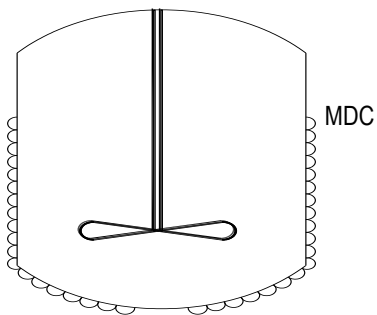
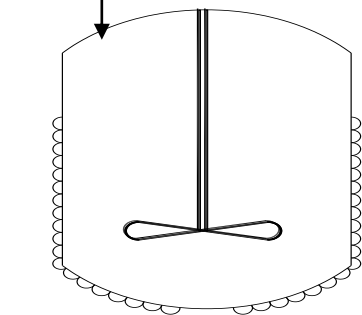
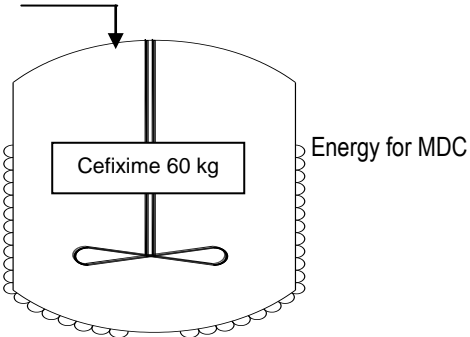
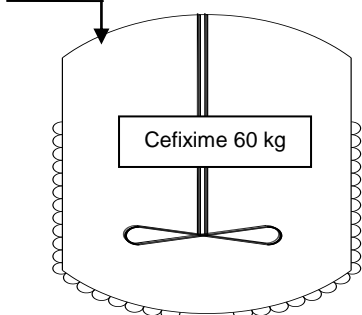


## Energy Conservation Measure implemented in 2007-2008

(To be filled up separately for each Energy Conservation Measure)

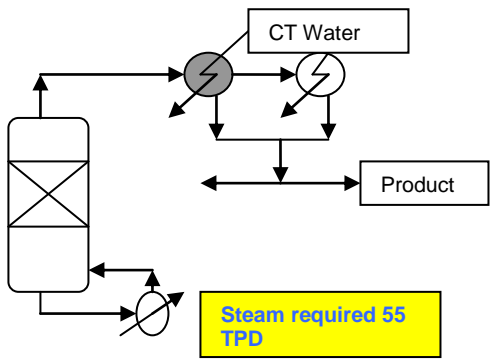
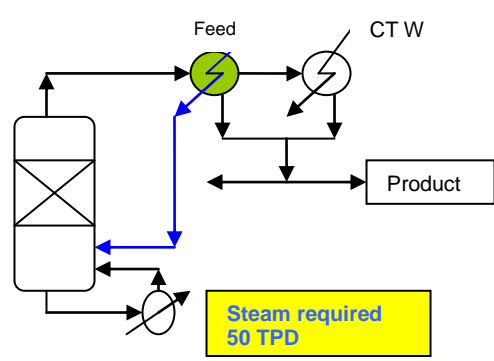
ID to be filled by BEE	<b>Title of the measure</b> New process development with less solvent usage (50% reduction in solvent usage)	Sector -PHARMACEUTICAL INDUSTRY
Year to be filled by BEE		Technology : Process Development
<p><b>Description of the energy conservation measure:</b></p> <p><b>Earlier process:</b> As per original technology, the MDC, Acetone specific consumptions were <b>14.71 Kg /kg , 18 kg /Kg respectively in Pavest &amp; Cefixime( products).</b></p> <p><b>Modified Process:</b> Now the process was optimized, and the specific solvent consumptions of MDC &amp; Acetone were reduced to <b>7.92 &amp; 9.0 respectively</b>. This has reduced the energy needs for processing the Solvent MLs to get recovered MDC &amp; Acetone for the subsequent batches.</p> <p><b>Energy Saving Calculations :</b> As the ML quantities got halved There is a thermal energy saving equivalent to <b>433 KL FO</b> : &amp; Total power saved/year = <b>3.54</b> Lac units:</p>		
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>	
<p style="text-align: center;">Pavest 175 kg</p> <p>2574 kgs MDC/batch – 2 batches/day</p> <div style="text-align: center;">  </div> <div style="background-color: yellow; padding: 5px; margin-top: 10px;"> <math>SPC = 0.18 \text{ Unit/kg MDC} \times 14.71 = 2.64</math>  <math>SSC = 1 \text{ Kg steam / kg MDC} \times 14.71 = 14.71</math> </div>	<p style="text-align: center;">Pavest 175 kg</p> <p>1386 kgs MDC/batch-2 batches/day</p> <div style="text-align: center;">  </div> <div style="background-color: yellow; padding: 5px; margin-top: 10px;"> <math>SPC = 0.18 \text{ Unit/kg MDC} \times 7.92 = 1.42</math>  <math>SSC = 1 \text{ Kg steam / kg MDC} \times 7.92 = 7.92</math> </div>	
<p>Acetone 1080 kgs/batch - 3 Batches/day</p> <div style="text-align: center;">  </div> <div style="background-color: yellow; padding: 5px; margin-top: 10px;"> <math>SPC = 0.36 \text{ Unit/ kg Acetone} \times 18 = 6.48</math>  <math>SSC = 10 \text{ Kg steam/kg Acetone} \times 18 = 180</math> </div>	<p>Acetone 540 kgs/batch-3 batches/day</p> <div style="text-align: center;">  </div> <div style="background-color: yellow; padding: 5px; margin-top: 10px;"> <math>SPC = 0.36 \text{ Unit/ kg Acetone} \times 9 = 3.24</math>  <math>SSC = 10 \text{ Kg steam/kg Acetone} \times 9 = 90</math> </div>	
Agency that executed the project (with complete address and email): Indigenous		
Total investment, Rs: 0 Crores	Year of implementation: 2007~08	

