

[CLICK TO VIEW](#)

[Table of Contents 2](#)

[List of Tables & Charts 3](#)

[Study Overview 4](#)

[Sample Text, Table  
& Chart 5](#)

[Sample Profile, Table &  
Forecast 6](#)

[Order Form & Corporate  
Use License 7](#)

[About Freedonia,  
Custom Research,  
Related Studies, 8](#)



# Specialty Fuel Additives

---

US Industry Study with Forecasts for **2016 & 2021**

---

Study #2874 | April 2012 | \$4800 | 211 pages

---

[www.freedoniagroup.com](http://www.freedoniagroup.com)



**The Freedonia Group**

767 Beta Drive

Cleveland, OH • 44143-2326 • USA

Toll Free US Tel: 800.927.5900 or +1 440.684.9600

Fax: +1 440.646.0484

E-mail: [info@freedoniagroup.com](mailto:info@freedoniagroup.com)

## Table of Contents

### EXECUTIVE SUMMARY

### MARKET ENVIRONMENT

General .....	4
Macroeconomic Overview .....	4
Motor Vehicle Industry Overview .....	8
Historical Market Trends .....	11
Pricing Trends .....	15
Technology .....	17
Gasoline Engines .....	18
Diesel Engines .....	21
Hybrids & Electric Vehicles .....	23
Fuels .....	24
International Activity .....	27
Environmental & Regulatory Issues .....	28
Gasoline Regulations .....	31
Tier 2 Standards .....	32
Mobile Source Air Toxics (MSAT) Reduction .....	33
Detergent Rule .....	33
Oxygenates .....	34
Reformulated Gasoline (RFG) Program .....	35
Diesel Fuel Regulations .....	36
Renewable Fuels Legislation .....	37
CAFE Standards .....	39

### FUEL INDUSTRY OVERVIEW

Crude Oil & Refined Petroleum	
Products Outlook .....	41
Fuel Demand .....	43
Gasoline .....	44
Demand by Grade .....	46
Demand by Formulation .....	48
Distillate Fuel .....	50
Diesel Fuel .....	51
Other Distillate Fuel .....	53
Jet Fuel .....	54
Residual Fuel .....	55
Alternative Fuels & Energy Threats .....	56
Ethanol .....	57
Biodiesel .....	57
Natural Gas .....	58
Propane .....	59

Electricity .....	59
Other Energy Threats .....	60
Commodity Fuel Additive Outlook .....	62
Ethanol .....	64
Biodiesel .....	67
Other Commodity Fuel Additives .....	70

### SPECIALTY FUEL

#### ADDITIVES BY TYPE

General .....	72
Deposit Control Additives .....	76
Detergents .....	79
Other Deposit Control Additives .....	84
Cetane Improvers .....	86
Antioxidants .....	90
Lubricity Improvers .....	93
Cold Flow Improvers .....	95
Petroleum Dyes & Markers .....	98
Corrosion Inhibitors .....	101
Metal Deactivators .....	104
Other Specialty Fuel Additives .....	106
Octane Enhancers .....	107
Biocides .....	109
All Other .....	110

#### SPECIALTY FUEL ADDITIVES BY APPLICATION & MARKET

General .....	114
Applications .....	115
Gasoline Additives .....	116
Regular & Midgrade .....	
Gasoline Additives .....	119
Premium Gasoline Additives .....	121
Diesel Fuel Additives .....	123
Other Fuel Applications .....	128
Markets .....	129
Blenders & Terminals .....	132
Refiners .....	134
Aftermarket .....	136

### INDUSTRY STRUCTURE

General .....	141
Market Share .....	144
Competitive Strategies .....	148
Marketing & Distribution .....	150
Merger & Acquisition Activity .....	151
Cooperative Agreements .....	153

