

# INTENSIFIED EQUIPMENT FOR PRODUCING HIGH PURITY MTBE

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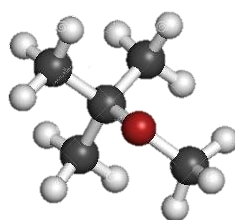
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## HIGH PURITY MTBE (HP MTBE)

- ❑ MTBE is produced from reaction between isobutene and methanol
- ❑ HP MTBE is obtained from purification of industrial grade MTBE to purity of  $\geq 99.7$  wt%
- ❑ HP MTBE is used in agriculture, pharmaceutical, cosmetics, food and chemical intermediates.



- ❑ Industrial grade MTBE contain contaminants i.e., isobutene, tertiary butanol, methanol, methyl sec-butyl ether or water.
- ❑ Analysis of 11 components in IG MTBE founds 41 azeotropes. 7 related to MTBE.
- ❑ Few options to break azeotrope i.e., pressure swing distillation, extractive distillation, membrane etc.
- ❑ These approaches are however complex

### OBJECTIVE

To produce HP MTBE with minimum 99.7 wt.% from industrial grade MTBE

## FUTURE DEMAND



The global revenue of HP MTBE market is estimated to cross a value of US\$ 100 Mn by 2030



Global boost of HP MTBE from 2020 to 2030 due to increasing application in pharmaceutical and agrochemicals sectors\*



Price of HP MTBE in comparison with industrial grade MTBE is 4 times higher

\* Transparency Market Research's

### RESULTS

**99.7 wt.%\***  
purity HP MTBE

**60%**  
Product to feed rate

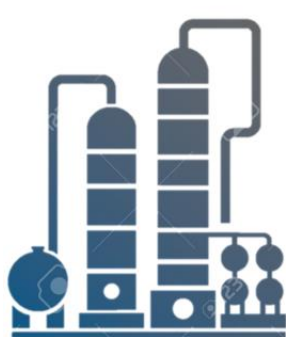
\* Analysed by MTBE producer

## EQUIPMENT – INTENSIFIED DC

### TECHNOLOGY UNIQUENESS

- ❑ Intensified distillation column
- ❑ Combine 2 DCs into 1
- ❑ Saves capital cost and operating cost
- ❑ Operate at reduced pressure and temperature

### PILOT PLANT



- ❑ Intensified DC pilot plant
- ❑ Located in UMP Gambang
- ❑ Made in UMP & 1<sup>st</sup> of its kind in Malaysia
- ❑ Height 9 meters & diameter 4 to 8 inch
- ❑ Interchangeable parts with pneumatic reflux divider
- ❑ Temperature pocket column
- ❑ Industrial grade structured packings
- ❑ Batch, semi-batch and continuous operation mode

### OPERATION POTENTIALS



Production capacity  
**2.5 ton**  
HP MTBE/month



Processing capacity  
**3.8 ton**  
Industrial MTBE/month

### ECONOMIC POTENTIALS



**RM 3.5/kg HP MTBE**  
Production cost\*



**RM 16/kg HP MTBE**  
Market price



**RM 40,000**  
Monthly revenue\*\*

\*Based on service business model  
\*\*Sold at market price at potential production capacity



### Potential clients

- PETRONAS
- Evonik Industries AG
- Vinati Organics Limited
- DOR Group
- Monument Chemical
- LyondellBasell Industries N.V.
- Honeywell International Inc.
- Loba Chemie Pvt. Ltd.
- Shandong Huachao Chemical Co., Ltd

### RESEARCH METHOD



**TRL**  
**6-7**

### PATENT POTENTIAL

- ❑ 3 patents by European companies.
- ❑ No patents in SEA, Asia regions.