

CHEMICAL BUSINESS FOCUS

A MONTHLY ROUNDUP AND ANALYSIS OF THE
KEY FACTORS SHAPING WORLD CHEMICAL MARKETS

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- World aniline supply is satisfactory, but operating rates exceed 90%
- DowSaudi Aramco to propel the Middle East as downstream chemicals production centre
- Sucrose price rebounds from late April lows, helped by EU's decision to curb exports
- Huntsman increases MDI by Euro100/ton in Europe
- 10 c/lb price nominations announced on TDI to North American customers
- Polyether polyols stable with some tightness reported here and there

Propylene Oxide

Consumers say that the supply of propylene oxide is satisfactory and has been easier than during last year. No significant price movements have been reported, and the Euro1400/ton mark still looks as being the minimum to be paid. Dow intends to build a coal-to-chemicals complex with Shenhua Group, which will include propylene derivatives.

TDI

Several suppliers are aiming for 10 c/lb hikes for July on North American material, and whilst no such nominations have been made in Europe, world TDI markets remain tight. TDI offers have reached \$3500/ton and more in the Middle East and in Africa as well as in South America, whilst Asian quotes have also been high following last month's explosion at Cangzhou Dahua. BASF announced on 28 May a 50% allocation on all its North American contracts following a technical incident at its Geismar factory.

MDI

Despite several announcements of price increases in Europe and in North America, prices of both crude and pure MDI have remained stable in most industrialised countries. Typical numbers have been at Euro1870-1950/ton for polymeric and Euro1825-1970/ton for monomeric grade in Europe. Consumption of MDI in China continues to grow rapidly, in the last year it has risen by more than 20% from 480 ktons to 600 ktons.

Polyols

Prices have remained stable at Euro1550-1630/ton in Europe and at \$2100-2200/ton in the Middle East and Africa, within a context of balanced market conditions. System houses have said that sourcing rigid polyether grades has been easing in the last few months, but some tightness has been observed here and there, for instance at Bayer Material Science (BMS), who says it has practically sold out. BMS will soon announce construction of a world-scale polymer polyols facility at Antwerp.

PRICE MONITOR

US PRICES

		6 March 2007 ¢/pound	5 April 2007 ¢/pound	10 May 2007 ¢/pound	11 June 2007 ¢/pound		11 June 2007 \$/ton
Propylene Oxide		82-87	83-88	83-88	83-88	DEL	1830-1940
TDI		150-160	150-160	150-160	150-160	DEL	3307-3527
MDI	Crude	120-135	120-135	120-135	125-135	DEL	2756-2976
	Pure	125-135	120-135	120-135	125-135	DEL	2756-2976

WEST EUROPEAN PRICES

		€/ton	€/ton	€/ton	€/ton		\$/ton
Propylene Oxide	Merchant	1400-1460	1420-1500	1420-1500	1420-1500	DEL	1911-2019
Polyether Polyols							
	Flexible, slabstock	Contract	1600-1650	1600-1650	1600-1650	DEL	2153-2221
	Flexible, moulding	Contract	1620-1680	1620-1680	1620-1680	DEL	2180-2261
	Rigid, slabstock	Contract	1650-1800	1650-1800	1650-1800	DEL	2221-2423
Polyester Polyols	Contract	1420-1600	1420-1600	1450-1600	1450-1600	DEL	1952-2153
TDI	Contract	2400-2550	2450-2600	2500-2650	2500-2650	DEL	3365-3567
MDI							
	Crude	Contract	1880-2000	1800-1900	1850-1950	DEL	2517-2624
	Pure	Contract	1850-1960	1780-1850	1830-1900	DEL	2463-2624

ASIAN PRICES

		\$/ton	\$/ton	\$/ton	\$/ton	
MDI						
	Crude	2200-2450	2200-2350	2500-2600	2500-2600	FOB
	Pure	2150-2400	2150-2300	2300-2500	2400-2500	FOB

MIDDLE EASTERN & AFRICAN PRICES

		\$/ton	\$/ton	\$/ton	\$/ton	
Polyether Polyols						
	Flexible, slabstock	2050-2250	2050-2250	2050-2200	2100-2200	FOB
TDI		3400-3700	3600-3800	3200-3400	3400-3600	FOB

N.A. = Not Available † = Provisional

Current one US dollar equivalent (7 June 2007)

€: 0.743 £: 0.505 (1/1.980) Yen 121.4 NT\$: 33.04 Won: 926.75 RMB Yuan: 7.65

Current one € equivalent (7 June 2007)

US\$ 1.346 £: 0.680 (1/1.471) Yen 163.4

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Isocyanate Intermediates

Crude oil prices continued to climb in May, peaking at over \$70/bbl, due to tensions over Iran's nuclear programme and ongoing militant violence in Nigeria, the world's eighth largest exporter. There was also growing concern regarding the unrest in Lebanon and its possible impact upon oil production in the Middle East. A string of refinery problems in the US has triggered a round of speculative buying in gasoline due to fears of potential summer shortages. The price moved down slightly towards the end of the month as concerns over Nigerian supplies eased following news that a strike by Nigerian oil workers had ended. Nevertheless prices remain high at around \$70/bbl. The higher price has also been supported by a tight supply position in the US in both crude and gasoline stocks going forward into June ahead of the summer driving season. According the Centre for Global Energy Studies (CGES), the oil market is far from being in balance and volatility will persist over the coming months. The CGES believes that there is not sufficient cracker capacity to meet the summer demand for gasoline. OPEC appears also determined to keep the market tight, and this will likely spark another summer price peak. On the pricing front, experts have noticed a widening price differential between the London-quoted Brent and the WTI. However, many experts believe that the price gap will eventually diminish, making it less of an issue.

