

Second Prize

Drugs & Pharmaceuticals

ORCHID CHEMICALS & PHARMACEUTICALS LIMITED

Alathur Unit
Kanchipuram (Tamil Nadu)

Unit Profile

The Orchid Chemicals & Pharmaceuticals Ltd. Is a manufacturer of bulk Cephalosporin range of products (antibiotics), Intermediates and Neutraceuticals with two sophisticated manufacturing facilities in India (One at Alathur near Chennai and the other at Aurangabad) and formulation units at Irungattukottai, Alathur. The Alathur facility has a work force of about 1200 and a turnover of Rs.510 crores.

The unit is one of the largest manufacturer of Cephalosporin products in India and one among the top five in the world 100% EOU with ISO 9000, ISO 14000, US-FDA, TGA, EDQM, MHRA certifications.

Energy Scenario

Electrical power is generated from a CPP of 10.56 MW capacity (3.38 x 2nos. + 3.8 x 1no. FO Gensets). 110KVTNEB supply is in service as a prime source. Due to TNEB realization the plant demand has come down to 9.5 MVA against 10.5 MVA when operated of CPP due to improvement in power factor. Steam of 550 Tons per day is generated from 4 Nos. of FO fired boilers and 3 nos. of WHRBs. Fuel bill is approximately Rs. 47 crores per annum (50% for Utility, 20% for ETP and 30% for process)

Energy Conservation Achievements

Project-1

New process development with less solvent usage (50% reduction in solvent usage)

Earlier process: As per original technology, the MDC, Acetone specific consumptions were **14.71 Kg / kg, 18 kg /Kg respectively in Pavest & Cefixime (products).**

Modified Process: Now the process was optimized, and the specific solvent consumptions of MDC & Acetone were reduced to **7.92 & 9.0 respectively**. This has reduced the energy needs for processing the Solvent MLs to get recovered MDC & Acetone for the subsequent batches.

Energy Savings: As the ML quantities got halved There is a thermal energy saving equivalent to 433 **KL FO:** & Total power saved/year = **3.54** Lac units:

Investment- Nil
Annual Savings -Rs.70 Lakhs

Project-2

Optimization of distillation column operation by preheating the feed using the Vapor heat recovery technique

Earlier Process: The vapors from the column are condensed & sub cooled by the CT Water. The total steam requirement was 55 Tons/day.

Modified Process: The feed is made to pass through the condenser instead of CTW, and around 10 % of the heat is picked up by the feed. Remaining 90% heat is handled by the CTW .The total steam required/day is 50Tons/day.

Energy Savings: FO saved / year = 122 KL= Rs. 21 Lakhs

Investment – Rs. 80 Lakhs
Annual savings - Rs. 21 Lakhs

Project-3

Water cooled centrifugal chillers instead of Air cooled Screw chillers.

Earlier Process: In our 300 TR “+10” chiller plant, the air cooled screw compressors, were in operation consuming **1.2 kW/TR**

Modified Process: The Air cooled screw chillers were replaced by water cooled centrifugal chillers and the Specific Power consumption was **0.9 kW/TR**.

Investment -Rs. 13.7 Lakhs
Annual savings -Rs. 32 Lakhs

Project-4

The MDC condensation was done by CTW instead of “+10 using Plate HE- semi welded type- saving 100 TR load

Earlier Process: The MDC being a low boiling (39’c) solvent, “+10 was used in a shell & tube HE to condense vapors from the column. The SPC was 1.2 kW/TR. 3780 Kgs/Hr of MDC vapor was condensed

Modified Process: The MDC vapors are condensed by CTW using Semi welded type PHE which works even up to closer Delta T of 1.5 ‘c The SPC is 0.15 kW/TR

Investment -Rs. 30 Lakhs
Annual savings -Rs. 30 Lakhs

Project-5

Using “-70” brine from compressor instead of Liquid Nitrogen chilling in Manufacturing Process

Old process: Liquid Nitrogen (bought out from Prax, Inox air) was used for the process. Consuming 38 Kg of Liq Nitrogen/TR. In prax air, 1 Kg of liq Nitrogen consumes 1.2 Units. Therefore, SPC/TR = 46 units.

Current process: Using “-70” brine from OCPL utility plant instead of buying & using Liquid Nitrogen from Prax/Inox air. The chiller compressor units consumes = 6.6 Unit of power/TR.

Investment -Rs. 320 Lakhs
Annual savings -Rs. 426 Lakhs

Project-6

Using solar water heaters in canteen instead of electric heaters

Old process: In canteen 6 kW X 6 Nos. of electric water heaters (consuming 500 units /day) was used for generation of hot water.

