motor of Length Hemmig & CCCH Machine ideal running during change over	0.21
Utilizing Cotton Waste from Yarn in Boiler. Total Waste feed is 2.5 TPD,	

**RAYMOND UCO DENIM PVT. LTD.**  
**Yavatmal (Maharashtra)**

***Unit Profile***

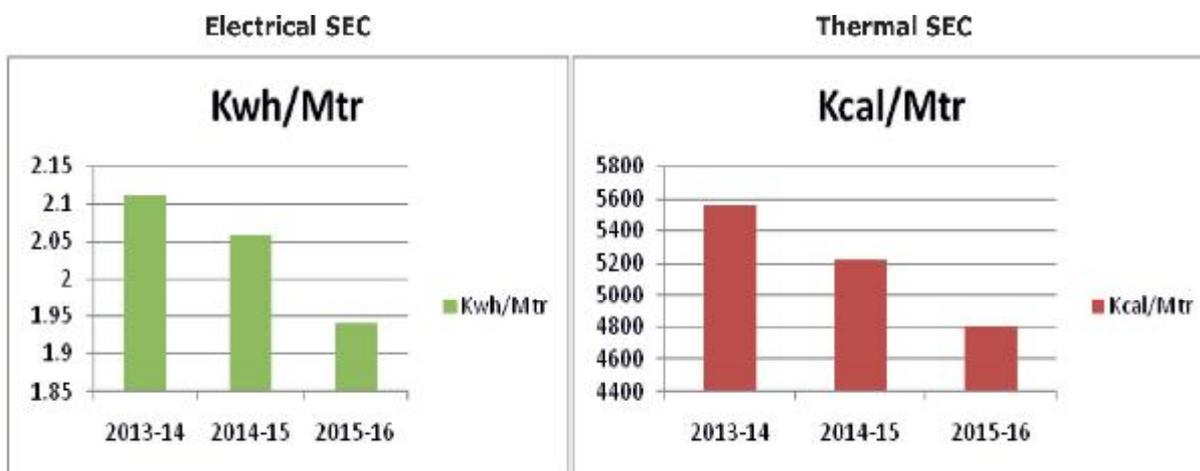
**Raymond Group** is a front runner in the Indian textiles market. Denim plant of Raymond is one of the largest Denim fabric producers in India. Raymond Denim is well recognized in India and created a favorable image in international market for its superior product.

The plant is located in Yavatmal (Maharashtra) and manufacturing one of the best Quality Ring Denim fabric. In the year 2015-16, 371.71 Lac linear meter fabric was produced and sales turnover is Rs. 74531 Lakhs. Investment made for Encon project For FY -15-16 is Rs. 872 Lakhs and Saving of Rs. 510 Lakhs/year.

The Unit strive continuously to reduce the specific energy consumption by a well established system in place for monitoring, and finding innovative techniques for adopting Energy Efficient Equipment and machineries.



## Specific Energy Consumption



### SEC Consumption of Plant for Last Three Years:

Years	Kwh/Mtr	Kcal/Mtr
2013-14	2.11	5559.59
2014-15	2.06	4976.35
2015-16	1.94	4802.99

### Electrical & Thermal Energy Saved In Last Three Years:

Years	Electrical Energy Thermal Energy	(Lacs KWH) ( Million Kcal)
2013-14	10.02	4902.45
2014-15	14.75	23069.14
2015-16	44.4	23600.46

### Energy Conservation Measures Planned for 2016-17:

Electrical Saving Lacs KWH	Thermal Saving Million Kcal
21.34	9032

## List of ENCON Project Implemented – 2015-16

Project description	Achievement of Annual energy savings in 2015-16						Investment (Lakhs Rs)
	Electricity (Lakh kWh)	Fuels*				Total savings (Rs. Lakhs)	
		Coal (MT)	F.Oil (kL)	Gas (MT)	Total fuel (MTOE)		
Centrifugal Compressor installation 2 Nos. capacity 4100 CFM each	20.62	0.0	0	0	177.34	123.72	300
Waste Heat Recovery at HT Compressor	0.00	1100.0	0	0	429.96	44.00	25
Fogging system in Spg. - 1 and Spg. - 2	8.80	0.0	0	0	75.68	52.80	35
Installation of PNLD to 1 No. Centrifugal Compressor.	1.20	0.0	0	0	10.32	7.20	5
Installation of Turbo Ventilator - 95 Nos.	2.04	0.0	0	0	17.55	12.24	10
Installation of Transparent sheet - 25 Nos.	0.50	0.0	0	0	4.30	3.00	5
Installation of 4000 LED tube lights in place of FTL.	6.87	0.0	0	0	59.11	41.24	24
Reduction in coal consumption through various measures like - RO water to Boiler, Insulation, Waste heat recovery at process machines.	0.00	3596.0	0	0	1405.58	143.84	350
LPG saving through optimization of machines setting.	0.00	0.0	0	6.73	0.00	3.10	0
Installation of 55 KW Solar plant.	0.79	0.0	0	0	6.77	4.73	30
Installation of Back pressure Turbine in steam line.	3.58	0.0	0	0	30.79	21.48	55
Using coal additive to reduce coal cons.	0.00	1322.0	0	0	516.73	52.88	33
<b>Sub Total</b>	<b>44.40</b>	<b>6018.0</b>	<b>0</b>	<b>6.73</b>	<b>2734.13</b>	<b>510.23</b>	<b>872</b>