US benzene contracts settled at a record \$4.20/gal in May, up from \$2.80/gal a year ago. This is due to various factors, including tight supply, strong demand and production issues. A \$1.00/gal increase in benzene roughly translates into a 10 c/lb increase in the cost of MDI. US toluene prices have increased, mirroring the firm gasoline market, and were in line with other aromatics. Spot prices have stayed above \$3.00/gal for three consecutive weeks, and by mid-May, numbers for nitration grade were up to \$3.09-3.11/gal. Towards the end of May the West European benzene market saw few trades and prices peaked at \$1210-1230/ton, before coming back down to \$1185-1210/ton, up \$30-40/ton from April. Some players say the market is a little on the tight side, possibly because improved styrene economics leave less benzene for the spot market. June prices remain stable at \$1130-1140/ton fob Korea and at \$1140-1150/ton for July, again up on April levels.

Aniline producers have seen their margins being squeezed by benzene and will undoubtedly seek price increases. A \$1.00/gal benzene increase translates roughly into a 10 c/lb increment in the cost for making aniline. The supply side of aniline is for the time being rather tight, with operating rates above 90%. This MDI feedstock should see its consumption continue to outperform GDP growth for the next three or four years, with an estimated 4% annually. MDI, whose demand relies heavily on construction and now also on automotive industry sectors. MDI consumes about 87% global aniline. As far as European aniline production is concerned, Dow initiated in early May a six-week scheduled maintenance at its Böhlen aniline unit, coinciding with a five-week maintenance programme at its MDI plant in Stade.

Petrochemia-Blachownia in Kedzierzyn-Kozle, Poland, has brought a new extractive distillation plant on stream for benzene/toluene fractionation, using technology from GTC Technology with Prochem, Poland, acting as the general contractor for the turnkey investment. Hungary's BorsodChem has acquired Blachownia and has modernised it to achieve backward integration in aromatics: benzene for MDI and TDI production. BorsodChem says 40% of its aromatics requirements for isocyanates will come from Blachownia this year.

Germany's Linde AG and the Hungarian chemical company BorsodChem Zrt have agreed to expand their cooperation regarding industrial gas supplies to BorsodChem's main production site in Kazincbarcika, Hungary.

Propylene Oxide and Derivatives

Industry contacts have indicated that the price of propylene could increase a little in Q3 2007, so far as Europe is concerned, but no big movements are expected to take place in the immediate future. However, propylene prices in West Europe are up slightly compared to last month at Euro880-920/ton and there is a shortage of spot material due to a lack of imports and ongoing logistical problems. In the US, spot refinery grade propylene traded at 45 c/lb for May, up from the previous deal done at 44.5 c/lb and two June deals were completed at 44.75 c/lb. One end-June load cargo was reported sold at \$1070-

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1080/ton fob Korea, a drop of \$50/ton compared to early May. In South & Southeast Asia, July cargoes were quoted at \$1160-1165/ton cfr SE Asia. Offers for end-June/July deliveries into China/Taiwan came below \$1100/ton cfr and for Northeast Asia to about \$1080-1090/ton cfr China/Taiwan. The news that Formosa Petrochemical Corporation's 1200 ktpa cracker started up in late May depressed prices slightly with the offers for July at \$1050-1080/ton cfr China/Taiwan. As far as propylene oxide is concerned,

UNITED STATES PROPYLENE OXIDE EXPORTS

	March 2007		Jan-Mar 07	Jan-Mar 06
	Tons	\$/Ton	Tons	Tons
Canada	5,031	1,508	13,935	14,014
Mexico	5,876	1,439	13,155	14,235
Argentina	162	1,305	652	544
Brazil	549	1,614	1,533	286
Colombia	953	1,409	3,691	2,854
Venezuela	1,569	1,654	2,529	1,000
Netherlands	-	-	-	11,196
South Africa	454	2,857	454	-
Australia	675	1,360	675	1,049
Indonesia	3,759	1,406	6,060	2,411
South Korea	-	-	10	2,099
Taiwan	5,460	1,542	5,460	5,125
Others	36	1,952	143	146
Total	24,524		48,297	54,959

\$/ton figures are calculated from customs data and may not reflect market prices

JAPANESE PROPYLENE OXIDE EXPORTS

	March 2007		Jan-Mar 07	Jan-Mar 06
	Tons	\$/Ton	Tons	Tons
Thailand	2,491	1,336	4,448	4,646
China	7,992	1,211	20,109	18,648
South Korea	-	-	-	1,966
Taiwan	-	-	1,257	995
Others	-	-	-	59
Total	10,483		25,814	26,314

\$/ton figures are calculated from customs data and may not reflect market prices

TAIWANESE PROPYLENE OXIDE IMPORTS

	March 2007		Jan-Mar 07	Jan-Mar 06
	Tons	\$/Ton	Tons	Tons
United States	-	-	2,619	2,411
Netherlands	-	-	-	2,265
Singapore	2,526	1,497	9,165	9,076
South Korea	-	-	2,005	-
Japan	-	-	1,257	995
Others	-	-	12	-
Total	2,526		15,058	14,747

\$/ton figures are calculated from customs data and may not reflect market prices

SOUTH KOREAN PROPYLENE OXIDE IMPORTS

	March 2007		Jan-Mar 07	Jan-Mar 06
	Tons	\$/Ton	Tons	Tons
United States	-	-	1,838	2,099
Netherlands	-	-	-	1,219
Singapore	8,028	1,360	19,175	16,163
China	979	1,413	4,874	2,040
Japan	-	-	11	1,033
Total	9,007		25,898	22,554

\$/ton figures are calculated from customs data and may not reflect market prices

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contacted polyol manufacturers and system houses say that propylene oxide is less problematic than last year. Contract prices are stable at Euro1400/ton minimum.

