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INDUSTRIAL ADHESIVES Raw Materials FACTS

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PRICE PRESSURE CONTINUES IN POLYURETHANE ADHESIVES

Shortness in the MDI market and increasing prices for polyols and castor oil continue to pressure the polyurethanes sector.

MDI

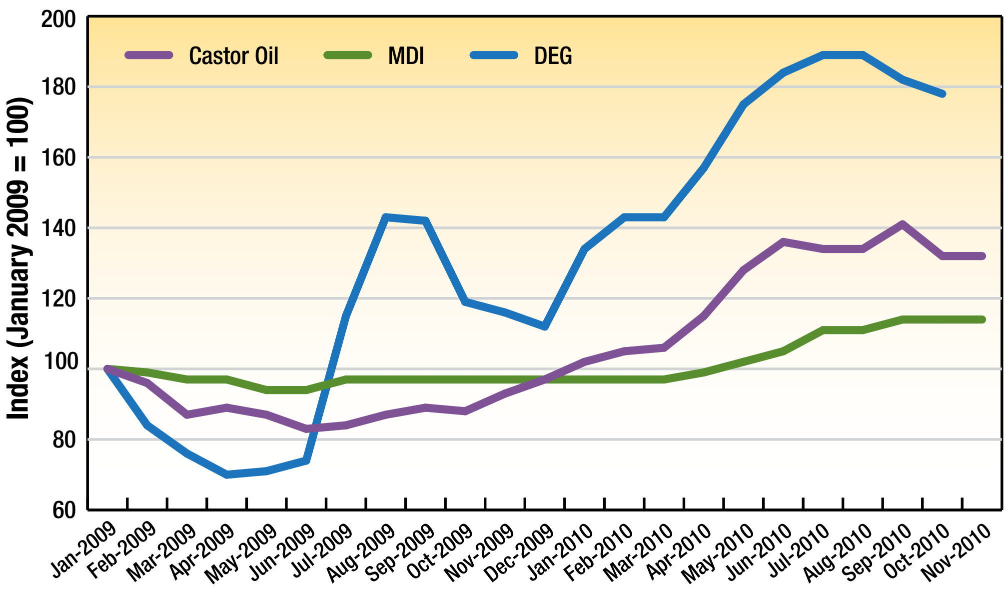
"We are seeing a strong recovery in global demand for MDI", Peter Huntsman, CEO of Huntsman Corporation, told analysts on the company's Q3 2010 results conference call in early November. The biggest issue right now for MDI is the supply of raw materials, Huntsman said.

Strong demand and a string of planned and unplanned outages kept the European MDI market tight during Q2 and Q3. Supply constrictions have eased somewhat in Q4 with the resumption of production following maintenance shutdowns and the lifting of a longstanding *force majeure* at Borsodchem's MDI unit in Hungary. Although ongoing issues at BASF's plant in Antwerp, Belgium (the largest MDI unit in Europe) and Huntsman's plant in Rozenburg, Netherlands will continue to pressure supply.

Meanwhile, producers report that demand volumes are back to pre-crisis levels. Legislation to improve energy efficiency in buildings will ensure that robust insulation demand will continue to drive MDI demand growth in 2011.

As a result, MDI prices have climbed almost 20% since the beginning of 2010. During Q3 results conference calls, executives clearly stated that they have been successful in passing MDI cost increases on to customers. The sharp MDI price increases in Q4 will begin to impact adhesives prices in Q1 2011. Rising feedstock costs will continue to affect MDI costs, which could keep the upward pressure on adhesives prices well into next year.

The Rise of Polyurethane Raws



Sources: *Oil World Weekly*, ICIS, Tecnon OrbiChem

Polyether Polyols

The recent French labour strikes affected the supply of raw materials for polyether polyols. Reduced refinery run rates and transportation slowdowns, forced propylene oxide producers to slow operating rates, decreasing supply, drawing down inventories and contributing to rising prices.

Tecnon OrbiChem reports that the polyether polyols market has now returned to the demand levels experienced prior to the crisis. Producers are optimistic about further demand improvement in 2011.

At the same time, ongoing planned and unplanned outages at several facilities continue to restrict supply. The tightness in polyether polyols supply, combined with the rising cost of feedstocks, contributed to a 20% rise in prices this year. Rising propylene prices may put additional upward pressure on prices going forward, according to Tecnon OrbiChem.

Polyester Polyols

The global supply of adipic acid remains tight. In a recent report, Tecnon OrbiChem said that European adipic acid producers have been running facilities at maximum capacity since early summer.

