Fluoropolymers

US Industry Study with Forecasts for 2013 & 2018

Study #2496 | May 2009 | $4600 | 217 pages
# Table of Contents

## EXECUTIVE SUMMARY

## MARKET ENVIRONMENT
General ........................................ 4
Macroeconomic Outlook .................... 5
Manufacturing Outlook .................... 10
Historical Market Trends .................. 12
Pricing Trends ................................ 15
Competitive Materials ..................... 17
Environmental & Regulatory Issues ..... 18
Perfluorooctanoic Acid ..................... 20
International Activity ..................... 21
Foreign Trade ................................ 23
Imports ....................................... 24
Exports ....................................... 28

## PRODUCTS
General ....................................... 31
PTFE ........................................... 35
Applications & Markets .................... 37
Types .......................................... 39
Granular ...................................... 40
Fine Powder .................................. 42
Dispersion .................................... 44
Micronized Powder ......................... 46
FEP .............................................. 48
Resin Demand ................................ 48
Applications & Markets .................... 50
Fluoroolastomers ............................ 52
Applications & Markets .................... 54
Types .......................................... 56
Standard ..................................... 57
Specialty ..................................... 60
PVDF ........................................... 64
Resin Demand ................................ 64
Applications & Markets .................... 66
Other Fluoropolymers ...................... 67
Applications & Markets .................... 68
Types .......................................... 70
PFA ............................................. 71
ETFE .......................................... 72
PCTFE .......................................... 73
ECTFE .......................................... 74
All Other ..................................... 74

## APPLICATIONS
General ......................................... 79
Coatings & Liners ............................ 81
Mechanical Parts & Components ......... 85
Films ............................................ 87
Additives ..................................... 90
Other Applications .......................... 93

## MARKETS
General ......................................... 96
Industrial Equipment ....................... 99
Industrial Indicators ....................... 100
Fluoropolymer Demand ..................... 102
Chemical & Pharmaceutical Equipment .. 104
Semiconductor Manufacturing Equipment .. 106
Other Industrial Equipment ............... 108
Electrical & Electronic ...................... 110
Electrical & Electronics Indicators ...... 111
Fluoropolymer Demand ..................... 114
Wire & Cable .................................. 115
Photovoltaic Modules ....................... 118
Batteries & Fuel Cells ....................... 120
Chemical Products .......................... 122
Chemical Product Indicators ............... 123
Fluoropolymer Demand ..................... 126
Architectural Coatings ...................... 127
Plastics & Elastomers ....................... 129
Lubricants .................................... 131
Transportation Equipment .................. 133
Transportation Equipment Outlook ....... 134
Fluoropolymer Demand ..................... 136
Motor Vehicles ................................ 138
Aerospace ..................................... 139
Other Transportation Equipment ......... 140
Other Markets ................................ 141
Medical ......................................... 142
Cookware ...................................... 143
Construction .................................. 144
Textiles ....................................... 144
All Other ..................................... 145

## INDUSTRY STRUCTURE
General ......................................... 146
Market Share .................................. 147
Competitive Strategies ..................... 151
Product Differentiation ..................... 151
Strategic Partnerships ..................... 153
Mergers & Acquisitions .................... 155
Manufacturing ............................... 157
Marketing & Distribution ................. 158
Research & Development ................... 159

## COMPANY PROFILES
Afton Plastics .................................. 161
Arkema SA ................................. 162
Asahi Glass ..................... 164
Castle (AM) & Company .................... 167
Chicago Gasket ......................... 168
Daikin Industries ....................... 170
Dongyue Group ....................... 173
DuPont (EF) de Nemours ............... 176
Flontech USA ......................... 179
Fluoro-Plastics Incorporated ....... 180
Fluorotherm Polymers ................... 181
Gore (WL) & Associates ............... 182
Halocarbon Products ................... 184
HaloPolymer OJSC ..................... 185
Honeywell International ............ 187
Kureha Corporation ................... 189
Momentum Performance Materials ... 190
NewAge Industries .................... 191
Parker-Hannifin Corporation ...... 192
Quadrant AG ......................... 195
Robbins & Myers ...................... 197
Saint-Gobain .......................... 198
Saudi Basic Industries .............. 201
Shamrock Technologies ............ 202
Shin-Etsu Chemical ................... 204
Solvay SA .................................... 206
3M Company ......................... 208
Westlake Plastics .................... 212
Whitford Corporation ............... 213
Zeus Industrial Products ............ 215
Zhejiang Jusheng Fluorochemical .... 216