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The sluggish price trend reported last month has persisted as monopropylene glycol quotes seem to have gone down by another Euro30-50/ton during May. Main transactions are happening within Euro1060-1140/ton. Cheapest deals took place in Benelux as imported material has been offered near the Euro1000/ton mark in Antwerp. Distributors report a lack of demand. Prices have behaved better in South Europe. Whilst oversupply has characterised technical grade, USP is more in balance, reflected in more stable prices.

AROMATIC ISOCYANATES

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Dow Chemical has signed a detailed memorandum of understanding with Saudi Aramco for the two companies to construct, own and operate the Ras Tanura project, which will involve 30 world scale petrochemicals plants with a yearly production of 4 million tons of upstream products and 7 million tons of downstream products. The upstream units will produce ethylene, propylene, aromatics and chlorine and downstream output will include PE, EO, EG, PO, PG, chlor-alkali, VCM, PU components, epoxy resins, PC, amines and glycol ethers. The Ras Tanura chemicals complex will be integrated with Aramco's 550,000 bbl/day Ras Tanura refinery complex and its Ju'aymah gas processing plant. The companies have not disclosed the investment cost but this has been estimated at more than \$20bn.

POLYOLS

Additives

Polyurethane

Footwear

Environmental

Flexible

Non-Foam

Dow has also signed a cooperation agreement with China's Shenhua Group to build a 50:50 joint venture of a worldscale coal-to-chemicals complex in Shaanxi which will use clean coal technologies to convert coal to methanol to produce ethylene and propylene. The Shaanxi complex will include a chlor-alkali unit, enabling production of caustic soda, VCM and chlorinated organics. Other planned derivatives include glycols, amines, solvents, surfactants, acrylic acid and derivatives, as well as propylene derivatives. Dow estimates that the coal-to-chemicals project with Shenhua could come on stream in 2014.

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Ashland and Cargill intend to launch a joint venture to develop and produce bio-based chemicals, with the first project being a 65 ktpa PG plant, located at a yet to be finalised site in West Europe, using licensed and proprietary technology to produce high-grade PG from glycerine, a co-product of bio-diesel production. The capital investment is expected to be in the range of \$80-100million. Annual global production for propylene glycol totals more than 1400 ktons, and research shows demand growing at a rate of around 5%.

Saudi Aramco and Sumitomo Chemical will make a final decision on further investments at their PetroRabigh, Saudi Arabia venture by the end of this year. They will look at ethane cracker and downstream capacity but no final decisions have yet been made on the product slate. Already under construction are a 1300 ktpa ethane cracker and 900 ktpa of propylene. The complex, which also includes a refinery upgrade and downstream plants, is due on stream in 2008-09. Earlier reports have indicated that the joint venture is evaluating polyurethane, methyl methacrylate, polymethylmethacrylate and polycarbonate plants.

Taiwan's state-run petrochemicals major CPC Corporation is considering building a new residual fluid catalytic cracker unit by the second half of 2010 that would almost double its production of propylene. The planned unit, to be located in Dalin, China, would be able to produce 600 ktpa of propylene. CPC Corp currently supplies about 750 ktpa of propylene from its three naphtha crackers and RFCC/FCC units and about 40 ktpa of propylene is already produced in Dalin from one of the company's FCC units. The above projects will sooner or later include propylene oxide production facilities.

Other Polyol Intermediates

Europe Q2 butanediol contracts initially settled at an average Euro50-60/ton higher with prices assessed within Euro1850-2000/ton bulk delivered NWE. A major producer has said that it obtained an Euro80/ton increase in Europe. Suppliers have held firm on many accounts, with some looking to regain momentum lost in the first quarter when many accounts rolled over. For some buyers, the hikes mean an 11th increase in the last 12 quarters. Since Q1 2004, the mid-point in the BDO price range has moved from Euro1105/ton to Euro1910/ton, up Euro805/ton or by 42%. In recent discussions, supply and demand factors played a major role, with producers reporting good demand for major derivatives, especially the global tetrahydrofuran sector. GACIC's production was below expectations until recently, which reduced buyers' negotiating power.

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In the US, similar hikes were reported for second quarter contracts, with the range assessed up by 4 c/lb to 108-121 c/lb delivered (\$2380-2670/ton). Healthy demand and a firm line from manufacturers was also noted, with hikes of 6-7 c/lb reported in some cases but still quoted in the assessed range. A series of maintenance shutdowns has capped BDO output and average plant operating rates are very high, although a more balanced situation is likely throughout the rest of this year.

Spandex is strong as is PBT, the latter being helped by a resilient automotive market. THF demand of pharmaceuticals is buoyant. However, import opportunities into Europe have not been sufficient to change the tone of the market and prices in China for BDO are expected to continue falling due to weak demand from downstream markets amid abundant supplies in the market. Prices in China have fallen more than Rmb2500/ton, or 11%, since mid-April to Rmb19700-20000/ton on a delivered basis in east China. Q1 saw high BDO prices as reduced imports tightened spot availability and end-users reduced buying levels as they could not pass on the price increase. Prices then began to fall as producers reduced prices to clear inventories before the Labour Day holidays in May and the price continued to slide as buyers waited to see how far the rapidly falling prices would go. With demand from PBT and PU sluggish, prices will continue to fall in the coming weeks but the spiral is predicted to be close to its end. BASF's 190 ktpa BDO plant at Ludwigshafen, Germany, returned to full production on 14 May after two weeks' routine shutdown.

US adipic acid producers report widespread acceptance of last month's 5-7 c/lb posted price increase, with forward order books remaining strong; they are running at or near capacity, with shipments to Asia continuing strongly. Clearly, the sharp increase in the price of benzene has underpinned discussions, and buyers are ultimately willing to agree an increase in order to secure supply. The current tightness in Europe has encouraged some new enquiries to US suppliers, but it is understood that the high freight rates into Europe make actual transactions unlikely. The non-nylon adipic acid market is entering its mid year lull, when the shoe industry is running down the manufacture of the current season's footwear and preparing production for the next season's lines. This dip in demand is in line with expectations and is usually accompanied by a reduction in Asian and particularly Chinese orders. In the polyurethane market there remains some concern about the shortage of MDI, which is needed to react with adipic acid to form polyurethane. Several PU producers are short of MDI and hence have reduced their adipic acid purchases. Northeast Asian adipic acid prices for May fell by \$50/ton, following four consecutive increases in 2007, with settlement at \$2200-2250/ton cfr Northeast Asia.

