HAZARD CONTROL TECHNOLOGIES, INC.

ENCAPSULATOR AGENT

INTRODUCTION

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F-500 Encapsulator Agent Characteristics

- Amphipathic Molecules
  - Large molecule with a polar end and a nonpolar end with sufficient distance between so each end acts independently
    - Polar end (hydrophilic - “loves water”)
      - Soluble; it dissolves in water
    - Nonpolar end (hydrophobic - “fears/hates water”)
      - Protrudes out of the water droplet and seeks out molecules other than water (such as hydrocarbon)
### Water Droplet

- **H₂O Molecules**

### F-500 EA Droplet

- **F-500 EA Molecules**

<table>
<thead>
<tr>
<th>Droplet</th>
<th>Molecular Weight</th>
<th>Boiling Point</th>
<th>Thermal Conveyance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>18 g/mol</td>
<td>212°F (100°C)</td>
<td>Inefficient</td>
</tr>
<tr>
<td>F-500 EA</td>
<td>&gt;1000 g/mol</td>
<td>248°F (120°C)</td>
<td>Highly Efficient</td>
</tr>
</tbody>
</table>
Droplet Comparison

Plain Water

Wetting Agent

F-500 Encapsulator Agent

F-500 EA Molecules
**WETTING AGENT**

**Surface Tension Reduction**
- Spreads
- Penetrates

**Heat Reduction**
- Same mechanism as water
- Converts H₂O to Steam

**FOAM**

**Surface Tension Reduction**
- Aids in spreading the blanket

**Blankets**
- Separates fuel from oxygen to smother the fire

**Heat Reduction**
- Blanket insulates and traps the heat
- Counterproductive to heat reduction
- Requires maintenance of separation for extended period until heat slowly dissipates

**ENCAPSULATOR AGENT**

**Surface Tension Reduction**
- Aids in spreading MEA

**Encapsulation**
- Encapsulates fuel and vapor molecules and renders them nonflammable and nonignitable

**Heat Reduction**
- Changes the heat reduction mechanism of water droplet
- 10-20 times faster heat reduction than plain water, wetting agents and \*
Market-Applications

• Municipal Fire Departments
  – Class A and B Fire Suppression
  – Class B Spill Control

• Power Companies
  (Fixed Systems and Hand line)
  – Coal Handling Systems (PRB Coal)
  – Turbine/Generator/Boiler/Transformer

• Petro-Chemical
  – Class B Spill Control
  – Tank Degassing and Cleaning
  – Pipeline Cleaning and Devaporization
  – Soil Washing

• Rubber Tire Industry
  (Fixed Systems and Hand line)
  – Production Lines and Areas
  – Warehouse Storage
  – Scrap Pile Storage

• Paper Industry
  (Fixed Systems and Hand line)
  – Raw Material Stock Piles
  – Recycling Stock Piles
  – Hydraulic Pit Press Areas
  – Warehouse Storage

• Military
  – Structural Firefighting
  – Spill Control
Industrial Hazards and HCT Solutions
Any questions?