World Emulsion Polymers

Industry Study with Forecasts for 2018 & 2023

Study #3216 | October 2014 | $6200 | 373 pages

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World demand to rise 4.6% annually through 2018

Global demand for emulsion polymers is forecast to advance 4.6 percent per year to 12.6 million metric tons in 2018, driven by accelerating growth in construction spending, manufacturing output, and paper and paperboard production. In particular, rebounding construction activity in North America and Western Europe -- both intensive regional consumers of emulsions -- will propel market advances. In addition, the ongoing displacement of solventborne coatings and adhesives with water-based types -- which are manufactured using emulsion polymers -- is expected to continue in virtually all parts of the world.

Asia/Pacific region to remain largest market

The Asia/Pacific region will remain the largest regional consumer of emulsion polymers, bolstered by growth in the massive Chinese market. Meanwhile, India and Malaysia are forecast to see the fastest annual gains of any major market through 2018. In India, double-digit annual growth in the paint and coatings market will underpin advances, spurred by expanding use of water-based packaging and industrial coatings, as well as the increasing penetration of latex paint in rural markets as per capita incomes rise. Demand in Malaysia will be boosted by robust growth in the country’s huge export-oriented latex gloves industry, as well as by the increased substitution of nitrile gloves for natural latex types worldwide.

Paint and coatings to be fastest growing market

Of the major markets for emulsions, the paint and coatings segment is projected to achieve the most rapid annual growth through 2018, climbing 5.8 percent per year. Ongoing concerns about the health and environmental hazards posed by solvent-based coatings will continue to drive the use of waterborne technologies. In addition, improvements in the performance characteristics of latex paint are expected to increase its use in industrial and maintenance coating applications.

The general purpose adhesives market is expected to grow at an average pace, rising 4.5 percent per year through 2018. Expanding packaging industries and construction spending -- particularly in the Asia/Pacific and Africa/Mideast regions -- coupled with the growing adoption of waterborne technologies will boost consumption growth. However, suppliers of emulsion polymers will continue to face competition from producers of other low VOC adhesive technologies such as hot melts. Below average annual advances are projected for the global paper and paperboard coatings market for emulsion polymers, largely due to highly mature coated paper industries in North America and Western Europe.
Demand for emulsion polymers in South Korea is forecast to advance 2.7 percent per year to 325,000 metric tons in 2018, lagging gains for the global market overall. Such growth will represent a continuation of the relatively moderate growth experienced between 2003 and 2013; despite a small decline in construction spending, South Korea was not as negatively affected by the global economic weakness beginning in 2008 as were most other higher income nations. Emulsion polymer suppliers will benefit from an acceleration in construction spending, which will generate rising production of water-based coatings and adhesives in South Korea. Nevertheless, more modest gains in the output of paper and paperboard will prevent faster advances in the total market, as will a slight deceleration in overall manufacturing activity. Acrylic-based emulsions are expected to continue to account for the largest share of demand, increasing to 153,000 metric tons on 3.3 percent annual growth. SB latex will also continue to comprise a large portion of demand, bolstered by the country’s sizable paper and paperboard industry.

South Korea’s paper coatings market is projected to remain the leading outlet for emulsion polymers in 2018, with demand expected to reach 104,000 metric tons. The country’s large paper and paperboard sector sustains demand in this market. In 2013, South Korea was the fifth largest producer of paper and paperboard in the Asia/Pacific region and the seventh leading producer globally. The country experienced a modest average annual growth in paper and paperboard production between 2003 and 2013, a trend that is expected to continue through 2018 and generate increased demand for emulsion polymers.

The paint and coatings market for emulsion polymers is expected to see the fastest annual growth of any market in South Korea.