Click here to purchase online

Order now, click here!
List of Tables/Charts

EXECUTIVE SUMMARY
1 Summary Table.......................... 3

MARKET ENVIRONMENT
1 Macroeconomic Indicators.............. 9
2 Manufacturers’ Shipments .......... 12
3 Fluoropolymer Demand, 1998-2008................. 14
Cht Fluoropolymer Demand, 1998-2008................. 14
4 Fluoropolymer Pricing Trends..... 16
Cht World Fluoropolymer Demand, 2008................. 23
5 Fluoropolymer Foreign Trade...... 24
6 Fluoropolymer Imports by Source, 2003-2008......... 26
Cht Fluoropolymer Imports by Source, 2008: Volume Versus Value...... 27
7 Fluoropolymer Exports by Destination, 2003-2008......... 29
Cht Fluoropolymer Exports by Destination, 2008................. 30

PRODUCTS
1 Fluoropolymer Demand by Type... 33
Cht Fluoropolymer Demand by Product, 2008: Volume Versus Value..... 34
2 PTFE Demand ........................... 37
3 PTFE Demand by Application & Market......................... 39
4 PTFE Demand by Type................. 40
5 Granular PTFE Demand by Application & Market................. 42
6 Fine Powder PTFE Demand by Application & Market................. 44
7 Dispersion PTFE Demand by Application & Market................. 46
8 Micronized PTFE Demand by Market......................... 48
9 FEP Demand.......................... 50
10 FEP Demand by Application & Market......................... 51
11 Fluoroelastomer Demand............. 53
12 Fluoroelastomer Demand by Application & Market................. 56
13 Fluoroelastomer Demand by Type................................ 57
14 Standard Fluoroelastomer Demand by Application & Market ...... 60
15 Specialty Fluoroelastomer Demand by Market......................... 63
16 PVDF Demand.......................... 65
17 PVDF Demand by Application & Market......................... 67
18 Other Fluoropolymer Demand..... 68
19 Other Fluoropolymer Demand by Application & Market................. 70
20 Other Fluoropolymer Demand by Type................................ 71

APPLICATIONS
1 Fluoropolymer Demand by Application.......................... 80
Cht Fluoropolymer Demand by Application, 2008.......................... 81
2 Coating & Liner Applications for Fluoropolymers......................... 84
3 Mechanical Part & Component Applications for Fluoropolymers 86
4 Film Applications for Fluoropolymers.......................... 90
5 Additive Applications for Fluoropolymers.......................... 93
6 Other Applications for Fluoropolymers.......................... 95

MARKETS
1 Fluoropolymer Demand by Market.......................... 98
Cht Fluoropolymer Demand by Market, 2008.......................... 99
2 Industrial Equipment Indicators.102
3 Industrial Equipment Markets for Fluoropolymers................. 104

INDUSTRY STRUCTURE
1 US Fluoropolymer Sales by Company, 2008................. 147
Cht US Fluoropolymer Market Share, 2008................. 148
2 Selected Cooperative Agreements.......................... 154
3 Selected Acquisitions & Divestitures.......................... 156
Demand will be driven by a turnaround in key markets, the increasing need for high-performance materials in chemical processing, and rising demand in emerging, fast-growing markets.

US demand to grow 4.5% annually through 2013

US demand for fluoropolymers will rise 4.5 percent per year to $1.7 billion in 2013. Gains will represent an acceleration from the pace of the 2003-2008 period, during which the fluoropolymer market was hampered by weakness in the manufacturing sector. Going forward, fluoropolymer demand will be driven by a turnaround in key markets such as motor vehicles and wire and cable, and the increasing need for high-performance materials in chemical processing applications. Rising demand in emerging, fast-growing markets such as advanced batteries, fuel cells and photovoltaic modules will also support fluoropolymer market gains. Fluoropolymer volume demand will rise 3.6 percent per year to 172 million pounds in 2013.

Fluoroelastomers, smaller-volume types to lead gains

Polytetrafluoroethylene (PTFE), the first commercial fluoropolymer, will continue to account for the largest portion of demand in 2013. Advances for PTFE will be driven by growing opportunities in applications such as chemical processing and industrial filtration. However, the most rapid gains will be seen in fluoroelastomers, fueled by a strong rebound in motor vehicle production from a low 2008 base. Demand for fluorinated ethylene propylene (FEP) and polyvinylidene fluoride (PVDF) resins will rise at a more moderate pace, limited by a drop in nonresidential construction activity. Nonetheless, volume gains for these resins will exceed three percent per year, outpacing growth in real manufacturing activity over the same period.

