

# **METHANOL AS A GASOLINE BLENDING COMPONENT**

Methanol Institute



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## **Methanol Institute**

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- **MI Established in 1989**
- **Serves as the trade association for the Global Methanol Industry**
- **Directs Product Stewardship Activities**
- **Initiates Market Development Efforts**
- **The Voice of the Global Methanol Industry**

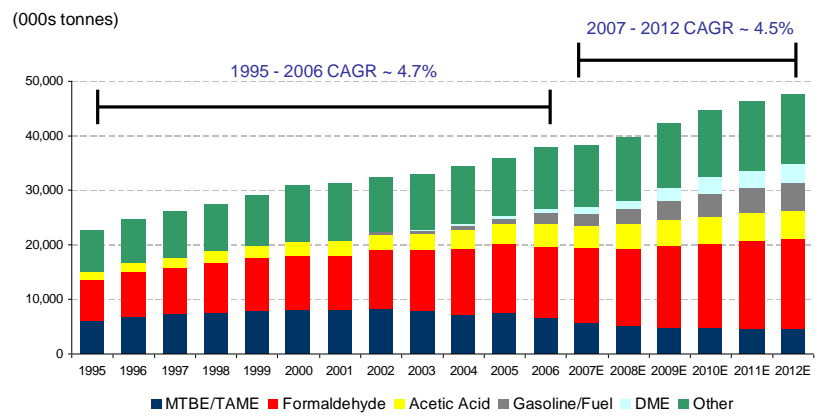
# 2008 Members

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# World Methanol Demand

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Source: Chemical Market Associates Inc. (CMAI)  
 - Excludes 5.8 million tonnes of forecasted methanol demand for methanol to olefins and propylenes (captive demand) in 2009-2012

### Product Applications (traditional)



2007 Global Demand by Derivatives

- ▶ 35% Formaldehyde
- ▶ 15% MTBE/TAME
- ▶ 11% Acetic Acid
- ▶ 3% MMA
- ▶ 6% Fuel Blending
- ▶ 3% DME
- ▶ 27% Other



**METHANEX**  
1 Responsible Care® Company

### METHANEX CORPORATION Business Overview

### Product Applications (energy)



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## Methanol Facts

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- ***Production Resources***
- ***Well-to-Wheel GHGs***
- ***Fuel Uses***
- ***Low Fuel Cost***
- ***Compatible with existing vehicles and fueling infrastructure.***

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## **Methanol from Biomass**

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- **A number of companies have built or are building plants to prove biomass to methanol production technology:**
  1. **BMCN, (Netherlands) converting existing methanol plant to use glycerin.**
  2. **Chemrec (Sweden): operates a demo plant to convert black liquor (by-product of wood pulp) into methanol.**
  3. **Range Fuels (US) currently building a plant in Georgia to convert wood waste into syngas and then into a mixture of ethanol and methanol.**
  4. **Chemrec (US) plans to build a plant in Michigan to convert black liquor into methanol & DME.**
  5. **Methanex has a joint development agreement with a Brazilian company to evaluate conversion of sugar cane bagasse, tops and leaves into methanol.**

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## **Use as a Fuel Proven**

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- **Blends of 5% methanol used successfully in the U.S., and 3% methanol used in much of Europe.**
- **Over 20,000 M85 vehicles demonstrated successfully in the U.S. traveling over 100 million Km.**
- **3.4 billion liters of methanol blended gasoline used in China in 2007; around 4 billion expected in 2008.**

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# Methanol Blending Properties

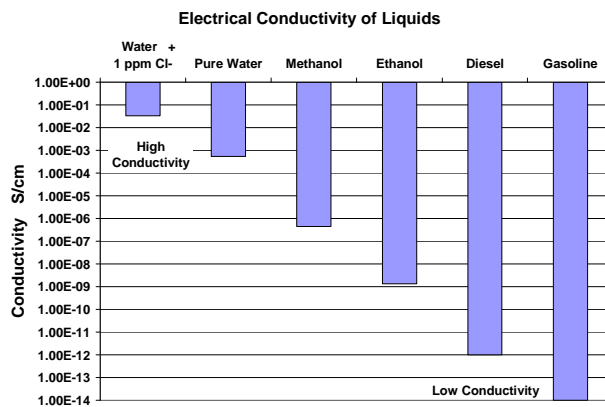
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- **High octane value**
- **Vapor pressure increase**
- **Corrosion potential**
- **Elastomer compatibility**
- **Emissions**
- **Ethanol denaturant**
- **Infrastructure compatibility**