### Table VII-7

<table>
<thead>
<tr>
<th>Item</th>
<th>2003</th>
<th>2008</th>
<th>2013</th>
<th>2018</th>
<th>2023</th>
</tr>
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<tbody>
<tr>
<td>Population (million persons)</td>
<td>47.8</td>
<td>48.8</td>
<td>49.8</td>
<td>50.6</td>
<td>51.2</td>
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<td>per capita GDP</td>
<td>22470</td>
<td>27340</td>
<td>31390</td>
<td>36760</td>
<td>42970</td>
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<tr>
<td>Gross Domestic Product (bil 2012$)</td>
<td>1074</td>
<td>1334</td>
<td>1563</td>
<td>1860</td>
<td>2200</td>
</tr>
<tr>
<td>Manufacturing Value Added (bil 2012$)</td>
<td>271</td>
<td>382</td>
<td>486</td>
<td>563</td>
<td>649</td>
</tr>
<tr>
<td>Construction Expenditures (bil 2012$)</td>
<td>252.5</td>
<td>249.7</td>
<td>258.5</td>
<td>295.5</td>
<td>328.0</td>
</tr>
<tr>
<td>Paper &amp; Paperboard Prdn (mil metric ton)</td>
<td>10.1</td>
<td>10.6</td>
<td>11.5</td>
<td>12.3</td>
<td>13.3</td>
</tr>
<tr>
<td>kg emulsion/capita</td>
<td>4.41</td>
<td>4.94</td>
<td>5.70</td>
<td>6.42</td>
<td>7.32</td>
</tr>
<tr>
<td>kg emulsion/mil $ GDP</td>
<td>196</td>
<td>181</td>
<td>182</td>
<td>175</td>
<td>170</td>
</tr>
<tr>
<td>kg emulsion/000$ MVA</td>
<td>0.78</td>
<td>0.63</td>
<td>0.58</td>
<td>0.58</td>
<td>0.58</td>
</tr>
<tr>
<td>Emulsion Polymer Demand (000 m ton)</td>
<td>211</td>
<td>241</td>
<td>284</td>
<td>325</td>
<td>375</td>
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<tr>
<td>net exports</td>
<td>60</td>
<td>57</td>
<td>107</td>
<td>120</td>
<td>140</td>
</tr>
<tr>
<td>Emulsion Polymer Prdn (000 m ton)</td>
<td>271</td>
<td>298</td>
<td>391</td>
<td>445</td>
<td>515</td>
</tr>
</tbody>
</table>
Sample Profile, Table & Forecast

COMPANY PROFILES

Archroma Management LLC
Neuhofstrasse 11
4153 Reinach
Switzerland
41-61-469-7222
http://archroma.com

Annual Sales: $1.3 billion (estimated)
Employment: 3,000 (estimated)
Key Products: vinyl acetate, acrylate, styrene, vinyl acetate ethylene, and other emulsions

Archroma manufactures dyes and related additives for the textile and paper industries; and emulsion polymers for the paints, adhesive, construction, textile, paper, and other markets. The Company was established in October 2013 when SK Capital Partners (New York, New York) acquired the Textile Specialties, Paper Solutions, and Emulsion Products businesses of Clariant International Limited (Switzerland). Following the transaction, Archroma Management became the new parent company of the acquired businesses.

The Company is active in the world emulsion polymers industry via the Emulsion Products business (São Paulo, Brazil), through which Archroma is engaged in the manufacture and sale of emulsion polymers for the paint, construction, adhesives, textile, paper, and other industries. These emulsions are based on vinyl acetate, acrylate, styrene, vinyl acetate ethylene, and other chemistries.

Among the specific emulsion polymers produced by Archroma are MOWILITH emulsions for use in paints and coatings; MELIO emulsions to use in leather treatment and finishing applications; APPRETAN, EMUCRYL, and PRINTOFIX binders to use in textile applications.

TABLE VII-8
SOUTH KOREA:
EMULSION POLYMER DEMAND BY PRODUCT & MARKET
(thousand metric tons)