### COMPANY PROFILES

Albemarle Corporation .....	156
Armored AutoGroup .....	157
Ashland Incorporated .....	159
Baker Hughes .....	161
BASF SE .....	163
Berkshire Hathaway .....	165
Buckman Laboratories International .....	167
Champion Technologies .....	168
Chemtura Corporation .....	169
Chevron Corporation .....	170
Clorox Company .....	172
ConocoPhillips .....	173
Dorf Ketal Chemicals .....	174
Dow Chemical Company .....	176
DuPont (EI) de Nemours .....	178
Ecolab Incorporated .....	180
Evonik Industries .....	182
Exxon Mobil .....	184
Groupe SNPE .....	186
Huntsman Corporation .....	187
ICC Industries .....	188
Illinois Tool Works .....	189
Innospec Incorporated .....	192
LyondellBasell Industries .....	196
NewMarket Corporation .....	198
Parker-Hannifin Corporation .....	200
Royal Dutch Shell .....	202
Chimiques SA .....	205
Soltex Incorporated .....	206
Stepan Company .....	207
TPC Group .....	208
Warren Oil .....	210

## List of Tables

### EXECUTIVE SUMMARY

- 1 Summary Table .....3

### MARKET ENVIRONMENT

- 1 Macroeconomic Indicators .....8
- 2 Motor Vehicle Indicators ..... 11
- 3 Specialty Fuel Additive Market, 2001-2011..... 14
- 4 Specialty Fuel Additive Prices.17

### FUEL INDUSTRY OVERVIEW

- 1 Petroleum Industry Outlook ... 43
- 2 Petroleum Fuel Supply & Demand..... 44
- 3 Gasoline Supply & Demand .... 46
- 4 Gasoline Demand by Grade & Formulation..... 50
- 5 Distillate Fuel Supply & Demand..... 51
- 6 Diesel Fuel Demand by Sulfur Content..... 53
- 7 Jet Fuel Supply & Demand ..... 55
- 8 Residual Fuel Supply & Demand..... 56
- 9 Commodity Fuel Additive Demand..... 64

### SPECIALTY FUEL ADDITIVES BY TYPE

- 1 Specialty Fuel Additive Demand by Type..... 74
- 2 Deposit Control Additive Demand..... 78
- 3 Fuel Detergent Demand ..... 82
- 4 Other Deposit Control Additive Demand..... 86
- 5 Cetane Improver Demand..... 89

- 6 Antioxidant Demand ..... 92
- 7 Lubricity Improver Demand.... 95
- 8 Cold Flow Improver Demand... 98
- 9 Petroleum Dye & Marker Demand ..... 101
- 10 Corrosion Inhibitor Demand. 103
- 11 Metal Deactivator Demand... 105
- 12 Other Specialty Fuel Additive Demand..... 107

### SPECIALTY FUEL ADDITIVES BY APPLICATION & MARKET

- 1 Specialty Fuel Additive Demand by Application ..... 116
- 2 Gasoline Additive Demand ... 118
- 3 Regular & Midgrade Gasoline Additive Demand..... 121
- 4 Premium Gasoline Additive Demand..... 123
- 5 Diesel Fuel Additive Demand 127
- 6 Other Fuel Additive Demand. 129
- 7 Specialty Fuel Additive Demand by Market..... 131
- 8 Blender & Terminal Fuel Additive Demand..... 134
- 9 Refiner Fuel Additive Demand..... 136
- 10 Aftermarket Fuel Additive Demand..... 140

### INDUSTRY STRUCTURE

- 1 Specialty Fuel Additive Sales by Company, 2011.... 142
- 2 Selected Acquisitions & Divestitures ..... 153
- 3 Selected Cooperative Agreements..... 155

## List of Charts

### MARKET ENVIRONMENT

- Cht Specialty Fuel Additive Market, 2001-2011..... 15

### SPECIALTY FUEL ADDITIVES BY TYPE

- 1 Specialty Fuel Additive Demand, 2011: Value Versus Volume ..... 75

### SPECIALTY FUEL ADDITIVES BY APPLICATION & MARKET

- 1 Gasoline Additive Demand by Type, 2011..... 119
- 2 Diesel Additive Demand by Type, 2011..... 128
- 3 Fuel Distribution Flowchart.. 131

### INDUSTRY STRUCTURE

- 1 Specialty Fuel Additive Market Share, 2011..... 144

*Advances will be driven by a mild rebound in petroleum fuel demand as the economic recovery continues and by an increase in additization rates due to mandated biofuel consumption.*

## US demand to grow 4.8% annually through 2016

US demand for specialty fuel additives will grow 4.8 percent per year to \$1.6 billion in 2016, with volume demand increasing 1.1 percent annually to 725 million pounds. Advances will be driven by a mild rebound in petroleum fuel demand as the economic recovery continues to strengthen and by an increase in additization rates due to rising biofuel consumption as mandated by the federal government. Additionally, market growth will reflect continued price inflation due to upward pressure on raw material costs as natural gas prices rebound from their 2012 lows.

