

| <b>Alcohol Masterclass: Advanced Fermentation Training Program 25<sup>th</sup> - 27<sup>th</sup>Feb 2010</b><br><b>25<sup>th</sup> February 2010, Thursday (Day 1)</b> |   |
|--|---|
| 09.00 - 09.30  | <b>REGISTRATION OF PARTICIPANTS – PRAJ HOUSE , BAVDHAN</b><br>Tea / Coffee with Snacks  |
| 10.00 - 10.30  | Well-come Note<br>Inauguration :  |
| 10.30 – 11.15  | <b>Perspectives in Sugar To Alcohol Fermentation Technology</b><br>Potential Feed stock's <ul style="list-style-type: none"> <li>○ Sugar Cane</li> <li>○ Sugar beet</li> <li>○ Sweet Sorghum</li> <li>○ Alternate sugary feedstock</li> </ul> Fundamentals of Fermentation <ul style="list-style-type: none"> <li>○ Microbiology &amp; Biochemistry aspects</li> </ul> Yeasts and its Management <ul style="list-style-type: none"> <li>○ Yeast preservation, maintenance, quality</li> <li>○ Cell mass propagation</li> <li>○ Additives</li> </ul> Feedstock Vs Fermentation Technology- A Review <ul style="list-style-type: none"> <li>○ Feedstock Composition</li> <li>○ Impact of feed stock composition &amp; selection of Technology</li> <li>○ Feedstock composition &amp; Downstream Processing</li> </ul> <b>Speaker : Mahesh Kulkarni</b>  |
| 11.15 - 11.45  | Tea / Coffee Break  |
| 11.45 - 13.15  | Multi-feed Fermentation Process & Developments <ul style="list-style-type: none"> <li>○ Combination of various sugar streams</li> </ul> Mode of Operation <ul style="list-style-type: none"> <li>○ Continuous</li> <li>○ Fed Batch</li> <li>○ Yeast Recycle</li> </ul> Vinasse Recycle <ul style="list-style-type: none"> <li>○ Dos' and don't</li> </ul> Plant Hygiene - A Holistic Approach <ul style="list-style-type: none"> <li>○ Engg. Aspects</li> <li>○ CIP Procedures</li> <li>○ Dis-infection</li> <li>○ Safety Procedures</li> </ul> Dual Route Plant <ul style="list-style-type: none"> <li>○ Market need of flexibility of Operations</li> <li>○ Conversion of existing molasses based plant to grain based</li> <li>○ Land &amp; Utilities requirement for grain module</li> </ul> Review of advances in Molasses Fermentation Technology<br>Feedback from Operating Plants<br><b>Speaker : Ajay Soni</b> |
| 13 .15- 14 .15   | Lunch   |
| 13.30 – 14.30  |   |

|                |  |
|----------------|--|
|                | <p><b>25<sup>th</sup> February 2010, Thursday, (Day 1, Afternoon Session) Contd.</b></p>   |
| 14.30 – 15.30  | <p><b>Perspectives in Grain technology</b></p> <p>Potential Feedstock's &amp; their composition</p> <ul style="list-style-type: none"><li>○ Grains</li><li>○ Tubers</li><li>○ Impact of composition on overall Process / Comparisons</li></ul> <p>Starch Processing- Fundamentals</p> <ul style="list-style-type: none"><li>○ Starch Chemistry</li><li>○ Enzymes</li><li>○ Non Starch polysaccharide (NSP's)</li></ul> <p><b>Speaker : Ajay Soni</b></p>   |
| 15:30 – 16:00  | <p>Tea Break</p>   |
| 16:00 – 17:00  | <p><b>Process Developments in Starch Processing</b></p> <p>Review of Grain Processing Technology</p> <ul style="list-style-type: none"><li>○ Grain Handling , Storage &amp; Pre Cleaning</li><li>○ Milling</li><li>○ Liquefaction</li><li>○ Fermentation</li><li>○ Decantation</li><li>○ Drying DDGS</li></ul> <p>Review of Enzymes &amp; Dosages</p> <ul style="list-style-type: none"><li>○ Enzymes for<ul style="list-style-type: none"><li>▪ Fuel Grade Alcohol</li><li>▪ Beverage graded Alcohol</li></ul></li><li>○ Liquefaction Process<ul style="list-style-type: none"><li>▪ Grains</li><li>▪ Tubers</li></ul></li></ul> <p>Review of Advances in Grain Technology<br/>Feedback from Operating Plants</p> <p><b>Speaker : Mahesh Kulkarni</b></p> |
| <b>7:00 PM</b> | <p><b>Cocktails with Dinner at : Garden Court</b><br/>Garden Court , NDA Road , Chandani Chowk , Pune</p>  |