Current process: Solar water heaters are used for hot water generation- saving 500 units/day

Energy savings: 1.6 Lakhs units of electrical energy saved/year = Rs 6.7 Lakhs

Investment - Rs. 10 Lakhs

Project-7

Replacement of multiple (low capacity - Reciprocating) old compressors by a single centrifugal air compressors

Earlier status: The compressed air was generated using, 2 nos. of KGK (Reciprocating-93 kW),3 nos. of CPT (Reciprocating – 55 kW) & one number CPT (Reciprocating -160 kW) (erected in the initial stages of plant start up).

Current status: Energy efficient Centrifugal Compressors (2000 cfm with 355 kW) was erected and used as the base load compressor. According to the demands, one of the old – smaller compressors was used for sudden demand variations.

Energy Savings: Around 1340 units power saving was observed. The saving is 4.48 Lac units/year = Rs. 20 Lakhs

Investment - Rs. 60 Lakhs

Annual savings - Rs. 20 Lakhs

Energy Conservation Plan and Targets

Specific Energy Consumption Planned Target for the year 2008-09 & 2009-10

Year	Electrical*	Thermal*	Reduction over the year 2007-08	
			Electrical%	Thermal%
2007-08 (Base year)	95858	126.7		
2008-09	94700	125	1.2	1.3
2009-10	93700	123.5	1.1	1.2

Plans

S. No.	Project Brief	Savings in Rs. Lakhs	Investments Rs. Lakhs
1	Choosing energy efficient ways to recover solvent like DMF, DMAc, A CN	340	200
2	Increasing the steam condensate recovery % from 85 to 90	20	5
3	Corresponding effluent reduction due to the above project by 25KL / day	112	0
4	Going for hot water fired VAS by using heat energy from effluent vapour of crystallizer plant	71	85
5	New process development with reduce quantity of solvent usage	108	0
6	Recovery gaseous nitrogen from used liquid nitrogen and stopping the existing nitrogen PSA plant	46	40

Environment and Safety

Orchid Alathur has installed a 5 effect evaporator plant to separate the salt from the effluent stream to reduce the TDS load on the down stream processes and have put up a large number of lean stream recovery facilities to recover the low boiling solvents from the ML with less than 5% of solvents. This includes MDC, Acetone, and Methanol etc.

Solid waste are used for bio decomposing and used for the cultivation of Jetropha - used for Bio diesel, Orchid Alathur spends around 35% of the total energy for treating effluent (Recovering Water from the effluent)

HINDUSTAN LATEX LIMITED
Peroorkada Post, Thiruvananthapuram (Kerala)

Unit Profile

Hindustan Latex has its corporate office at Thiruvananthapuram, the capital of 'God's Own Country' – Kerala. Two of the company's manufacturing facilities are situated at Thiruvananthapuram – one unit at Peroorkada, which manufactures condoms, and the other unit at Akkulam, which manufactures blood bags, Intra Uterine Devices, Surgical sutures, Hydrocephalus shunts, and Tissue Expanders. The third manufacturing unit for Condoms and Oral Contraceptive Pills is located at Kanagala near Belgaum, Karnataka.

Today HLL-Perookada unit is the single largest unit in the world producing male contraceptive condoms with a total operating capacity of more than 1 Billion condoms per annum



