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AN ELECTRIFYING FUTURE FOR CARS

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EUROPEAN FLEX FOAM TRENDS
Each car and truck may contain several hundred meters of cables. Some specific sections of these cables need protection from water, heat, chemicals and dust while others must basically seal holes between different compartments of the cabin. These functions are fulfilled by the so called “cable grommet” and “wire encapsulation”, both made by using polyurethane, to provide high mechanical and technical properties, like stability and sealing. Cannon supplies integrated turn-key systems for the production of cable grommet and wire encapsulation through the classic RIM Technology, where a harness of cables is closed in a sophisticated mould and protected with a bun of polyurethane. Depending on customer needs, Cannon provides an advanced moulding system, with moulds controlled by a network of sensors to avoid expensive scraps and ensure superior quality.
Construction and footwear growth drive sales at Huntsman, Strong H1 sales at BASF, Recticel sales rise by a half, Nike earnings leap in 2021

Polyurethane performance bounce continues at Dow Chemical in Q2, Faurecia bounces back in H1 but raw materials prices a problem, Trelleborg sales up in H1 2021, News in Brief

Sheela Foam invests in 12th site and creates e-commerce platform, India’s Shakun Industrie to hike polyol capacity, PTPL building second polyol export facility in Gujarat, Material shortages helped Manali to strong FY21

Chinese polyol demand picks up in post-pandemic recovery, Wanhua’s H1 earnings grow amid market resurgence, Shanghai Harvest to develop cryogenic pipes with BASF, Huntsman enters partnership with Megafan Bedding, Miracol to build TPU park

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Covestro restructures to sharpen growth focus... and upgrades H1 guidance, Bostik launches new sealants, Grammer Q2 earnings stifled by chip and raw material shortages

DuPont SPF wins ACC sustainability award, News in Brief

Seating is consumer-facing. It has a number of touchpoints

Sustainability is definitely becoming more of a talking point

This is a once-in-a-lifetime opportunity to get green materials into vehicles

It is absolutely the moment to promote PU with this kind of solution

It was the wildest ride that the polyurethane industry has had for as long as I can remember

Looking at Europe’s flexible foam in 2020

Changing gears The nature of new passenger cars is changing quickly in Europe as environmental regulations start to bite, and it’s going to have implications for the polyurethane industry as the materials used in them evolve. Simon Robinson investigates

Closing the automotive circle There have been many attempts to make automotive components greener. Simon Robinson finds out more about Dow’s new circular polyols and systems, and how they are being applied in the automotive sector to improve its sustainability.

Are trends electric? As the market moves towards electric cars, polyurethane will be increasingly important. Simon Robinson finds out what Huntsman is doing in the area, and what is driving the changes

A heady mixture With 2020 being a year like no other, there have been some definite trends in the flexible foam sector from raw material shortages to e-commerce. We take a look at some of the highlights of the market survey commissioned by EuroPUR, the European association of flexible polyurethane foam blocks manufacturers.

Key events for the PU industry

Front cover picture

The world is starting to move from fossil fuels to electricity to power passenger cars, with Europe leading the way. Read more in our feature on pages 21–27. Picture Desk
Coming out of the tunnel

Paradoxically, 2021 could be a bit tougher for business than 2020. Last year was marked by considerable uncertainty and a very worried population who often stayed at home and saved their money. Although this depressed spending at the time – and caused groups like car makers to cancel orders for those vital chips that control vehicles nowadays – there were still commercial commitments made between companies that had to be honoured.

If it is possible to plan strategically for these things, then 2021 was going to be the year of transition out of the crisis for large numbers of vaccinated populations. It would take things a while to get back to normal (or establish a new normal) and there would be disruption, but we’d be on the right track.

At the moment, sitting in London, where it is now possible to go to the pub and then on to the discotheque again (ah, for the days of my youth!), there is the impression that the coronavirus pandemic seems some distance away. Many others around the world are feeling this, and have done for several months. Hopefully, the developed world is now getting coronavirus under control, and we can start rolling out vaccinations to those nations who cannot afford them.

This feeling of release is reflected in the splurge of demand for cars, especially in North America, as you can see in our automotive special feature on page 20. Yet car makers – and this may be a novel experience for them – find that they are not at the top of the order list with the people who make electronic chips, and there is a shortage which could last until well into 2022.

This issue highlights how the auto industry is struggling with disrupted supply chains, high consumer demand, and an insistence in the EU – at least – that it stops building combustion engines and goes electric by 2050.

There is also good news from PU China, which was held in late July in Shanghai. Look out for more on that in our October/November issue. This will appear in good time for UTECH Europe, which is scheduled for 16-18 November, and promises to herald that new normal for the industry that we all crave.
Huntsman doesn’t manufacture plastic bottles, but we’re deeply concerned about the global impact of plastic waste. That’s why every year, we upcycle 1 billion PET bottles into energy-saving polyurethane insulation that significantly reduces heating and cooling costs in homes and commercial buildings.

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Construction and footwear growth drive sales at Huntsman in 1H21

The Woodlands, Texas – Sales in Huntsman’s polyurethanes business rose by 37.4% between the first half of 2020 and the first half of 2021. The $2.2bn achieved in the first half of 2021 compares with $1.6bn in the first half of last year.

Adjusted EBITDA in the division was up 261%, at $415m in the first half of 2021. The figure was $115m in the equivalent period in 2020.

Speaking at an analysts call, CEO Peter Huntsman said that the turnaround at the company’s MDI facility in Rotterdam, Netherlands took about $35m off adjusted EBITDA because of third-party start-up problems. These meant the plant had to run at reduced capacity in May and June.

If Rotterdam had been running in a normal year, total volumes would have been 22% greater, he said.

He told analysts: ‘We were essentially sold out on our MDI units worldwide.’

There was growth in rigid and elastomer products powered by increases in construction activity in the US and Europe for rigid products, and the global footwear market for flexible products.

Looking across the company, sales were $3.9bn in the first half of 2021, up 36% on the same period last year. Adjusted EBITDA across the business rose by 184% to $623m in the first half of 2021.

He added that MDI remains well balanced. ‘However, during the second half of this year just over 10% of the capacity of MDI will be lost due to announced closures for needed maintenance work,’ he said.

‘This will be taking place at a time when our facilities ought to be operating at design rates and sold out.’

Strong H1 sales at BASF

Ludwigshafen, Germany – BASF generated sales of €39.2bn in the first half of 2021. This is up 33.0% on the same period last year. EBIT across the business rose from €1.5bn to €4.6bn in the half.

CEO Martin Brudermuller said: ‘Thanks to higher prices and volumes we can present very strong second-quarter results today. We achieved volume growth and price increases across all regions and all segments compared with the second quarter of 2020. The strong growth momentum of the previous two quarters has continued.’

There was momentum across the downstream businesses. In the company’s materials business, which is home to polyurethanes, half-on-half sales rose by 43.3% to €7.2bn. This compares with €5bn in the equivalent period in 2020.

EBIT in the division rose from €1m in the first half of 2020 to a total of €1.4bn in the first half of 2021.

Revenue and EBIT grew because of demand-related increased in volumes and prices, the company said.

Looking across the remainder of the year, BASF now believes there will be stronger growth in industrial production in the coming months.

The company estimates that this could be up by 6.5%. There is also likely to be a similar increase in chemical production in the rest of the year.

This means that by the end of 2021 BASF could be recording sales could between €74bn and €77bn in the year, and EBIT between €7bn and €7.5bn.

But BASF stressed that these predictions assume that there will be no severe coronavirus restrictions imposed in the second half of the year.

Recticel sales rise by half

Brussels – Recticel said that sales are likely to be €596m in the first half of 2021. This is an increase of 59.3% on 2020, and 31.4% on the €453.8m recorded in the first half of 2019.

Commenting in the trading statement, CEO Oliver Chapelle said: ‘The positive sales trend observed during Q1 2021 continued in Q2, driven by very strong demand in insulation and solid demand in engineered foams.’

He added that raw materials supply remains very tight, with MDI in particular being affected by planned maintenance and new force majeure incidents primarily affecting MDI. ‘It is hard to see when the situation will normalise,’ he said, adding that Recticel is passing on costs.

The cost savings from the FoamPartner integration look likely to be €18m, not €14m as earlier predicted, and should start to be felt in 2023. FoamPartner sales added €71.9m to Recticel’s sales in the first half of this year.

The company is pressing on with the disposal of its bedding division.

Nike earnings leapt in 2021

Beaverton, Oregon – Nike, the global footwear giant, generated sales of $44.6bn in 2021. This represents a 19.3% increase on the previous financial year.

EBIT across the business rose by 130% to $6.9bn in 2021. This compares with $3bn in 2020, a rise of $3.9bn.

John Donahoe, Nike’s CEO said: ‘The strong results this quarter and full fiscal year demonstrate Nike’s unique competitive advantage.’