|                   |  |
|-------------------|--|
| 09:30 – 10:15     | <b>26<sup>th</sup> February 2010, Friday ( Day 2)</b><br><b>Trouble Shooting in Fermentation - Molasses Based Plants</b><br>Monitoring & Control Of Fermentation Process   |
|                   | <ul style="list-style-type: none"> <li>○ Types of contamination, effects on process &amp; yields</li> <li>○ Identification of contaminants , isolation &amp; trouble shooting</li> <li>○ Improvements for better yields, consistent &amp; stable fermentation</li> <li>○ Factors affecting Capacity, Productivity &amp; Efficiency</li> <li>○ Factors affecting Fermentation Kinetics</li> <li>○ Control of contamination through process parameters &amp; operation</li> <li>○ Control of contamination through Plant Hygiene aspects</li> <li>○ Role Of Additives in Controlling Fermentation Process</li> </ul> |
| 10:15 – 10:30     | <b>Speakers Panel :Prasanna Tamhankar</b><br>Troubleshooting in Liquefaction / Fermentation Grain Based Plants   |
|                   | <ul style="list-style-type: none"> <li>○ Impact of feed stock quality &amp; Monitoring</li> <li>○ Impact of Particle size distribution &amp; effect on yields</li> <li>○ Issues related to infection &amp; frequent plant stoppages</li> <li>○ Issues related to Erosion : Effective Pre-cleaning &amp; Post cleaning</li> </ul>   |
| 10:30 – 10:45     | <b>Speakers Panel : Mahesh Badgujar</b><br>Tea break   |
| 10:45 – 11:30     | <b>Sweet Sorghum Technology</b>  |
|                   | <ul style="list-style-type: none"> <li>○ Overview of 1<sup>st</sup> Commercial Plant</li> <li>○ Front End Engineering &amp; Offerings</li> </ul>   |
|                   | <b>Speaker : Prasanna Deshpande</b>  |
| 11:30 – 12:00     | <b>Water Management Services &amp; Support Services</b>  |
|                   | <ul style="list-style-type: none"> <li>○ Water Management : Recycle &amp; Reuse Options</li> <li>○ Utility Operations: Ensuring Quality of PW / WTP / CTW &amp; Steam</li> <li>○ Static &amp; Rotating Equipments – Critical Care &amp; SPM</li> </ul>   |
|                   | <b>Speaker : Pradeep Dhotey / Hemant Wagh</b>  |
| 12 : 00 – 12 : 45 | <b>Lunch at Praj House</b>   |
|                   | <b>Travel to Matrix R&amp;D Center, Praj Urawade by Bus</b>  |
| 14:00 – 15:00     | <b>Practical's at Matrix - Innovation Center, PRAJ Urawade</b>   |
|                   | <b>Analytical Procedures for feed stocks :</b>   |
|                   | <ul style="list-style-type: none"> <li>○ Complete Wet chemistry Sugar Stream Sample Analysis</li> <li>○ Complete Wet chemistry Grain Stream Sample Analysis</li> <li>○ Complete Wet chemistry Product Sample Analysis</li> </ul>   |
|                   | <b>Matrix Coordination : Suresh Zirpe</b>  |
| 15:00 – 15: 15    | <b>Tea / Coffee Break</b>  |
| 15:15 - 17: 30    | <b>Analysis by Instrumentation :</b>   |
|                   | <b>HPLC :</b>  |
|                   | <ul style="list-style-type: none"> <li>○ Introduction of Instrument &amp; Principle</li> <li>○ All types of sample analysis : Molasses / Syrup / Starch</li> <li>○ Online Process Sampler</li> <li>○ DE ( Dextrose Equivalent )</li> <li>○ Residual Starch</li> <li>○ Fermentation Byproducts – Organic Acids</li> </ul>   |
|                   | <b>GC :</b>  |
|                   | <ul style="list-style-type: none"> <li>○ Introduction to Instruments &amp; Principals</li> <li>○ Fermentation byproducts ; Aldehyde , Esters , Higher Alcohols</li> </ul>  |
|                   | <b>Spectrophotometer</b>   |
|                   | <ul style="list-style-type: none"> <li>○ Introduction to Instruments &amp; Principals</li> <li>○ Measure of Color of Molasses</li> <li>○ Caramelization &amp; its effect on yeast inhibition</li> </ul>  |
|                   | <b>Matrix Coordination : Suresh Zirpe</b>  |