Downstream demand remains strong. CMAI reports that there's been no seasonal slowdown in demand from the polyurethane sector. Adipic acid is also a feedstock for nylon 6,6. Poor weather conditions have reduced the global cotton harvest this year and fuelled demand growth for nylon 6,6, which is being substituted for cotton.

The tight supply and robust demand have driven adipic acid prices up 44% so far this year. Rising prices for benzene, the feedstock for adipic acid, could continue to put upward pressure on costs into the new year.

Glycol prices have also risen. Tecnon OrbiChem reports that capacity reductions in recent years have left the global diethylene glycol (DEG) market undersupplied. Production problems earlier in the year, coupled with recent labour strike-related outages, constrained DEG feedstock supply. DEG prices have increased almost 60% in 2010. Meanwhile, the preference for lighter cracker feed slates has had a similar impact on the dipropylene glycol (DPG) supply.

All of this has put upward pressure on the price of polyester polyols, which have increased by 13% since the beginning of 2010.

Castor Oil

The price of castor oil has softened slightly in Q4 but remains supported by strong demand, dwindling stocks and uncertainty surrounding the coming harvest season, which takes place in December and January.

Global demand, as indicated by imports of castor oil, was up over 40% in the recent harvest year (October 2009 to September 2010). Demand from China alone almost doubled. Prices in Rotterdam increased by over 60% in the same period. Higher freight costs to ship castor oil from India to Europe are also boosting prices.

The fate of castor oil prices now rests with the success of the coming harvest. Prices traditionally soften during the harvest months; however, some analysts say that strong global demand could counter any seasonal variations in pricing. Weather conditions during the harvest along with actual production levels will dictate prices going forward. ■

WATERBORNE RAW MATERIALS ON THE RISE

The supply of many raw materials used in waterborne adhesives remains tight, prices have yet to retreat from the year's highs and uncertainty persists in the market.

Natural Latex Rubber

Unfavourable weather conditions in two of China's top rubber-producing provinces limited production of natural latex rubber this year and led the country to boost imports. In September, China imported 19% more rubber than in the previous month. At the same time, resurgence in the automotive sector, especially in China and India, is boosting demand for natural rubber to make tyres.

This increased demand comes at a time when Thailand, the world's largest rubber producer, is experiencing one of the worst monsoon seasons in recent history. As a result, the Thai Rubber Association estimates that rubber production may decline by 5% in 2010. CMAI forecasts a 10% decline. A recent Goldman Sachs report forecasts that global rubber inventory stockpiles will fall by 12% and cover only 67 days of projected demand in 2011—the lowest level in at least a decade. Analysts say that consumption will continue to outpace supply in the coming years.

This has pushed Thai rubber prices to record levels. Prices spiked 11% in October and are up 42% in 2010. Analysts say that the price of rubber futures in Singapore could surge an additional 20% in Q1 2011.

Benzoate Plasticizers

Ethylene oxide is a feedstock used in the production of diethylene glycol (DEG), a key raw material for benzoate plasticizers. Tecnon OrbiChem reports that ethylene oxide demand has held steady in Europe this year. The recent labour strikes in France curtailed feedstock supply and led INEOS Oxide to declare *force majeure* on ethylene oxide and its derivatives, including glycols, from its Lavera, France site.

In addition, a number of DEG producers have shut facilities and reduced capacity in recent years. This has led to undersupply in the market. Prices have climbed steadily as a result and are up almost 60% so far in 2010, according to Tecnon OrbiChem. The pace of price increases has slowed recently, Tecnon OrbiChem says, however, "there is unlikely to be significant softening in [the European] market as long as the global market is undersupplied and the Chinese market is the scene of very robust demand and high prices".

The demand for benzoate plasticizers is also on the rise, driven largely by health concerns over the use of phthalate plasticizers. In a 2009 report, the European Chemical Agency named benzoate plasticizers as suitable (and safe) alternatives