Robust gains will also be found in smaller-volume fluoropolymer products, which include a number of high value materials used in emerging markets. Double-digit growth in solar energy products will fuel gains for polyvinyl fluoride (PVF) films used in the production of photovoltaic modules. Demand for perfluorosulfonic acid polymers (such as DuPont’s NAFION) will be driven by the rapid rise in fuel cell production. Additionally, a strong pharmaceutical market will bolster demand for polychlorotrifluoroethylene (PCTFE) polymers, which are used in drug packaging films.

Film, additives to be fastest-growing applications

Among fluoropolymer applications, coatings and liners and mechanical components were the largest uses in 2008, comprising three-quarters of total demand. However, faster gains are expected for fluoropolymer film, which is used in a number of high-value electronics and industrial applications; and for fluoropolymer additives, which impart enhanced thermal stability and nonstick properties to products such as plastics, elastomers, lubricants, and coatings.
**Sample Text, Table & Chart**

**PRODUCTS**

**PTFE**

PTFE is a completely fluorinated version of polyethylene which offers a number of performance benefits including chemical inertness, heat resistance and temperature stability as well as low conductivity and a low coefficient of friction. Because of this wide range of properties, PTFE is often used in extreme applications where other polymers would be ineffective. For example, PTFE’s chemical inertness makes it useful for fittings and equipment for chemical and food processing industries. The superior electrical resistance of PTFE is beneficial for semiconductor and wire and cable applications. It is also used in various forms in coatings, thin tapes and powders. However, the major limitation of PTFE is that it is difficult to process. It is not amenable to melt-processing techniques; therefore, it must be shaped by procedures such as compression molding and machining, which limit its utility. In fact, the drive behind the development of tetrafluoroethylene-based copolymers such as FEP, PFA and ETFE was to produce a material with properties approaching those of PTFE, but with the ability to be processed by traditional extrusion, blow molding, thermoforming and injection molding methods.

---

**TABLE IV-4**

**FILM APPLICATIONS FOR FLUOROPOLYMERS**

(million dollars)

<table>
<thead>
<tr>
<th>Item</th>
<th>1998</th>
<th>2003</th>
<th>2008</th>
<th>2013</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturers’ Shipments (bil 2000$)</td>
<td>3867</td>
<td>3737</td>
<td>3616</td>
<td>3820</td>
<td>4020</td>
</tr>
<tr>
<td>lb fluoropolymer/mil $ mfg</td>
<td>2.3</td>
<td>3.1</td>
<td>4.1</td>
<td>5.2</td>
<td>6.5</td>
</tr>
<tr>
<td>Film Fluoropolymer Demand (mil lb)</td>
<td>8.8</td>
<td>11.5</td>
<td>14.7</td>
<td>19.9</td>
<td>26.2</td>
</tr>
<tr>
<td>$/lb</td>
<td>10.35</td>
<td>10.45</td>
<td>11.10</td>
<td>11.85</td>
<td>13.00</td>
</tr>
<tr>
<td>Film Fluoropolymer Demand</td>
<td>91</td>
<td>120</td>
<td>163</td>
<td>236</td>
<td>340</td>
</tr>
<tr>
<td>PTFE</td>
<td>20</td>
<td>26</td>
<td>35</td>
<td>45</td>
<td>58</td>
</tr>
<tr>
<td>PVDF</td>
<td>14</td>
<td>17</td>
<td>21</td>
<td>26</td>
<td>32</td>
</tr>
<tr>
<td>Other Fluoropolymers</td>
<td>57</td>
<td>77</td>
<td>107</td>
<td>165</td>
<td>250</td>
</tr>
<tr>
<td>% film Fluoropolymer Demand</td>
<td>9.1</td>
<td>10.3</td>
<td>11.8</td>
<td>13.7</td>
<td>15.5</td>
</tr>
<tr>
<td>Fluoropolymer Demand</td>
<td>999</td>
<td>1167</td>
<td>1378</td>
<td>1720</td>
<td>2190</td>
</tr>
</tbody>
</table>

---

**CHART VI-1**

US FLUOROPOLYMER MARKET SHARE, 2008

($1.4 billion)

