SPECIAL REPORT ON MOUNTING PRESSURES

ADHESIVES Raw Materials FACTS

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Maintaining Supply in Challenging Times

Rising costs continue to be the story of the day in the adhesives industry. Most industry experts and consultants expected costs to level out by mid-year but that wasn't the case. Key drivers continue to be persistently high and volatile hydrocarbon and energy costs, which are being pushed down the supply chain, and ongoing supply/demand imbalances. Through these challenges, National Adhesives has continued to maintain supply to our customers — no excuses, no broken contracts, no declarations of force majeure — but guaranteeing supply hasn't come without cost.

Oil Prices Driven Higher

Oil prices have surpassed the $60 level and, as anyone who has recently filled their gas tank knows, the higher at-pump prices related to the busy summer travel season are scorching. Fifty-dollar-a-barrel oil seems to be generally accepted in the industry, but until prices complete the adjustment to sixty-dollar-a-barrel, experts anticipate continued upward price pressures on raw materials.

"Over the near-term, we think elevated crude oil and natural gas prices could spell more feedstock pain before gain," says Kevin McCarthy, analyst at Banc of America.

"Prices for far-future delivery of oil and gas have risen even more markedly than spot prices over the past year," U.S. Federal Reserve chairman Alan Greenspan said recently. "Apparently, market participants now see little prospect of appreciable relief from elevated energy prices for years to come." Therefore, further volatility in energy prices is to be expected, and raw materials prices will remain elevated.

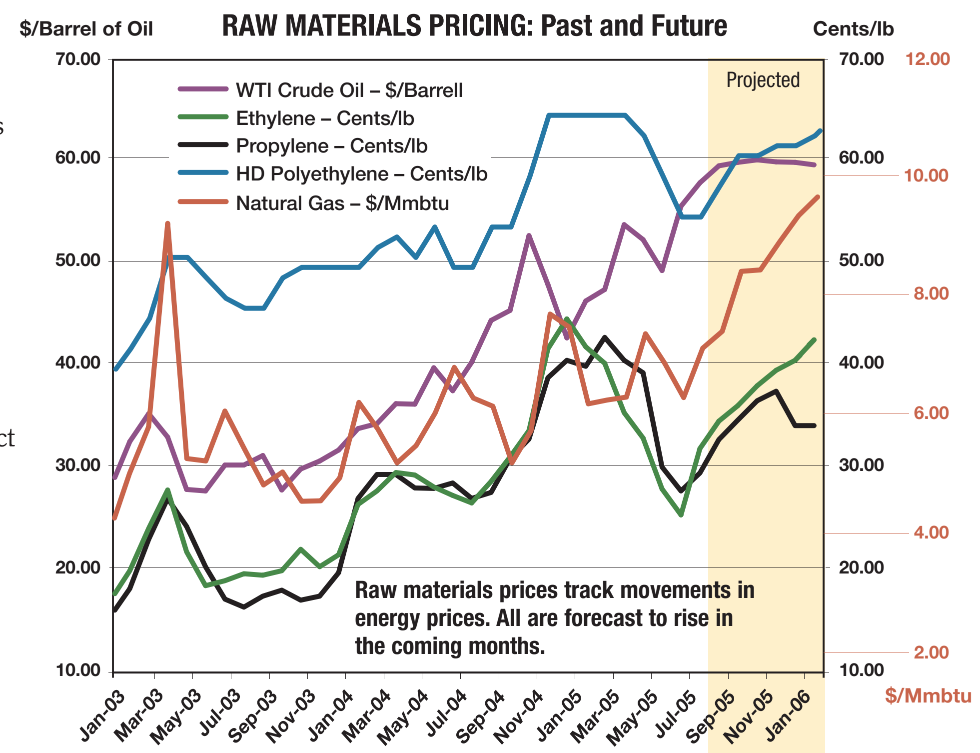
Supply/Demand for Raw Materials Tightens

The second quarter was "a period when the industry paused," says J.P. Reinhard, CFO of Dow Chemical Company. However, according to Reinhard, the impact of this pause on the chemical industry was very small, and was due largely to de-stocking of inventories.

With the dramatic price increases of 2004, customers throughout the value chain built up inventories. As economic growth slowed through early 2005, customers satisfied end-user demand through de-stocking. "It is pretty clear our industry was impacted by a large global inventory correction during the second quarter as customers consumed much more of our products than they purchased," says Jeff Lipton, president and CEO, Nova Chemicals. Demand rose in June, "and we expect the third quarter to begin a return to stronger business conditions," Lipton says.

