A rocky road for the auto sector

PU CUSHIONS
THE IMPACT
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.
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Move with the times

I was, rather unfairly I feel, nicknamed ‘Fango’ by a colleague 20 short years ago. I had recently bought a Fiat Uno from him and, by the time it reached my tender care, I was its fourth loving owner. I am not running down the designers of that fine brand, nor the skilled men and women of Turin who assembled the car, when I say it was as quiet inside as it would be if you were sitting within a bell that was repeatedly struck by a mallet.

It was a Mediterranean car. It certainly didn’t want to move on cold, damp winter mornings in South London. But in the English ‘summer’, on the rare occasions the sun came out, you could have all the windows open, and it was possible to drive at anything up to 110kph (70mph) on the open road at about 40mpg. It went around corners like a tray on a roller-skate but it was, after all, about 10 years old when I got it.

I later sold the car to a couple who drove from London to Scotland in it… love may be deaf as well as blind. I still miss the old thing, but now we’re surfi ng the zeitgeist.

And we can then either hand it back or get a different one in a few months.

The cost of the lease for this Volvo hatchback is, I think, slightly lower than the capital depreciation, insurance and running costs of owning a car in central London. And we can then either hand it back or get a different one in a few months.

Every time I get into the Volvo, I think of the fi ne people in the polyurethane industry. The seats are fi rm and comfy. And, in stark contrast to that long-departed Fiat Uno, you can hear yourself speak because there is acoustic management, made possible by the PU in the fl ooring, headliners, bonnet liners and bulkheads.

It is an automatic and, on long drives, will happily cruise at the speed limit, and give me 50% better fuel efficiency than the tiny Uno, despite being twice its weight. Starting in the winter isn’t a matter of optimism over reality, either. But it’s the all-round comfort brought by its PU components that really make the difference.

You can fi nd our automotive feature on pages 20 to 33.
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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Eco-mobilier and Dow partner to fill Semoy PU-to-polyol plant

**Semoy, France** – Dow has agreed to take sufficient old mattress foam from Eco-mobilier, France’s recycling scheme, to fill the Orrion Chemicals Orgaform recycling plant to capacity.

Eco-mobilier has collected 66kT of mattresses already in 2020. Dow says the scheme will supply foam from up to 200,000 mattresses each year. The large number of mattresses processed, and Eco-mobilier’s nationwide reach, means that there will always be a good random mixture of material to be processed.

The process at Semoy is sufficiently robust to handle any mixture of mattress foam, said Dow. It added that the foam will be dry, clean and free of metal, latex and other non-PU materials. When bales are shipped, they will be stored, shredded and fed into the reactor. Dow is working with H&S as part of a collaboration first reported in 2018.

When the conversion process is complete, the result is a single-phase material, which will be filtered and then stored. ‘During the chemical recycling, the different additives are managed and absorbed within the process,’ Dow said. Functionality and KOH numbers are close to existing virgin grades. It added that the process can be tailored to make polyols for rigid applications, too. However, initially the polyols are designed for the polyurethane mattress market to close the loop.

The recycled material will be mixed 50:50 with virgin Polyurethane, the automotive interior and seating company, generated sales of CHF730.6m ($794m) in the first half of 2020, a fall of 37% on the same period in 2019. EBIT across the business is also scheduled to take three years to complete.

Dramatic rise in online sales at Tempur

**Lexington, Kentucky** – Sales at Tempur Sealy were $1.49bn in the first half of 2020. This represents a 5% hike compared with the same period in 2019.

Gross profit across the business rose 6% to $865m. In the same period in the previous year, the figure was $818.5m.

Looking at the second quarter, CEO Scott Thompson said: ‘We are currently experiencing tremendous order volume in the US that is broad-based, with growth across both Tempur and Sealy brands. In fact, our sales have been constrained by our Sealy manufacturing capacity and our suppliers’ capacity to meet this increased demand.’

In its North America division, sales through wholesalers fell by 6.4% in the second quarter.
The Woodlands, Texas – Huntsman's polyurethane business seems to have turned a corner in the second quarter, in what was a tough first half for the business.

Adjusted EBITDA for polyurethanes in the quarter was $31m, compared with $156m in the same quarter in 2019. Earlier in the year Huntsman had released a trading statement pointing to the business breaking even in the quarter with volumes down 30% year on year.

