



# Alternate Fuels

8/16/2007



# Ethanol fuels

- **Steel is the material of choice for storage of ethanol**
- **Steel is and has always been compatible with all blends of ethanol including E10, E20 and E85**

# Compatibility with E85

Ed English, FQS

- **Compatible**

- **Steel, Nickel Plated Metals, Viton, Teflon, Buna-N, Nitrile, Neoprene, FRP Listed by UL for High Ethanol %, Polypropylene**

- **Incompatible**

- **PVC, Non-tested Polyurethanes, Aluminum, Brass, Copper, Zinc, Certain Thermoset Resins & Thermoplastics, Cork, Leather, Rubber**

# Renewable Fuel Program

- **A national Renewable Fuel Program (also known as the Renewable Fuel Standard Program, or RFS Program) will increase the volume of renewable fuel required to be blended into gasoline, starting with 4.0 billion gallons in calendar year 2006 and nearly doubling to 7.5 billion gallons by 2012.**

# 7 States with Pump Incentives

**Alaska, Connecticut, Hawaii, Idaho, Illinois, Iowa, and South Dakota.**

- **Range from 1-4 cent partial exemptions from state excise taxes on gasoline to sales tax exemptions.**

# States Requiring Ethanol

**Minnesota**    E10 since 1997, will require E20 in 2013

**Hawaii**        E10 in April of 2006.

**Montana**       E10 when capable of 40 mg.

## **States Considering E10 Standards**

Idaho, Iowa, Michigan, Missouri, Nebraska,  
North Dakota, Oregon, South Dakota,  
Washington, Wisconsin, and....

## States where Ethanol Mandates are in progress

- **Colorado – E10 by 2009, E20 by 2013**
- **Illinois – 10% of total sales by 2008, 15% by 2012**
- **Iowa – 25% of total sales by 2015**
- **Kansas – E10, B2 by 2010**
- **Missouri – E10 by 2010**
- **New Mexico – E10, B2 by 2009**

# Ethanol in Minnesota

- **Dec 2006, 312 stations selling E85**
- **20% minimum ethanol use mandated**
- **Sept, 2005, 2% minimum biodiesel mandate**
- **July 1, 2007 and 2008, \$1.5 million is made available for grants to install E-85 and biodiesel dispensing systems.**



# Ethanol grants in Minnesota

- ***\$1,500,000 the first year and \$1,500,000 the second year are for E85 costshare grants. The commissioner may reimburse owners of gasoline service stations for up to 75 percent of the total cost of installing an E85 pump, including the tank and any related components, up to a maximum of \$15,000 per E85 pump.***
- **Until December 31, 2009, the federal government allows retailers an income tax credit of up to 30% of installation costs (not to exceed \$30,000) for refueling equipment used for E-85, B-20, propane, CNG and LNG.**

# Ethanol in New York State

- **A \$20 million program in the New York state budget is slotted for the development of a cellulosic ethanol pilot facility in New York State**
- **114 million gallon ethanol plant scheduled to begin operation in early 2008**

# Biodiesel

- **Biodiesel is the latest alternate fuel to hit the market.**
- **Steel is the material of choice for the storage of biodiesel.**
- **Steel is compatible with all blends of biodiesel including B5, B20 and B100.**

# What is BioDiesel?

Courtesy of Steve Westbrook - SwRI

ASTM D 6751, Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels:

3.1.1 *biodiesel, n*—a fuel comprised of monoalkyl esters of long chain fatty acids derived alkyl esters from vegetable oils or animal fats, designated B100.

# Biodiesel

- Advantages
  - Renewable
  - Tax Credits
  - Automotive Emissions Reductions
  - Lubricity Improver
- Concerns
  - Fuel Stability
  - Materials Compatibility
  - Water Separation
  - Polymer Solubility

# Key Issues

- Ensure the biodiesel meets the ASTM specification for pure biodiesel (ASTM D 6751) before blending with petrodiesel.
- Check fuel filters on the vehicles and in the delivery system frequently upon initial biodiesel use, and change them necessary.

# Key Issues

- Be aware of biodiesel's cold weather properties and take precautions as with #2 petrodiesel use in cold weather.
- Be aware of biodiesel's compatibility with engine components.
- Biodiesel is a solvent - wipe surfaces if spills occur.

# States Requiring Biodiesel

**Minnesota    B2 (2% biodiesel) since  
September, 2005**



# Other storage systems

- **Other materials are available, but steel is and always has been used for the storage of fuels.**
- **Steel tanks have always included alternate fuels such as ethanol and biodiesel in their warranties – leaving no doubt that steel is the material of choice**

# Regulations

- **What are states doing?**
  - **Some issued cautionary statements to clean tanks before adding ethanol**
  - **Midwest states addressed eqpt requirements for E85 & biodiesel.**
  - **IA & others have mandatory “checklist” when converting to E85**
  - **See “reference materials” for a list of state web sites on alternate fuels.**

# E85 Storage



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**Modern Welding – Fireguard Tank - California**



**Northern Steel – Fireguard Tank – E85 - Canada**

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## Northern Steel – DW ULC AST – Canada<sup>1</sup>

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**Clemmer Tank – Fireguard Tank – E85 - Canada<sup>1</sup>**

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**Modern Welding – Fireguard Tank – E85  
NASA's Johnson Space Center.**

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**Clemmer Tank – Fireguard Tank – E85 & biodiesel - Canada<sup>1</sup>**

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**B & H Tank – Flameshield – E85 – Iowa**

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**B & H Tank - E85 – Flameshield**

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**Flameshield Tank – Willie Nelson Biodiesel - Texas**  
**Stanwade Tank**

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APPROX. EMPTY WEIGHT  
1590 Kgs. 3500 Lbs.

DOUBLE WALL  
VACUUM MONITORED



PERMANENTLY ATTACHED VACUUM MONITOR  
DO NOT TAMPER  
VACUUM DRAWN BETWEEN WALLS  
IF VAC. GAUGE BELOW 42 KPA  
DO NOT INSTALL  
CONTACT REGAL TANKS LTD.

CONSULT AUTHORITY HAVING  
JURISDICTION PRIOR  
TO INSTALLATION

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**Northern Tank – Fireguard Tank – E85 - Canada<sup>1</sup>**

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## Modern Welding – Fireguard Tank – E85 – Reno

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# Acknowledgements

**1 - Photos © Courtesy of Agriculture  
and Agri-Food Canada, 2005**