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# Both Methanol and Ethanol Increase Fuel Conductivity

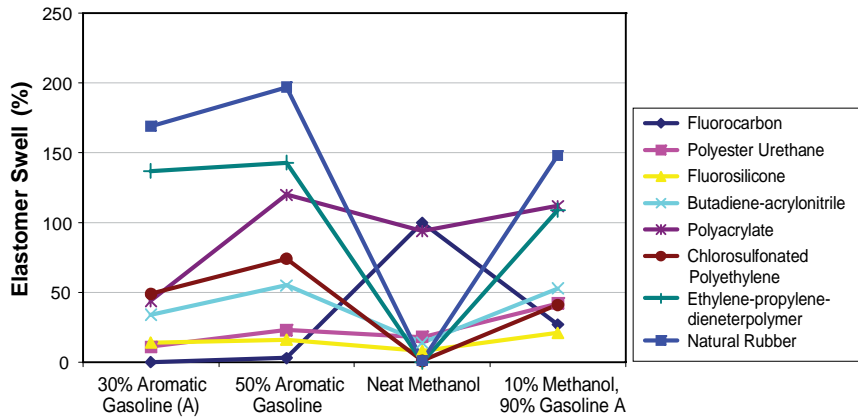
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# Elastomer Compatibility

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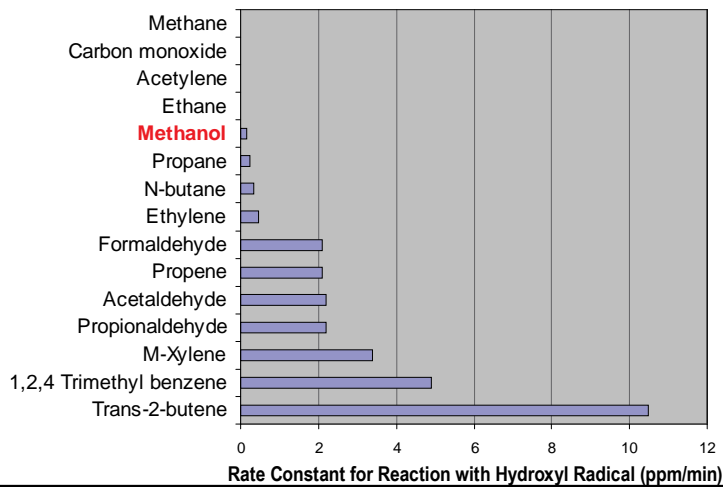


Source: American Petroleum Institute

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# Photochemical Reactivity

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## Toxicity

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- **Methanol**
- **Gasoline**
- **Fuel Handling Important**

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## Half-Lives of Methanol and Benzene in the Environment

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<b>Environmental Medium</b>	<b>Methanol Half-Life (days)</b>	<b>Benzene Half-Life (days)</b>
<b>Soil</b>	<b>1-7</b>	<b>5-16</b>
<b>Surface Water</b>	<b>1-7</b>	<b>5-16</b>
<b>Groundwater</b>	<b>1-7</b>	<b>10-730</b>

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## **Environmental Impact**

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- **Methanol is ubiquitous in the environment, and is readily biodegradable.**

- **Methanol is injected into 200 U.S. wastewater treatment plants to accelerate the biodegradation of wastewater.**



- **Each year, 400 million gallons (1.5 billion liters) of methanol used in windshield washer fluid in the U.S.**

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## **Methanol and Biomethanol Part of the Fuel Quality and Renewable Energy Directives**

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- **EU Fuel Quality Directive sets methanol content in fuel at 3%**
- **Biomethanol to play a valuable role in meeting EU Renewable Energy Directive requirements:**
  - **10% of transportation fuels by 2020**
  - **Methanol from wood reduces GHGs 95%, second best of all transportation biofuels and bioliquids (2008 EU Renewable Energy Directive report)**

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## ***MI Methanol Fuel Activities***

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- ***MI willing to assist CEN on methanol fuel issues.***
- ***MI assisting China to develop responsible methanol blend regulations for both low- and high-level blends based on the extensive U.S. experience.***

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## ***Summary***

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- ***Methanol can supplement gasoline supplies with non-petroleum energy at low cost and risk.***
- ***Emissions similar to ethanol.***
- ***Poses similar compatibility with vehicles and infrastructure as ethanol.***
- ***Biomethanol has potential to assist in meeting Renewable Energy Directive requirements.***

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## ***For More Information***

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