Volumes fell 15% because of declines in the US and Europe, although rebounding Chinese demand helped the number to this level. Differentiated businesses such as spray foam maintained their margins, but volume fell as coronavirus shutdowns hit both the insulation, automotive and elastomer sectors.

In North America, spray foam, part of Huntsman Building Solutions, is the company’s fastest growing business. Despite coronavirus shutdowns, that business contributed $15m adjusted EBITDA in Q2. CEO Peter Huntsman put the company’s performance in the first half of 2020 to its move into downstream areas that now account for about two-thirds of demand. This, Peter Huntsman said, included 1bn lb (450kT) of what he considers to be polymeric commodity grade materials.

‘We’ll incrementally expand our capacity as we can,’ he said. ‘But the focus has to be on how we add greater margin, greater consistency, greater reliability to the 3bn lbs operating consistency at 15-20% EBITDA margin in the coming years, that will be a unique global franchise.’

In terms of MDI capacity in the second quarter, Peter Huntsman added: ‘Europe is running at about 60%, Americas is probably at 70% and Asia is probably at 70%. So globally it’s about 66%.

In July he said Europe was at 65%, and the Americas 75%. ‘Asia is for us, about 95%,’ he claimed. ‘We’re moving as much as we can right now in China.’

He added that other producers were probably matching production to demand.

‘I’d be shocked if somebody was trying to add tonnage in today’s sort of market conditions. I think it would just be a colossal waste of shareholder money,’ he said.

Hongbaoli ups H1 profit on revenue drop

Nanjing, Jiangsu – Chinese system house Hongbaoli reported CNY552m ($74m) net profit in H1 2020, up 33% from a year ago, despite its revenue falling by 21% to CNY969m.

The coronavirus pandemic has dragged down sales volumes. Lower prices for feedstock propylene oxide, down 7% from a year ago, has led to lower product prices, according to the company’s half-year report in July.

Nevertheless, it was able to raise the overall profit margin by 3.8%, thanks to lowered costs and better control over the production process, the report said.

Net profit less non-recurring items for the period reached CNY45m.

During H1 2020, sales for Hongbaoli’s rigid system business shrank by 23% from a year ago, to CNY565m. High flame-retardant PU insulation panels generated CNY5.5m sales for the company, down 45% from H1 2019.

Its capacity now stands at 150kT/year rigid system, 30kT/year specialty system and 10 km²/year of PU panels.

BASF materials division hammered in H1

Ludwigshafen, Germany – Earnings in BASF’s materials division fell 81% between the first half of 2019 and 2020 to €128m from €657m. Low diisocyanate margins hit performance.

Sales in the business fell 15% to €5bn in the half.

BASF said divisional ‘sales declined considerably.’

This was mainly due to lower volumes recorded, especially in the performance materials division.

‘[This was] as a result of weaker demand from all customer industries but especially the automotive industry. Lower prices for isocyanates in the monomers division also contributed to the decrease.

EBIT declined because of lower margins in the disocyanate business. BASF put in lower polyester production in the first half of 2020 at around 30%.

Considering the performance materials and monomers divisions together, they made €80m loss in the second quarter.

Overall, BASF’s sales were €29.4bn in the first half of 2020. This is a fall of 2% in comparison with the same period in 2019.

EBIT across the business fell 35% and hit €1.5bn. In the same period in the previous year the figure was €2.3bn.

The company said that it still cannot give any guidance about how its sales and earnings will develop over the rest of the year.

This is because of the unknown effects of coronavirus on the global economy.

Commenting on the results Martin Brudermuller said: ‘The coronavirus pandemic is still a huge challenge for all of us. This situation is a catalyst for change and a chance to do many things differently.’

News in Brief

ProfHolod goes for its own polyester supply

Schelkovo, Russia – ProfHolod has become one of the first rigid PU makers in Russia to start producing its own polyester polyols.

The company, based about 40km north-west of Moscow, recently commissioned a plant from Sulingen, Germany-based H&S Anlagentechnik. The new plant has a capacity of more than 2kT/year, and is based on H&S’s glycolysis technology.

ProfHolod is making its own polyols to reduce its reliance on imported raw materials.