First year energy cost savings, Rs.: 70.32 lakhs (implemented from the start of the financial year)					
First year other savings, Rs.:					
On annual basis	KWh (Lacs)	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before	7.32	0	0	876	0
Energy consumption after	3.78	0	0	443	0
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...	4.4	0	0	16979	0
Company complete address: Mr.S.Nammalvar ( Vice president) 138-151, Sidco Industrial Estate, Alathur, Kanchipuram Dt. 603110. Ph-No : 044 27446320, Fax : 044 27446321 E.Mail :vsnam@orchidpharma.com Contact person who could be contacted for more information:				We authorise Bureau to use this information for dissemination  Signature  Date	

Annexure 'B

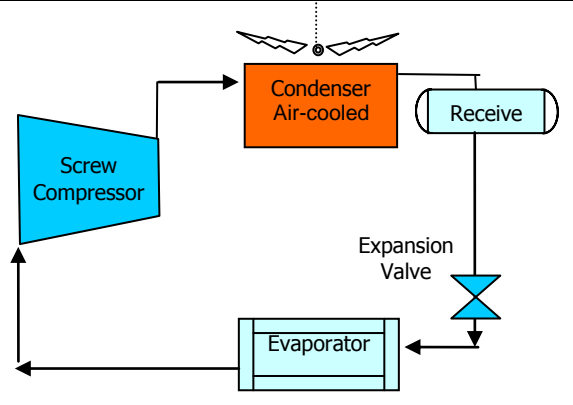
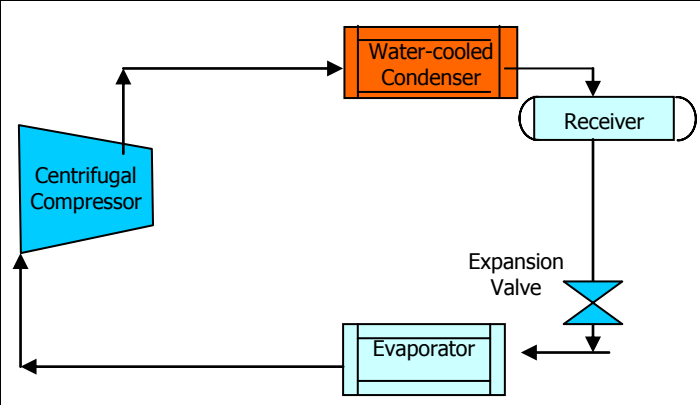
## Energy Conservation Measure implemented in 2007-2008

(To be filled up separately for each Energy Conservation Measure)