Nan Ya Plastics, Taiwan, is ready to start-up its largest monoethylene glycol (MEG) unit, based at Mailiao, with a nameplate capacity of 600 ktpa but able to produce up to 720 ktpa, at the end of May. The unit will help Nan Ya maintain its status as the third largest MEG producer in the world, at 1,980 ktpa, after Dow Chemical and SABIC. Pre-commissioning of a third project – a 60 ktpa BDO unit which can produce up to 80 ktpa – has started and is due for start up in June, it will boost the company's total BDO nameplate capacity to 100 ktpa.

Industry continues to search and develop new uses for glycerine, whose structural production glut makes it cheap. Solvay's novel technology to make epichlorohydrin from glycerine was given awards from the American Biodiesel Industry Board and also from the Soap & Detergents Association. Quite ironically, tightening US supply pressures caused refined glycerine prices to move upward as Q3 contract negotiations were being discussed. April vegetable grade rose to 35-40 c/lb, a gain of two or three cents over Q1 prices and May levels will presumably end up higher. The rapidly tightening supply in North America resulted from a rash of Q2 turnarounds and several unplanned outages adding to supplier inventory pulls from good demand, growing substitution of glycols with glycerine and a drop of import volumes due to unattractive North American prices.

White sugar fundamentals are still weak, as the fundamental world sugar scene continues to be dominated by the huge surplus despite noticeable off-takes particularly to the Middle East and to Asia. However, a further slide is unlikely in the immediate future, as the European Union has agreed to export 83% less white sugar between October 2006 and coming September. The market apparently gives this news some credit as white sugar prices had rebounded from a \$302/ton low on 25 April to \$338/ton in the first week of June but still far off its \$420/ton peak reached on 25 October 2006.

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MDI

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European crude and pure MDI contract prices are unchanged in April and May at Euro1870-1950/ton following balanced market conditions. Most buyers and sellers talk of steady off take, with construction activity described as healthy by producers. Pure MDI contract prices are also unchanged at Euro1825-1970/ton free delivered West Europe. Huntsman has announced that it will increase prices on 1 June in West Europe, East Europe and the Middle East and Africa for all MDI products, including all polymeric and pure MDI grades, by Euro100/ton. The price increases reflect sustained high growth rates for MDI across Europe and rising costs of key raw materials.

AROMATIC ISOCYANATES

MDI

TDI

The MDI consumption outlook is mixed in the US, with good season factors being offset by slowing housing markets and it is too early to say whether the latter will pick up after summer. The four major MDI producers, Bayer, BASF, Dow Chemical and Huntsman – who control 80% of global MDI capacity – have all announced a 5 c/lb price increase for 1 June for the USA and Canadian markets, due to significant increases in raw materials, especially benzene. The price of benzene in the US is currently at a level of \$4.20/gal, compared to \$3.64/gal four weeks ago and \$2.80/gal one year ago and a \$1.00/gal increase in benzene translates into a 10 c/lb increase in the cost of MDI. Polymeric MDI was sold within a 128-135 c/lb range.

POLYOLS

Additives
 Polyurethane
 Footwear
 Environmental
 Flexible
 Non-Foam

Asian Polymeric MDI prices are stable at \$2550-2600/ton cfr China and at \$2400-2450/ton cfr South & Southeast Asia. It could be hard to implement a price rise in China during June as demand from the refrigeration sector should be entering its off-peak season after strong demand in March-May. Also some plants are expected to resume operations in June, which should improve supply and forward prices could weaken to \$2450-2500/ton cfr China. Domestic prices in China were largely stable at Rmb26000-26500/ton delivered. Pure MDI prices were steady at \$2500-2650/ton cfr Northeast Asia in a quiet market but a price rise is predicted for June due to limited import volumes, although it is not certain if this can be implemented due to signs of softening demand from the PU resin and shoe sole sectors. Domestic prices in China were largely stable at Rmb28000-30000/ton delivered. The consumption of MDI in China rose 22%, compared to 12 months ago, which means that about 120 ktpa of additional MDI will be needed in 2007 for China alone. The consumption of MDI in China has reached a level of around 600 ktpa for 2007, whilst production is limited to about 180 ktpa, hence 420 ktpa needs to be imported. The global MDI situation is balanced.

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Dow began work on a scheduled five-week turnaround at its MDI production facility in Stade, Germany on 5 May for routine maintenance and fulfilling a government mandate, which requires process equipment inspection every five years. The turnaround involves equipment repairs and replacements, reactors inspections and process adjustments. BMS confirmed it has limited pure and crude MDI volumes available towards the end of May due to an issue at one of its production units, but no details are available. Huntsman's 400 ktpa MDI facility in Rozenburg, the Netherlands restarted at the end of May following scheduled maintenance work. The Dow MDI conversion unit at Delfzijl, the Netherlands was operating normally at the end of May following an unspecified problem end March, which caused the unit to be shut down.

Shanghai Lianheng Isocyanate (the joint venture between BASF, Huntsman and Chinese partners) had aimed to restart its crude MDI plant in the second quarter but the restart will now reportedly happen later this month. Other industry experts think that the restart might even be delayed until August. The 240 ktpa plant, which is part of an integrated isocyanates complex at the Shanghai Chemical Industry Park in Caojing, was shut in mid-December due to problems with one of the heat exchangers, and its restart has been delayed a few times.