New Dates set for UTECH Europe 2021

London – UTECH Europe 2021 has been rescheduled to 14-16 September. The venue, the MECC in Maastricht, the Netherlands is unchanged.

Anybody interested in presenting a paper now has until 22 January 2021 to submit an abstract.
Three-way venture to advance efficient window technology

Shanghai – China’s energy-efficient window market has been boosted after Covestro, Krauss-Maffei and Chinese fiberglass maker Chongqing Polycom International Corporation (CPIC) signed a memorandum of understanding. The three parties will combine efforts to advance energy-efficient window and door frames with Covestro’s Baydur polyurethane pultrusion composites.

The frames will use non-alkali fiberglass as reinforcement, and polyurethane resin as the matrix. The profiles will be shaped by closed-injection pultrusion.

Covestro will research more energy-efficient materials, CPIC will develop fiberglass for a high-speed pultrusion process, and Krauss-Maffei will provide machinery specially designed for polyurethane pultrusion.

The project was inspired by China’s Technical Standard for Nearly Zero-Energy Buildings. This was published in 2019, and sets national targets on building energy consumption. New standards are also being promulgated on a local level.

Beijing, for example, is revising its residential building design standards, and setting the whole-window thermal conductivity coefficient at 1.1W/m²K. The municipal authorities estimate that heat loss through windows and doors accounts for 25% of total building energy consumption in the city.

With Covestro’s Baydur material, it should be possible to produce glass reinforced frames with a coefficient as low as 0.77 W/m²K, the company said. Part of the project will study how the profile’s cross-section can be simplified to cut costs. The material combination has good soundproofing performance, and has passed the hour-long fire resistance integrity test under China’s national standards.

Covestro added that polyurethane profiles made using COVESTRUS® 3D Printing Technology have high fibre content, high modulus and an expansion coefficient similar to that of concrete.

CPIC was set up in 1991 in Chongqing, and claims to be the world’s fourth-largest fiberglass maker.

Huide starts up PU resin and TPU plant

Ningde, Fujian – Huide New Materials started up the first phase of its plant for PU resin, TPU and other products in Ningde, Fujian on 18 June. Fujian Huidong Construction Engineering was the contractor; planning applications were filed in 2016, and ground was broken in March 2018. The total investment is expected to be CNY450m (US$64m); phase one has received CNY283m.

The first phase will have a production capacity of 100kT/year PU resin, 20kT/year TPU elastomer, 10kT/year modified PU systems and 5kT/year water-based PU.

Phase two will take another 12 months to complete, the company said. This second phase will increase the plant’s capacity to 100kT/year PU resin, 50kT/year TPU elastomer, 20kT/year modified PU systems and 10kT/year water-based PU.

Fake running shoes increase risk of injury, scientists conclude

Xi’an, China – A team at Shaanxi University has been investigating the damage that can be caused by counterfeit sporting footwear. They looked at the acute effects of fake shoes on foot loading and comfort during running.

The midsole materials based on TPU that are now incorporated into more expensive shoes have proved popular with runners, they said. However, knock-off running shoes are commonplace in China, and typically cost less than half the price of genuine branded products.

They wondered whether the advanced materials in genuine shoes were effective in decreasing foot loading and impact force during running. So they ran two tests using 15 healthy male volunteers, including running and comfort evaluation. Participants were asked to identify which was the genuine branded footwear, and which the fake, based on their perception of comfort.

They concluded that fake footwear significantly increased impact loading compared to the genuine shoe.

Wanhua works with Coin and XIE to print TPU building moulds

Shanghai, China – Wanhua is cooperating with two Chinese partners on TPU 3D printing for construction moulds and related areas. The polyurethane giant signed an agreement with 3D printing machinery maker Coin Robotics, and XIE Technologies, which specialises in structural design and construction of buildings and bridges.

Under the agreement, Wanhua will supply TPs, Coin Robotics will develop 3D printing equipment and the manufacturing process, and XIE Technologies will design product prototypes and expand its application in the sector. A key goal of the partnership is to cut costs and boost customised manufacturing in higher-end construction, Wanhua said.

Coin Robotics was set up in 2018. Its customers are in the building industry, aerospace, wind power and furniture. Its largest machinery has a standard working space of 4m x 1.2m x 1m.