## Cold flow improvers to grow at fastest rate

Cold flow improvers will grow at the fastest rate through 2016 due to the increasing use of biodiesel in the fuel supply, a requirement of the EPA's Renewable Fuel Standard 2 (RFS2). Biodiesel's reduced functionality in diesel engines in winter conditions requires higher loadings of cold flow improvers, which will help drive demand. However, biodiesel's high cetane number and excellent lubricating properties will also reduce demand for lubricity improvers and cetane improvers, making them the only additives to experience a decline in volume demand through 2016. Dyes and markers and metal deactivators will also not benefit from growing fuel demand, with volume demand for both products remaining flat through 2016. Dyes and

## US Specialty Fuel Additive Demand by Application, 2011 (\$1.3 billion)



markers will be mildly impacted by an end to EPA-mandated dyeing of high sulfur fuels, while metal deactivator loadings will decrease slightly due to the use of more metal-free additives in fuel. Demand for antioxidants, corrosion inhibitors, and other additives will all expand at a moderate pace, due to increasing fuel demand.

Deposit control agents will remain the largest product segment. A previous attempt by the EPA to regulate detergent levels in gasoline actually resulted in a decrease in demand, causing deposit-related engine problems. This prompted several automakers to establish the Top Tier Detergent Gasoline standard in 2004. Deposit control demand rebounded quickly as most major gasoline

brands adopted the Top Tier standard. Future growth in this segment will be aided by recent retailer efforts to differentiate their products by promoting the high concentrations of detergents in their gasoline.

## Blenders, terminals to remain largest market

Blenders and terminals will remain the largest market for fuel additives. Demand in this market will continue to grow as marketers attempt to differentiate their fuel offerings to end-consumers. Aftermarket volume demand will benefit from customers' efforts to offset rising gasoline costs by increasing fuel efficiency.

Copyright 2012 The Freedonia Group, Inc.

[Click here to purchase online](#)



## Sample Text, Table & Chart

### SPECIALTY FUEL ADDITIVES BY TYPE

#### Antioxidants

The market for antioxidants used in gasoline and other fuels is forecast to increase from 1.3 billion in 2011 to 1.5 billion in 2021. Overall average demand will be 1.4 billion pounds over the period. Higher biodiesel use will benefit demand for antioxidants. Biodiesel is more susceptible to oxidation than gasoline. Some types of antioxidants are used in both gasoline and biodiesel. In addition, demand for antioxidants will become more diverse as antioxidant consumption will rise. Negatively influencing demand will be the production of more effective antioxidants (lower addition rates) and better refining. Stricter CAFE standards will cause the amount of fuel consumed to increase only marginally through 2016, which will prevent demand for antioxidants from growing at a faster pace. Rapid chemical price increases will drive dollar value demand.

Antioxidants are used as a stabilizer in fuel and are incorporated into gasoline and other fuels to preserve the product during storage, enabling fuels to be stored for longer periods of time. These chemicals are typically added by the end user or those storing fuels for long periods to prevent fuel components from reacting with oxygen in the air to form peroxides or gums. Antioxidants work by reacting with free radicals, thus inhibiting the propagation of radical oxidation, which generates peroxides. Peroxides can reduce antiknock quality and damage engine or fuel system parts composed of elastic polymers. They also form soluble and insoluble gums, which can lead to engine deposits, fuel filters, engine system fouling, performance loss, or at worst, engine shutdown. These additives are needed in most fuels, but especially in fuels with high olefin contents, such as gasoline.