Nike said that performance in 2021 was fuelled by double-digit growth across footwear and apparel. Nike Direct, the company’s online sales channel, generated 30% more revenue than in 2020, at $16.4bn.

The company increased its gross margin as it paid lower factory cancellation charges than in the previous financial year, because of the way these fell through the coronavirus pandemic.
Polyurethane performance bounce continues at Dow Chemical in Q2

Midland, Michigan – Dow Chemical generated total sales of $13.9bn in the second quarter of 2021. This is up 66.2% on the same period last year. Operating EBIT across the business rose from $57m in the second quarter of 2020 to $2.8bn in the second quarter of 2021.

CEO Jim Fitterling said: ‘Our second quarter results reflected strong demand in all our value chains and regions as we achieved substantial growth in sales and earnings, both sequentially and year-over-year.’ He said the company reduced debt by $1bn in the quarter, and paid shareholders what he described as an industry-leading dividend.

There was strong performance in the polyurethane & construction chemicals business segment of the industrial intermediates & infrastructure division. Sales rose by 74.4% between the second quarter of 2020 and the second quarter of 2021, to $4.2bn, up from $2.4bn in the 2020 period.

Operating EBIT across the business increased from a loss of $220m in the second quarter of 2020 into positive territory, with operating EBIT of $648m in the second quarter of 2021.

Trelleborg sales up in H1 2021

Stockholm – Trelleborg, a major PU processor, had total sales of SEK16.8bn ($530m) in the first half of 2021, up 8.7% on the same period last year. EBIT across the business rose by 33.4%, to SEK2.7bn in the first half of 2021.

Looking specifically at the second quarter, CEO Peter Nilssen said it was characterised by a continued strong performance. ‘Organic sales increased 6%, and all three business areas contributed growth,’ he said.

In the company’s industrial business, sales rose by 5.2% between the first half of 2020 and the first half of 2021 to SEK5.5bn in the first half of 2021. This compares with SEK5.2bn in the equivalent period in 2020. EBIT in the division increased by 58.1% to SEK683m in the first half of 2021. This compares with SEK432m in the equivalent period in 2020. This business benefited from improvements in activity in automotive and construction customers compared to 2020.

In sealing, sales were up by 10.3% to SEK1.5bn in the quarter, up from $57m in the same quarter last year. EBIT in the business rose by 27.2% to SEK1.5bn in the quarter.

Faurecia bounces back in H1, but raw materials prices a problem

Nanterre, France – Faurecia, the automotive seating and interiors company, generated €7.78bn in sales in the first half of 2021, up 27.9% on the same period last year. Operating income across the business increased from a loss of €100m to €510m in positive territory in H1 2021.

‘We delivered strong performance in H1 despite the shortage of semiconductors and raw material inflation,’ said CEO Patrick Koller. ‘We are convinced automotive production hit a low in Q2 and should gradually rebound in the coming quarters.’ He said the company had reduced debt and that the business had solid order intake in the first half of the year.

In the company’s seating business, which opened a new plant in Tolyatti, Russia in the half, sales rose by 30.7% between the first half of 2020 and the first half of 2021, reaching €29.6bn.

News in Brief

Repsol and Rampf strike PU waste recycling deal

Madrid, Spain – Repsol has an exclusive licence to use Rampf’s polyurethane recycling technology to make polyols for flexible foam from consumer waste streams. No details of the length of exclusivity or financial details were available.

More pentane due from Haltermann Carless

Speyer, Germany – Haltermann Carless claims it will become the world’s largest supplier of cyclopentane blowing agents for rigid polyurethane foam when its new German plant comes on stream in early 2022. The project started in 2018 and was halted last year during the coronavirus lockdowns. Construction restarted in Q3 2020.

H&S supplies tank farm

Ramos Arizpe, Mexico – H&S Anlagentechnik has supplied a tank farm to foam maker Ikano at its Mexican site. The 78ha facility makes mattresses for IKEA’s Latin American stores. The new capacity is modular. It allows Ikano to purchase raw materials in larger quantities.

Covestro sells Pearl

Dubai, UAE – Covestro completed the sale of its 51% stake in Pearl Covestro Polyurethanes Systems house on 26 July 2021. The business will continue to operate as Pearl Polyurethane Systems, and is now 100% owned by Pearl Overseas Industries. This was Covestro’s last systems house to sell and it has now fully exited this business.

Alfa Klebstoffe opens competence centre

Rafz, Switzerland – Alfa Klebstoffe has opened a competence centre for foam bonding at its Swiss HQ. The Simalfa Competence Center covers more than 300m², across two floors. It is designed to map the entire bonding process at production scale, and includes a full-size roller line as well as spray equipment.
Sheela Foam invests in 12th site, creates e-commerce platform

By Satnam Singh

Noida, India – Sheela Foam is to invest INR20bn ($269m) in its 12th foaming plant, which will be located at Jabalpur, Madhya Pradesh.

Products from the plant will be sold via e-commerce, the company said.

‘This will be the biggest, and a state-of-the-art production unit for e-commerce purposes,’ said Rahul Gautam, the company’s chairman. No further details on machinery or capacity were available from the company, which is celebrating its 50th anniversary.

The company is building the new site, despite having enough foam capacity to meet the current surge in demand. ‘Our existing units are operating with 55–60% capacity and could cope with the slight increase in demand very well,’ Gautam said.

‘Building up e-commerce will be the key focus for the company in the near future. We want to give customers a comfortable online shopping experience with our Sleepwell@Home campaign. We also want to and strengthen the distribution of products at the lower end of the market.’

Gautam said India’s prolonged coronavirus lockdown, helped people become more aware of comfort. He added that this is helping consumers to spend money on mattresses and furniture.

‘Business in India is getting closer to normal, with positive sales and increased footfall at the company’s Sleepwell stores, he said. Sheela pushed up sales in 2021.

PTPL building second polyol export facility in Gujarat

Sonipat, India – Poliolotechnology (PTPL) is investing in new a polyols facility in Gujarat in the west of India.

The upcoming second site will have three times more installed capacity than the company’s current plant in Haryana, north India.

‘We are investing about INR1bn ($13.4m) in the Gujarat site, which will have an installed capacity 2kT/month,’ said Bernard Devakirubakaran, PTPL’s CEO. ‘The plant is likely to be functional by the second quarter of 2022.

The company is a key exporter of polyols, but its current facility is almost 1200 km from Mundra port. The Sonipat site, with a capacity of 8.4kT/year, exports about 30% of its production overseas.

Material shortages helped Manali achieve strong FY21

Chennai, India – Manali, an Indian polyol producer, had sales of INR 104bn ($1.4bn) in its 2021 financial year, which was reported at the end of June. This is up 27.2% on the previous financial year.

EBITDA across the business rose by 279% to INR 3.1bn. This compares with INR 828.5m in 2020, the last financial year. ‘Manali has been able to do a quick turnaround despite pandemic-related challenges,’ said chairman Ashwin Muthiah. The company also attributed performance to international and domestic market conditions, and lower import of the products into India.

India imposed anti-dumping duties on polyols from Saudi Arabia and the UAE in April this year.

Manali had to write down the value of some assets amounting to a reduction of INR279m in value. It is still waiting for clarification from the state of Tamil Nadu of the status of the lease on the land its plant in Chennai is built on.
Polyols: for flexible and rigid foam, CASE

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**Xuchuan bets on interior insulation**

Shanghai, China – Chinese polyurethane materials maker Xuchuan Chemical showcased its newly upgraded rigid foam system with lower VOC at PU China/UTECH Asia.

The product will target building interior insulation as well as cold chain logistics, Zhang Weidong, the company’s general manager of intermediate division, told UTECH-polyurethane.com on the sidelines of the event.

As opposed to exterior insulation, where PU panels have been having trouble claiming a larger market share because of higher costs, interior insulation requires cleaner greener materials, Zhang said. He also believes that the end consumers of these products may be less cost sensitive.

Xuchuan is also a maker of other PU materials such as shoe sole resin, faux leather resin and adhesives, and today has 600kT/year total capacity in five sites in the Greater Shanghai area.

In the footwear sector, Zhang believes growing pressure from costs will make clients choose whichever material is less expensive of PU, rubber and EVA which, to a large extent, have similar performance attributes.

PU currently has a 20% share among the materials, but its price is at least 30% higher compared with the rest, Zhang said.

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**Chinese footwear exports continue upswing in May**

Beijing – China exported 690m pairs of shoes in May 2021, up 5% on May 2020, according to China’s General Administration of Customs figures.

The total value of these exports climbed by 64% year on year to $3.4bn, the government customs department continued.

The monthly volume was still behind pre-coronavirus May 2019, when China exported 840m pairs.

Although the monthly volume was down on 2019, the value of exports in the period, exceeded May 2019’s $2.6bn.