XIE Technologies was formed in 2015, and it consults on and design structures.
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Mitsui receives incentive award for Stabio

Tokyo, Japan – Mitsui Chemicals has received an award for two innovative materials from the Japan Association for Chemical Innovation. The award was given for the company’s development of 1,5-pentamethylene disiocyanate (Stabio PDI), which it claims is the world’s first bio-based isocyanate.

A polyisocyanate hardener using the same material shared the award.

Mitsui said that 1,5-pentamethylene disiocyanate is more reactive than conventional 1,6-hexamethylene disiocyanate. This means that curing time can be 25% shorter than with the conventional material. Greater reactivity allows it to be cured at lower temperatures saving energy.

The new material has improved chemical resistance, high gloss and better abrasion resistance than 1,6-hexamethylene disiocyanate. This makes it attractive for use in paints and adhesives. In addition, the company claims, the product does not yellow.

Mitsui added that the product has environmental benefits to, said the company. In CO2-equivalent terms, this reduces greenhouse gas emissions by about 20%.

Sales and profits on the rise at Sheela

Noida, India – Sheela Foam, India’s only publicly listed flexible foam maker, had sales of INR22.1bn ($278m) in 2020. This was up 2.1% on the previous financial year.

Net profit across the business rose by 35.3% to INR2.6bn in 2020. This compares with INR1.9bn in 2019, a rise of INR6.9m. The company made significant savings of INR670m in raw materials costs in 2020 compared with the year before.

However, the company, which stopped production at its Indian operations for several weeks in the spring and re-started in late May, was hit by the coronavirus pandemic and also incurred an exceptional expense in 2020. ‘The loss of sales, and earnings for India, Australia and Spain operations are estimated at INR100 crores (INR1bn) and INR30 crores, respectively,’ the company said.

Turning to the fourth quarter of 2020, Sheela said that the Indian business revenue was down by INR910m. About INR750m of this fall was attributable to the coronavirus lockdown in the country.

At Joyce Foam, the Sheela-owned Australian business, revenue also suffered. A total of INR230m was wiped off sales because of the lockdown, and also because the rupee strengthened against the Australian dollar in the fourth quarter of the year. But the business had a lease rental payment reversed, and this took EBITDA for the division up 75% to INR21m.

This is the second quarter that the results of Sheela’s Spanish business have been included in the consolidated numbers. Sales there were INR530m, and the net profit was in total INR60m.

Sheela Foam also had to write off INR120m to cover an insurance claim for a fire at a facility in Noida in 2016. The company is still pursuing the claim, but there is currently no sign that it will be settled. This affected net profit numbers.

Forward AM and Prismlab sign 3D print partnership

Shanghai, China – BASF’s Forward AM business has signed a partnership agreement with Prismlab, a Chinese 3D printer manufacturer. The two companies’ relationship dates back to 2018, when BASF Venture Capital invested in Prismlab.

The Chinese company will distribute Forward AM Ultracur3D materials alongside its 3D printers in Asia. The Ultracur3D portfolio includes several reactive urethane-based photopolymers, such as the flexible Ultracur3D FL, rigid Ultracur3D RG, and high-impact Ultracur3D ST.

‘With this deepended collaboration, we will be able to leverage synergies with BASF in the 3D printing industry,’ said Hou Feng, founder and chairman of Prismlab. ‘The partnership with Forward AM complements our current material offering. It enables us to further explore and enhance innovative applications, including functional prototyping requiring tailor-made material solutions with improved toughness, heat resistance and long-term stability.’

François Minec, managing director of BASF 3D Printing Solutions, added that his company is now setting up local production, logistics and technical services in Asia. ‘We are convinced this partnership strengthens our market position, especially in the orthodontic industry, and will enable us to engage deeper with downstream customers,’ he said.

Manali sales affected by lockdowns

Chennai, India – Sales at Indian polyol supplier Manali were INR3.8bn ($49.9m) in 2020, down 45.6% on the previous financial year. Pre-tax profit across the business, which runs its financial years from June to June, fell by 56.2% to INR449.7m in 2020. This compares with INR1026.8m in 2019, a drop of INR577.1m.

The company said it shut its plant in 25 March to comply with the Indian government’s coronavirus lockdown decree. Production restarted in phases from the second week in April.