- DuPont 39%
- Other Companies 10%
Sample Profile, Table & Forecast

COMPANY PROFILES

Westlake Plastics Company
West Lenni Road
Lenni, PA 19052
610-459-1000
http://www.westlakeplastics.com

Annual Sales: $40 million (estimated)
Employment: 250 (estimated)
Key Products: fluoropolymer-based rods, sheets and films

Westlake Plastics extrudes and compresses high-performance thermoplastics into rods, sheets and films for the medical, automotive, semiconductor, aerospace and chemical processing markets. The privately held company operates through seven business groups: Chemical Resistance, Engineering, Film, High Performance, Medical, Compression Molded and Static Control. Westlake Plastics conducts operations at two US facilities in Lenni, Pennsylvania and Placentia, California.

The Company competes in the US fluoropolymer industry through the Chemical Resistance group, which makes plastic materials that can withstand acids and caustics; the Compression Molded group, which produces compression molded plastic materials; and the Film group, which manufactures plastic films. Plastic materials from these three groups are available in rod, sheet and film formats, and are composed of a broad range of resins, including such fluoropolymer resins as HALAR (Solvay SA -- Belgium) ethylene chlorotrifluoroethylene (ECTFE) and KYNAR (Arkema SA -- France) polyvinylidene (PVDF).

Among the fluoropolymer-based products produced by Westlake Plastics are products made from HALAR ECTFE for semiconductor

Copyright 2009 The Freedonia Group, Inc.
Order Information

Five Convenient Ways to Order

ONLINE: www.freedoniagroup.com
MAIL: Print out and complete the order form and send to The Freedonia Group (see address at the bottom of this form)
PHONE: Call toll free, 800.927.5900 (US) or +1 440.684.9600
FAX: +1 440.646.0484 (US)
EMAIL: info@freedoniagroup.com

Free Handling & Shipping
There is NO charge for handling or UPS shipping in the US. Expect delivery in 3 to 5 business days. Outside the US, Freedonia provides free airmail service. Express delivery is available at cost.

Orders Outside of the US
Checks must be made payable in US funds, drawn against a US bank and mailed directly to The Freedonia Group. For wire transfers please contact our customer service department at info@freedoniagroup.com. Credit cards accepted.

Credit Card Orders
For convenience, Freedonia accepts American Express, MasterCard or Visa. Credit card purchases must include account number, expiration date and authorized signature.

Save 15%
If you order three (3) different titles at the same time, you can receive a 15% discount. If your order is accompanied by a check or wire transfer, you may take a 5% cash discount (discounts do not apply to Corporate Use Licenses).

Corporate Use License
Now every decision maker in your organization can act on the key intelligence found in all Freedonia studies. For an additional $2300, companies receive unlimited use of an electronic version (PDF) of the study. Place it on your intranet, e-mail it to coworkers around the world, or print it as many times as you like.

Click here to learn more about the Corporate Use License

Order Form

Fluoropolymers .......................................................... $4600

☐ Corporate Use License (add to study price) * + $2300
☐ Additional Print Copies @ $500 each *

Total (including selected option) $________________________

☐ Enclosed is my check (5% discount) drawn on a US bank and payable to The Freedonia Group, Inc., in US funds (Ohio residents add 7.75% sales tax)

☐ Bill my company ☐ American Express ☐ MasterCard ☐ Visa

MM YY

Credit Card #

Expiration

Name ________________________________
Title ________________________________
Company ________________________________
Division ________________________________
Street ________________________________
City/State/Zip ________________________________
Country ________________________________
Phone ________________________________ Fax ________________________________
Email ________________________________

☐ Individual Use License Agreement
The undersigned hereby represents that the above captioned study will be used by only __ individual(s) who are employees of the company and that the study will not be loaded on a network for multiple users. In the event that usage of the study changes, the Company will promptly notify Freedonia of such change and will pay to Freedonia the appropriate fee based on Freedonia’s standard fee schedule then in effect. Note: Entire company corporate use license, add $2300; one additional user, add $500; two additional users, add $1000; three additional users, add $1500.

☐ Corporate Use License Agreement
The above captioned study may be stored on the company’s intranet or shared directory, available to company employees. Copies of the study may be made, but the undersigned represents that distribution of the study will be limited to employees of the company.

Signature ________________________________

☐ Corporate Use License Agreement

Signature ________________________________
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

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-tailed to answer specific questions and provide the basis from which a company can make informed business decisions.