|                                 |   |
|---------------------------------|---|
|                                 | <p><b>27<sup>th</sup> February 2010 , Saturday ( Day 3)</b></p> <p><b>Practical's at R&amp;D Center</b><br/> <b>Matrix - The Innovation Center (R&amp;D), PRAJ Urawade</b></p> <p><b>Microbiology Laboratory for Analysis –</b></p> <ul style="list-style-type: none"> <li>○ Introduction to Instruments &amp; Principals</li> <li>○ Sterile Techniques - AutoClave &amp; Heat Sterilization</li> <li>○ Culture handling – Laminar Flow Bench Unit</li> <li>○ Advanced Microscopy – Yeast Growth &amp; Study</li> <li>○ Yeast Culture Bank – Culture preservation</li> </ul> <p>R&amp;D lab – Molasses &amp; Grain Fermentation Facilities for Research</p> <ul style="list-style-type: none"> <li>○ Yeast Culture Bank – Culture preservation</li> <li>○ Different reactors for Pre-Treatment of Grain Slurry</li> <li>○ Lab Scale Grain Ethanol Fermentation</li> <li>○ Lab Scale Molasses Ethanol Fermentation</li> </ul> <p>New Brunswick - Advanced Bioreactor – Fermentation Studies &amp; Development</p> <p><b>Matrix Coordination : Milind Kulkarni</b><br/> <b>Visit - Pilot Plant Facility</b></p> |
| <p>12: 15<br/>13.00 – 14.00</p> | <p>Travel to Praj House by Bus<br/>Lunch - Praj House</p>   |
| <p>14.00 – 15.00</p>            | <p><b>Feed back session Co-opting with Customers</b><br/>Feed back Session from participating customers</p>   |
| <p>15.30 – 16:30</p>            | <p>Concluding Address &amp; <b>Presentation Of Alcohol Masterclass Certificates 2010</b></p>  |
| <p>16:30 - 17:00</p>            | <p>Vote Of Thanks</p>   |
| <p>17 : 00</p>                  | <p>Alcohol Masterclass 2010 Group Photo - Participants</p> <p><b>Participants departure by bus – Drop at Deccan Gymkhana</b></p>  |

- Note:**
1. The Lodging & boarding is to be arranged by the participants directly, Praj will facilitate booking & make available list of hotels, contact nos. with tariff rates .
  2. Tea / Coffee breaks in the morning, after noon session will be taken for 15 - 20 minutes depending on the schedule for the day
  3. Course Fees for these 3 days Training Program:Rs.20,000 per Participant. For more than 2 Nomination's from one Company 15% Discount will be given on the course fee & total fees will be Rs 17,000/- per participant .
  4. One bus from Deccan Gymkhana pick up to Praj House & Back to Deccan Gymkhana will be arranged for Participants for 3 days