Energy Consumption

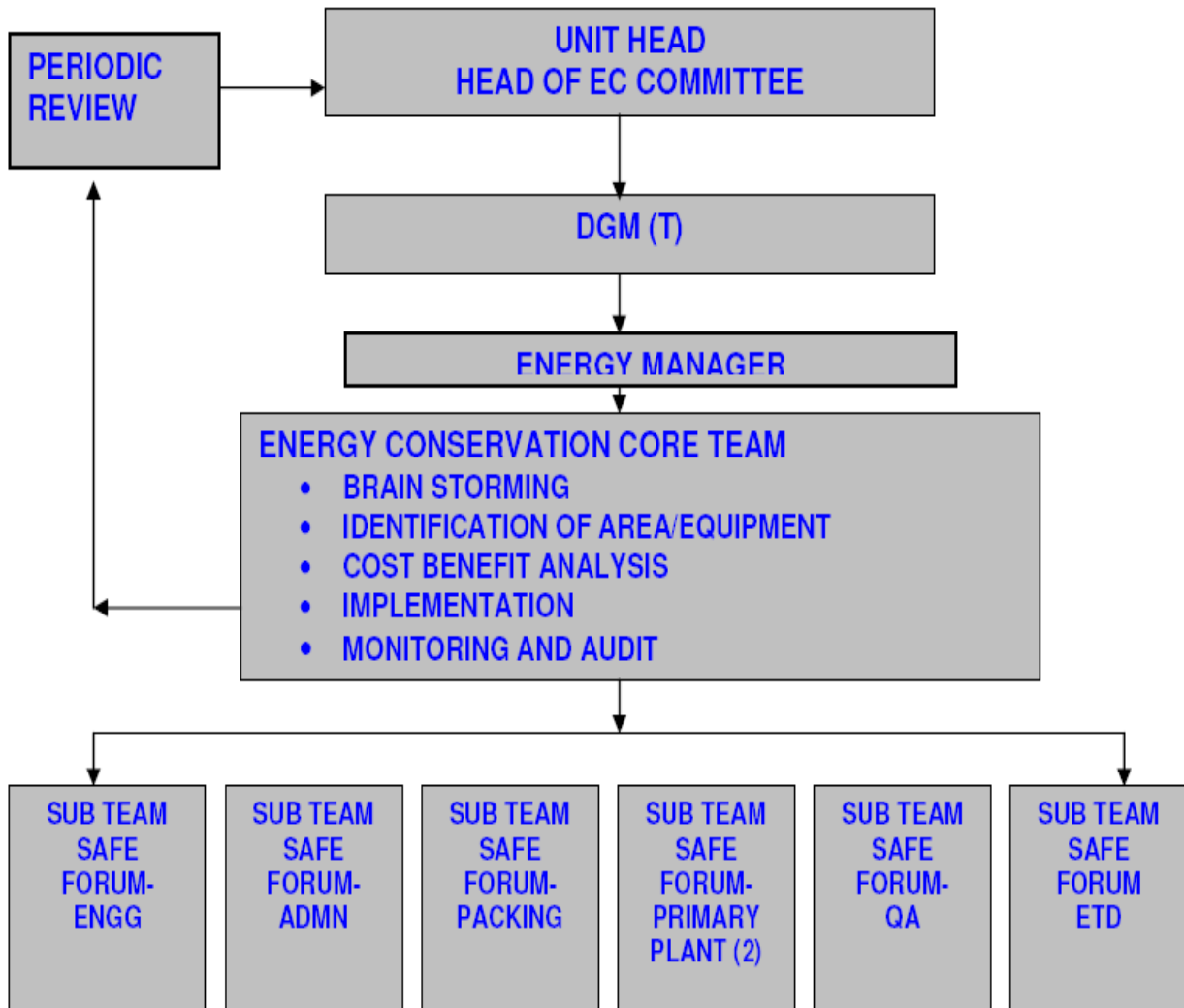
Description	Unit	2005-06	2006-07	2007-08
Annual Condom production	Million Pieces (MPcs)	844	878.54	898.08
Total Electrical Energy Consumption / Annum	Lakh KWH	66.18	62.50	64.86
Specific Energy Consumption - Electrical	KWH /MPcs	7841.37	7117.50	7047.25
Total Thermal (Furnace Oil) Consumption	MKCals	25685	25469	26453
Specific Fuel Consumption- (Furnace Oil)	MKCals/ MPcs	31.41	30.41	28.37

Energy Conservation Commitment, Policy and Organizational Set up

During last three years, the company implemented a number of innovative energy conservation projects/schemes and majority of which resulted in considerable savings. Continuous improvement, total employee participation and technology up gradation resulted in waste reduction, energy conservation, yield optimization and productivity increase. HLL has its own Energy Conservation Team led by Executive Director (operations), Unit chief supported by all Controlling officers (Dept. Head) of all departments and SAFE Forum members. AGM (Engineering) acts as the co-ordinator and facilitator for energy management activities.

The Safe Forum is a scheme existing in the company to ensure involvement of people at all levels of an organization by assigning responsibility towards energy conservation, safety and environment protection. Energy Conservation Committee attached with the safety committee and safe forum meets regularly and achieves the following objectives

Energy Conservation Team Structure



Energy Conservation Achievements

1. Installation of energy efficient screw chiller



Replaced old and inefficient chiller with energy efficient screw chiller resulting an annual savings of Rs 21 Lakhs/Annum.

2. Replacement of Old DG by Fuel-efficient DG set



Installed 500 KVA Fuel efficient DG set after replacing old DG set resulting an annual savings of Rs 20 Lakhs / Annum.

3. Installation of Condensate Recovery System



Installed condensate recovery system resulting an annual savings of Rs. 31.86 Lakhs / Annum.

