**UTTAM SUGAR MILLS LTD. UNIT BARKATPUR (U.P)**

**Form I (1)**

**For Central Sugar Factories**

**Schedule of Machinery**

 **Name of Factory : Uttam Sugar Mills Ltd. (Distillery Unit : - Barkatpur-Bijnor)**

 **Capacity Licenced : 52500 KL/ANNUM**

**NEW 75KLPD PLANT**

|  |  |
| --- | --- |
|  |  |
|   **Technical Data** | **Degasifying****Column** | **Analyser Stripper Column**  | **Pre Rectifier Column** | **Vent Scrubber**  |
| 1. Height of column (In Meter) | **5.700** | **20.730** | **23.50** | **2.500**  |
| 2.Outer diameter of column | **1258 mm** | **2510 mm** | **2060 mm** | **906 mm** |
| 3. In 3. Inner diameter of column | **1250 mm** | **2500 mm** | **2050 mm** | **900 mm** |
| 4. 4. Material of construction | **AISI 304** | **AISI 304** | **AISI 304** | **AISI 304** |
| 5.Total number of plates in the column | **6 Nos** | **21 Nos** | **72 Nos** | **6 Nos** |
| 6.Plate spacing | **750 mm** | **750 mm** | **250 mm** | **200 mm** |
| 7.Shell Thickness | **4 mm** | **5 mm** | **5,4 mm** | **3 mm** |
| 8.Tray Thickness | **3 mm** | **3 mm** | **2.5 mm** | **3 mm** |
| 9.Downcomer Thickness | **3 mm** | **3 mm** | **2.5 mm** | **3 mm** |
| 10. plate Efficiency | **85%** | **85%** | **85%** | **85%** |
| 11.Design of plate | **Sieve Tray** | **Rh Grid tray** | **Bubble cap** | **Sieve tray** |
| 12.Material and heat balance worked out on each plate with calculations of efficiency of each plate | **NA** | **NA** | **NA** | **NA** |
| 13.Location and design of the feed plate from bottom | **6th plate** | **21st plate** | **18th plate** | **NA** |

**NEW 75KLPD RS PLANT**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  **Technical Data** | **Degasifying****Column** | **Mash Stripper Column**  | **Rs Rectifying cum Stripping Column** | **Vent Scrubber**  |
|  |  |  |  |  |
| 15. Percentage (v/v) of alcohol in feed and the output | **8.0% v/v (Liquid feed)/ 52 % v/v (Vapour out)** | **8.0% v/v** **(Liquid feed)/** **41.5 % v/v (Vapour out)** | **47.7% v/v (Liquid feed)/ 95% v/v (Vapour out)** | **NA** |
| 16. Base and top pressure of the column Bar (A)Top PressureBase Pressure | **0.40****0.43** | **0.43****0.56** | **2.2****2.5** | **NA** |
| 17. Pressure drop across the Column (Bar) | **0.03** | **0.13** | **0.30** | **NA** |
| 18. Vapour velocity indicating the final flooding velocity | **1.60 m/s** | **0.55 m/s** | **0.6 m/s** | **NA** |
| 19. Percentage of alcohol in v/v in the reflux clearly indicating the ratio and the column of reflux | **NA** | **NA** | **95% v/v****R/R : 3.4** | **NA** |
| 20.The economics of neutral spirit, production  | **NA** | **NA** | **NA** | **NA** |

**UTTAM SUGAR MILLS LTD. UNIT BARKATPUR (U.P)**

**NEW 75KLPD RS PLANT**

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|  |  |  |
|  **Technical Data** | **Units** | **Analyser Column****Reboiler I** | **Analyser Column****Reboiler II** | **Analyser column****Reboiler****III** | **Pre Rectifier Column Reboiler** |
| 1.HTA | Sq.Mtr. | **350** | **350** | **350** | **350** |
| 2 2.Total number of the tubes | Nos. | **1170** | **1170** | **1170** | **1463** |
| 3.Length of the tubes | MM | **3000** | **3000** | **3000** | **3000** |
| 4.Outer diameter of the tubes | MM | **31.75** | **31.75** | **31.75** | **25.4** |
| 5.Inner diameter of the tubes | MM | **29.35** | **29.35** | **29.35** | **23.0** |
|  6.Length of the shell | MM | **3000** | **3000** | **3000** | **3000** |
| 7.Outer diameter of the shell | MM | **1510** | **1510** | **1510** | **1360** |
|  8.Inner diameter of the shell | MM | **1500** | **1500** | **1500** | **1350** |
|  9.Material of construction | -- | **AISI 304** | **AISI 304** | **AISI 304** | **AISI 304** |
| 10.Shell Thickness | MM | **5** | **5** | **5** | **4** |
| 11. Tube Thickness | MM | **1.2** | **1.2** | **1.2** | **1.2** |
| 12.Tube Sheet Thickness | MM | **35** | **35** | **35** | **35** |
| 13.Heat transfer coefficient used | Kcal/hr.m20 C | **650** | **650** | **650** | **750** |
|  1 14.Temp. of the incoming coolant | 0 C | **81** | **81** | **81** | **126** |
|  15.Temp. of the outgoing coolant | 0 C | **83** | **83** | **83** | **128** |
|  16.Temp. of the incoming Product | 0 C | **95** | **95** | **95** | **147** |
|  17.Temp. of the outgoing product | 0 C | **95** | **95** | **95** | **147** |