ID to be filled by BEE	Title of the measure <b>Optimization of distillation column operation by preheating the feed using the Vapor heat recovery technique</b>	Sector PHARMACEUTICAL INDUSTRY			
Year to be filled by BEE		Technology .....			
<p><b>Description of the energy conservation measure:</b></p> <p><b>Earlier Process:</b> The vapors from the column are condensed &amp; sub cooled by the CT Water. The total steam requirement was 55 Tons/day.</p> <p><b>Modified Process:</b> 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. ( PI note that, the following is just a schematic, where,complete instrumentation/piping is not shown)</p> <p><b>Energy Saving Calculations :</b> FO saved / year = 5 TPD steam X 350 days / 15 = 122 KL= Rs. 21 Lacs</p>					
Picture/ sketch/ drawing before modification (if available)	Picture/ sketch/ drawing after modification				
					
Agency that executed the project (with complete address and email): Indigenuous					
Total investment, Rs.: 80 Lakhs		Year of implementation: 2007 -2008			
First year energy cost savings, Rs.: 21 Lakhs					
First year other savings, Rs.:					
On annual basis	kWh 000'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Steam consumed before :55 TPD= 19,250 Tons/year of steam	0	0	0	1350.8	
Energy –steam consumed After : 50 TPD ... = 17 500 Tons/year of steam				1228	
Energy Tariff Rs/ KL				16,979	
Company complete address: Mr.S.Nammalvar ( Vice president), 138-151, Sidco Industrial Estate, Alathur, Kanchipuram Dt. 603110 Ph-No : 044 27446320,27446205,27446206 : Fax : 044 27446321 E.Mail :vsnam@orchidpharma.com				We authorise Bureau to use this information for dissemination	
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				Date	

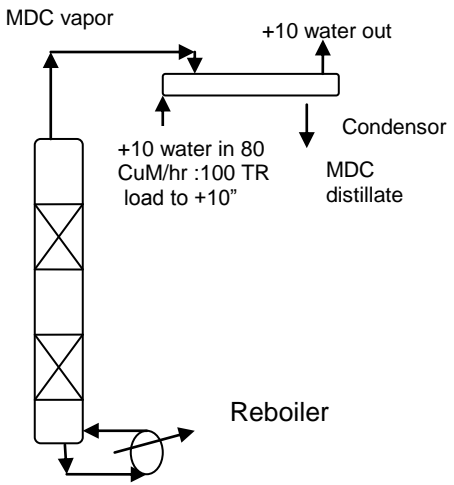

## Energy Conservation Measure implemented in 2007-2008

(To be filled up separately for each Energy Conservation Measure)

ID to be filled by BEE	Title of the measure Water cooled centrifugal chillers instead of Air cooled Screw chillers.	Sector : PHARMACEUTICAL INDUSTRY.			
Year to be filled by BEE		Technology .....			
<b>Description of the energy conservation measure:</b>					
<p><b>Earlier Process:</b> In our 300 TR "+10" chiller plant, the air cooled screw compressors, were in operation consuming <b>1.2 Kw/TR</b></p> <p><b>Modified Process:</b> The Air cooled screw chillers were replaced by water cooled centrifugal chillers and the Specific Power consumption was <b>0.9 Kw/TR</b>.</p> <p><b>Energy Saving Calculations:</b> There is a saving of 0.3 Kw/TR. Hence for 300 TR chilling load the power saved = 300X 0.3 = 90 Kw Energy saved = 7.2 Lacs units/year = Rs 32 Lacs/year.</p>					
<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>				
					
Agency that executed the project (with complete address and email):					
Total investment, Rs.: 13.7 Lakhs	Year of implementation: 2006 -2007 end				
First year energy cost savings, Rs.: 32.0 Lakhs					
First year other savings, Rs.:					
On annual basis	kWh (Lacs)	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before	28.8	0	0	0	0
Energy consumption after	21.6	0	0	0	0
Energy tariff, Rs/ kWh/ ...	4.4	0	0	0	0
Company complete address: Mr.S.Nammalvar (Vice president) 138-151, Sidco Industrial Estate, Alathur, Kanchipuram Dt. 603110. Ph-No : 044 27446320,27446205,27446206 Fax : 044 27446321 E.Mail :vsnam@orchidpharma.com			We authorize Bureau to use this information for dissemination		
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			Date		