This activity is reflected in the pricing trends of many of the main petrochemical feedstocks (see graph). While prices of precursor chemicals — ethylene, propylene and styrene — decreased in May and June, they were not accompanied by decreases in the prices of adhesives raw materials made from these chemicals. Industry experts agree that prices appear to have bottomed out and have already begun to increase again. This is expected to continue through the rest of 2005 and into 2006. "Now, the adjustment period is very clearly over," said Reinhard.

"If world GDP continues to grow at 3%, I think we'll be extremely short of supply in the coming years," says Dan Smith, president and CEO of Lyondell Chemical Company. "Peak conditions could last two to five years — we're likely to see more shoulders on this peak."



Sources: CMAI and Purvin & Getz (forecast from August 2005)

Maintaining Supply

Over the past year raw materials shortages have led a number of suppliers to impose allocations — in some cases reducing supply by as much as 75%. These allocations, coupled with increased demand, have put significant pressure on the adhesive manufacturing industry and have resulted in more than one declaration of force majeure by adhesive manufacturers.

National Adhesives' global procurement network continues to source and guarantee all compulsory raw materials necessary to satisfy customer hot melt requirements. National's approach to securing supply has been two-pronged: cultivate long-term relationships with existing suppliers and seek relationships with new suppliers of quality raw materials in order to diversify supply sources. The top priority is to keep customers' plants running.

"We've brought in container loads of raw materials from around the world at extremely high cost to ensure that we can supply product," says Steve Ringsdore, Sales Director for National Adhesives – North America. "We have not passed on these extra costs because we regard them as part of our responsibility to keep our customers going. It's all part of the price of doing business and keeping our customers supplied."

It's only through the dedication of the global procurement and technical teams that National has been able to overcome shortfalls of many millions of pounds and secure the raw materials needed to continue to produce our adhesives without a single interruption of supply to its customers. ■

FACTS: PLASTICIZERS
- 15-20% increase expected in Q2/Q3 2005
- 5-7% increase expected in Q4 2005

FACTS: ACRYLIC MONOMERS
- 15% price increase since January 2005
- Supply still tight on certain monomers

FACTS: TACKIFIERS
- 15% increase in Q3 2005
- Supply very tight for hydrocarbon based grades

BUSINESS FOCUS: WATERBORNE AND SOLVENT ACRYLIC ADHESIVES

Waterborne and solvent acrylic adhesives are experiencing price pressures similar to those of hot melts — tight supply, volatile demand and high raw material costs. Most of the key waterborne and solvent acrylic adhesives ingredients — VAM, acrylates, solvents — act more like specialty chemicals and do not closely track the price of petroleum feedstocks. Their prices have increased by as much as 90-100% since 2004.

Solvent acrylic and water-based adhesives continue to be affected by high prices and ongoing raw materials shortages:

- Acrylic monomer pricing remains at historically high levels, despite decreases in propylene prices over the past several months. In August, the price of propylene, a key intermediate for acrylates, rose by almost 6% over July prices. Propylene prices are projected to increase another 16% by year end, keeping cost pressures high.
- Vinyl acetate monomer (VAM) prices have increased 7-10% this year (more than 20% since January 2004) and are at a historic high.
- Solvents have increased an additional 10-30% this year. Prices of isopropanol and heptane have skyrocketed since 2004. Some specialty solvents are on sales control.
- Plasticizers have increased by 35% since the beginning of the year, directly related to the high price of oil.
- Compounding items that go into waterborne adhesives have gone up 5-10% in 2005. Some materials are on sales control.
- Prices of polyvinyl alcohol (PVOH) have been rising steadily all year. An additional 3% increase was announced for August. If energy prices continue to rise, PVOH prices will follow suit.
- Prices of 2-ethyl hexyl acrylate (2-EHA) are up 90% since January 2004. Shortages of 2-EHA have affected all solution acrylic pressure sensitive adhesives. Supplies of 2-EHA are tight due to limited global producers of the specialty chemical coupled with unusually strong demand. A new acrylic acid plant is now operating in China; however, it does not produce 2-EHA and represents only a very small addition to world capacity. Supplies of 2-EHA are expected to remain tight for the foreseeable future, and prices will remain high. ■

FACTS: VINYL ACETATE MONOMER (VAM)
- 10% price increase expected in Q2/Q3 2005
- 5% increase expected in Q4 2005

BUSINESS FOCUS: HOT MELT ADHESIVES

Rising prices for crude oil, natural gas, and gasoline in Q3 2005 will impact all downstream petrochemical materials used to make hot melt polymers, tackifiers, waxes and oils. The 2006 outlook is equally grim as crude oil is not expected to recede below $50 anytime soon. This will cause additional upward pressure on hot melt raw material pricing.