Exports for the first five months of 2021 totalled 3.4bn pairs, up 31% year on year. The value of five-month exports increased by 40% from 2020, to $16bn.

This compares to 3.9bn pairs of shoes exported over the first five months of 2019, worth $11.5bn.

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**Sanyo launches new polyols for low-resilience foam**

Kyoto, Japan – Sanyo Chemical has developed new polyester-based polyols for flexible foam formulations. The resulting foams have low resilience, good breathability, and retain softness at low temperatures, the company said.

There are currently two grades in the range, Sannix FA-817A and FA817T. The new polyols enable formulators to overcome issues with low breathability, which Sanyo said is one of the common problems of producing foams using polyols that have low relative hydroxyl equivalents with increased viscosity.

The company has revealed little about the structure of the polyols, but said they have combined polyols with an ester group and other materials to make them.

‘Further, we performed optimal design at the molecular level such that the temperature-dependence of the foam is reduced, the newly developed foam does not harden at low temperatures,’ it said.

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**Coronavirus spurs Kenya’s Superfoam to donate**

Ruiru, Kenya – Superfoam, a Kenyan flexible foam and bedding company, has donated mattresses to the local police station in Ruiru to help children who have been abandoned there by their parents.

One of the effects of the coronavirus pandemic in the town is that a number of parents and guardians have found themselves unable to cope, and have left children at the police station.

‘The time they spend at the station is very traumatising for the children. Sleep is extremely critical for their healthy growth and development of children,’ the company said.

Ruiru is home to Superfoam’s headquarters.

Samuel Mwangi, the commanding officer at Ruiru Police Station, said: ‘It has been quite a challenging time for everyone due to coronavirus infections. Young boys and girls have been dropped off at the station since their guardians cannot take care of them.’

The commanding officer continued: ‘the company came through by donating mattress to help these children have somewhere comfortable to sleep while we find a proper home for them.’

Earlier this year Superfoam donated a number of mattresses to a Nairobi hospital for coronavirus patients.

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**Nigeria presses on with its HCFC phase-out**

Abuja, Nigeria – A steering committee has been set up in Nigeria to manage the second stage of its HCFC Phase Out Management Plan, according to local news reports.

Announcing the development, environment minister Mohamed Abubakar, said: ‘This is a follow up to stage one, which the Ministry successfully implemented from 2010 to 2018 in the foam, refrigeration and air conditioning sectors.’

As part of the first phase of the plan, a systems house owned by Lagos-based Vitaapur developed a number of formulations for methyl formate-based pre-blended polyols, Abubakar said.

In addition to being a systems house, Vitaapur also operates a Saip-built panel line for rigid insulation products.

‘The systems house will provide availability of ozone-friendly and low global warming potential blowing agents in the production of rigid foam,’ Abubakar said.

This will be good for Nigeria, he said because, the technological developments will generate foreign exchange from the export of methyl formate.

‘It will also assist to building local capacity in the formulation of methyl formate-based systems and generate employment,’ he continued.

The new steering committee includes a number of representatives from UN organisations, the Nigerian government, as well as Nigerian trade bodies.
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Chinese polyol demand picks up in post-pandemic recovery

Beijing – China’s polyol capacity in the first half of 2021 was 10.7mT/year, up from 9.8mT/year in H1 2020. This compares with 8.42mT/year capacity in H1 2019, according to data from China Polyurethane Industry Association.

The capacity increase from 2019 to 2021 includes 1.48mT/year polypropylene glycol (PPG) and 800kT/year propylene oxide (PO), it said.

China’s polyol production in H1 2021 rebounded to 3.44m tonne, up by 42% from H1 2020. PO production in the same period showed particularly fast recovery, registering an 86% jump year on year, according to the CPUIA.

In 2020, China made 5.66mT polyol, slightly down from 5.7m tonne in 2019 because of the low utilisation rate amid the pandemic.

The country’s polyol consumption in 2020 also dropped 1% from a year ago, to 6m tonne.

In H1 2021, as downstream factories in China were operating stably and market warmed up, polyol consumption climbed by 45% year on year, to 3.7mT, CPUIA said.

Wanhua’s H1 earnings grow amid market resurgence

Yantai, Shandong – Wanhua estimates its net profit in H1 2021 will be between CNY13.4bn and CNY13.6bn ($2.07bn to $2.1bn), compared with CNY13.2bn in H1 2020 and 5.6bn in H1 2019, according to a company announcement.

During the first half of 2021, Wanhua’s completed a technical upgrade at its MDI facility in Yantai. This increased capacity from 600kT/year to 11MT/year at the site, and expanded Wanhua’s total MDI capacity to 2.6MT/year.

The company’s new ethylene project, which has 1MT/year capacity, also came on stream during the period.

‘Both production and sales of the company’s main products increased year on year,’ the announcement said. ‘In addition, demand from the downstream markets warmed up as the global pandemic eases.’

It added that some overseas facilities had been hit by factors such as extreme weather conditions, which led to a global supply shortage and, subsequently, a rise in chemical material prices had affected prices.

Huntsman enters partnership with Megafeat Bedding

Shanghai, China – Huntsman signed a contract for a strategic partnership with Chinese mattress and pillow maker Megafeat Bedding on 28 June. Huntsman will supply its Terol polyester polyol to Megafeat. It will be used in slow-rebound and high-resilience foams, according to an announcement.

‘It was by working closely with Megafeat that Huntsman made its breakthrough and first em-ployed Terol polyester polyol in flexible polyurethane foam,’ said Pan Lumin, president of the company’s polyurethane division in Asia Pacific. Terol has already been applied in building insulation, cold chain storage and other rigid foam segments.

Under the partnership, the two parties will speed up the commercialisation of the Terol polyol in flexible foam. It will also look to increase the bedding products’ service life and flame re-tardancy.

Huntsman’s VOC-free hot-melt adhesive Speedlam will also be used in Megafeat’s foam mattresses, and the two parties will develop a range of PU products using modified MDI.

Shanghai Harvest to develop cryogenic pipes with BASF

Shanghai, China – BASF and Shanghai Harvest Insulation Engineering have signed a joint development agreement to develop pre-fabricated cryogenic pipes. They will be made with BASF’s Elastopor Cryo rigid polyurethane system.

BASF said its Elastopor Cryo system has a limiting oxygen index of more than 30%, and also has good strength.

In addition to pipe insulation, BASF said the system can be used to make core insulation materials for cryogenic containment systems for LNG. This fuel may need to be shipped at temperatures ranging from −60°C to −163°C, the company said.

‘Harvest and BASF have been strategic partners since 2019, and have been working on the development of innovative polyurethane products for the fast-growing cryogenics and shipbuilding industries in China,’ said Rohit Ghosh, who is BASF’s Asia Pacific head of business management for construction industry performance materials.

Miracll to build TPU park

Hebi, Henan – Chinese TPU maker Miracll Chemicals is to invest CNY3.5bn ($541m) to build a PU new materials park in Hebi. It is setting up a joint venture to manage the project, Miracll Technology, with local PTMEG maker Hebi Coal Chemical. It will retain a 55% stake in the JV.

The park will cover 600,000m² and phase one will include 100kT/year capacity for specialty TPU, as well as upstream and downstream products. The joint venture’s shareholders will put together CNY500m in cash as the initial investment.

Miracll is one of a small number of Chinese companies able to make mid- to high-end specialty TPU. However, the feedstock is both expensive and import-dependent, the company said.
Simpler casting with new Huntsman elastomers

Shanghai, China – Huntsman launched a new range of easy-to-use elastomers that makes it simpler to cast complex heavy-duty parts at the PU China/UTECH Asia trade show. It also introduced new catalysts for rigid and spray applications.

Castable polyurethane elastomers suffer from a narrow processing window, according to Huntsman. The new grades have longer pot life, and can tolerate processing temperature variations. They are designed to be processed without post-cure at lower temperatures than comparable cast polyurethanes on existing machinery.

The new Technothane ETU grades have good part-to-part consistency. As a result, scrap rates can be lower than with conventional products, the company said.

Huntsman said that other highlights of its stand at the show included details of its Castech casting machinery, as well as hot castable polyols and chain extenders.

Jeffcat catalysts for spray foam and rigid applications were also outlined. These include S-117 and H-1 catalysts.

S-117 is designed for 10-16kg/m³ density spray foams, but can be used with denser formulations. It has a strong blow effects and moderate gel behaviour, Huntsman said.

The H-1 catalyst is designed for HFO blown insulation foam it helps generate foams with low VOC levels.

PU China/UTECH Asia was held on 28–30 July at the Shanghai World Expo and Convention Centre.

