

# CHEMICAL PROFILE

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## Acrylic Acid

### DEMAND

2006: 2.552bn lbs (1.157m tonnes); 2007: 2.568bn lbs; 2011: 2.735bn lbs, projected. Demand equals production plus imports (2006: 14m lbs; 2007: 13m lbs) less exports (2006: 157m lbs; 2007: 135m lbs). Sources: *ICIS Chemical Business*; USITC

### GROWTH

Historical (2002–2007): 3.4%/year; future: 1.6%/year through 2011. Source: *ICIS Chemical Business*

### PRICE

Historical (2002–2007): High, \$1.11/lb, contract, US Gulf Coast, glacial acrylic acid, tanks, delivered; low, 49 cents/lb, same basis. Current prices are \$1.10–1.15/lb, same basis. Source: ICIS pricing

### USES

Acrylate esters, 55%; polyacrylic acid and salts, 42%; miscellaneous, 3%. Source: *ICIS Chemical Business*

### MARKET PERSPECTIVE

US consumption of acrylic acid (AA) grew by 3.4%/year in the period 2002–2007, buoyed by peak growth years in 2002 and 2003, coming out of the 2001 recession. For the past three years growth slowed to about 2%/year. The market contributors to demand growth during this period were polyacrylic acid and acrylic esters, particularly n-butyl acrylate and 2-ethylhexyl acrylate.

Polyacrylic acid is used in producing superabsorbent polymers (SAPs), which are largely used in disposable diapers and feminine hygienic products. SAPs accounted for about 35% of AA demand in 2007, but this sector is now saturated. One new application for SAPs is soaker pads used in food packaging. Last year, the US Food and Drug Administration authorized SAPs in packaging with indirect food contact. The action covers packaging for poultry, meat, fish, fruit and vegetables. Smaller volumes of polyacrylic

acid are used in detergents, dispersants and for water treatment.

Acrylic esters are chiefly employed in formulating water-based acrylic emulsions. Applications for water-based acrylics are primarily in architectural and industrial coatings but other uses include adhesives, paper and leather coatings, polishes, carpet backing compounds and tablet coatings.

With the downturn of the home construction industry this year, demand for architectural coatings and other AA-based products used by the building trades will be down, perhaps by 5–10%. Recovery in this sector is not anticipated until 2010.

The AA export market has remained strong in recent years, averaging 145m lbs/year. Brazil and Belgium account for more than 50% of the exported material, taking 41% and 11% respectively.

On the technology front, US ethanol producer Cargill announced earlier this year that it and Danish bio innovator Novozymes are developing technology that could create AA through 3-hydroxypropionic acid by using sugar as the feedstock. The project is receiving \$1.5m (€960,000) from the US Department of Energy. In the process, engineered microorganisms ferment sugar to make 3-hydroxypropionic acid. The acid is then converted to AA. The companies said the technology should be commercially viable within five years.

### OUTLOOK

US demand for acrylic acid will grow by 1.6%/year and reach more than 2.7bn lbs, valued at \$3.4bn, by 2011. Consumption of polyacrylic acid for SAPs is expected to grow by 0.5%/year as a result of sector saturation. This could be improved, however, if SAP use in food packaging is widely adopted. Consumption of commodity acrylate esters will grow by 2.1%/year. AA, derived from propylene, is price-sensitive to the cost of crude oil. With the recent high prices for crude, further price increases are expected for acrylic acid.

### US ACRYLIC ACID CAPACITY, MILLIONS OF LBS/YEAR

Company	Location	Capacity
American Acryl	Bayport, Texas	305
BASF	Freeport, Texas	505
Dow Chemical	Clearlake, Texas	660
Dow Chemical	Taft, Louisiana	240
Rohm and Haas/StoHaas	Deer Park, Texas	1,275
<b>TOTAL</b>		<b>2,985</b>

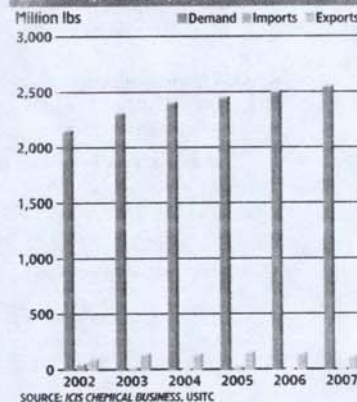
SOURCE: ICIS CHEMICAL BUSINESS

\*Millions of lbs/year of crude AA. Industrial production is by gas-phase catalytic oxidation of propylene. Roughly, three-quarters of production are converted directly into acrylate esters and the rest is purified into glacial acrylic acid.