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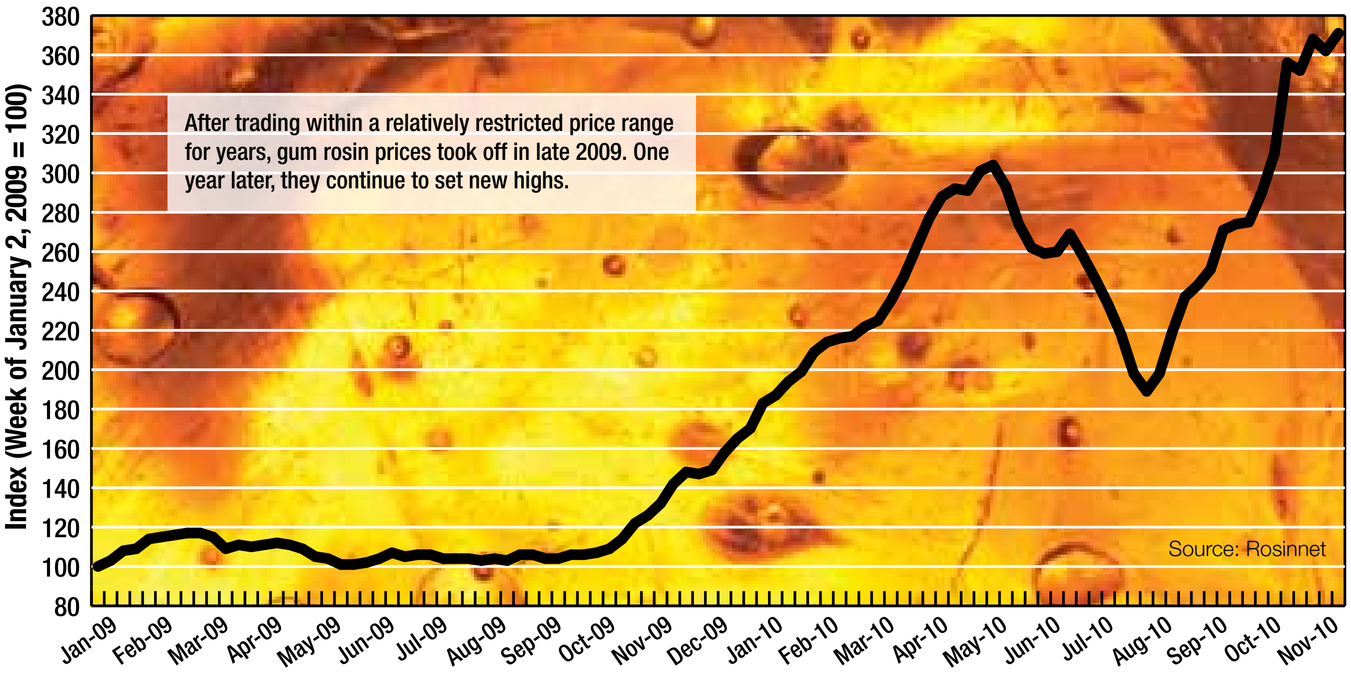
SPOTLIGHT: TACKIFIERS

Gum rosin prices have more than doubled since the beginning of 2010 and continue to put pressure on tackifier costs. Industry analysts expect prices to remain at current levels well into 2011.

Gum Rosin Price Development



For the past decade, gum rosin prices have hovered in the €600 to €700 per tonne range and the market has remained relatively stable. Prices began to rise steeply in Q4 2009. As a result, export prices are now well above €2,000 per tonne. The reason for the rise isn't entirely clear.

"Nobody could have anticipated the price explosion as no fundamental reason for the price increase was evident", Wang Peow Tan, Vice President of Procurement and Asian Sourcing for Flint Group said in an October press release. "Market dynamics allowed it to happen. Namely, healthy demand, low stocks in the supply chain and well organized traders and producers. And there is no sign of relief yet".

Some buyers blame the price escalation on increased speculation in the gum rosin market. Others suggest that this is setting up a cycle whereby supply tightness is exacerbated by cash flow problems experienced by many of the small Chinese traders and processors who may not have the capital necessary to purchase rosin at the current high prices and convert it to rosin esters for the tackifier market. Contracting supply drives prices higher, which perpetuates the cycle.

Regardless of the cause, "the current high prices appear to be robust" and are "defining a new market level", Jan Paul van der Velde, Senior Vice President Procurement for the Flint Group said in the same press release. Gum rosin prices rose steeply in Q1 and Q2 2010 but began to moderate in the summer months. They changed course again in late August and since then have rebounded almost 80%.

With the harvest season now ending in China, DeWitt fears that these high price levels will remain until a new harvest begins next year. Flint Group executives say that the market has found a new, higher equilibrium and "we would not expect a return to previous [price] levels any time soon". Security of supply remains the short-term challenge, they say, and the market may not improve in the next six to nine months.

This situation is leading to new rounds of price increases for gum rosin-based tackifiers. Suppliers have announced additional price increases in Q1 2011. "Pricing has defied all logic so far", one industry insider said. "We have no idea where pricing will be next year". This will, in turn, continue to drive up the cost of hot melt adhesives. ■

WATERBORNE RAW MATERIALS ON THE RISE

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to phthalates. This has opened a new market for benzoate plasticizers and led to increasing substitution, which is driving demand and contributing to plasticizer price escalation.