Evonik highlights novel additives at PU China

Shanghai, China – Additives producer Evonik highlighted a number of new products for the polyurethane industry at PU China/UTECH Asia. It has a range of new products that have been optimised to reduce VOC emissions in flexible foam applications. These include Tegotab B8244, which has minimised cyclic siloxanes, and is designed for demanding applications. Dabco NE 750, a gel catalyst, and Oregol 700/1/2 products to help foam recovery, are for the bed-in-a-box market.

For the rigid market, Tegostab B 84831 can, the company said, help significantly reduce the K factor of rigid foams, and B84828 improve the surface performance of foam used in metal-faced panel applications.

Evonik was also showing several developments for the automotive sector. Tegostab B 8734 Lo and B 8761 Lo are silicone surfactants designed to help OEMs meet stringent odour and emission targets. They also have good emulsifying properties, and can operate with a wide degree of process latitude.

As well as these products for flexible and rigid foams, Evonik displayed products aimed at the CASE and footwear sectors, and a product to improve the hydrolysis resistance of foams.

Kosmos MB bismuth and zinc-based gel catalysts were shown as alternatives to tin-based systems for CASE.
New TPU for fire hoses and textiles

The Woodlands, Texas – Huntsman has launched a version of its Irogran A 85 P 4394 TPU with a higher tensile strength at break. The new material is aimed at blown film applications.

The HR version of the product has a higher melt strength, Huntsman said.

Higher melt strength is useful because this makes it more process resilient. In addition, the A 85 P 4394 HR TPU product offers improved film extrusion quality, it said.

This combination leads to lower scrap rates and higher production throughput, according to Huntsman.

The new material is aimed at applications such as lay-flat hoses for high pressure industrial applications like firefighting. In addition, it can also be successfully laminated to fibres to form a breathable waterproof layer.

To make hoses, the material should be applied using the extrusions through the weave process, Huntsman added.

The resilience of TPU helps composite hoses go from tightly rolled objects to hoses withstanding water pressure at between 8 and 20 bar (116 to 290 psi) very quickly, the company continued.

In textile lamination production, thin-blown films are laminated to fabrics where it can waterproof, add breathability, and aid fabric shape recovery. Gloss, smooth and matte finishes are all possible using the new TPES for laminated products, Huntsman added.

Aptalon M8120 Polyurethane Dispersion has 5B adhesion to substrates according to ASTM D 3359 Method B. This means that no paint is removed during the test. It resists salt spray, and is abrasion resistant.

The new grade generates VOC of 230g/L when tested using US methods, and 100g/L when tested using EU methods, Lubrizol said.

Aptalon M8120 is designed for use in commercial transportation and general metal finishes. Marketing manager Nick Sterne said: ‘We’ve seen increased interest in single coat product that reduce the number of steps in coating process… it delivers all the protective properties of a high-end PUD without the need or a primer coat on metallic surfaces.’
DuPont SPF wins ACC sustainability award

Wilmington, Delaware – DuPont’s HFC-free Froth-Pak polyurethane spray foam has won an American Chemistry Council (ACC) Sustainability Leadership Award in the environmental protection category. The new Froth-Pak formulation uses a blowing agent that cuts its global warming potential by more than 99%.

‘We are honoured by the ACC’s recognition of DuPont’s commitment to deliver innovation that helps solve important sustainability problems like climate change,’ said Shawn Hunter, global sustainability leader for DuPont’s performance building solutions.

The original Froth-Pak products were first introduced more than half a century ago, and are self-contained low pressure spray foam kits for professional contractors. They can be used in commercial and residential applications.

DuPont SPF wins ACC sustainability award
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**EUROPE NEWSLINES**

**Plixxent expands systems house portfolio into Italy**

**Hamburg, Germany** – Systems house Plixxent has bought Tagos, an Italian systems house based near Milan, Italy, for an undisclosed sum.

Tagos makes polyurethane systems, catalysts and coatings for the transport, hospitality, and construction sectors. The Italian company was founded in 1965.

**Plixxent expands systems house portfolio into Italy**

**Brussels** – Christopher Metz, who is vice president of business management for isocyanates at BASF, has been elected as the new president of ISOPA, the European Diisocyanate and Polyol Producers Association.

Metz was previously a vice president of the organisation, and succeeds Herman Motmans of Dow in the role of president.

Erik Vangronsveld of Huntsman has been appointed as a vice president.

Jörg Palmersheim, ISOPA/Alipa secretary general said: ‘Christopher and Erik will support ISOPA in meeting today’s challenges and opportunities.’ Metz is scheduled to give a keynote speech at UTECH Europe in November.

**Metz elected ISOPA president**

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**PU insulation selected for flagship project**

**Uberlingen, Germany** – PU insulation has been chosen for 180 climate-neutral apartments in a public housing scheme because of its good insulation properties and low maintenance requirements.

A total of 180 rental apartments in the Schattisberg area of Uberlingen are being insulated, with material supplied by Puren.

PU insulation is a low-tech solution for the buildings, which are designed to be energy-efficient, economical, robust and durable.

The panels are fixed and forget, and after end of life can be removed and recycled, the company said. Using PU enables the running costs to be kept extremely low over the long term.

Insulation starts with the car parks. These have a total of 140mm insulation with a 0.18w/m²K value. The flats’ massive concrete outer walls are insulated with 180mm of 0.12 W/m²K material.

The sloping insulation in the roofs is 170mm, and the flat parts have an additional 80 mm of 0.1 W/m²K of insulation installed as well.

The gaps between the roof and the walls were covered with more PU panels to properly insulate the buildings.

**Xtratherm to buy Ballytherm in rigid PU consolidation**

**Navan, Ireland** – Xtratherm has agreed in principle to buy fellow Irish PU insulated panel maker Ballytherm. The price has not been disclosed.

Barry Rafferty, Xtratherm’s managing director, said: ‘The acquisition of Ballytherm, along with additional investment in new technologies, will allow Xtratherm to deliver new product innovations.’

The deal includes Ballytherm’s two production sites. One is in Ballyconnell, Ireland, and the other is near Ross-on-Wye in the UK.

Xtratherm is part of Unilin, which makes insulated panels in Europe, and is owned by US company Mohawk Industries, which predominantly makes flooring products. Mohawk purchased Unilin in 2005.

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**PU-carbon ropes for speedy lifts**

**Vienna** – Carbon fibre-reinforced ropes are being used in the 180m tall Danubeflats development in Vienna.

They will support what lift-maker Kone claims are the fastest lifts to be used in a residential project in the country of Austria.

“The ropes are 80% lighter than steel cables and are extremely durable, facilitating the speed, said Kone, which had specified the ropes.

The two high speed lifts reach 7m/s (15mph) and the slower ones 4m/s. ‘A speed of 1m/s is more usual,’ the company said.

The polyurethane coated-carbon fibre ropes can be used without lubricants. Additionally, there should be much greater lift availability, Kone said.

This is because the ropes will not be affected by building movements from strong winds or earthquakes, the company claims.

**News in Brief**

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Covestro restructures to sharpen growth focus...

**Leverkusen, Germany** – Polyurethane raw materials giant Covestro is splitting its business into two divisions. One will include its specialty businesses, and the other commodity products.

The new solutions & specialties segment has six business units: tailored urethanes, thermoplastic polyurethanes, coatings and adhesives, elastomers, engineering plastics and specialty film. Covestro described them as complex products, with a high pace of innovation. It will continue to offer application technology services for these products.

The performance materials business is built around base chemicals, along with commodity polycarbonates and polyurethane chemicals. Covestro described them as complex products, with a high pace of innovation. It will continue to offer application technology services for these products.

[These are] standard products at competitive prices,’ the company said.

Coventro will start financial reporting for the new structure in the third quarter of the year. CFO Thomas Toepfer said that the new structure will help the company to make investments where there is greatest return.

‘We are very serious about sustainability, and we are systematically working towards circular economy,’ said CEO Markus Steilemann. ‘Our new structure forms the foundation for further implementing our strategy.

... and upgrades its H1 guidance

**Leverkusen, Germany** – Covestro said it expects its EBITDA to be between €2.7 and €3.1bn in the 2021 financial year.

The company has upgraded its outlook because it believes trading conditions will improve in the second half of the year. This is because of rolling coronavirus vaccination programmes.

Although volumes will still grow by between 10 and 15%, there is an improved margin outlook for the second half of the year.

Covestro released the upgrade on the basis that its second quarter EBITDA will be about €815m. This figure falls in the middle of the analysts’ range of forecasts.

Bostik launches new sealants

**Colombes, France** – Bostik, the adhesives division of Arkema, is expanding its PU sealants portfolio for the construction sector. The company claims this will leave it well positioned to meet the demands of new construction in emerging countries.

Its new range of products offer higher technical properties, Bostik said, and more sustainable performance. The range of products includes low-free isocyanate and solvent-free formulations.

