Transportation and Safety
Topics for Consideration

Transportation
- Trucks, Railcars, Barges
- Pipeline

Storage Tank
- Tank Construction
- Floating Roof
- Vapor Recovery

Safety
- Polar Solvent Consideration
Fuel Ethanol Transportation

• Rail Transportation
  – DOT 111A 30k gallon capacity

• Truck Transportation
  – MC306/ DOT406 Transport Trucks

• Barge Transportation
  – Mississippi, Ohio, Missouri, Illinois, Columbia
  – 10k, 15k barrel inland capacity, Intercoastal barges

• Pipeline interest
  – Quality, Compatibility Research
Recognizing Fuel Ethanol on the move...

- UN 1987 used for all transportation for E95
  - Ethanol content >95%
- UN 3475 used for all transportation for E85
  - Ethanol content >10%, <94%
- UN 1993 used for denaturant transportation
  - Hydrocarbon only designation, Natural Gasoline, Gasoline, Naphtha
- UN 1203 used for ethanol/gasoline blends E10
  - Ethanol content <10%
<table>
<thead>
<tr>
<th>Ethanol Concentration</th>
<th>Preferred Proper Shipping Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1 to E10</td>
<td>Gasohol, UN 1203 <em>or</em> Gasoline, UN 1203</td>
</tr>
<tr>
<td>E11 to E94</td>
<td>Ethanol and Gasoline Mixture, UN 3475</td>
</tr>
<tr>
<td>E95 to E99</td>
<td>Denatured Alcohol, NA 1987 <em>or</em> Alcohols n.o.s., UN 1987</td>
</tr>
<tr>
<td>E100</td>
<td>Ethanol <em>or</em> Ethyl Alcohol, UN 1170</td>
</tr>
</tbody>
</table>
Storage Tank Considerations

- Materials of construction
- Safety equipment
- Gauging equipment
- Vapor Recovery
  - Non ethanol vapors should not be directed to ethanol storage tanks
Hardware Considerations

- Plastics/ elastomers construction
  - Viton
  - Teflon
  - Fluorinated Plastics
  - Polypropylene
  - Neoprene

**No Natural Rubber**

See RFA Guideline document at [www.ethanolrfa.org](http://www.ethanolrfa.org)
Safety considerations

• Ethanol is different that Gasoline!
• Treat more like solvent
  – Chemical compatibility
  – Not petroleum based product
• Static discharge
• Fire Emergencies
Fuel Ethanol Properties

• Content: Fuel, 98% Ethanol, 2% Denaturant: Natural Gasoline, Unleaded, Naphtha

• Characteristics
  – Boiling Point: 78°C
  – Vapor Pressure: 44mm HG @ 20°C
  – Completely miscible with water

• MSDS

• Polar Solvent- must have Alcohol Resistant type of foam

• E85 very similar to this product, higher gasoline %
Fire Fighting Considerations

• Recommend use of a Polar Solvent or Alcohol Resistant (AR) type of Foam
  – Traditional AFFF foams have limited ability
  – AR type of foams work on all alcohol blended fuels
• Verify Dry Chemical effectiveness
• Complete Training program available:
  – Foam Selection video, Responding to Ethanol Incidents, and Training Modules with instructors guide.

• Public and Private Industry coming together to provide much needed emergency response information.

Ethanol Emergency Response information available:
www.ethanolresponse.com