American Acryl is a 50/50 joint venture, between France's Arkema and NA Industries (owned by Japan's Nippon Shokubai). StoHaas is a 50/50 joint venture between Rohm and Haas, of the US, and Stockhausen of Krefeld, Germany, a subsidiary of Germany's Evonik Industries. On July 10, US chemical giant Dow Chemical announced it had reached a definitive agreement to acquire Rohm and Haas.

In June, Dow revealed that it had idled 30% of its North American AA capacity. In addition to the plants listed at Clear Lake, Texas and Taft, Louisiana, Dow has 140m lbs of AA capacity at Coatzacoalcos, Veracruz, Mexico.

### US ACRYLIC ACID CAPACITY, DEMAND, IMPORTS AND EXPORTS



SOURCE: ICIS CHEMICAL BUSINESS, USITC

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» For the latest market prices and reports on more than 120 commodity chemicals from the leading independent pricing and market intelligence service, please visit ICIS pricing at [www.icispricing.com](http://www.icispricing.com)

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are expected to rise by some 15 cents/lb in August because of soaring BD costs.

Contract nominations are up 12-19 cents/lb from July's 98 cents/lb US Gulf. Non-oil grade 1502 SBR spot prices are heard at 150-170 cents/lb, but with the expected spike, spot prices in the US may rise to 165-185 cents/lb in August.

#### BENZENE

High July spot prices are fueling US benzene producers' push for August contract hikes.

Aromatics traders say that nominations are at \$4.65 and \$4.70/gal FOB. A settlement is said to be imminent. July contracts were agreed at \$4.16-4.18/gal.

#### METHANOL

Canadian methanol producer Methanex has decided to keep its North American non-discounted reference price stable for August at 158 cents/gal. Prices have remained the same since June. The news follows the decision by US methanol importer Southern Chemical Corp. to keep its August contract price at 155 cents/gal - which was also no different from June or July.

With a weak US new house construction market, domestic demand for methanol has faltered. Spot methanol prices are at 134-144 cents/gal FOB US Gulf Coast.

#### METHYL METHACRYLATE

European third-quarter methyl methacrylate (MMA) contracts have settled at an average increase of €80/tonne from the previous quarter at €1,565-1,625/tonne FD NWE.

Buyers confirm a range of hikes, some as low as €30/tonne, up to €100/tonne.

Demand for MMA is steady, say sellers, although consumers see a different picture.

#### TITANIUM DIOXIDE

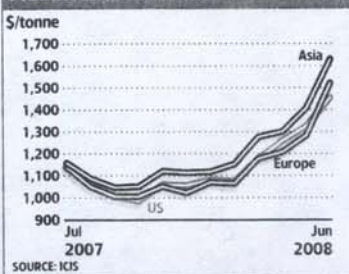
The sinking of Sierra Leonean mining company Sierra Rutile's dredge *Solondo* on July 25 in Sierra Leone, West Africa, could lead to a significant shortfall in titanium dioxide (TiO<sub>2</sub>) supply in Europe. The five-storey dredge sourced 80,000 tonnes/year of natural rutile - a key ore used in the production of TiO<sub>2</sub>. This could further tighten the market. One European TiO<sub>2</sub> manufacturer said that it had received notice from Sierra Rutile that it could no longer fulfill all of its pre-arranged quotas because of the incident.