‘This ambitious programme has helped us address the market’s growing expectations in terms of quality and sustainability for PU products,’ said Marc-Antoine Mallet, Bostik’s sealing and bonding director. ‘It also enables us to provide our customers with a unique mix of local presence and outstanding quality standards.

Grammer Q2 earnings stifled by chip and raw material shortages

**Uresolen, Germany** – Speciality automotive seat maker Grammer said that second quarter revenue will be around €469m, up 66%. The company said this would have been higher were it not for microchip shortages.

The company issued a trading statement and said revenue had fallen compared to the first quarter of 2021. It said this was primarily because of a significant reduction in certain customer call-offs, resulting from the limited availability of semiconductor components in the Americas.

Earnings were hit because Grammer completed the sale of a European subsidiary to improve overall costs. It added that it expects EBIT to be about €5m in the quarter, compared with a €5m loss in the second quarter of 2020.
Under pressure

Isocyanates remain under pressure

Report by Regina Sousa
Consultant, Tecnon Orbichem

The North American MDI market continues to be disrupted because of raw material shortages, and prices are still firming. Lack of supply availability, even though most plants are reported to be online, because of a shortage of raw materials, plus high freight costs and truck shortages, are adding upward pressure on MDI prices. Demand in July has been strong, with housing starts and construction continuing to perform well, and is in line with expectations for the season. Offtake volumes from furniture and bedding have also been healthy, and this is likely to continue in the short term.

European MDI supply remains more or less unchanged from June; production continues to be disrupted, and availability is low. Covestro was reportedly running its European units at reduced rates in order to complete maintenance. However, on 2 July the operator declared force majeure at the 200 kT/year MDI plant in Brunsbuttel, Germany. The length of the force majeure is unknown. Borsodchem was due to start planned maintenance at its MDI unit in Kazincbarcika, Hungary. The unit usually shuts in mid-July and coincides with a turnaround at its TDI plant at the same site. In terms of demand, some market players say that demand is still strong, particularly from the construction sector. August is usually seasonally quiet, and demand could slow down as most of Europe takes time off for the summer holiday. However, demand is still very high, supply low and this, combined with the current backlog of orders, could mean the market will see less of a slowdown.

In China, the major MDI plants were operating at about 70%. Tosoh’s MDI plant in Ruian was running at low rates because of a shortage of raw materials. During the first half of June, BASF’s MDI plant in Shanghai was influenced by the maintenance of Huntsman’s MDI unit in Shanghai. As a result, its run rates were at 60–70%, which was lower than in May. Because of the maintenance of some MDI plants in May, pure MDI supply in June was still limited, causing prices to increase in late June.

North American TDI supply was expected to return to previous levels as May, and the market to be in recovery mode. However, supply remains disrupted. BASF’s Geismar plant was reportedly down for a turnaround until mid-June, but reports suggest the plant could still be offline. Covestro is reported to have lifted its force majeure in the first week of July. Ongoing logistic issues and feedstock shortages also continue to affect North American markets. Demand was strong again in June.

Planned turnarounds

TDI supply in Europe was heard to be better balanced at the end of June. Most buyers reported that they have had no issues with availability. However, the market is certainly not back to full strength. Borsodchem is preparing for its turnaround this month; BASF was expected to shut its 300 kT/year TDI plant in Ludwigshafen, Germany for a planned turnaround in mid-March until the end of May, but the turnaround was longer than expected and the plant was back online at the end of June. It is not known if the plant is operating at full capacity. Typically, demand is stronger in June and July, but then slows down during August in some southern European countries as downstream plants shut for the summer holidays. The rest of Europe and Russia should remain stable.

In China, overall market sentiment was bearish in June. Chinese TDI supply was tight as BASF’s Shanghai 160 kT/year TDI plant had a maintenance outage during the first half of June. Yantai Juli and Xinjiaxiang Juli, with 80 kT/year and 150 kT/year capacities respectively, also had maintenance plans in June. Total supply of TDI in China decreased in June but downstream demand was still weak, and supply-demand was relatively balance. As a result, TDI prices fluctuated at low levels. Demand from the flexible foam sector, which is the main downstream market for TDI, was still in its off-season. Downstream customers were cautious, purchasing only for immediate use, and inventory was at normal levels.

The polyol market in the US is described as tight, with supply still unavailable because of a lack of feedstock PO. LyondellBasell’s facility in Channel View, Texas is reported to have put PO customers on sales allocation. Dow is also rumoured to have issues at its plant during June. Indorama reported there had been a fire at a power station near its PO plant in Port Neches after a transformer exploded, and some units had to be taken down. Demand into auto applications is heard to be good, while demand for flexible polyether polyols into furniture and bedding is strong. Demand for rigid polyether polyols into construction and home appliances is expected to remain stable.

In Europe, the polyether polyol market has slowed down somewhat from June to July as demand from foam markets declined. Supply is still disrupted, but availability is improving; some have said there are concerns due to ongoing issues with PO supply. Polylol production is still being hit by raw materials shortages. Downstream buyers are still not able to get all the polyols needed, and some have had to reduce operating rates. Demand weakened in June. Construction and the automotive industries continue to perform well helping demand.

In China, flexible foam polyol prices continued to decrease in June as most of the downstream markets were still in their off-season. In addition, a rising number of coronavirus cases in Guangdong province caused flexible foam polyol demand to weaken further in south China. Export orders were low because of the continuing pandemic in other regions and logistic problems. Many new polyol plants, such as Dongda and Longhua, gradually released their products to the market, which resulted in further over-supply. As a result, flexible foam polyol prices decreased in the first half of June.

For more pricing information, contact Regina Sousa at regina.sousa@orbichem.com or visit the Orbichem website at www.orbichem.com
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Changing gears

The nature of new passenger cars is changing quickly in Europe as environmental regulations start to bite. And it’s going to have implications for the polyurethane industry as the materials used in them evolve. Simon Robinson investigates.

From hydrocarbons derived from the coal-gas process to gasoline and diesel, automotive fuel has changed dramatically since it started to be sold as motor spirit at the start of the last century. But soon, the last commercial gasoline and diesel engines for passenger cars will be built in Europe, as car makers shift their production exclusively to electric propulsion. According to a report in Automobilwoche, a Crain publication, in late June, the last gasoline and diesel engines may be produced in Europe in 2035.

Audi’s CEO Markus Duesmann said: ‘In 2025 we will bring the last new model with a combustion engine on the market.’ He added that it would be phased out sometime between 2033 and 2035. Similarly, in an interview with a regional German newspaper, Volkswagen sales director Klaus Zellmer said that his company was preparing to exit the business of combustion-powered vehicles between 2033 and 2035.

General Motors has decided to stop selling cars with local emission from 2035, and Fiat also decided to switch to an all-electric portfolio between 2025 and 2030. Volvo, Jaguar and Smart have all made similar commitments for the European market for similar timeframes, according to Automobilwoche.

High pressure

Piling on the pressure, Ursula von der Leyen, president of the European Commission, said in mid-July that the EC will bring forward an absolute cut-off date after which car makers will have to stop making combustion-powered vehicles in the EU. Von der Leyen was speaking after a summer of extreme weather events in the northern hemisphere, with record high temperatures in the high latitudes of Canada, Finland and Russia, and devastating summer floods in parts of Belgium, Luxembourg, Germany and the Netherlands where between 27 and 15 cm of rain fell in 24 hours. There were also major downpours in China where, according to Reuters, 61.7cm of rain fell in four days on the city of Zhengzhou, Henan.

According to consultants LMC Automotive, the key points of the proposal covering new passenger car sales in the EU, Norway, UK and Iceland are that average CO₂ emissions must be 55% lower than 2021 by 2030. This is tougher than the 37.5% drop that is currently demanded. Emissions from new vehicles must cease by 2035. ‘This implies that gasoline and diesel combustion cars will no longer be able to be sold by that time,’ LMC Automotive said.

Keep to schedule

The consultants said that the change has been made because if the car-makers take the current levels as the minimum and work to that, the EU will not meet its goal of a zero-emission fleet of passenger vehicles by 2050. This would break the EU’s legal determination to achieve net-zero CO₂ emissions by 2050 from all sectors.’ LMC Automotive said that if the new proposal is adopted – and LMC believes that it will be – then the mix of vehicles sold in 2030 will change as companies try to meet the target. There will be an increase in the proportion of battery electric powered cars from 51.5% to 56%, and plug-in hybrids share will rise from 7.1% to 8% of the mixture. Full hybrids are likely to stay flat at 9%, and so are fuel cell vehicles, at just 0.1%, but mild hybrids, including 48V powered vehicles, will see their share fall slightly from 24.5% to 23.2% of the market. Combustion engine vehicles will fall from 7% of the market in 2030 to 3%.

There will still be a lot of cars on the road and in garages with gasoline or diesel engines for some time to come, but the market-leading developments will all be electric. This change in power source will bring opportunities for polyurethanes as carmakers aim to reduce weight, increase acoustic and, eventually thermal insulation, and conserve battery power.