Nippon Polyurethane Industry is due to restart its MDI lines at Yamaguchi prefecture, Japan, in the first half of June. The lines, which have a total capacity of 200 ktpa, were shut two weeks ago for a turnaround. Mitsui Chemicals Polyurethanes is slated to restart its 60 ktpa MDI plant in Ohmuta, Fukuoka prefecture, Japan in early June after a month-long turnaround. Nippon Polyurethane (Ruian), a wholly owned subsidiary of Nippon Polyurethane Industry, is expected to start up its 50 ktpa MDI splitter in China in July or August.

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MDI Sale History in Europe, Africa & Middle East Region (2006-2007)

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	Period	Volume (ktons)	MDI Marketshare on Isocyanates, %	Growth in last Period, %
	2006 Q1	335	71	10
FEEDSTOCKS	2006 Q2	370	72	10
Isocyanate Intermediates	2006 Q3	375	74	1
Propylene Oxide & Derivatives	2006 Q4	361	74	-4
Other Polyol Intermediates	2007 Q1	387	71	7

Source: compiled from various supplier sources by de Walque & Associates

AROMATIC ISOCYANATES

World MDI Market per Region in Q1 2007 versus Q1 2006

MDI

TDI	Description	Q1 2007	Q1 2006	Change, %
	Capacity (effective)	985	875	+13
POLYOLS	Production	1000	865	+16
Additives	Consumption per Region			
Polyurethane	West Europe	290	265	+9
Footwear	East Europe	50	>35	+40
Environmental	Subtotal Europe	340	>300	+13
Flexible	Middle East & Africa	>45	40	+42
Non-Foam	North America	225	235	-5
	South America	25	<25	+5
	Japan	>40	40	+6
	Asia (excluding Japan)	270	>230	+16
	Total World	945	865	+9

Source: compiled from various supplier sources by de Walque & Associates

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TDI

TDI offers to Middle East and African clients went up to \$3500-3600/ton cfr. Effective 1 July, Dow will increase its price for TDI in the US and Canada by 10 c/lb. This price adjustment was first proposed for 1 May, then 1 June and has now been postponed again. BASF wants to increase TDI by 10 c/lb in North America from 1 June onwards, because of tight supply and strong demand combining with escalating feedstock and energy costs. TDI has remained unchanged at 150-156 c/lb benchmark quotes during May. However, supply has been tightening recently in the US, reflected in strengthening quotes. In contrast, TDI availability has remained good in Europe, which is reflected in prices stabilising within Euro2500-2650/ton bulk delivery.

China's TDI prices surged after the explosion a few weeks ago at Cangzhou Dahua's plant and domestic prices rose from Rmb28000-30000/ton to Rmb33000-35000/ton. Cangzhou Dahua suspended trading its shares in Shanghai for several days, following the explosion, which killed five people and severely injured 14 workers with more than 60 others also injured. The company has yet to determine its losses and when it can resume production. South Korean and Japanese producers have kept their prices unchanged within \$3300-3500/ton cfr.

TDI remains tight in South America amid strong demand and supply problems, both regional and global, have led to a tight market. The Dow TDI plant in Camacari, Brazil, was restarted on 20 May, after a planned 30-day maintenance was extended to 40 days. US TDI volumes into South America have only slowly increased following the ending of outages at two Gulf Coast facilities. TDI prices in Brazil stand at \$3800/ton delivered before PIS/Cofins taxes and at \$4200/ton delivered after PIS/Cofins taxes. Prices into Colombia and Venezuela are \$3400-3600/ton cfr whilst prices in Chile are at \$4100-4200/ton delivered.

Global availability of TDI is likely to improve in June following the completion of the May round of maintenance shutdowns in Asia. By July prices should be dropping due to a moderate demand in the US, the low demand season in Africa (the current hot and humid weather there does not support foam production) along with a projected increase in global supply following the Asian plant restarts.

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BASF announced 28 May that it would enforce a 50% allocation on all contracts and related agreements for TDI products in North America effective immediately. The TDI allocation is necessary because of a recent overpressure in BASF's TDI plant located in Geismar, Louisiana. No employees were injured and the incident was contained within the perimeter of the site. BASF Urethane Korea has also declared force majeure, after failing to restart its TDI plant at Yeosu, South Korea. The 140 ktpa plant was shut around 10 May due to technical problems and repairs will be completed by the end of May or early June. BASF's TDI unit in Schwarzheide, Germany was expected to have restarted by the end of May after technical issues delayed it being brought back on stream. The 70 ktpa plant was originally scheduled to be operational again by the middle of May after planned maintenance but undisclosed technical issues delayed the restart.

TDI supply in Asia has been tight since October 2006 due to planned and unplanned shutdowns in the US and West Europe and is expected to remain tight until at least June as key producers such as South Korea's Korea Fine Chemical and BASF Urethane Korea, Japan's Mitsui Chemical Polyurethanes, and China's Cangzhou Dahua have scheduled plant turnarounds in May.