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**NEW 75KLPD RS PLANT**

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|  |  |  |
|  **Technical Data** | **Units** | **Degasser column Condenser - I – Beer heater** | **Primary Column Vent Condenser** | **RS Rectifier Column Vent Condenser I** | **RS Rectifier Column PCV Condenser**  | **Vacuum Vent Condenser I** | **Technical Alcohol Cooler** | **Fusel Oil Cooler** |
| 1. HTA | Sq.m | **60** | **35** | **35** | **5** | **5** | **3** | **2 (2 no)** |
| 2 2.Total number of the tubes | Nos. | **201** | **146** | **146** | **21** | **21** | **13** | **8** |
| 3.Length of the tubes | MM | **3000** | **3000** | **3000** | **3000** | **3000** | **3000** | **3000** |
| 4.Outer diameter of the tubes | MM | **31.75** | **25.4** | **25.4** | **25.4** | **25.4** | **25.4** | **25.4** |
| 5.Inner diameter of the tubes | MM | **28.55** | **23** | **23** | **23** | **23** | **23** | **23** |
|  6.Length of the shell | MM | **4443** | **4200** | **4443** | **3600** | **3600** | **3500** | **3500** |
| 7.Outer diameter of the shell | MM | **768** | **471** | **471** | **226** | **226** | **166** | **166** |
|  8.Inner diameter of the shell | MM | **760** | **465** | **465** | **220** | **220** | **160** | **160** |
|  9.Material of construction | -- | **AISI 304** | **AISI 304** | **AISI 304** | **AISI 304** | **AISI 304** |  **AISI 304** |  **AISI 304** |
| 10.Shell Thickness | MM | **3** | **3** | **3** | **3** | **3** | **3** | **3** |
| 11. Tube Thickness | MM | **1.2** | **1.2** | **1.2** | **1.2** | **1.2** | **1.2** | **1.2** |
| 12.Tube Sheet Thickness | MM | **25** | **25** | **25** | **20** | **20** | **20** | **20** |
| 13.Heat transfer coefficient used | Kcal/hr.m20 C | **600** | **600** | **600** | **600** | **600** | **150** | **150** |
|  1 14.Temp. of the incoming coolant | 0 C | **32** | **32** | **32** | **32** | **32** | **32** | **32** |
|  15.Temp. of the outgoing coolant | 0 C | **40** | **40** | **40** | **40** | **40** | **40** | **40** |
|  16.Temp. of the incoming Product | 0 C | **72** | **72** | **95** | **95** | **50** | **95** | **105** |
|  17.Temp. of the outgoing product | 0 C | **72** | **72** | **95** | **95** | **50** | **35** | **35** |

**UTTAM SUGAR MILLS LTD. UNIT BARKATPUR (U.P)**

**NEW 75KLPD MOLASSES SECTION**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| **Sr.No.** | **Particulars** | **Fluid** | **Material of construction** | **No. of tanks** | **Size (Meter)** | **Shell Volume****(in M3)** | **Cone/Slope Volume****(in M3)** | **Total Volume (in M3)** |
| **Diameter** | **Shell Height** | **Cone/Slope Height** |
| 1 | Molasses Day Tank | Molasses  | M.S. | 1 | 6.0 | 6.25 | NA | 176.738 | NA | 176.738 |
| 2 | Weighed Molasses tank  | Molasses  | M.S. | 1 | 2.2 | 1.25 | 0.572 | 4.752 | 0.7248 | 5.477 |
| 3 | Molasses Receiving Tank | Molasses | M.S. | 1 | 2.75 | 3.75 | NA | 22.276 | NA | 22.276 |