Getting settled

Speaking at Deutsche Bank’s 2021 Global Automotive Summit in late June, Adient’s CFO Jeff Stafeil explained why seating will rely on polyurethane, and that it will remain an important component of the automotive interior for a long time to come. ‘Seating remains one of the most costly systems within a vehicle,’ he said. ‘It’s critical; it’s consumer facing. It has a number of touchpoints, and it’s very differentiated. A lot of that differentiation doesn’t manifest itself into differentiation in the vehicle. Some of it’s just complexity that doesn’t really turn into value.’

Continued on page 22
Del Grosso: a great opportunity

Grosso said. ‘That gets into discussions of the automotive seating market to claim 50% of seating sold into electric vehicles. ‘As our customers transition from conventional vehicles, they are looking for technology associated with seating systems,’ he said. ‘They were looking for quick adoption into an electric vehicle, something off the shelf that didn’t require a lot of investment. Speed was a key element.’

This combination of factors enabled the company, which claims a 30% share of the automotive seating market to claim 50% of seating sold into electric vehicles. ‘As our customers transition from conventional vehicle architecture to skateboard architecture, they are looking for technology associated with seating systems,’ Del Grosso said. ‘That gets into discussions about the block – the distance between the bottom of the seat and the floor of the vehicle – as they try to package batteries in, that distance is shrinking, and that drives a different configuration.’

Opportunities, opportunities

Lear’s CFO Jason Cardew also spoke at the Deutsche Bank meeting. He agreed that the transition to electric vehicles will open up new opportunities for seat design. ‘We think typically with electric vehicles that offers a unique opportunity for our customers to reduce the battery draw that’s consumed by traditional HVAC systems today,’ he said.

‘Over time, we see that as a really great growth opportunity for us. The seat can heat or cool the passengers through its microclimate, as opposed to only using the traditional HVAC. I think that’s an appealing technology that has value to our customers in the EV space.’

Adient’s Del Grosso agreed. ‘Our customers are looking at the efficiency gains they give by moving heating and ventilation into a seating system at the expense of having HVAC units in the instrument cluster,’ he said. ‘They are asking a lot more of seating as they move into their vehicle architecture change. You can think of it in terms of thinner profiling, so we’ve developed some technology around that where you can eliminate the amount of urethane foam and go with a better suspension system.’

Irina Bolsbakova, market manager for automotive and transportation at Huntsman EMAL, said the strong commitment of the European Commission and EU to reduce carbon footprint is cascading into industry. ‘The automotive industry in Europe, has a large impact on the region’s carbon footprint,’ she said.

‘All the OEMs at the moment have very clear reduction commitment. BMW’s is to be neutral by 2050, and reduce carbon emissions by 50% by 2030. Daimler is even more aggressive; it has a 2035 target to be neutral. Renault wants to be neutral by 2050. There are very clear roadmaps. There are very clear expectations that their suppliers are committed and will support them to reach these goals. It has cascaded all the way down the value chain.’

Talking point

James Paul, global marketing manager at Evonik, said that sustainability is an opportunity to do things differently for OEMs and Tier suppliers. ‘Sustainability is definitely becoming more of a talking point,’ he said. ‘Car-makers have operated under standards defining how much of the car must be recyclable for a long time. When you look at an automotive seat, there could be parallels with recycling mattresses, but automotive seats are notably more complicated with sensors, airbags, heating and so on.’

He added that, fundamentally, most OEMs are not yet designing seats from the start to make them easy to recycle. They contain clips, springs, sensors, have

What does 2021 hold for auto sales

World car registrations in June 2021 were up 5.6% compared with the same month in 2020 at 7.01m units, according to LMC Automotive. In the US, sales were higher by 16.6% in June, at 1.30m units. In the same month in 2020, US dealers sold 1.11m units. Sales in Brazil and Argentina reached 204,000 units in the month. This compares with 158,000 units in the same month in 2020.

Chinese sales were down 12.9% on the same month last year, at 1.9m units. In the same month in 2020, Chinese dealers sold 2.2m units. In Western Europe, sales were 1.3m units in the month. This is higher than the amount sold in June 2020 by 12.1%.

The recovery from coronavirus continues, LMC Automotive’s figures suggest. In the first six months of the year, world sales reached 42m units, up 27.9% on the same period last year. There was 29% growth in sales in the US, at 8.3m units, compared with 6.4m units in the first half of 2020. In Western Europe, sales were up by a similar percentage to 6.8m units from 5.3m units in the first half of 2020. There was also a 24.4% increase in sales to date in China. So far in 2021, a total of 12.2m vehicles have been sold.

Looking over the rest of the year, LMC Automotive predicts that 84.4m vehicles could be sold, compared with a total of 77.8m in 2020.
tight fitting leather or fabric coverings and other trim parts. This complexity, he said, makes it prohibitively expensive to economically remove and dismantle a seat, separate the components and sort them into waste streams. But this could change in the future, if legislation changes.

Looking ahead, he believes this will change. ‘I think we’re going to see more OEMs in the coming years designing a seat from the start to make it easier to recycle,’ he said. ‘At the moment, theoretically, you could get the foam back, but practically the costs are just too high and legislation is presently not in place to mandate this.’

Greener and cleaner
While the move away from internal combustion engines may seem like a threat to many technologies, Huntsman’s Bolsnakova takes a different view. ‘This is a once-in-a-lifetime opportunity to get green materials into vehicles, where historically price and performance were the only two criteria that mattered,’ she said. ‘Price is still important; don’t underestimate that. That’s why all the players in the value chain cooperate to ensure that all the technology is affordable. There are very clear expectations that their suppliers are committed and will support them to reach these goals. It has cascaded all the way down the value chain.’

Because of the energy limitations of electric vehicles, light weighting is a big focus, Evonik’s Paul said. ‘Electrical vehicle makers want to make their vehicles lighter and more efficient,’ he said. ‘But in autonomous vehicles, travel sickness can become a problem because the occupants are not facing the direction of travel. Car-makers are looking at using equipment to help overcome this. But that increases complexity and weight.’

If the change from internal combustion engines to electric propulsion were not enough, car makers face other challenges. In this, as in so much else, China leads the way. Traditional car makers could be viewed as engine designers, vehicle assemblers and marketing organisations. If engines are completely replaced with relatively simple electric motors, this opens the field to new players.

‘In China, a number of new OEMs are entering the market, designing vehicles around what young people desire, such as large, responsive screens and innovative new features,’ Paul said. ‘Many of these new OEMs have partnered with technology companies such as Huawei, giving them huge head starts, and enabling strong growth. These customers may see established automotive brands as boring. They’re not giving them the technology that they crave.’

The good news for the polyurethane foam industry is that, no matter what brand of car these new consumers buy, they will want to be carried on something comfortable for the foreseeable future. Polyurethane foam will remain essential for a long time to come.
Closing the automotive circle

There have been many attempts to make automotive components greener. Simon Robinson finds out more about Dow’s new circular polyols and systems, and how they are being applied in the automotive sector to improve its sustainability.

While ‘synthetic naphtha’ is not yet the battlecry of those who want to make the automotive industry greener, Dow Polyurethanes would like to change that. The company recently announced that two of its most important automotive polyurethane brands, Specflex systems and Voranol polyols, would contain grades made with intermediates made from synthetic naphtha. They are drop-in replacements and have the same properties as materials made from crude oil, but are designated C for circular.

Naphtha and alkane gases like ethane are common starting materials for cracking. This is the process that makes the raw materials used to make both polyols and diisocyanates.

Close the loop

Dow is not saying much about the composition of the synthetic naphtha it is using, or how it is made. Esther Quintanilla, global & EMEAI mobility market segment leader at Dow Polyurethanes, explained that Dow’s flexible crackers allow them to explore new feed streams, and incorporate new circular feedstocks.

‘It is a big thing to change the feedstock of crackers,’ she said. ‘We are working with the specification process to ensure the circular naphtha is good to go into the cracker.’

After the naphtha is cracked and the components separated, she said, they are working with the specifications of the downstream C₃ and C₅ streams that can be used to make the polyol feedstocks ethylene and propylene oxide. This makes it a quite different approach to the company’s collaboration that makes Renuva polyols from recycling polyurethane.

It is the first time that polyurethane raw materials have been made and commercialised from such raw materials. ‘Polyurethanes is the second business group in Dow to have the materials available for a market,’ she said. ‘But this is the first time that circular naphtha has been made from end-of-life waste generated by the mobility sector.’ Dow is using a mass balance approach.

The automotive industry is facing a very urgent need to become more sustainable,’ she added. ‘OEMs have more targets for using recycled materials. Now they talk very specifically about the amount or the proportion in the RFQ.’ Dow chose to focus on polyurethane because it is a high-volume automotive polymer. ‘People talk about sustainability in the automotive sector,’ she said. ‘It is really the time to stop talking and start making it happen.’ She also said that customers were increasingly adding sustainability requirements in their request for quotation documents.