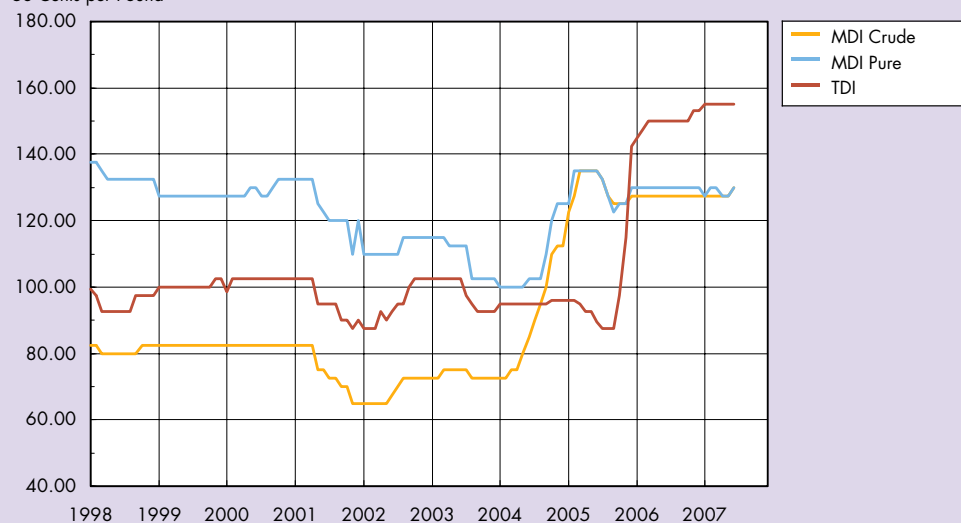
World TDI Market Picture in Q1 2007 vs Q1 2006 and Q1 2005

Description	Q1 2007	Q1 2006	Q1 2005
Capacity (effective)	420	450	450
Production	430	400	420
Consumption per Region			
West Europe	>75	<75	75
East Europe	30	<25	25
Subtotal Europe	<110	95	100
Middle East & Africa	<50	<50	>45
North America	75	85	95
South America	25	<30	25
Japan	20	20	20
Asia (excluding Japan)	130	100	100
Total World	405	370	385

Source: compiled from various supplier sources by de Walque & Associates

**UNITED STATES
MDI and TDI PRICES**

US Cents per Pound



Source: Tecnon OrbiChem

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Prices for conventional polyols for flexible slabstock stayed constant in May because of stable market conditions at an unchanged Euro1545-1630/ton (\$2088-2202/ton) free delivered Northwest Europe. Steady demand, especially from the furniture and mattress sectors, and balanced market conditions mean there was little pressure on prices. Middle East & Africa show a steady market for flexible polyols with prices within the range \$2100-2200/ton cfr but sellers without TDI were said to be offering polyols below this range in order to sell. Abundant polyols supplies were available but sales were limited by the lack of TDI.

A price increase of 10 c/lb (\$220/ton) for US flexible polyether polyols has been indefinitely postponed after being proposed for 1 April, and then for 1 May. Although producers say demand is adequate, polyols consumers said it was soft-to-moderate and so prices remained unchanged at 108-113 c/lb delivered in bulk with high resilience products at 131-133 c/lb.

In China imported flexible foam grade polyols were unchanged at \$1480-1500/ton delivered and at \$1500/ton cfr Hong Kong for drummed shipment. In the Chinese domestic market, offers for local material rose by Rmb100/ton to Rmb12500-12700/ton delivered. Prices in Southeast Asia were in the range \$1600-1650/ton delivered, Vietnam, drummed flexible slabstock polyols remained around \$1700/ton cfr Manila, Philippines and in India at \$1570-1650/ton cfr.

Rigid polyols were seen to be stable with the expectation that prices would roll over into June around a level of Euro1640-1740/ton free delivered North West Europe. Polyols, particularly rigid grades, are tight at least for BMS, the latter being practically sold out.

In the US, rigid polyester polyols have maintained the same price levels in May as there was abundant supply and as end-users assessed the impact of the proposed 5 c/lb increase for 1 June driven by strong demand, thin margins and rising feedstock costs. The availability of polyester polyols is good, with demand in the construction sector being seasonally adequate on reasonable weather and the approach of summer, but the government statistics on housing starts discourages optimistic projections for the near future. In May, the price of polyester polyols stood at 82-87 c/lb delivered in bulk, and polyether polyols at 121-126 c/lb.

Bayer MaterialScience is close to announcing the construction of a world scale polymer polyol facility in Antwerp, Europe. The plant, which will produce state-of-the-art polyols aimed at the automotive industry, will be the latest investment for the company's polyurethanes business and follows hot on the heels of its planned 300 ktpa TDI facility in Caojing, China. One analyst believes BMS is to establish its PMPO material as an automotive industry standard to reinforce its position as market leader in TDI technology.. The company would neither confirm nor deny this planned investment but said that it had developed a superior quality PMPO product that has received great interest from the automotive sector and that if it was to invest in PMPO in the near future, a site in Europe would be the logical location. Analysts are predicting an announcement as early as June this year.

BASF is expanding its annual capacity for THF by 30 ktpa to 210 ktpa at its Ludwigshafen, Germany, site with completion expected by the end of 2007. BASF makes THF in Europe, NAFTA and Asia.

A sustainable polyol unit has been brought on stream at the site of IFS Chemicals in Roydon, Norfolk, to produce a polyol based on rape-seed oil for use in the manufacture of rigid polyurethane foams. IFS has introduced the polyol to a number of customers producing rigid PU foam for refrigeration and building insulation applications and they have found that their end-users have already started to specify sustainable products. The polyol is being manufactured from unrefined rape-seed oil from crops grown by local farmers. The plant has a capacity of 6t/day, although Colvin says it is only working at 50% of its capability at present. The polyols are used in exactly the same way and in the same quantity as conventional products but getting the right formulation is the key to their success in producing good quality foams.

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Solvay Fluor, Europe's leading Fluorochemical company and number two worldwide announced on 26 May that with immediate effect or as agreements permit, it will be posting a 10% price increase on sales of Solkane R134a and Solkane HFC blends. A company spokesman stated that the increase was more than justified to partially compensate steep raw material and energy costs that all producers of the ozone friendly refrigerants have to sustain. It was also confirmed that the supply position of the product has also tightened considerably over the last couple of weeks, at a moment when the world demand soars to meet refrigerant requirements for the summer season.

