

***OWENS CORNING (INDIA) LIMITED***  
***Taloja, New Mumbai.***

**OWENS CORNING (INDIA) LTD.** is a Joint venture between M/S Owens Corning USA and M/S Mahindra & Mahindra from India. Owens Corning USA is a global leader in Glass Fiber manufacturing and building material providers. The Company started its commercial production in the year 1999. Current manufacturing capacity of this plant is 35,000 tons/year. More than 80% of the product is exported while rest is consumed in domestic market.

Introduction to Owens Corning Composites Systems Business: Owens Corning is dedicated to creating value for customers by delivering cost-effective solutions that replace traditional materials such as wood, steel and aluminum.

Glass fiber composites have become a material of choice for added performance because of their design flexibility, higher strength, lighter weight, corrosion resistance, electrical properties and cost reduction benefits. They are used in more than 40,000 end-use applications. Owens Corning has built a core competency in solving advanced material needs in virtually every major industry.

To help create new product concepts, Owens Corning can support customers' design processes and concept implementation with its System Thinking™ approach. Starting with an understanding of customer needs, the *System Thinking* strategy involves new combinations of materials, equipment, processes and services that go beyond today's common practices

Owens Corning has developed a number of new products for composites. These include Advantex® glass fiber, a new proprietary glass formulation that will permit global consistency, and AquaBlok™ and Instant Dry™ coating technology for telecommunications cables, which prevents sensitive optical fibers from water damage.

Owens Corning India ranks among the top 20 Net Foreign Exchange earners in India. OCIL has received the Capexil award for countries Top Exporters for three consecutive years from 1999 to 2003.

The manufacturing plant of Owens Corning India is located at Taloja, approximately 40 Kilometers outside Mumbai. The plant manufactures state-of-the-art glass fiber reinforcement materials on an international scale. The plant was set up to manufacture Advantex glass, one of Owens Corning's proprietary glass formulations. This glass is used to manufacture chopped strand mats (CSM), multi-end Roving and Type 30 Roving.

The plant was awarded ISO 14001 certification in January 2001. The company later obtained OHSAS 18001 certification in the year 2001 and ISO 9001:2000 in year 2002. December 2003 all these three systems were integrated into one system i.e. Operation Management System™ (OMS) which is certified by LRQA, India.

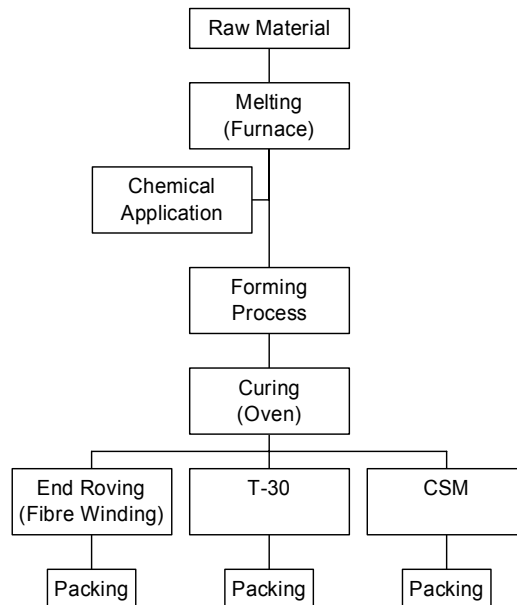
Energy is 25% of the product cost and therefore is a major area of focus for all. The company has a unique feature called as Mission Possible Energy. This is a forum where the ideas to improve energy consumption is awarded. This forum helps and encourages the shop floor personals to participate and be aware of energy consumption. In past, this program done on global basis, where all the Owens Corning plants used to participate. The India Plant was awarded as the Global Winner of Energy Mission Possible plant of the year for two consecutive years 2000 and 2001. Now this forum is shifted to plant level and continues to do the good work in the plant.