Hydrotreating required for ULSD removes natural antioxidants from the fuel. Biodiesel, especially in combination with ULSD, has

TABLE IV-1

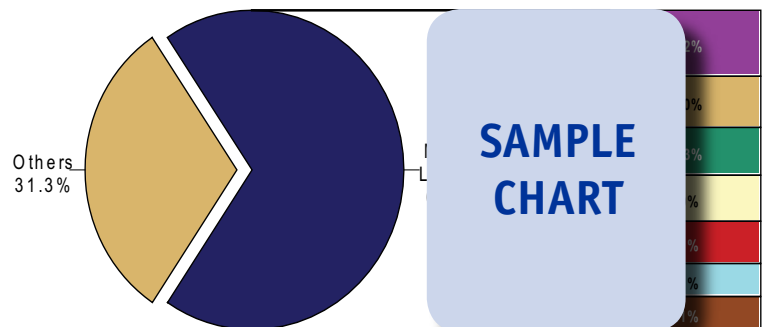
SPECIALTY FUEL ADDITIVE DEMAND BY TYPE  
(million dollars)

Item	2001	2006	2011	2016	2021
Petroleum Fuel Demand (bil gal) lb additive/000 gal fuel					31
Specialty Fuel Additive Demand (mil lb) \$/lb					6
Specialty Fuel Additive Demand					0
Deposit Control Additives					0
Cetane Improvers					5
Antioxidants					5
Lubricity Improvers					0
Cold Flow Improvers					5
Dyes & Markers					5
Corrosion Inhibitors					4
Metal Deactivators					1
Other					5

SAMPLE TABLE

CHART VI-1

SPECIALTY FUEL ADDITIVE MARKET SHARE  
(\$1.3 billion, 2011)

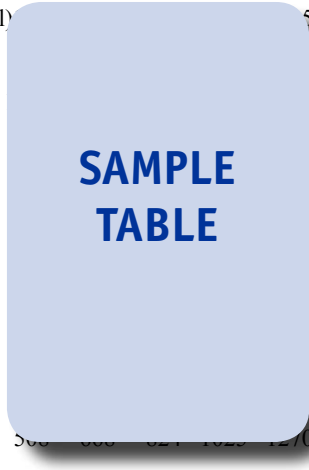


SAMPLE CHART

## Sample Profile, Table & Forecast

**TABLE V-3**  
**REGULAR & MIDGRADE GASOLINE ADDITIVE DEMAND**  
 (million dollars)

Item	2001	2006	2011	2016	2021
Regular/Midgrade Gas Demand (bil gal) lb additive/000 gal gas					
Regular/Midgrade Additive Dmnd (mil \$/lb)					
Regular & Midgrade Additive Demand					
Deposit Control Additives					
Antioxidants					
Dyes & Markers					
Corrosion Inhibitors					
Metal Deactivators					
Other					
% regular & midgrade Total Gasoline Additive Demand					



**COMPANY PROFILES**

---

**Albemarle Corporation**  
 451 Florida Street  
 Baton Rouge, LA 70801  
 225-388-  
 http://w

**SAMPLE PROFILE**

Sales: \$  
 US Sales:  
 Employe

Key pro

Albemarle is a global supplier of specialty and fine chemicals that enhance consumer products. The Company operates through three segments: Polymer Solutions, Catalysts and Fine Chemistry.

The Company participates in the US fuel additives industry through the Polymer Solutions segment, which posted 2011 sales of \$1 billion. The segment produces two main product lines: curatives and stabilizers, and flame retardants. Albemarle's stabilizers and curatives line includes antioxidant additives for fuels and lubricants. In 2011, curatives and stabilizers accounted for sales of \$221 million.

Antioxidant fuel additives from the Company are marketed under the ETHANOX brand name and are designed to extend fuel storage life and protect fuel systems, as well as control the formation of insoluble gum. In addition, ETHANOX antioxidants increase resistance to oxidation and help meet government and original equipment manufacturer guidelines. Albemarle makes ETHANOX additives for aviation and motor gasoline, aviation turbine fuel, diesel fuel oil, and other applications. Specific antioxidant fuel additives from the Company comprise ENTHANOX 4733 noncorrosive types that are engineered to inhibit

156 Copyright 2012 The Freedonia Group, Inc.

"Demand for specialty additives incorporated into regular and midgrade gasoline is projected to advance 4.6 percent annually to \$935 million in 2016, with volume growth projected at nearly one percent growth per year, reaching 412 million pounds over the same time span. Growth in volume will primarily stem from increased deposit control additization by gasoline retailers to brand their products as superior, while value growth will be due to an increase in chemical prices."

--Section V, pg. 119



**OTHER STUDIES**

**World Catalysts**

World demand for catalysts will rise 5.8 percent per year to \$19.5 billion in 2016. Rapid growth will occur in both Asia and the Middle East. Brazil will lead strong growth in Central and South America. Polymerization catalysts will experience the fastest growth, driven by healthy expansion of polymer resin production. This study analyzes the \$14.7 billion world catalyst industry, with forecasts for 2016 and 2021 by material, type, market, world region and for 24 countries. The study also evaluates company market share and profiles industry players.