Acrylics

Acrylates buyers remain on guard following the turmoil experienced in the acrylates market earlier in the year. Good news arrived in September when several key producers lifted *forces majeures* and operations returned to normal production.

Throughout 2010, any easing of supply was immediately matched by resurgence in demand. This is an indication that buyers are interested in growth but are being constrained by supply. Next year will not be much different. European producers recently told *ICIS News* they will run plants at full capacity and expect to sell out production. With suppliers unable to build inventories, any disruption to the supply chain can quickly shorten the market.

The prices of acrylic acid and acrylates have decoupled from feedstock price development and are being dictated by the imbalance between supply and demand. Contract acrylic acid prices are up 83% in 2010, and producers recently announced another round of increases. Contract butyl acrylate (BA) and 2 ethylhexyl acrylate (2-EHA) prices continue to climb monthly. BA prices are up 77% and 2-EHA prices, 59% so far this year.

Casein

Strong casein prices are still working through the supply chain and will continue to impact adhesives costs well into 2011. Casein prices rose sharply at the end of 2009. They are up an additional 30% in 2010 and are holding steady at current levels.

European casein supply is sufficient to meet current contract needs but there is no additional material for the spot market. Inventory stocks are low. With the European dairy season now over, attention has shifted to Oceania, where the season is entering peak production. The USDA warns that forecasts of drought for the upcoming southern hemisphere summer in New Zealand could reduce production. If milk supply is reduced, producers will prioritize other products over casein, potentially tightening casein supply. ■

ADHESIVES ROADMAP: 2011

Ongoing supply shortages, supplier pricing power and low inventories point to rising adhesives costs in the new year.

Chemical companies delivered strong results in the third quarter. No one in the industry could have predicted such performance even a short while ago. While demand has certainly rebounded, the results can also be attributed to prudent cost containment and the ability to pass on rising raw materials costs. These tactics may now be setting the stage for heightened challenges for the adhesives industry in 2011.

The Balance of Pricing Power

Chemical company executives were candid about their ongoing ability to pass the rising cost of raw materials on to their customers. BASF reported a 40% escalation in raw materials costs in the third quarter. Dow Chemical expects feedstock costs to rise by an additional $300 million in Q4, following a $585 million increase in Q3. With tightness in many adhesives raw materials streams, suppliers say that pricing power is slanted in their favour. They will continue to raise prices to recoup increases and build margins.

"We're running our assets very hard. They're running well. Inventories are low. And we're very focused on price", Dow CEO Andrew Liveris told analysts on October 28. "So, in other words, we're pretty much sold out and are now selling up".

Managing Inventories

Unplanned outages and operational constraints disrupted suppliers' plans to match supply to demand this year, tightening adhesives raw materials supply. The shortages hampered the ability of many suppliers, and their customers, to build inventory buffers to protect from future supply threats.

Suppliers say buyers are shifting behaviour toward smaller volume purchases. This helps to mitigate the risk of holding expensive material in inventory. But the trade-off lies in the higher freight costs associated with smaller and more frequent shipments. The trend also forces both suppliers and buyers to improve demand forecasts to ensure adequate supply.

The price of this shift is increased supply chain uncertainty. CMAI recently said that the aversion to holding inventory during the downturn rendered the supply chain less efficient. Any unexpected supply disruption could quickly propel the market into a shortage situation.

Supply Reliability

Europe's older crackers require relatively high levels of maintenance to remain functional and consistently achieve nameplate capacity. Despite this, there is a noticeable lack of planned cracker maintenance in Europe in 2011, CMAI said in a recent report. This suggests that "producers are still working on minimizing capital expenditure on maintenance or have found ways to complete turnarounds in record time". CMAI said that in 2011 there is a "strong risk that plant reliability will be no better, and possibly worse" than in 2010 and that "increased unplanned problems are almost inevitable".

Outlook for Adhesives

Future demand levels are the great unknowable for 2011. What is clear is that current demand coupled with supply shortages throughout the year has delivered suppliers the upper hand in price negotiations. Suppliers will continue to use this to their advantage to pass high feedstock prices down the supply chain and rebuild margins.

With thin inventory levels and the abbreviated maintenance schedule indicated by CMAI, it is hard to imagine that 2011 will escape the types of unexpected raw materials outages that plagued 2010. Unless demand slows—and no one in the industry wishes for such a scenario—the stage could now be set for further increases in the cost of adhesives raw materials in the year to come. ■

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