The company has incorporated the energy saving policy as a part of ISO policy so as to keep a constant focus on the subject. During ISO/ OMS audits the area of Energy savings are also audited and certified. All energy saving project are certified as a part of one of the OMP (Operation Management Program)

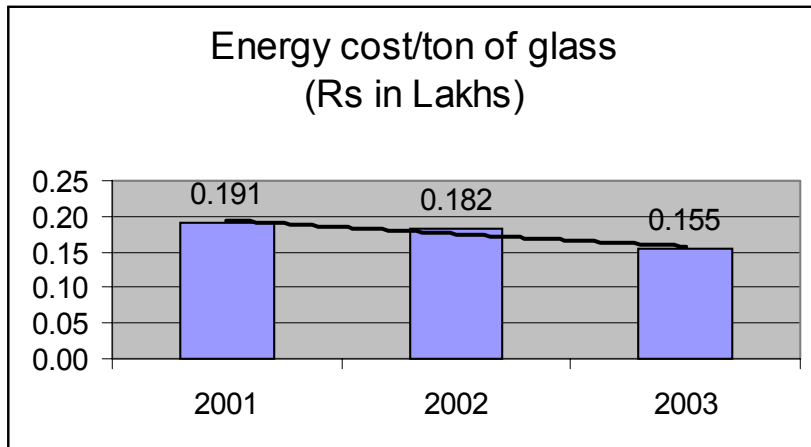
Energy Cell, to bring a focus on the subject of energy saving, company has identified an Energy manager and an Energy auditor to continue the focus on Energy saving activities in addition to their other responsibilities.

### Manufacturing Process Flow Chart

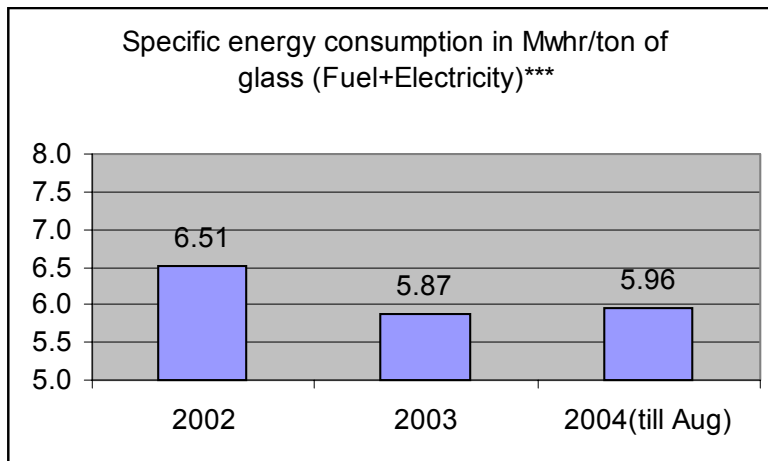
Manufacturing Process Flow Chart



## Energy Cost



## Specific Consumption



\*\*\* The fuel (LSHS,LDO and Propane) are converted into Mwhr and added with Electricity in Mwhr.

## **Energy Conservation Commitment, Policy and Set up:**

Owens Corning India is committed to save Energy. To enhance this commitment and create the awareness at shop floor the "Mission Possible Energy" program is introduced and on a quarterly basis the best project in energy saving is awarded.

Owens Corning India has an Integrated "Operation Management System" (OMS) Policy, which also includes the company's commitment on Energy. The policy is as shown below:

## **OMS POLICY (ISO 9001:2000,ISO14001,OHSAS 18001)**

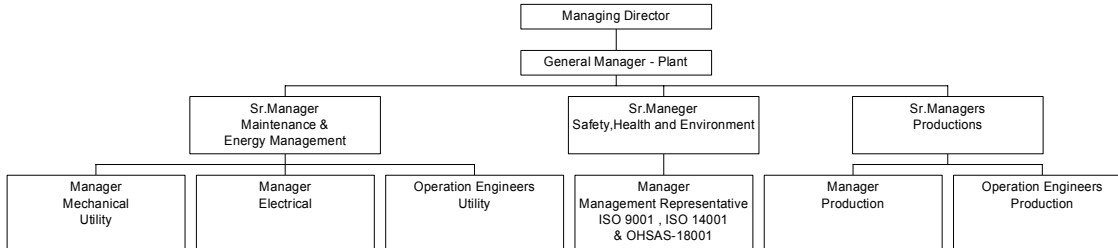
We at Owens Corning (I) Ltd, manufacturers of Glass Fibre Reinforcements, are committed to the following key values:

- 1) Prevention of occupational Injuries and illnesses to our employees, contractors and visitors by:**
  - Risk assessment and control at all stages of our processes, equipment and methods.
  - Hazard elimination
  - Providing a safe work environment
  - Sustaining an ongoing Ergonomics program.
- 2) Fulfillment of customer requirements through:**
  - Proactive identification of customer's needs by establishing Fitness for use criteria
  - Consistent product quality
  - Exceptional customer service
  - Continual Improvement of our processes and work practices.
- 3) Protection of the environment by promoting:**
  - Prevention of pollution
  - Recycle, reuse and recovery of our process elements including water, energy and byproducts.
  - Appropriate changes in the use of raw materials, methods and technology
  - Controlling air emissions, solid and hazardous waste, utilities consumption and liquid effluent.
- 4) Efficient management and optimization of our energy consumption by:**
  - Exploring avenues for employment of low emission fuels in our operations
  - Up gradation of hardware wherever necessary
  - Sharing ideas on energy conservation with like organizations
- 5) Optimization of our business process by:**
  - Increasing our process efficiencies
  - Effective utilization of resources
  - Mutually beneficial customer supplier relationship
  - Use of cost effective alternatives
- 6) We foster continual improvement in these areas by:**
  - Employee Engagement
  - Increasing awareness levels of our employees and related personnel
  - Establishing appropriate performance metrics
  - Using Six Sigma approach

In doing so we will comply with all the relevant applicable legislations, regulations and other requirements that govern us.

This policy will be made available by OCIL to any one concerned on request.

## ENERGY CELL STRUCTURE



### Energy Conservation Achievements:

In year 2003, Owens Corning India has implemented 4 major energy saving projects. Together this has resulted in a saving of Rupees 26 lakhs for the year, with a minimal investment of Rs 4.35 lakhs.

The details of Energy saving project implemented in 2003 are

#### 1. Installation of AC drive in Fuzz fan:

Using Six Sigma tools carried out a study for process change. Changing the speed of Fuzz Collection fan saw encouraging results. A saving of 290 Kw-hr was experienced. This was done by installation of a drive in the fuzz collection fan motor.

#### 2. Optimisation of plant Lighting:

Lux level in the different parts of the plant was studied and accordingly Light fittings were relocated to meet the required Lux levels. ON-OFF Switches were provided in areas, which were not of continuous operations and where other wise the lights used to remain ON. Use of energy efficient lights were incorporated in many areas. Some of the important areas where continuous lighting is not essential but light is required the moment one enters the room, like unitized substations, Auto Sensing devices were installed.

All this has resulted into a saving of 37285 Kw per month. Annualized Saving of Rs 14 Lakhs with a minimal investment of Rs. 1.3 lakhs.

**3. Bushing power reduction:** The average drop in voltage across the bushing secondary and bushing ear was 1000 mV. Based on the technical possibilities & best practices, A target was taken to reduce this voltage drop from 1000 to 800 mV. This target is as per the standard acceptable limits. It was found with new hardware the drop of 800 mV was possible but as these hard wares became old this was not possible. The project decided to refurbish the hardware used like Flexible bus bar, tubular bus bar of the bushing transformer. This was done (in India) and found the drop in voltage came down to 800 mV. Now every time during the bushing change we need not replace with new fittings but are reusing refurbished fittings. Since then we are maintaining a drop of 800 mV. This has resulted into the saving of **Rs 8.0 lakhs annually** - an investment of Rs 2.0Lakhs.

## Energy Conservation plans and Targets:

Energy Conservation Measures (Planned)	Anticipated savings Rs. Lakhs	Approx. Investment (Rs.lakhs)	Project Commencement & Completion year
Fuzz fan#2 speed reduction	0.613	0.05	2004 & 2004
Reduce energy consumption by 2% by providing online energy monitoring system	15	5	2004 & 2004
Fuel substitution (LSHS,Propane to Natural Gas)	400	200	2005 & 2006
Power quality improvement by reducing harmonic effects (4% Reduction in energy bill by achieving PF to unity)	50	80	2004 & 2005

## ENVIRONMENTAL AND SAFETY

As a corporate commitment, Owens Corning has the goal of maintaining one standard of environmental performance in all of its operations worldwide. As a result, the plant incorporates design and equipment for pollution controls that match the standards of Owens Corning's other international production facilities.

The project site is within an existing industrial estate for chemical manufacturing. The site is well removed from areas of concentrated population and ecologically sensitive areas.

