

Workshop on Updates to E85 Motor Vehicle Fuel Specifications

April 15, 2010



Overview

- Background
- Current E85 Specifications
- Options Under Consideration
 - Maximum Vapor Pressure/Volatility Class Designation
 - E85 Sulfur Content
 - Ethanol Content
 - Other Properties
 - Denatured Ethanol Sulfur Specification
 - Discussion of Other Issues
- Schedule

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Background

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- E85 is a blend of denatured ethanol and other hydrocarbons
- Nominally 85% ethanol and 15% gasoline
- E85 is used in flexible fueled vehicles (FFVs) which run on E85, gasoline, or a mix

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E85 Regulatory Background

- E85 Specification
 - ARB specifications
 - ASTM International
- Related Requirements
 - Federal Renewable Fuels Program
 - ARB Low Carbon Fuel Standard

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ARB E85 Specifications

- ARB E85 Specifications are in Title 13, CCR § 2292.4
- Part of ARB Alternative Fuel Regulations
 - Title 13, CCR § 2290 – 2293.5
 - Prohibits the sale or supply of fuels that do not meet specifications
- Current E85 specifications are out of date

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US EPA / ASTM E85 Requirements

- No US EPA E85 specifications
- ASTM International
 - ASTM D5798-09b adopted
 - Modifications being considered

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ASTM Specifications

- ASTM specifications focus on fuel quality, vehicle performance and safety
- Division of Measurement Standards (DMS) adopted ASTM D5798-09b
 - ARB now only needs to address specifications that impact air pollution emissions

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Federal Renewable Fuels Standard

- Requires increasing amounts of renewable fuels to be used in transportation fuels eventually reaching 36 billion gallons by 2022
 - Most of the renewable fuels requirement is expected to be ethanol
 - Will be at E10 nationwide by 2012
 - E85 is expected to be used to meet increasing renewable fuels requirements after 2012

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Low Carbon Fuel Standard

- Requires producers and importers of transportation fuels to reduce the carbon intensity of their fuel
- May contribute to the need for volumes of low carbon intensity E85

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Current Picture

- About 40 E85 stations in California
- More than 300,000 FFVs in California
- The growing use of E85 has prompted a review of the specifications, which have not been updated since originally adopted.

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Current E85 Specifications

Current ARB E85 Specifications

Ethanol	79 vol % (min.)	
Other alcohols	2 vol % (max.)	
Hydrocarbons + aliphatic ethers	15.21 vol %	
Vapor pressure, dry	6.5 to 8.7 psi 7.3 to 9.4 psi 8.7 to 10.2 psi	Volatility Class: A, A/B, B/A, B B/C, C/B, C, C/D, D/C D, D/E, E/D, E
Acidity as acetic acid	0.007 mass % (max.)	
Total chlorine as chloride	0.0004 mass % (max.)	

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Current ARB E85 Specifications

Copper	0.07 mg/1 (max.)
Lead	2 mg/1 (max.)
Phosphorus	0.2 mg/1 (max.)
Sulfur	0.004 mass % (max.)
Gum, heptane washed	5 mg/100 ml (max.)
Total particulates	5 mg/1 (max.)
Water	1.25 mass % (max.)
Appearance	Free of turbidity, suspended matter and sediment

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Options Under Consideration

Options

Options Under Consideration

- E85
 - Maximum Vapor Pressure/Volatility Class Designation
 - Sulfur Content
 - Ethanol Content
 - Other Properties
- Denatured Ethanol
 - Sulfur Specification

Maximum Vapor Pressure / Volatility Class Designation

- Current ARB E85: 8.7 to 10.2 psi depending on area and time of year
- ARB staff considering: Maximum RVP of 7.2 psi in summer as defined in CaRFG3 CCR § 2262
- Volatility class the same as CaRFG3

E85 Sulfur

- Current ARB E85: 40 ppm
- ARB staff considering Maximum Sulfur Content: 20 ppm

Ethanol Content

- Current ARB: 79% (min)
- Current ASTM
 - 79% min (Class 1)
 - 74% min (Class 2)
 - 70% min (Class 3)
- Proposed ASTM
 - 68-83% (Class 1, 2 and 3)
 - ARB staff considering ASTM proposal

Other Properties

- Aromatics, benzene, olefins, lead, phosphorus, and manganese
 - Currently evaluating current E85 requirements and CaRFG3
 - Goal: at least as protective as CaRFG3

Denatured Ethanol Sulfur Specification

- Proposed Specification: 10 ppm
 - Consistent with denatured ethanol for CaRFG3

Discussion of Other E85 Issues

- Minimum Vapor Pressure
 - E85 is currently being sold under a test program exemption
 - Test program exemptions a temporary fix
 - Evaluate use of Federal gasoline as a blendstock
 - Cost-effective way to meet minimum vapor pressure
 - Current ARB E85: 8.7 to 10.2 psi depending on area and time of year
- Test Program Exemptions

Schedule

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- Public Workshop April 15, 2010
- Submit Workshop Comments April 30, 2010
- Board Hearing Fall 2010

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Contact Information

Katrina Sideco

Fuels Section
(916) 323-1082
ksideco@arb.ca.gov

Jim Peterson

Fuels Section
(916) 327-1502
jpeterso@arb.ca.gov

Jim Guthrie

Industrial Section
(916) 327-1508
jguthrie@arb.ca.gov

Renee Littaua

Manager, Fuels Section
(916) 322-6019
rlittaua@arb.ca.gov

<http://www.arb.ca.gov/fuels/altfuels/e85/e85.htm>

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