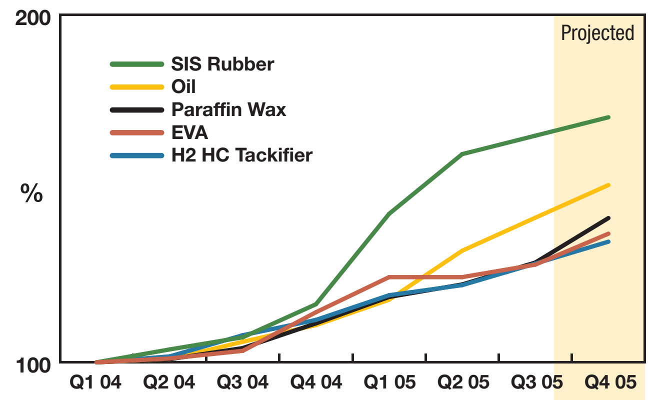
In addition to pricing concerns, hot melt adhesives continued to be affected by ongoing raw materials shortages:

- Wax supply is very tight. Fischer-Topsch Sasol Wax is on force majeure and has reduced allocation to 25%. Meanwhile, paraffin wax production in the U.S. continues to decrease, and Chinese wax supply is becoming less available.
- Tackifiers have been tight for over a year due to high demand, limited supply and several production problems. No new capacity is expected until 2007.
- EVA polymers are on 100% sales control from at least two major suppliers. A recent fire at Dupont's Sabine River plant has exacerbated the situation. Given the combination of higher feed costs, strong demand and tight supply, EVA suppliers have announced 8-12% price increases for September 2005.
- The continued shortage of isoprene, due in part to high demand from competing industries, is contributing to supply problems for styrene block copolymers — especially SIS, which is expected to remain in short supply into 2006.
- Butadiene prices are at historical highs and supply is tight, leading to increased prices for SBS polymers. At least one producer is on sales control.
- The global styrene market remains tight with operating rates over 90% and recent outages in Europe. Global demand is expected to grow at 4% per year, according to CMAI, and operating rates will remain above 90% through 2007.
- Increased demand and several planned and unplanned plant outages have recently tightened the ethylene market. Almost 5% of North American ethylene production capacity is currently offline. ■

FACTS: STYRENE-ISOPRENE-STYRENE (SIS)

- 40% price increase since Q4 2004
- Shortage of supply — will remain tight for whole of 2005 and through Q1 2006

Percentage Cost Increase of Key Hot Melt Raw Materials



Source: National Starch and Chemical Company

Costs on key raw materials used in hot melt adhesive production have risen throughout 2005 and are expected to continue into 2006.

FACTS: SBS POLYMERS

- 10% increase in Q2 2005
- Butadiene supply tight
- One major supplier on sales control

OTHER PERSPECTIVES

"Significant price improvements, supported by solid volumes, enabled further margin recovery across virtually all of Dow's businesses, despite an increase of more than $1 billion, or 30%, in purchased feedstock and energy costs."

J. Pedro Reinhard, Executive V.P. and CFO, Dow Chemical Company

"Across the board, operating rates are increasing and supply/demand is getting tighter. This has a direct effect on pricing and product availability. Product prices are affected when any part of the value chain becomes constricted. In fact, when intermediates go short, downstream derivatives compete on margin delivered for the limited supply.

"Any time product is short a supplier makes choices about which customers it can continue to supply. These choices are not easy, especially when you have to tell a customer that we can't supply them any more."

Phil Cook, Senior V.P./Performance Chemicals and Thermosets Dow Chemical Company

FACT: POLYVINYL ALCOHOL (PVOH)

- 3% increase expected in Q3 2005

"Our performance reflects the ongoing emphasis on implementing price increases to recover extraordinarily high raw material and energy costs."

Raj Gupta, Chairman and CEO Rohm & Haas

"Just this morning one of our nation's largest financial institutions, in reporting on gas price futures, referred to the forecast of a worse than normal hurricane season and the possibility of decreasing gas imports, which would be excuses to force up the price, as 'good news.' It makes absolutely no sense."

Peter R. Huntsman, President and CEO of Huntsman Corporation

FACTS: EVA POLYMERS

- Ethylene outages in USA and Canada putting pressure on spot prices
- 8% polymer increase announced for Q3
- Polymer supply tight

EXPERT PERSPECTIVE:

Dan Murad, President and CEO, The ChemQuest Group

"Adhesives companies' costs have gone up on aggregate about 29% over the last 2 years. And the expectation is that they'll probably go up an extra 5-8% through the rest of this year and into the summer of next year," he says.

Adhesives formulators have been struggling with strong demand and unanticipated supply interruptions — force majeure and raw materials allocations. Competition for limited raw materials supplies has added to the pressure. "Adhesives is not a big enough industry to be critical mass for any of these raw materials. So, they tend to suffer when competing with other industries that use up more of the raw materials."