Big opportunity

‘PU is the second biggest polymer used in automotive after polypropylene,’ she said. ‘PU makes up about 19% of the plastics used in vehicles, and polypropylene is about 33%. This is why the automotive industry wants circular products and circular PU. It can help them to comply with the end-of-life vehicle directive, and with their own sustainability goals.’

Dow claims that because it knows how much of the synthetic naptha goes into each downstream product, it can provide a paper trail of proof of its claims. Its customers can do the same, too. ‘This can help defend the position of polyurethane,’ she added. ‘This is why we chose the Specflex C and Voranol C materials, because the recycled components can go into a system or into a component. There is a lot of flexibility... it is up to our customers. But it can be used in a lot of applications to show circularity.’

Dow is looking to promote PU, and make it a greater part of the solution. ‘This is a start,’ she said.
Are trends electric?

As the market moves towards electric cars, polyurethane will be increasingly important. Simon Robinson finds out what Huntsman is doing in the area, and what is driving the changes

Polyurethane plays many critical roles in the modern car, from comfort to insulation – whether thermal or acoustic. Two MDI-based PU systems from Huntsman, Acoustiflex and Rubiflex, are specifically designed for automotive applications. Acoustiflex systems are aimed at sound insulation applications in the car interior and in the engine compartment, while Rubiflex systems are designed to make foam-based comfort parts inside the car including seat cushions, backs, head rests, arm rests and for the driver, passenger, and rear seats. Both are fully formulated systems designed to meet OEM requirements for these applications.

As Irina Bolshakova, market manager for automotive and transportation at Huntsman EMAI, explained, in the past 18 months sustainability has become the top topic for Huntsman’s development agenda. “There are three aspects,” she said. “The first is around reducing emissions and the odour of our components, lower VOCs, and the ability to meet the most stringent requirements of OEMs for formaldehyde and acetaldehyde and reducing the odour of the final components. We can meet BMW’s requirements, which are the most stringent on the market.”

**Triple aspect**

The second aspect is cutting the carbon footprint of its products in manufacturing and development. “This is driven by our own CO₂ reduction targets, and reflects the automotive industry’s own commitments in these areas,” she said. “All the manufacturing processes upstream are subject to this. A good example is at our facility in Rotterdam. Here, we have started to use only green-based energy, which will give us a significant reduction in carbon footprint, and we have reduced the carbon footprint of our transport in the EU by more than 50%. There are very aggressive targets globally.”

The third aspect is to add recycled and biobased content into the formulations. “We are already able to supply formulated systems with 15% bio-based raw materials,” she said. “This is 15% in the final foam.”

The company is now working on delivering 30% biobased or recycled-based content in early 2022. In contrast, the biobased content is for the polyol side of the formulation, and focuses on the use of natural-based oils and components. The recycled content is based on its Terol-based polyols, which are made from old PET bottles.

It represents quite a switch, going as it does from highly branched rigid polyols into more linear flexible polyols, and this is why it requires investment. “It will not be possible to do everything with this at first,” she said. “Very soft flexible foam is a big challenge. But steering wheels, instrument panels, headliners are all good potential applications.”

**Become flexible**

The company has also started a project in Belgium, working with two partners to develop biobased polyol technology for Acoustiflex applications. The target is to put 45% biobased content in the final foam. The aim is to use raw materials derived from nature but, importantly, ones that have no impact on the food chain. Huntsman is working on a range of technological developments to meet current and future needs. For example, it is looking at developing acoustic systems that will withstand temperatures as high as 180°C, for insulating the motor and starter under the hood. “Hybrid technology is leading to higher under-bonnet temperatures, as smaller engines are squeezed into smaller spaces by the addition of more electronic components such as electric motors,” she said.

“As we move towards full-electric vehicles, there are going to be more requirements for motor encapsulation. This reduces engine noise in the cockpit, it helps with thermal management, and provides flammability resistance, which is becoming more important with increasing levels of electronic components,” she said.

“We expect that thermal insulation will be a much bigger topic than it is at the moment,” Bolshakova said. “One of our assumptions is that there will be a significant improvement in battery technology itself, and the use of batteries in vehicles. There could be two or three batteries, with the tasks of heating and cooling separated from starting and driving the vehicle. I think that thermal insulation will become important.”

**Bio-based Insulation**

The company plans to launch highly biobased engine insulation components in the Acoustiflex range later in the year. “These will be designated HT for high temperature, with the temperature resistance between 180°C and 200°C and very high biobased content,” she said. “We can reach up to 45% bio-content in the polyurethane part, depending on the customer’s requirements.”

This is a new application for the company, with the product aimed at all three current automotive power sources, conventional combustion, hybrid and electric. “This will increase the temperature range of PU components and exceed the green content which automotive companies demand,” she said.

Huntsman developed the materials based on mapping the market, looking at where the technology is going and changes in the engine compartment and how they could be met. At the moment, she said, electric and hybrid are leading in terms of sales. This is being driven by government incentives, and the changing attitude of consumers. “The change is happening more quickly in Europe,” she said. “In the US, the interest is there, but there is not yet the regulatory push.”
Looking again at TPUs

Thermoplastic polyurethanes play an important role in giving vehicles a feel of quality and luxury. They have surfaces with a pleasant feel or good haptics, in the language of automotive interiors. They are durable, and can be hypoallergenic. Additionally, it is possible to replace materials such as leather.

Covestro is taking a second look at its Desmopan 6 family of TPUs in the automotive sector. It believes that the products could have interior component uses.

‘Desmopan 6 has been in the market for a while,’ said Mark Scheller, business development manager at Covestro. ‘It has some advantages, which appeared with time. It is a relaunch, as we launched it eight years ago. At the time, it suffered from a negative perception because of the earlier C/uni-based TPUs, but the properties are good in comparison.

One area where the materials are claimed to be good is in fogging and VOC, something that became clear after discussions with an automotive interior customer. ‘We thought that the values could not be true, so we tried with a black masterbatch-coloured material, and still the fogging values were very good,’ Scheller said.

Covestro decided to develop the Desmopan 6 C/uni materials because they are back-integrated into the C/uni stream from its crackers. This gives it a cost advantage, and the chance to make useful materials, said Scheller.

The range does have some limitations, however. ‘88 Shore A is, and will be, the hardest grade in this series because once the materials get harder than that, then mechanical properties go down,’ he said. ‘There is an overlap between the Desmopan 6 range, which can span the gap between 70 Shore A and 80 Shore D, and the Desmopan 9 range that covers hardness from 64 Shore A to 88 Shore A.’ There is a hardness gap between that and the softest of the Desmopan 9 grades. These are sold in Europe without plasticisers or fillers.

At the other end of the spectrum, the company is looking to extend the range, for the 9 series making them even harder to 85 Shore D. ‘For the 6 Series we are aiming for very soft materials, and we are trying to achieve 45 Shore A,’ he added.

TPUs bond well with polar polymers such as ABS, ad polycarbonates, glass-filled polyamides and glass filled PBT, and can be co-injected for parts such as gear lever knobs. The products are available as ether and ester grades. The latter are preferred for hydrolysis resistance.
With 2020 being a year like no other, there have been some definite trends in the flexible foam sector from raw material shortages to e-commerce. We take a look at some of the highlights of the market survey commissioned by EuroPUR, the European association of flexible polyurethane foam blocks manufacturers.

With all the challenges to business that the coronavirus pandemic posed, the year 2020 was quite the year. ‘It was the wildest ride that the polyurethane industry has had for as long as I can remember,’ said Clint Raine of Belvedere & Partner, presenting the EuroPUR business review.

The presentation was made online to EuroPUR members in June this year, and because of the unusual nature of 2020, some of the traditional benchmarking data were unavailable. Instead, he gave a preliminary roundup, based on EuroPUR’s regular calls to its members across the continent. Final data will be presented later in the year.

Despite the unusual nature of 2020, Raine was not too downbeat. ‘I would dare to say that 2020 was actually surprisingly good, considering everything that everybody had to deal with, forced closures and uncertain openings, followed by an explosion in demand and supply chain challenges,’ he said.

Raine said that while these were the ingredients for a heady mixture of confusion through the year, the pot was stirred by dramatic changes in customer behaviour. ‘The skewing of data was not helped by government action, particularly in the US,’ he said.

Stay-home shopping

Turning to the trends for upholstered furniture, mattresses and automotive applications, Raine said that there has been a terrific growth of e-commerce in 2020. ‘This is not surprising since the shops were shut, and people staying at home wanted to improve their houses,’ he said. ‘It was especially prevalent if you look at bed-in-a-box sales. In addition, there were increased exports to the US and Canada.’ Changed trade flows came about because of the US decision to erect a tariff barrier between itself and a number of countries to protect its local mattress industry. This led to dramatic increases in exports from Europe to the US, and a dramatic fall from China to the US. There has been a larger-than-expected growth in exports from Turkey and Eurasia, he added.