The Taloja facility is a state-of-the-art with proprietary batch formulation technology. The Advantex Glas manufactured in this plant is an environmental healthy glass manufacturing process. This technology eliminates fluorides & Borates. Electrical boosting of the melter further reduces emissions of particulates, NO<sub>x</sub> and SO<sub>x</sub>. Wastewater treatment will incorporate neutralization, chemical coagulation and flocculation, primary sedimentation and activated sludge treatment. The project design also incorporates waste minimization and recycling programs and reclamation of by-products.

Owens Corning's routine project management approach will minimize environmental, health and safety hazards. The storage, use and handling of all raw materials are in strict compliance with established procedures at the company's operations worldwide.

The plant at Taloja was awarded ISO 14001 certification in January 2001.

## **1.Optimisation of plant Lighting:**

### **Project Scope:**

This project focused on three main areas to reduce the power consumption in lighting  
Measuring the illumination in all locations and optimizing based on standards

- Elimination of unwanted lighting.
- Reducing the lighting load during silent hours when not in use by providing necessary modifications

### **Some of the analysis used was**

FMEA (Failure Mode Effective Analysis) ,XY Metrics, Why Why analysis.

Examples

### **Why Why analysis**

- Why we need to provide lighting at un-manned area around the clock  
For visibility
- Why the entire lighting is ON  
There is no provision to shut off the lights at field side
- Why it was not provided  
Due to existing circuit design/ poor access to switch boards.

Action:

1. Identification of all such un-manned areas
2. Study & decide on circuit modifications
3. Fix the switches at convenient locations on/off control of fittings

### **Overall plant lighting analyzed and following action taken:**

- 1) Implemented SOP to control light fitting on/off operation in following areas:  
220KV Sub Station, Maint. Work Shop ,Bushing MCC
- 2) Some of the emergency light fittings converted to normal supply in following areas:  
SS, Glass lab, Alloy shop, TSO, Admin office
- 3) Provided switches at field site in following areas to operate light fittings: Utility, ETP, Batch house, Binder room, Winder Dog house, E-boost, FER shop, USS 1A/2A, Cake oven, Passages, Engg Stores.
- 4) Fixed sensors in Un-manned area i.e., in USS 3A/3B & 4A/4B. In this USS the lights will only be ON when someone enters in.
- 5) In some of the areas light fittings per area occupied was excess, hence removed unwanted fittings in area viz., Cake oven, above pipe racks & utilities etc.

### **Financial Analysis:**

The saving details are reported to Finance The details indicate the savings  
Monthly power consumed by lighting system (Before project ) = 144435 Units

Month	Lighting Consumption in KW after project	Savings in KW	Saved in Rs
Apr-03	100712	33354	103397.4
May-03	103832.0	29454	91307.4
Jun-03	99776.0	34524	107024.4
Jul-03	94076.8	41648	129108.8
Aug-03	96360.0	38794	120261.4
Sep-03	92372.0	43779	135714.9
Oct-03	95188	40259	124802.9
Nov-03	100292	33879	105024.9
Dec-03	95492	39879	123624.9
	Total	335570	1040267

Savings for 9months

Finally all Standard Operating Procedure were prepared and put the same in the Operation Management System (Integrated ISO system).After the project, the system itself is being taking care of the same. The check sheet under this system is an auditable tool and is being taken care similar to Quality requirements. This sheet is audited by Internal as well as external.

### **2.Bushing power reduction:**

Bushings are the special alloy part from where the Glass will flow out. This has an electric heating to maintain the heat of the metal surface. The average drop in voltage across the bushing secondary and bushing ear was observed to be 1000 mV. Based on the technical possibilities & best practices, a target was taken to reduce this voltage drop from 1000 to 800 mV. This target is as per the standard acceptable limits. It was found with new hardware the drop of 800 mV was possible but as these hard wares became old this was not possible. The project decided to refurbish the hardware used like Flexible bus bar, tubular bus bar of the bushing transformer. This was done (in India) and found the drop in voltage came down to 800 mV. Now every time during the bushing change we need not replace with new fittings but are reusing refurbished fittings. Since then we are maintaining a drop of 800 mV. This has resulted into the saving of Rs **8.0 lakhs annually** - an investment of Rs 2.0Lakhs.