Chemtura Corporation announced 24 May an off-list price increase of 10% for its hexabromocyclododecane (HBCD) based flame retardants, including Great Lakes CD-75P(TM), CD-75PM(TM), CD-75PC(TM), CD-75PXF(TM), SP-75(TM) and SP-75C(TM), effective 15 June or as contracts allow. This increase is necessary to cover increased energy and feedstock costs, as well as the costs associated with satisfying the strong demand for insulation and textiles in the building and construction industry. It also contributes to the increasing costs for product advocacy efforts, which ensure sustainable flame-retardant choices for customers and end users.

India's SRF Limited announced on 18 May that its board of directors had approved a proposal to set up a new generation refrigeration gases plant. The company said it would set up a hydrofluorocarbons (HFCs) swing plant to manufacture HFC-134a or HFC-32 and had commissioned the first phase, with a capacity of 2 ktpa, of its stand-alone HFC-134a plant. The company produces refrigerant gases at its existing chemical complex Bhiwadi in Rajasthan state. The company did not give any additional information on the proposed swing plant.

Arkema announced that it is investing significantly in its Changshu site in China, to bring on stream new polymer, additives and hydrochlorofluorocarbons capacities. One project is the de-bottlenecking of its HCFC 22 plant and this will be completed in September 2007. In line with the Kyoto Protocol, it will also build a unit to destroy HCFC 23, a by-product of HCFC 22, and this will be on stream in mid-2008. Despite the ban on HCFC in developed countries such as Japan, Europe and the US, demand is still growing in China and in Asia. The new capacity in China will replace the unit to be shut in France and it is feasible to expand in China as there are abundant fluoro-ore deposits available. However the company acknowledged that environmental pressures might stop the product's use earlier than its 2040 schedule.

Polyurethane

Bayer will increase TPU prices by Euro300/ton as of 1 June in the West Europe and Middle East & Africa regions, because of higher raw materials and energy costs. Bayer Q1 TPU sales were 8.0% higher at Euro56 million, thanks largely to higher volumes in Europe. Bayer is planning to build a 20 ktpa polyurethane dispersions plant at the group's Shanghai complex in order to expand its coatings and adhesives raw materials output in China and meet expected market growth. It is scheduled to come on stream in Q2 2008. Production of both the aromatic polyisocyanates Desmodur L and Desmodur IL is due to be expanded by the end of 2007, the former to 20.5 ktpa and the latter to 5.5 ktpa. Also by the start of 2008, it intends to expand the 11.5 ktpa plant for the production of aliphatic polyisocyanates of the Desmodur N series, but the scale of the expansion is not known.

Noveon is considering doubling its TPU capacity at its Songjiang, Shanghai, China plant, amid rapidly growing demand as it is predicted that China will eventually become the world's largest TPU market. The company has started engineering work on the second unit, but a final decision on the project should be made in Q3, with the aim to bring the new capacity on stream by the middle of 2008. In July, Noveon will be re-branded as Lubrizol, as part of the parent's plans to have a single identity for the company.

Footwear

Bayer has shown that waterborne, heat-activated adhesives can be used in the shoe, furniture and automotive industries to give environmental compatibility that does not have to come at the expense of bond quality and

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economy, so Bayer is adding two new grades to its proven line of polyurethane dispersions. Adhesives with very low melting viscosities can be formulated using a crystallizing polyurethane, Dispercoll U XP 2682, that exhibit superior substrate wetting at activation temperatures as low as 50°C. Systems formulated with non-crystallizing Dispercoll U XP 2643 are tacky even at room temperature, yet exhibit high final heat resistances when used in combination with a crosslinker as a two-component adhesive. Such systems are needed in the packaging industry, but they are also of interest to other industries for applications involving temperature-sensitive substrates, for example. Their use is also advantageous wherever VOC directives prohibit the use of solvent borne products. The two new Dispercoll U grades can be combined with the Desmodur D series of polyurethane crosslinkers and the new Desmodur XP 2671 is especially useful as it produces bonds with exceptionally high heat resistance immediately after they are formed without reducing the pot life. Such requirements are commonly found in the shoe industry, but other industries can benefit as well from the greater reliability that the new polyisocyanate brings to the bonding processes.

Environmental

The US has submitted a proposal to adjust the Montreal Protocol, accelerating the phase out of ozone-damaging chemicals. The Montreal Protocol says the US must first limit HCFC consumption (production and import) to a specific level and then reduce it in a step-wise fashion. The proposal would accelerate the phase out date of HCFCs by 10 years. Industrialised nations are required to phase out use of HCFC-22 by 2020, but most are moving faster. The accelerated phase out schedule appears to be a widely accepted idea in the US and Europe, but in other parts of the world questions remain about the willingness of officials to speed up the process. China is currently the number-one producer of HCFCs. While the US and many European countries are working to phase out HCFCs, studies have shown that production of certain HCFCs is rising in China and India, negating some of the benefits sought by earlier phase outs around the world. HFCs are the current alternative of choice and there are no regulations establishing a phase out schedule or restricting the use of HFCs. However, they are still considered to have Global Warming Potential (GWP). There are, however, several regulations promulgated under the Clean Air Act [CAA] that apply to HFCs. For instance, because HFCs are applied as a substitute for ozone-depleting substances, such as CFCs and HCFCs, they are subject to the provision of the Significant New Alternatives Policy [SNAP] Program. Also, it is illegal to vent HFC refrigerants to the atmosphere when repairing or disposing of air conditioning and refrigeration equipment. Other countries have already set restrictions on HFCs, for instance applying taxes or levees, EPA officials explain. Also, the European Union (EU) has passed good-practice regulations on the use of HFCs that follow similar procedures, but are more broadly applied, as those for the CFCs and HCFCs.

In mid-April, Honeywell announced it has developed a blowing agent that would replace R-134a, an HFC used to make one-component foam expand, and would meet EU regulatory requirements for reducing the use of high-GWP substances. The EU Fluorine-gas regulation phases out the use of HFC-134a in mobile air conditioning for new car models beginning in 2011 and requires use of a refrigerant with a GWP of less than 150. DuPont is also producing low GWP alternatives to meet the fluorine directive. DuPont has identified several candidate HFC-134 alternatives for this application. The leading candidate is DP-1.

