Heavy Oil Desalting
“Performance Issues”

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Desalting Steps

Desalter Flow Diagram

- Demulsifier Injection
- Process Heating
- Dilution Water Injection
- Mixing
- Interface Control
- Mud Wash
- Electrostatic Dehydration
- Effluent Water
Demulsifiers

- Higher Field Dosages
- Increased Refinery dosage
- Reverse Emulsion Breakers
- Easy to Overtreat
- Electrostatic Compatibility

![Graph showing the relationship between chemical dosage and effluent BS&W](image)
Process Heating

- Reduced heat transfer
- Increased temperature required
- More heat demand
- Higher exchanger fouling
- Potential for crystalline salts
Dilution Water

- Increased water demand
- More heat demand
- Recycle water can be used

<table>
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<tr>
<th>Mix Technology</th>
<th>Electrostatic Technology</th>
<th>BS&amp;W %</th>
<th>NaCl ptb</th>
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Mixing

- Reduced mixing intensity
- Increased pressure drop
- Creates tighter emulsions
- Produces more interface rag
- Compromises electrostatic dehydration

![Graph showing typical field and refinery requirements for residual water and salt content.](image)
Interface Control

- Interface formation up to 15% of charge
- Heavy solids loading
- Potential asphaltene
- Interface drains essential
Mud Washing

- Continuous preferred over intermittent
- Heavier loading to water plant
- Higher organic content
Electrostatic Dehydration

- Desalter capacity is reduced
- Slower water coalescence
- Hindered by filterable solids
- Needs viscosity between 5 and 10 cp.
- Lower density differential
- Slower water separation
AC/DC Electrostatic Field

- Dual Polarity®
- Modulated Dual Polarity ®
- Electro-Dynamic Desalter ®
- Dual Frequency ®

Bulk Water Removal
Desalting Technology

![Bar Chart]

- **Salt Content NaCl (ppt)**

- **Desalting Technology:**
  - AC
  - AC-AC
  - DF
  - DF-DF
  - DF-EDD
  - EDD-DF
  - EDD-EDD

- **Inlet Salt**
- **Outlet Salt**
- **%BSW**
Effluent Water

- Heavy solids loading
- Heavy oil loading
- Slower rates in a Biotreating facility