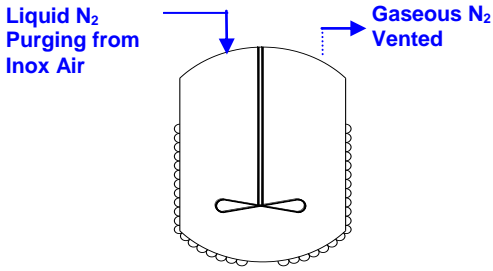
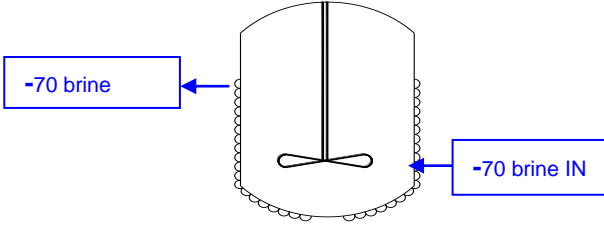
## Energy Conservation Measure implemented in 2007-2008

(To be filled up separately for each Energy Conservation Measure)

ID To be filled by BEE	Title of the measure The MDC condensation was done by CTW instead of "+10 using Plate HE- semi welded type- saving 100 TR load	Sector : PHARMACEUTICAL INDUSTRY.
Year to be filled by BEE		Technology .....
<p><b>Description of the energy conservation measure:</b></p> <p><b>Earlier Process:</b> The MDC being a low boiling (39'c) solvent, "+10 was used in a shell &amp; tube HE to condense vapors from the column. The SPC was 1.2 KW/TR. 3780 Kgs/Hr of MDC vapor was condensed</p> <p><b>Modified Process:</b> 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</p> <p><b>Energy Saving Calculations :</b> For 100 TR of heat load, power saved is 6.8 Lacs units/year. = Rs 30 Lacs/tear.</p>		
Picture/ sketch/ drawing before modification (if available)		Picture/ sketch/ drawing after modification
		
Agency that executed the project (with complete address and email):		
Total investment, Rs.: 30 Lakhs		Year of implementation: 2007 -2008
First year energy cost savings, Rs.: 30 Lakhs		
First year other savings,		
On annual basis	kWh (lacs)	Coal (Tons)
Energy consumption before	8.00000	0
Energy consumption after	1.20000	0
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...	4.44	0
Gas Nm <sup>3</sup>	0	0
Oil (kL)	0	0
Other	0	0
Company complete address: Mr.S.Nammalvar (Vice president) 138-151, Sidco Industrial Estate, Alathur, Kanchipuram Dt. 603110. Ph-No : 044 27446320,27446205, Fax : 044 27446321 E.Mail :vsnam@orchidpharma.com  :		We authorise Bureau to use this information for dissemination  Signature  Date

## Energy Conservation Measure implemented in 2007-2008

(To be filled up separately for each Energy Conservation Measure)

ID to be filled by BEE	Title of the measure	Sector -PHARMACEUTICAL INDUSTRY			
Year to be filled by BEE	Using "-70" brine from compressor instead of Liq.Nitrogen chilling in Manufacturing Process	Technology .....			
<b>Description of the energy conservation measure:</b>					
<p><b>Old process:</b> 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.</p> <p><b>Current process:</b> Using "-70" brine from OCPL utility plant instead of buying &amp; using Liq Nitrogen from Prax/Inox air. The chiller compressor units consumes = 6.6 Unit of power/TR.</p> <p><b>Energy Saving Calculations:</b> There is a difference in SPC by 40 Units/TR. With 30 TR load for 6500 hrs of operation there is a power saving of = 72 Lac units), if we consider the power consumption for <b>Nation as the whole.</b></p>					
<b>Picture/ sketch/ drawing before modification</b> (if available)			<b>Picture/ sketch/ drawing after modification</b>		
 <p style="margin-top: 10px;">= 38 X 1.2 = 45.6 units/hr Consumption TR, in the form of N<sub>2</sub> (1.2 units / kg of liq. N<sub>2</sub>) = SPC for Liq. N<sub>2</sub> = 1.2 = Specific Liq. N<sub>2</sub> / TR = 38 kgs/ hr Therefore <b>SPC for 1TR = 45.6 units</b></p>			 <p style="margin-top: 10px;"><b>SPC for 1 TR = 6.6 Units ( 30 TR plant consuming 200 KW)</b></p> <p>Therefore saving / TR = 45.6-6 ≈ 39 units / TR</p>		
Agency that executed the project (with complete address and email): York Refrigeration					
Total investment, Rs.: 320 Lacs			Year of implementation: 2006 -2007 end		
First year energy cost savings, Rs.: 426 lakhs					
First year other savings, Rs.: 426 Lacs					
On annual basis	Lacs KWh	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before ( For the Nation via Inox / Prax air)	109.44	0	0	0	0
Energy consumption after	14.4	0	0	0	0
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...	95	0	0	0	0
Company complete address: Mr.S.Nammalvar ( Vice president) 138-151, Sidco Industrial Estate, Alathur, Kanchipuram Dt. 603110. Ph-No : 044 27446320,27446205,27446206 Fax : 044 27446321 E.Mail :vsnam@orchidpharma.com				We authorise Bureau to use this information for dissemination  Signature  Date	
Contact person who could be contacted for more information:					