## Major Projects Implemented For Energy Conservation in FY 2015-16:

### 1 \* Installation of HT centrifugal compressor in place of Screw-



**Investment Rs. = 300 Lacs**  
**KWh saving = 20.62Lac / year**  
**Saving Rs. = 123.72 Lacs / year**

## 2. \*Installation Of waste Heat recovery at HT Compressor

Before



After



**Investment Rs. = 25Lacs**  
**Saving of coal = 1100 MT /year**  
**Saving Rs. = 44 Lacs /year**

## 3. \*Installation Of fogging system at Blow Room



**Investment Rs. =35 Lacs**  
**Saving Kwh = 8.80 Lac / year**  
**Saving Rs. = 52.8 Lacs/ year**

**Back Pressure Turbine in steam line**



**Investment Rs. = 55 Lacs**  
**Saving Kwh = 3.58 Lac / year**  
**Saving Rs. = 21.48 Lacs/ year**

**LED tube light 4000 nos**



**Investment Rs. = 24 Lacs**  
**Kwh Saving = 6.87 Lac / year**  
**Saving Rs. = 41.24 Lacs/ year**

**4. \* Solar Panel 55 KW \_**



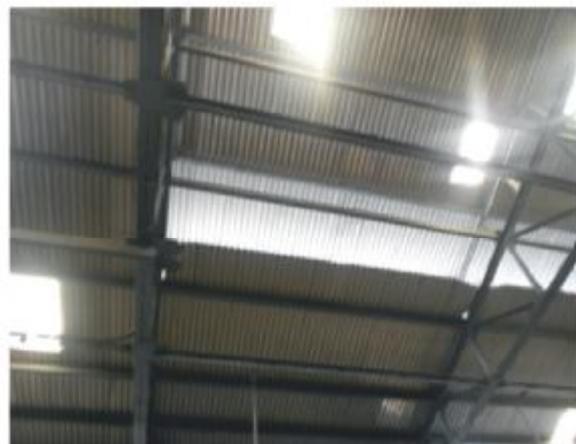
**Investment Rs. = 30 Lacs**  
**Saving KWH = 0.79 Lacs/year**  
**Saving Rs. = 4.73 Lacs/year**

**\* Transparent Sheet and Light Pipes \_**

**Light Pipe**



**Transparent Sheet**



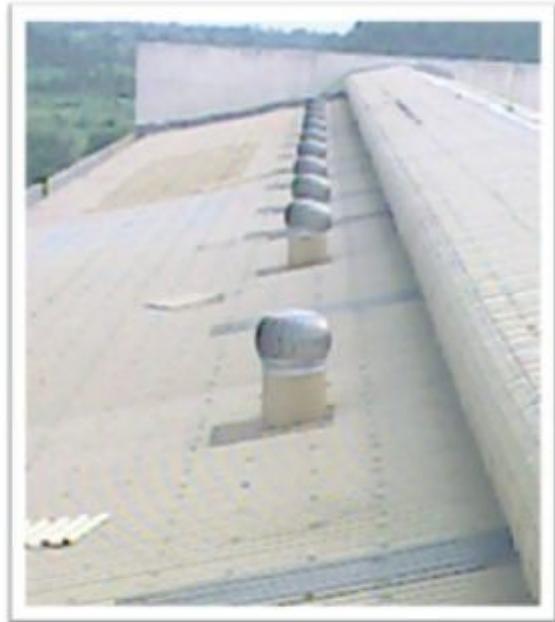
Investment Rs. = 5 Lacs , KWH saving = 0.52 Lac /year, Saving Rs. = 3.0 Lacs/year

## 5. Use of Renewable Energy Sources:

### \* Use of Solar Energy



### \* Use of Wind Energy



### **Energy Management Policy:**

We at Raymond UCO (Denim Division), Yavatmal, involve in the production of High quality Denim Fabric and Yarn are dedicated to Conserve Energy for the self, National and global interest without affecting our product quality.

We strive continuously to –

- Reduce specific energy consumption of the plant.
- Use renewable energy sources wherever possible.
- Rationalize the consumption of fossil fuels.
- Implement the innovative techniques to reduce energy consumption.
- Comply with the Energy Legislation and other regulations.
- Spread and implement the information of energy conservation techniques in Organization.
- Educate the people / student on the benefit of energy conservation.
- Reduce the specific energy consumption of our plant by 1% for next 5 years.

Nitin Shrivastava  
Works Director