<table>
<thead>
<tr>
<th>Item</th>
<th>2003</th>
<th>2008</th>
<th>2013</th>
<th>2018</th>
<th>2023</th>
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</thead>
<tbody>
<tr>
<td>Gross Domestic Product (bil 2012$)</td>
<td>1074</td>
<td>1334</td>
<td>1563</td>
<td>1860</td>
<td>2200</td>
</tr>
<tr>
<td>kg emulsion/mil $ GDP</td>
<td>196</td>
<td>181</td>
<td>182</td>
<td>175</td>
<td>170</td>
</tr>
<tr>
<td>Emulsion Polymer Demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>By Product:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acrylics</td>
<td>89</td>
<td>108</td>
<td>130</td>
<td>153</td>
<td>183</td>
</tr>
<tr>
<td>Styrene-Butadiene Latex</td>
<td>65</td>
<td>68</td>
<td>79</td>
<td>85</td>
<td>92</td>
</tr>
<tr>
<td>Vinyl Acetate Polymers</td>
<td>34</td>
<td>39</td>
<td>45</td>
<td>53</td>
<td>62</td>
</tr>
<tr>
<td>Other Emulsion Polymers</td>
<td>23</td>
<td>26</td>
<td>30</td>
<td>34</td>
<td>38</td>
</tr>
<tr>
<td>By Market:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paint &amp; Coatings</td>
<td>54</td>
<td>63</td>
<td>74</td>
<td>91</td>
<td>110</td>
</tr>
<tr>
<td>Paper &amp; Paperboard Coatings</td>
<td>80</td>
<td>85</td>
<td>97</td>
<td>104</td>
<td>112</td>
</tr>
<tr>
<td>Adhesives</td>
<td>48</td>
<td>57</td>
<td>69</td>
<td>81</td>
<td>96</td>
</tr>
<tr>
<td>Carpet Backing &amp; Other Markets</td>
<td>29</td>
<td>36</td>
<td>44</td>
<td>49</td>
<td>57</td>
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</table>

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### Other Studies

#### Engineering Plastics
Demand for engineering plastics in the US is expected to rise 2.6 percent per year to 5.1 billion pounds in 2019. Nylon, ABS, and polycarbonate will remain the three largest engineering plastics by volume, with nylon the fastest growing of the three. Smaller-volume engineering plastics such as polyphenylene sulfide, sulfone polymers, and fluoropolymers will grow the fastest. This study analyzes the 4.5 billion pound US engineering plastic industry, with forecasts for 2019 and 2024 by resin and market. The study also evaluates company market share and profiles industry players.

#3242 .......................... April 2015 .......................... $5300

#### Solvents
US demand for solvents is expected to increase at a 1.5 percent annual pace through 2018 to 11 billion pounds. Growing environmental concerns and regulatory pressure will drive demand for “green” solvents that are derived from renewable raw materials. The paint and coatings market will replace the transportation market as the largest solvent consumer. This study analyzes the 10.2 billion pound US solvent industry, with forecasts for 2018 and 2023 by product and market. The study also evaluates company market share and profiles industry players.

#3169 .......................... June 2014 .......................... $5100

#### Wood Protection Coatings & Preservatives
Demand for wood protection coatings and preservatives will rise 4.5 percent per year through 2018 to $4.8 billion. Gains will be driven by a rebound in residential construction. The dominant coatings segment will continue to outpace preservatives. Wood furniture applications will provide the best growth opportunities. This study analyzes the $3.9 billion US wood protection coatings and preservatives industry, with forecasts for 2018 and 2023 by product, application and market. The study also evaluates company market share and profiles industry players.

#3150 .......................... June 2014 .......................... $5100

#### World Kaolin
Global demand for kaolin will rise 3.3 percent yearly to 28.7 million metric tons in 2017, valued at $4.4 billion. The Asia/Pacific region will remain the largest and fastest-growing geographic market. Paper and paperboard production will remain the largest market, while ceramics will be the most rapidly growing, driven mainly by ceramic proppants. This study analyzes the 24.4 million metric ton world kaolin industry, with forecasts for 2017 and 2022 by market, world region, and for 22 countries. The study also evaluates company market share and profiles industry players.

#3147 .......................... April 2014 .......................... $6200

#### Silicones
US demand for silicones is forecast to climb 4.7 percent annually to $3.4 billion in 2018, with volume rising 3.2 percent per year to 900 million pounds. Silicone elastomers will grow the fastest, overtaking fluids as the leading product type. The construction and medical markets will be the fastest growing segments, while the industrial market will remain dominant. This study analyzes the $3.4 billion US silicones industry, with forecasts for 2018 and 2023 by product, market and application. It also evaluates company market share and profiles industry players.

#3138 .......................... March 2014 .......................... $5100