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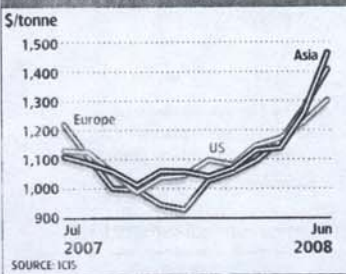
## MARKETS

# KEY INDICATORS

### PARAXYLENE SPOT PRICES



### ORTHOXYLENE SPOT PRICES



### SPOT BULK CHEMICAL PRICES (\* DENOTES NOMINAL RANGE)

	Asia		Europe		US	
	\$/tonne	Change	\$/tonne	Change	cents/lb	Change
Naphtha	1,058-1,062 CFR Japan*	-75	1,024-1,034 CIF*	+19	283.25-284.5/gal DEL*	-12.5
Ethylene	1,600-1,630 CFR NEA*	-60	1,800-1,850 CIF*	nc	58.5-59 DEL*	-2
Propylene <sup>1</sup>	1,550-1,670 CFR NEA*	-115	€970-1015 CIF*	nc	80-81*	-2
Butadiene	3,300-3,400 CFR NEA*	+100	2,350-2,450 FOB*	+50	125-130 CIF*	nc
Benzene	1,270-1,280 FOB Korea	-40	1,400-1,410 CIF*	-5	\$4.43-4.46/gal FOB HTC*	+0.02
Toluene	1,170-1,180 FOB Korea*	-50	1,100-1,110 FOB*	-10	\$3.65-3.70/gal FOB*	+0.05
Xylene <sup>4</sup>	1,250-1,270 FOB Korea	-45	1,290-1,310 FOB*	-70	\$3.79-3.85/gal FOB HTC*	-0.23
Paraxylene	1,430-1,440 CFR Taiwan	-160	1,500-1,525 FOB*	-37.50	66.91-69.17 FOB*	-1.23
Orthoxylene	1,480-1,490 CFR NEA	+15	1,450-1,500 FOB*	-50	63.5-64.5 FOB*	nc
Styrene	1,565-1,580 FOB Korea*	-32.50	1,790-1,800 FOB*	-35	75-76 FOB USG*	nc
Methanol	430-440 CFR China*	nc	€268-310 FOB*	-7.50	134-144/gal FOB*	-7.5
MTBE	1,000-1,050 FOB Singapore*	-97.50	1,125-1,147 FOB*	+18.50	\$3.35-3.60/gal FOB USG*	-0.18
Ammonia	690-700 CFR Taiwan	+50	750-800 FOB Yuzhny	+125	\$748-750/tonne CFR USG*	+159
Phenol	1,680-1,750 CFR CMP*	nc	€1,462-1,542 FD*	nc	72-75 FOB*	nc

### CONTRACT BULK CHEMICAL PRICES

	Europe	US
	€/tonne	cents/lb
Ethylene	1,228 Q3	65.5 May
Propylene <sup>1</sup>	1,015 Q3	85 Jul
Butadiene	1,260 Q3	98 Jul
Benzene	840 Jul	\$4.16-4.18/gal Jul
Toluene	\$1,220-1,230 Jul	-
Xylene	-	\$4.02-4.10/gal Jul
Paraxylene	1,085 Jul	71.25 Jun
Orthoxylene	960 Jul	64.5 Jul
Styrene <sup>3</sup>	1,180-1,236 Jul	79-82 Jun
Methanol	295 Q3	155-158 cents/gal Jul
Ammonia	-	\$745/tonne Aug
Ethylene glycol	-	60-62 Jul
Ethanol	63-66/HLT	\$3.85-3.95/gal Jul

Prices contained in this magazine are gathered by ICIS pricing through consultation with producers, consumers and traders across Asia, Europe and the US. They are intended as a guide to price levels of recent business and reflect medium-to-large tonnage sales. ICIS Chemical Business and ICIS pricing accept no liability for commercial decisions that are based on the market information/prices reported in this magazine.

**Abbreviations** used are FOB (free on board), CIF (cost, insurance and freight), FCA (free carrier), CFR (cost and freight), DEL (delivered). European contract prices are quoted on a free-delivered basis (FD), unless otherwise stated.

Initial, but unfixed, negotiating range is indicated (\*), na = not applicable, nc = no change, + initial settlement. 1 = polymer grade, 2 = solvent grade, 3 = barge price, 4 = isomer grade.

**Spot prices** in this issue are based on information that was available on July 31, 2008. Dollar prices are based on rates of exchange on July 28, 2008. \$1=€0.638, \$1=£0.503, €1=£0.788