



Module 1: Ethanol and Ethanol-Blended Fuels

Objective

Upon the successful completion of this module, participants will be able to describe the use and growth of ethanol in the United States.



Introduction

- May 14, 2007
- October 21, 2006
- June 19, 2006





May 14, 2007 Baltimore Maryland



October 21, 2006 New Brighton, PA

Train derails in downtown Missoula, spilling fuel

09:55 AM PDT on Monday, June 19, 2006- Associated Press

MISSOULA, Mont. - Five railroad cars bound for Washington state derailed on a Montana Rail Link track and leaked fuel near downtown Missoula, Montana, yesterday.

It happened at about 5:30 a.m. Company spokeswoman Lynda Frost says the derailment was caused by a broken track.

Two of the cars were carrying ethanol fuel, and one car leaked nearly ten-thousand gallons of fuel on the company's rail yard. Fire, police and hazardous materials teams responded, and covered the spill with foam to keep it from igniting.

Frost says crews will likely have to remove the soil.

Several homes in the area were temporarily evacuated.

No one was injured. The train originated in Laurel, Montana, and was headed to Pasco, Washington.

JUNE 19, 2006 MISSOULA, MT



Introduction

- Unique fire fighting challenges
- Traditional methods against hydrocarbon fires ineffective:
 - Gasoline tends to float on top of water
 - Ethanol fuels tend to blend with water
- AR foam recommended



Introduction

- Primary automotive fuel is derivative of crude oil
- U.S. automobile industry predominantly produced gasoline-powered vehicles
- Gasoline & diesel are hydrocarbons derived from crude oil

Introduction

- Ethanol-blended fuels becoming more substantial component of U.S. motor fuel market:
 - Ethanol blended into nearly half of nation's fuel
 - Available from coast-to-coast
- Fuel ethanol:
 - Less visible smoke than gasoline



Introduction

- 2007 production capacity > 6 billion gallons
- Currently 78 bio-refineries under construction
- 7 existing bio-refineries expanding
- Projected > 6 billion gallons new production capacity by 2009

Introduction

- Course addresses needs of emergency responders who may face incidents involving ethanol & ethanol-blended fuels

History of Ethanol-Blended Fuels

- Gasoline additive since late 1970s
- Primary role was octane enhancer until late 1980s:
 - Viewed as environmentally sound alternative to use of lead in gasoline

History of Ethanol-Blended Fuels

- Late 1980s:
 - Mandatory oxygenated fuel programs
 - Some states used ethanol / oxygenates to lower CO emissions
- Ethanol is currently most widely used oxygenate:
 - MTBE banned in most states

Common Ethanol-Blended Fuel Mixtures

- 3 common ethanol-blended fuels:
 - E-10 (most common)
 - E-95
 - E-85
- Ethanol is consistently blended at 5.7% & 7.7% levels in California

Summary

- Ethanol in use since early 1970s
- Use has expanded dramatically in U.S. since 2000
- Increase in transportation fuel consumption has been met by capacity expansion in ethanol industry