**UTTAM SUGAR MILLS LTD. UNIT BARKATPUR (U.P)**

**NEW 75KLPD FERMENTATION SECTION**

|  |  |  |
| --- | --- | --- |
|  |  |  |
| **Sr.No.** | **Particulars** | **No. of tanks** | **Size (Meter)** | **Shell Volume****(in M3)** | **Cone/Slope Volume****(in M3)** | **Total Volume (in M3)** |
| **Diameter** | **Shell Height** | **Cone/Slope Height** |
| 4 | Yeast Culture Vessels I | 1 | 0.55 | 0.85 | 0.156 | 0.202 | 0.0247 | 0.227 |
| 5 | Yeast Culture Vessels II | 1 | 1.1 | 1.25 | 0.241 | 1.188 | 0.1527 | 1.341 |
| 6 | Yeast Culture Vessels III | 1 | 2.15 | 2.5 | 0.621 | 9.077 | 1.503 | 10.580 |
| 7 | Pre-Fermentor I  | 1 | 4.1 | 5.063 | 0.562 | 66.853 | 3.713 | 70.566 |
| 8 | Pre-Fermentor II | 1 | 4.1 | 5.063 | 0.562 | 66.853 | 3.713 | 70.566 |
| 9 | Fermentor– I  | 1 | 7.825 | 7.875 | 0.875 | 378.761 | 21.04 | 399.801 |
| 10 | Fermentor– II  | 1 | 7.825 | 7.875 | 0.875 | 378.761 | 21.04 | 399.801 |
| 11 | Fermentor–III  | 1 | 7.825 | 7.875 | 0.875 | 378.761 | 21.04 | 399.801 |
| 12 | Fermentor–III  | 1 | 7.825 | 7.875 | 0.875 | 378.761 | 21.04 | 399.801 |
| 13 | Wash Holding Tank or Intermediate tank | 2 | 4.6 | 5.625 | 0.625 | 93.494 | 5.193 | 98.687 |
| 14 | Wash Settling system | 2 | 4.9 | 5.625 | 2.45 | 106.087 | 15.4002 | 121.487 |
| 15 | Sludge Trough | 1 | 1.5 | 0.625 | NA | 1.105 | NA | 1.105 |

**UTTAM SUGAR MILLS LTD. UNIT BARKATPUR (U.P)**

**NEW 75KLPD EVAPORATION SECTION**

**Falling Film Evaporator**

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| --- | --- | --- |
|  |  |  |
|  **Technical Data** | **Units** | **Falling Film Evaporator I** | **Falling Film Evaporator II** | **Falling Film Evaporator III** | **Surface Condenser** |
| 1. HTA | Sq.Mtr. | **500** | **500** | **500** | **500** |
| 2 2.Total number of the tubes | Nos. | **261** | **261** | **261** | **1045** |
| 3.Length of the tubes | MM | **12000** | **12000** | **12000** | **6000** |
| 4.Outer diameter of the tubes | MM | **50.8** | **50.8** | **50.8** | **25.4** |
| 5.Inner diameter of the tubes | MM | **48.4** | **48.4** | **48.4** | **23** |
|  6.Length of the shell | MM | **16585** | **16585** | **16585** | **7704** |
| 7.Outer diameter of the shell | MM | **1180** | **1180** | **1180** | **1180** |
|  8.Inner diameter of the shell | MM | **1170** | **1170** | **1170** | **1170** |
|  9.Material of construction | -- | **AISI 304** | **AISI 304** | **AISI 304** | **AISI 304** |
| 10.Shell thickness | MM | **5** | **5** | **5** | **5** |
| 11.Tube Thickness | MM | **1.2** | **1.2** | **1.2** | **1.2** |
| 12.Tubesheet Thickness | MM | **38** | **38** | **38** | **40** |
| 13.Heat transfer coefficient used | Kcal/hr.m2 C | **750** | **750** | **750** | **750** |

**UTTAM SUGAR MILLS LTD. UNIT BARKATPUR (U.P)**

**NEW 75KLPD EVAPORATION SECTION**

**Falling Film Evaporator**

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | **Units** | **Vapour Liquid Separator I**  | **Vapour Liquid Separator II** | **Vapour Liquid Separator III** |
| 1.Outer diameter of the shell | Sq.m | **1360** | **1360** | **1360** |
|  |  |  |  |  |
| 2.Inner diameter of the shell | Nos. | **1350** | **1350** | **1350** |
|  |  |  |  |  |
| 3. Length of the shell | MM | **4050** | **4050** | **4050** |
|  |  |  |  |  |
| 4.Material of construction | -- | **AISI 304** | **AISI 304** | **AISI 304** |
|  |  |  |  |  |
| 5.Shell thickness | MM | **5** | **5** | **5** |