Based on historical data and the time it takes for economics to trickle through the supply chain, Murad expects the cycle to peak in September 2006. While a number of raw materials suppliers have now approached brownfields and greenfields economics and are beginning to invest in new capacity, as opposed to de-bottlenecking projects, these changes won't impact the adhesives industry for another six-to-nine months, he says.

Murad expects some cost relief for adhesives formulators on the backside of the cycle but doesn't anticipate any cost-cutting gifts from suppliers. "The raw materials suppliers will continue to increase their margins on the backside because they just won't be lowering their prices at the same rate as their costs are decreasing."

Of course, if energy prices continue their climb, the cycle will continue. "That's the biggest uncertainty right now. If oil continues to go up, then all bets are off."

The ChemQuest Group is an international strategic business management consulting firm specializing in the paints, coatings, resins, polymers, adhesives and sealants industries. ■

FACTS: WAXES

- 15% increase since Q4 2004; new increases announced for Q3 2005
- Fischer-Tropsch Sasol Wax on force majeure — allocation as low as 25%
- Paraffin wax supply very tight; Chinese paraffin less available

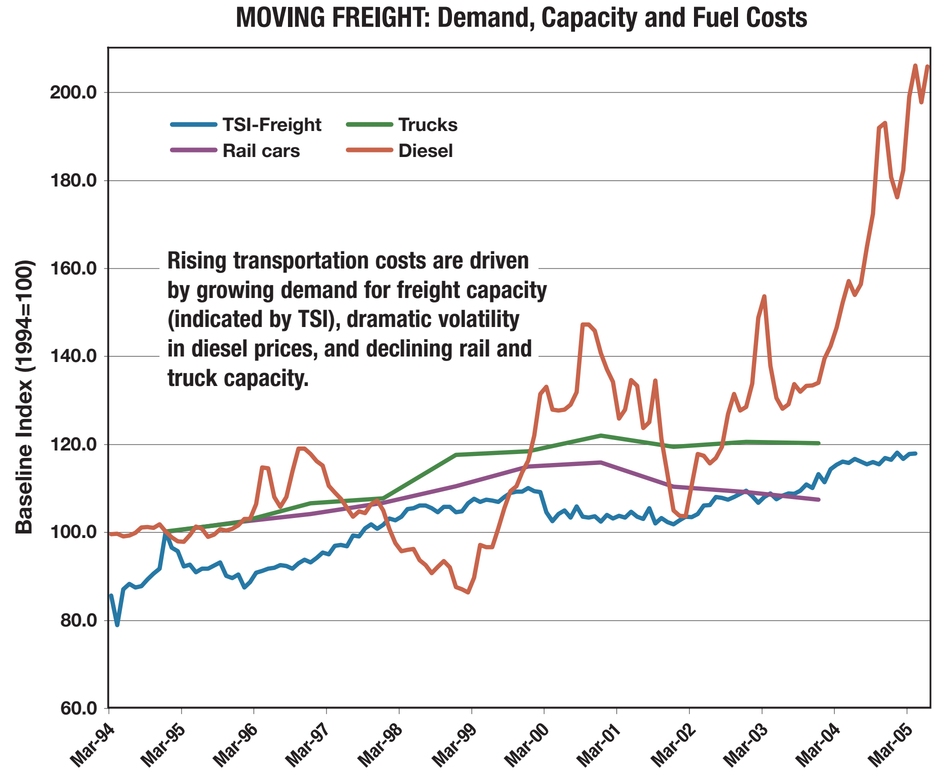
SNAPSHOT: Transportation Costs

Cargo capacity remains very tight throughout all modes of freight transportation, driven largely by the high cost of diesel fuel and compounded by increasing demand. As a result, prices are up in all segments.

In 2002, the U.S. transportation system carried more than 16 billion tons of freight valued at over $11 trillion (source: DOT). According to the American Association of State Highways and Transportation Officials, the volume of domestic freight will double and international freight will triple in the next 20 years. However, capacity is not rising to meet demand.

In the short term, manufacturers and retailers are looking ahead to the end-of-year holiday season. Ballooning freight volumes beginning in late August will further burden capacity as companies move imported goods from China into distribution centers. Transport prices are expected to rise with tightening seasonal supply/demand. ■

MOVING FREIGHT: Demand, Capacity and Fuel Costs



Sources: U.S. Department of Transportation Energy Information Administration and Bureau of Labor Statistics

Published by National Adhesives. For more information about raw material issues, contact Steve Ringsdore, National Adhesives Sales Director, at 908-685-5515.