ID To be filled by BEE	Title of the measure Using Solar water heaters in canteen instead of electric heaters	Sector : PHARMACEUTICAL INDUSTRY.
Year to be filled by BEE		Technology .....

**Description of the energy conservation measure:**

**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 ( Sudarshan) are used for hot water generation- saving 500 units/day

**Energy saving calculations :** 1.6 Lacs units of electrical energy saved/year = Rs 6.7 Lacs

<b>Picture/ sketch/ drawing before modification</b> (if available)	<b>Picture/ sketch/ drawing after modification</b>
<p style="text-align: center;"><b>Hot water generation in Canteen</b></p>	

Agency that executed the project (with complete address and email):



Total investment, Rs.: 10 Lakhs      Year of implementation: 2007 -2008

First year energy cost savings, Rs.: 6.7Lakhs

First year other savings,

On annual basis	kWh (lacs)'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before	1.5	0	0	0	0
Energy consumption after	0	0	0	0	0
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...	4.44	0	0	0	0

Company complete address: Mr.S.Nammalvar (Vice president) 138-151, Sidco Industrial Estate, Alathur, Kanchipuram Dt. 603110. Ph-No : 044 27446320,27446205, Fax : 044 27446321 E.Mail :vsnam@orchidpharma.com  :	We authorise Bureau to use this information for dissemination  Signature  Date
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ID To be filled by BEE	Title of the measure Replacement of multiple ( low capacity - Reciprocating) old compressors were replaced by a single centrifugal air compressors	Sector : PHARMACEUTICAL INDUSTRY.			
Year to be filled by BEE		Technology .....			
<p><b>Description of the energy conservation measure:</b></p> <p><b>Earlier status</b> The compressed air was generated using, 2 nos. of KGK( Reciprocating-93 kw ),3 nos. of CPT(Reciprocating – 55 kw ) &amp; one number CPT( Reciprocating -160 Kw) ( erected in the initial stages of plant start up).</p> <p><b>Current status:</b> ATLOS Capco-(2000 cfm with 355 Kw) Energy efficient Centrifugal compressors 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.</p> <p><b>Energy Saving Calculations:</b> Around 1340 units power saving was observed. The saving is 4.48 Lac units/year = Rs. 20 Lacs</p>					
<b>Picture/ sketch/ drawing before modification</b> (if available) – Old Reciprocating Air compressors		<b>Picture/ sketch/ drawing after modification</b> ( New energy Efficient Atlas Capco – Centrifugal Air compressors)			
					
Agency that executed the project (with complete address and email):					
Total investment, Rs.: 60 Lakhs		Year of implementation: 2007 -2008			
First year energy cost savings, Rs.: 20 Lakhs					
First year other savings,					
On annual basis	kWh (lacs)'	Coal (Tons)	Gas Nm <sup>3</sup>	Oil (kL)	Other
Energy consumption before	32.88	0	0	0	0
Energy consumption after	28.4	0	0	0	0
Energy tariff, Rs/ kWh/ Ton/ Nm <sup>3</sup> / kL ...	4.44	0	0	0	0
Company complete address: Mr.S.Nammalvar (Vice president) 138-151, Sidco Industrial Estate, Alathur, Kanchipuram Dt. 603110. Ph-No : 044 27446320,27446205, Fax : 044 27446321 E.Mail :vsnam@orchidpharma.com :		We authorise Bureau to use this information for dissemination  Signature  Date			