Automotive customers for moulded foam had these problems and also face the challenge of moving their ranges from liquid fuels towards hybrid and electric vehicles. Production shutdowns, which have stretched supply chains to the limit, did not help, he said. ‘There have been problems with supply from isocyanate and polyol suppliers, who have been joined by additive suppliers, textile suppliers, wood and even metal spring suppliers,’ he said. ‘The last point is a competitive point for mattresses.’

All of these factors led to price instability and volatility and increasing cost pressures which foam makers are passing on to the market, he said. Yet, at the other...
Market share of different foam types

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<tr>
<th>Foam Type</th>
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<td>HR</td>
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Source: Labyrinth Research and Markets/ Belvedere & Partner

Share of global eCommerce sales by region (%)

- **US + Canada**: 50%
- **Europe**: 40%
- **Asia Pacific**: 10%
- **ROW**: 20%

Source: CISL Global Mattress presentation, April 2021

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“Data from the International Sleep Products Association estimates that between 35% and 40% of mattress sales now occur on line, and in Europe more than 50 companies are operating in this market,” he said. Raine also suggested that these bed-in-a-box companies are struggling to make a profit, and that consolidation in the sector is a distinct possibility. “[The coronavirus pandemic has] exacerbated that shift towards e-commerce, certainly in Europe,” he said. “Germany has been the main driver, followed by the UK. Although Europe is lagging behind the US and Asia Pacific, the trend is clear and getting stronger.”

Mattress imports from the EU to the US grew by 216m in 2020 to 1.5bn. For some nations starting from a small base, there was a huge growth of exports. For example, US imports of mattresses manufactured in Slovenia grew by an enormous 1577% between 2019 and 2020. This took the absolute numbers from 5010 to 84,000 units. Spanish exports of mattresses to the US grew by 939% to a total of 20,787 units.

Serbia’s share grew by 345% to 8981 units. Turkey, a more established manufacturing base, exported 981,122 units in 2020. This is an increase of 740,000 units being sent to the US. Overall, the main European exporting nations increased their output to the US by 844,000 units. The EU, Serbia and Turkey increased exports by 17m units.

However, exports from China to the US fell from 31m to 120,000 now in the light of the import sanctions the US imposed in 2019 taking effect. The US is, by some margin, the largest e-commerce mattress market, accounting for 46% of sales, Raine said. ‘It is interesting to note that the leading bed-in-a-box supplier in the US is that well known foamer, Amazon,’ he said.

**China takes the lead**

In Asia, China is the largest e-commerce market, accounting for 30% of the total. In Europe, e-commerce accounts for 15% of the market with the UK and the fastest-growing market, Germany, leading the way. These markets are followed by Italy, France, and Spain. The other countries in the region account for just 7% of e-commerce sales, he added. In 2019, the global business-to-consumer market for mattresses was estimated at $10bn, and it was projected to be significantly higher in 2020.

The low density and bulky nature of flexible polyurethane slabstock foam has been a barrier to economic transportation over long distances. However, exports have become much easier because of the strides made in formulation and compression technology for both hybrid and foam mattresses.

Yet the market is not all going on line. There is an emerging trend for companies who previously operated online-only to partner with bricks and mortar retailers. This gives customers the opportunity to experience their mattress before buying.

**Export to succeed**

Turning to the automotive industry, Raine said that 2020 had endured a 20% fall in new car registrations in the EU. Turkey, however, was the home of a 57% increase in registrations. Consumers there benefited from low-cost auto loans, and favourable repayment terms. Vehicle sales in the EU fell by 25% in 2020. ‘[This is] the largest ever recorded,’ Raine said. This was a result of pandemic lockdowns and

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end of the pipeline, the PU industry faces pressure around end-of-life, recycling, sustainability and the circular economy.

There is, however, good news for polyurethane mattress makers in EuroPUR’s report. Raine said that there was no firm evidence to support statements that the mattress industry is moving towards other materials. Neither was there any definite shift away from polyurethane foam by mattress makers.

An unexpected twist in 2020 was the growth in mattress exports from the Balkans to the US. In the rest of the EU, the pandemic led people to buy new mattresses frequently via the bed-in-a-box route. As a result, bricks-and-mortar retailers have lost market share.

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reduced spending.’

While there was an overall fall, because people did not need to upgrade their driving experience so much during the pandemic, there was strong growth in hybrid and electric vehicles.

Looking at the numbers for flexible foam, Raine said that European polyester slabstock production topped 1.35MT in Europe in 2020, comfortably exceeding the volumes produced in 2019.

Overall, the volume of flexible foam produced by Europe’s 160 flexible foamers was 1.4MT, with a total of 63.9kT of polyester-based flexible foam included.

EuroPUR estimates that the industry employs 28,622 people in the EU27 nations, the UK, Norway, Switzerland, Russia, Turkey, and the rest of Europe. It turned over an estimated €5.3bn in 2020, according to research for the association.

Although turnover was flat between 2019 and 2020, the industry employed 4% more people in 2020, according to the information presented.

There was a 5kT, or 7.4%, decline in the amount of polyester slabstock foam produced between 2019 and 2020, but this was much more than offset by the 44kT increase in polyester foam used in domestic furniture and mattresses.

In the automotive industry, the amount of PU foam, that EuroPUR estimates is used in each vehicle has been reduced to 15kg from 16kg, as lightweighting efforts take hold.

Into the numbers

EuroPUR estimated that about 54kT of MDI was used in all kinds of slabstock foam in Europe in 2020, and that a further 363kT tonnes of TDI was consumed in these products. In moulded foams, the numbers are a little different, with 80kT MDI consumed in 2020, and more than 17.5kT TDI in these applications.

There was a slight fall in the amount of standard elastomeric slabstock foam produced in Europe in 2020. ‘Most of the growth has been in HR and viscoelastic types with a decline in CM modified,’ Raine said.

‘These changes have been driven by the growth in the bed-in-a-box market,’ he explained to the meeting.

There were two notable trade developments over the course of 2020. First, the volume of PU foam imported into the EU grew, with more material arriving from Russia and Serbia. This trade was driven by worldwide raw material shortages. And there was an unusual spike in flexible foam exports from Europe to the Yemen, possibly for mattresses for refugees there.

Looking more closely at the flexible slabstock market, Raine said that his information shows there is no great displacement of PU foam. ‘Creep to lower densities and lighter weights is visible,’ he said.

But, he warned, the world is becoming more competitive. Ever faster turnaround is required as e-commerce gets stronger, and the demands on the supply chain get stronger,’ he said. ‘Foamers are rationalising their ranges, and trying to make longer runs. Plants are facing tougher regulations from local authorities, and there is pressure to integrate downstream.’

Raine pointed to recent rationalisations, including Recticel restructuring its business with the purchase of assets of Foampartner; the recent rebranding of Eurofoam, Multifoam, Perfoam as Nevion; Vita Group’s recent purchase of IPME in Italy, and Nantong Healthcare’s expansion into Spain. Downstream, Tempur Sealy has bought furniture store Dreams in the UK.

Overall, despite the unusual nature of 2020, the industry is in reasonable shape. ‘Demand continues to be strong, although there were some reports of weakening demand in Q2,’ he said. ‘When will demand and the raw materials markets stabilise? Which forecasts will be nearer to reality? We are facing a lot of challenges but, nevertheless, I think we are strong enough to deal with them.’

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**About the graph**
**APAC PU PRODUCTION AND GROWTH 2020-2025 (KT)**

**Source:** IAL Consultants

East Asia is set to continue its dominance of production for all types of polyurethanes between 2020 and 2025. However, growth in production will be considerably faster in South Asia, according to IAL Consultants.

In 2020, the East Asia sub-region, which is dominated by China, produced 11.5MT out of a total of 13.1MT of polyurethane products of all kinds that were made in Asia. This represents 87.7% of the total amount. Although the region is growing more slowly than other parts of Asia, its large size means this translates into large volumes. At the 3.8%/year growth rate that IAL suggests in its report, this equates to about 437kT/year extra production.

The region which is likely to grow fastest is South Asia. Here, production is likely to increase from a level of 672kT/year in 2020 to 946kT/year in 2025, with an annual growth of 7.1%.

The South East Asian growth rate of 6.3%, estimated by IAL means that the region’s polyurethane production would increase from 936kT/year to 1.3MkT/year between 2020 and 2025 if the trend is followed.

All of this information as well as more data on production by different product types can be found in IAL Consultants report Polyurethane Chemicals and Products in Asia Pacific (APAC) 2021.
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