#2989 ..... February 2013 ..... \$6400

**World Fuel Additives**

The world fuel additives market will rise 8.0 percent yearly to \$59.4 billion in 2016. The rapidly growing fuel market in China will drive gains, especially as China's fuel standards become stricter and additive treat rates rise. Deposit control additives will see the greatest gains globally, while cold flow improvers grow at the fastest rate. This study analyzes the \$40.5 billion world specialty fuel additives industry, with forecasts for 2016 and 2021 by product, application, world region and for 19 countries. The study also evaluates company market share and profiles industry players.

#2977 ..... December 2012 ..... Price: \$6100

**Synthetic Lubricants & Functional Fluids**

Demand for synthetic lubricants and functional fluids is forecast to climb 8.6 percent per year to \$7.4 billion in 2015. Engine oil will remain the fastest-growing product type. Group III base oils and polyalphaolefins (PAOs) will be the fastest growing materials. The vehicle and equipment market will remain by far the largest outlet. This study analyzes the \$4.9 billion US synthetic lubricant and functional fluid industry, with forecasts for 2015 and 2020 by product, material and market. The study also evaluates company market share and profiles industry competitors.

#2842 ..... February 2012 ..... \$4900

**Oilfield Chemicals**

US oilfield chemical demand will rise 8.3 percent yearly through 2015, driven by the recovery of oil prices and the development of shale gas resources. Stimulation and cementing chemicals will be the fastest growing products, followed by drilling fluids. Natural gums, polymers, acids and surfactants will be among the best prospects in raw materials. This study analyzes the \$9.1 billion US oilfield chemical industry, with forecasts for 2015 and 2020 by product and raw material. The study also evaluates company market share and profiles industry players.

#2821 ..... November 2011 ..... \$4900

**World Lubricants**

World demand for lubricants will rise 2.6 percent annually through 2015. Asia will remain the fastest growing region, followed by the Africa/Mideast region and Central/South America. Manufacturing and other markets will outpace the motor vehicle aftermarket. Hydraulic fluids and process oils will be the fastest growing products. This study analyzes the 37 million metric ton world lubricant industry, with forecasts for 2015 and 2020 by formulation, product, market, world region and for 31 countries. The study also evaluates company market share and profiles industry players.

#2771 ..... July 2011 ..... \$6100

**About The Freedonia Group**

The Freedonia Group, Inc., is a leading international industry market research company that provides its clients with information and analysis needed to make informed strategic decisions for their businesses. Studies help clients identify business opportunities, develop strategies, make investment decisions and evaluate opportunities and threats. Freedonia research is designed to deliver unbiased views and reliable outlooks to assist clients in making the right decisions. Freedonia capitalizes on the resources of its proprietary in-house research team of experienced economists, professional analysts, industry researchers and editorial groups. Freedonia covers a diverse group of industries throughout the United States, the emerging China market, and other world markets. Industries analyzed by Freedonia include:

- Chemicals • Plastics • Life Sciences • Packaging • Building Materials • Security & Electronics • Industrial Components & Equipment • Automotive & Transportation Equipment • Household Goods • Energy/Power Equipment

[Click here to learn more about Freedonia](#)

**Freedonia Custom Research**

Freedonia Custom Research delivers the same high quality, thorough and unbiased assessment of an industry or market as an industry study. Since the research initiative is based upon a company's specific needs, companies harness Freedonia's research capabilities and resources to answer unique questions. When you leverage the results of a Freedonia Custom Research engagement, you are able to obtain important answers to specific questions and issues associated with: mergers and acquisitions, new product launches/development, geographic expansion, entry into new markets, strategic business planning, and investment and funding decisions.

Freedonia Custom Research is ideal for companies seeking to make a strategic difference in the status quo and focus on future business growth. Working side by side with clients, Freedonia's team is able to define a research project that is custom-tailored to answer specific questions and provide the basis from which a company can make informed business decisions.

[Click here to learn more about Custom Research](#)



[Click here for complete title list](#)



[Click here to visit freedoniagroup.com](http://www.freedoniagroup.com)