4. Installation of Industrial UPS at Moulding Plant



Installed energy efficient industrial UPS for reducing production loss during supply interruption and for better quality power to load centers. This resulted in an annual energy savings of Rs. 5.35 Lakhs and Rs 15 Lakhs savings by means of reduced wastage.

Projects Implemented for the Energy Conservation during 2007-08

SINo.	Description	(Lakhs (kWh)	F.Oil (KL)	Total (fuel) in KL)	Total savings in (Rs. Lakhs)	Investment incurred on the project (Rs. Lakhs)
1	Installation of Energy efficient UPS system in Moulding machine and boiler - Productivity improvement	1.260			20.350	51.000
2	Maintaining better power factor at substation including the additional load and thereby achieving an annual incentive from KSEB.				2.77	
3	FRP cooling tower fan introduced in 4 nos of Cooling Towers - Savings in Power by 36.8 %	0.290			1.17	1
4	Replacement of electrically heated dehumidifier with steam heated dehumidifier in Moulding plant A	1.650			6.6	10.7
5	Replacement of electrically heated tumblers with steam heated tumblers in RRT moulding vulcanizing in plant B	2.000			4.680	5.000
6	VFD and Centralized monitoring and control through touch screen in all main drives of Moulding machines	1.100			4.100	7.700
7	Replaced 36 nos of 40W fluorescent tube by 18 W CFL in the primary plants A,B and C	0.115			0.480	0.080
8	Replaced 4 nos of 250 Watts sodium vapour lamps by 4 sets of 144 Watts CFL in the Packing section ,Electrical section and main gate	0.027			0.116	0.030
9	Derating of 1 No of 30KW motors of the dust collector by 15 KW motor in Plant B	0.840			3.570	0.250
10	Replacement of silica gel drier with refrigerator type efficient air drier in compressors.	0.158			0.670	2.160
11	Conversion of conventional V belts into energy efficient flat belts in compressor No.2 (75 HP) and AHU's	0.350			1.500	0.500
12	Replacement of conventional 40W fluorescent tube with 28W T5- tube	0.012			0.050	0.100

SINo.	Description	(Lakhs (kWh))	F.Oil (KL)	Total (fuel) in KL)	Total savings in (Rs. Lakhs)	Investment incurred on the project (Rs. Lakhs)
13	Replacement of inefficient reciprocating chiller with energy efficient screw chiller	5.02			21.000	55.000
14	Installation of solid state relays in place of conventional air break contactor for heater.	0.127			0.540	0.120
15	Installation of condensate recovery system including flash vessel, trap module ,pressure powered pump etc.		144.000		31.860	90.000
16	Installation of online monitoring system (EffiMax 2000) in Boiler.		9.000		2.000	2.500
17	Installation of automatic blowdown control system to avoid blow down losses		15.800		3.500	1.500
18	Replacement of the existing single pass heat exchanger with multipass heat exchanger in moulding machine.		0.760		0.170	0.500
19	Installation of pressure reducing valve in low temp steam area in moulding plant		4.200		1.000	1.000
20	Replacement of existing old diesel generator set with energy efficient DG set.(500 KVA)			53.000	20.000	40.000
21	Installed and commissioned 87 nos of Turbine Air Ventilators in Plant	1.050			4.900	7.000
22	Installation of solar traffic signaling with LED blinking system in the company premises near to the road	0.028			0.117	0.260
23	Installation of Bio gas plant by using ETP and Kitchen waste.				1.5	3
24	Designed and installed rubber roller unit instead of Nylon brush in ETD machines in order to improve rolling - Savings - Rs 6.07 lakhs /year				6.05	0.81
	Sub Total	12.76651	173.76	53	118.3428	229.21

Environment and Safety

The company's commitment towards safety, health and environment is based on its policy which emphasis on business growth and responsibility towards safety and environment. Safety, health and environment are being continuously enhanced through appropriate budget provisions, safety audit, risk analysis, monitoring and measurement, health check up of all employees.

Safety

The company has well-established safety, occupational and environmental policy that ensures safety of the public, employees, plant and equipment. The Peroorkada plant comply with all statutory rules and regulations basis, imparting training to its employees as per the training calendar, carrying out statutory safety audits of its facilities as per legal requirement, conducting regular medical check up of its employees and promoting eco friendly activities. The plant has been certified for occupational health and safety management system, ISO 14000:2004 and also been certified for occupational health and safety management system, OHSAS 18001:2005. Peroorkada factory is the recipient of safety awards from the national safety council

Environment

The company strives to enrich the environment wherever possible by various initiatives such as air pollution management, waste water management, solid waste management and afforestation activities.