**UTTAM SUGAR MILLS LTD. UNIT BARKATPUR (U.P)**

**NEW 75KLPD EVAPORATION SECTION**

**Forced Circulation Evaporator**

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | **Units** | **Falling Film Evaporator IV** | **Falling Film Evaporator V** | **Forced Circulation Evaporator VI** | **Forced Circulation Evaporator VII** | **Surface Condenser** |
| 1. HTA | Sq.m | 150 | 150 | 150 | 150 | 150 |
| 2 2.Total number of the tubes | Nos. | 78 | 78 | 157 | 157 | 313 |
| 3.Length of the tubes | MM | 12000 | 12000 | 6000 | 6000 | 6000 |
| 4.Outer diameter of the tubes | MM | 50.8 | 50.8 | 50.8 | 50.8 | 25.4 |
| 5.Inner diameter of the tubes | MM | 48.4 | 48.4 | 48.4 | 48.4 | 23 |
|  6.Length of the shell | MM | 16585 | 16585 | 8018 | 8018 | 7704 |
| 7.Outer diameter of the shell | MM | 693 | 693 | 1018 | 1018 | 693 |
|  8.Inner diameter of the shell | MM | 685 | 685 | 1010 | 1010 | 685 |
|  9.Material of construction | -- | AISI 304 | AISI 304 |  AISI 316 |  AISI 316 | AISI 304 |
| 10.Shell thickness | MM | 4 | 4 | 4 | 4 | 4 |
| 11.Tube Thickness | MM | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| 12.Tubesheet Thickness | MM | 38 | 38 | 40 | 40 | 40 |
| 13.Heat transfer coefficient used | Kcal/hr.m2 C | 750 | 750 | 750 | 750 | 600 |

**UTTAM SUGAR MILLS LTD. UNIT BARKATPUR (U.P)**

**EVAPORATION SECTION**

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| --- | --- | --- |
|  |  |  |
|  | **Units** | **Vapour Liquid Separator IV** | **Vapour Liquid Separator V** | **Vapour Liquid Separator VI** | **Vapour Liquid Separator VII** |
| 1.Outer diameter of the shell | Sq.m | 1158 | 1158 | 2208 | 2608 |
|  |  |  |  |  |  |
| 2.Inner diameter of the shell | Nos. | 1150 | 1150 | 2200 | 2600 |
|  |  |  |  |  |  |
| 3. Length of the shell | MM | 3450 | 3450 | 4000 | 4750 |
|  |  |  |  |  |  |
| 4.Material of construction | -- | AISI 304 | AISI 304 | AISI 304 | AISI 304 |
|  |  |  |  |  |  |
| 5.Shell thickness | MM | 4 | 4 | 4 | 4 |

**UTTAM SUGAR MILLS LTD. UNIT BARKATPUR (U.P)**

**NEW 75KLPD EVAPORATION SECTION**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| **Sr.No.** | **Particulars** | **Fluid** | **Material of construction** | **No. of tanks** | **Size (MM)** | **Capacity****(in B.L)** |
| **Diameter** | **Height** |
| 1 | Evaporation Feed Tank | Spent Wash | S.S.304 | 1 | 1500 | 1800 | 3179 |
| 2 | Evaporation Feed Tank | Spent Wash | S.S.304 | 1 | 1500 | 1800 | 3179 |
| 3 | Process condensate Tank | Process condensate | S.S.304 | 1 | 1000 | 1250 | 981 |
| 4 | Process condensate Tank | Process condensate | S.S.304 | 1 | 1000 | 1250 | 981 |
| 5 | Concentrated spent wash Tank  | Concentrated Spent Wash | S.S.304 | 1 | 1000 | 1250 | 981 |

**UTTAM SUGAR MILLS LTD. UNIT BARKATPUR (U.P)**

**NEW 75KLPD RECEIVER SECTION**

|  |  |  |
| --- | --- | --- |
|  |  |  **PROPOSED** |
| **Sr.No.** | **Particulars** | **No. of tanks** | **Size (MM)** | **Capacity****(In M3)** |
| **Diameter** | **Height** |
| 1 | ETHANOL RECEIVERTANK I | **1** | **4600** | **6250** | **100** |
| 2 | ETHANOL RECEIVERTANK II | **1** | **4600** | **6250** | **100** |
| 3 | ETHANOL RECEIVERTANK III | **1** | **4600** | **6250** | **100** |
| 4 | ETHONOL Storage Tank No.- ET-03 | **1** | **15000** | **11000** | **1943** |
| 5 | ETHONOL Storage Tank No.- ET-04 | **1** | **14980** | **11000** | **1939** |
| **6** | Denatured ETHONOL Issue Tank No.- ET-05 | **1** | **7998** | **4250** | **216** |
| **7** | Denatured ETHONOL Issue Tank No.- ET-06 | **1** | **7998** | **4250** | **216** |
| **8** | ETHONOL Storage Tank No.- ET-03 | **1** | **15000** | **11000** | **1943** |
| **9** | ETHONOL Storage Tank No.- ET-04 | **1** | **14980** | **11000** | **1939** |