Flexible

The latest trend in furniture is hidden in seat cushions as foam based on polyols produced from soybeans is cropping up in sofas and chairs. The new product reduces the amount of petroleum used in polyurethane foam and comes at a time of rising concern over petroleum prices and the availability of raw materials. Cargill, the agricultural products giant in Minnesota, and the Kansas Polymer Research Institute, following the development of a soybean oil, BiOH, have jointly developed the new type of foam. Flexible foam manufacturers such as Hickory Springs in Hickory, N.C., are now using BiOH to produce their soy-based foam, Preserve. The first generation of Preserve foam uses 10-20% soy product, about 1 to 2 pounds of soy in a standard size sofa. Foam made with larger amounts of soy emits an odour but the company soon expects to introduce odourless second-generation Preserve products that have a higher soy percentage. They will include high-resiliency foam and memory foam, which can be used for mattresses since Preserve has a similar performance to traditional polyurethane foam. At the present it is not cheaper to produce Preserve than conventional flexible foams but as prices for petroleum continue to increase, the soy-based product is expected to be cheaper than

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traditional foam. Norwalk Furniture, a custom upholstery maker and retailer based in Norwalk, Ohio, recently made the switch to foam containing soy for its standard sofas and chairs as did another large furniture manufacturer, Lee Industries of Newton, North Carolina. Other furniture makers, such as Lane Home Furnishings, are also beginning to use soy foam in their cushions.

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Recticel signed an agreement in May to acquire the polyurethane foam and wadding products business from Finlayson & Co, Finland. The acquired companies, Espe Oy and Ewona Oy, had combined annual sales of Euro24.9 million in 2006 and employ about 150 employees in Finland and Estonia. Espe Oy operates a foaming and converting unit in Kouvola mainly for the upholstery-furniture and mattress industry. Espe Esti Oü, Espe Oy's Estonian subsidiary, operates a foam converting unit in Tallinn. Ewona Oy manufactures wadding products (thermally bonded fibre products for the bedding, furniture and construction industry) at Kankaanpää in Finland. The transaction is still subject to the approval of the Estonian antitrust authorities.

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Huntsman Polyurethanes has teamed up with Alberdingk Boley, one of Europe's leading producers of water-based systems for coatings, to develop new concepts for two-pack VOC-free coatings for the industrial flooring market. The new concepts, based on Huntsman Polyurethanes advanced MDI-technology and Alberdingk Boley's Albodur 912 VP polyols, will reportedly offer customers in Europe, America and the Middle East the chance of creating high performance flooring solutions that meet strict environmental regulations regarding VOCs. The result of marrying the two chemistries is a bespoke flooring solution that can be engineered to meet individual customers' needs. In addition to meeting key environmental regulations, products developed by Huntsman Polyurethanes and Alberdingk Boley will have key advantages over existing products, including ease of use. Albodur 912 VP is a VOC-free, 100%-Polyol based on renewable resources. Its hydrophobic backbone and low viscosity offers customers significant processing benefits over established products when combined with Huntsman Polyurethanes' isocyanates technology. The partnership will provide customers with highly versatile bespoke, flooring solutions that can be engineered for a diverse number of applications. Initial testing by an independent Technical Supervisory Association for the flooring industry has shown excellent results.

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Showa Denko K (SDK) has developed a new grade of isocyanate monomer that consists of an isocyanate group that readily reacts with a wide range of substances, a flexible short polyether polymer chain and a photo-polymerizable double bond all in the same molecular structure. Sample shipments will start in July, under the trade name of KarenzMOI-EG. Compared with the existing KarenzMOI product, the new grade has the following advantages over previous grades: elongation at break is 4.5 times as large, the breaking strength is maintained at the same level, the adhesion, to glass, metal, etc., is five times as large, cure shrinkage is reduced by approximately 40%, whilst the curing rate is maintained at the same level. As a result, KarenzMOI-EG is expected to be used in such new applications as surface coating and adhesives, in addition to the existing applications in the production of liquid crystal displays and semiconductors. SDK is already selling various grades of proprietary isocyanate monomers, including KarenzMOI and KarenzAOI. SDK aims to triple the sales of the Karenz family products, to around Yen2 billion by 2010.

Huntsman Performance Products have provided formulators, wanting to modify the cure speed of polyurea and polyurethane-based systems to give customers more open time and control for specialist coating, elastomer, adhesive and sealant applications, with a brand new technology due to the development of a new range of amine products. Jeffamine SD 231, SD-401 and SD-2001 amines are high content, secondary aliphatic, liquid polyetheramines. The secondary amine functional groups provide a much slower reaction compared to primary amines and are capable of significantly slowing down the cure speed of polyurea/polyurethane elastomeric coating systems. Designed to be used in conjunction with aromatic or aliphatic chain extenders, or to partially replace existing primary polyether amines, they can improve the flexibility and colour of aromatic formulations, while reducing the overall cost of development. As low viscosity liquids, these new secondary aliphatic diamines allow the efficient formation of much lower viscosity isocyanate prepolymers, with properties equivalent to primary polyetheramines or polyols used. The products are stable and there is no off-gassing of reversible blocking agents. They can also expand the formulation capabilities of aspartic esters and aromatic formulations at a lower

cost, with equivalent performance properties. Secondary aliphatic polyetheramines also allow the formation of high hardness aromatic and aliphatic systems, while maintaining flexibility and good cure speeds at a reasonable cost. When using these amines as reactants, their amine groups – which are secondary in nature – prevent more than one reaction at each amine site. The Jeffamine polyetheramines range is proprietary to Huntsman and they have EINECS (polymers) and TSCA registration.

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