Chairman Ashwin Muthiah said: ‘The outbreak of coronavirus led to an unprecedented situation globally. Our team’s resilience ensured that we continue to serve our customers even in such an extraordinary time.’

In a mid-July statement to the Bombay Stock Exchange, the company warned that unfair international competition could hinder its progress. It warned that ‘rampant dumping’ of products by multinational companies could affect its ability to recover as India’s coronavirus lockdowns ease.

In a statement to the Bombay Stock Exchange in mid July, the company called out its medical grade propylene glycol had not been affected by the shutdown.

However, it said, demand for polyols and related products has remained dormant in view of the shutdown of end-user operations in the light of lockdowns.

The prospects for revival of demand for the company’s products would depend on the general economic condition and consumer spending,’ it said.

However, the company warned that its business recovery is not a foregone conclusion. ‘Even if the user industries reopen and scale up, there could be challenges due to rampant dumping of products,’ the company said.
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DTSC: Look harder for MDI alternatives in spray foam

Sacramento, California – Spray polyurethane foam insulation continues to be under attack in California. The state’s Department of Toxic Substances Control (DTSC) has issued a Notice of Deficiency to SPF manufacturers, who claim there is no suitable alternative to MDI in their insulation products. DTSC believes they should be looking harder for safer alternatives.

Companies in the American Chemistry Council’s Spray Foam Coalition had provided DTSC Abridged Alternative Analysis reports at DTSC’s request. However, these were deemed insufficient. DTSC is now demanding more detailed information by 31 August

2020. Otherwise, the industry will face a second Notice of Deficiency being issued.

“We received input on the initial reports from a variety of stakeholders, and we directed spray foam manufacturers to address those concerns,” said DTSC director Meredith Williams. “Their response was inadequate, and we are directing the companies to submit revisions with more information and substantiation.”

SPF manufacturers maintain that there are no functional alternatives. DTSC says that if they do manage to provide adequate evidence for this, at the very least they will be required to fund further research into potential alternatives, and provide consumers with product safety information.

The ACC’s Center for the Polyurethanes Industry (CPI) has expressed its disappointment at DTSC’s response to its report. “The report concludes that there are no technically or economically feasible alternatives to spray polyurethane foam systems containing unreacted MDI – a position that the industry has maintained since this process started in 2014,” said Lee Salamone, senior director at the CPI.

Coronavirus has big impact on Stepan’s first half income

Northfield, Illinois – Operating income in Stepan’s polymers division fell by 34% in H1 2020 in the light of coronavirus stoppages in downstream construction markets in North America and Europe.

Overall, the rigid polyols producer generated sales of $911m in the first half of 2020. This is a decline of 5.3% on the $962m recorded in the first half of 2019. Adjusted net income across the business fell by 9% to $63m in the half, compared to the 2019 figure of $69m.

Sales in the company’s polymers business shrank by 16% compared to the first half of 2019, to $219m from $261m. Operating income in the division fell by 34% to $23m, compared with $35m in the first half of 2019.

Stepan said that second-quarter sales in the polymer division were hit by coronavirus-related construction project delays and cancellations. This affected demand for its rigid foam polyols in North America and Europe.

Looking at the first half of the year, CEO Quinn Stepan said: ‘Despite these challenges, the impact of the first quarter power outage at our Millsdale facility, the company had a solid first half of the year. Today, the world continues to be challenged in many ways.’

The company’s insurers have agreed that the Millsdale plant was covered.

Adidas, Allbirds to develop eco-friendly shoes

San Francisco, California – German athletic gear giant Adidas and direct-to-consumer shoe brand Allbirds are to collaborate on a sports shoe with almost no carbon footprint.

The companies claim the footwear industry produces 700 MT/year of carbon dioxide. They believe implementing innovative manufacturing, materials and supply chain processes will allow this to be reduced.

The shoe will carry the logos of both brands, according to an Allbirds spokesperson. The two companies’ brands have a year to design and create the product, she said.

‘Very excited to share that Adidas and direct-to-consumer shoe brand Allbirds are to collaborate on a sports shoe with almost no carbon footprint.

The companies claim the footwear industry produces 700 MT/year of carbon dioxide. They believe implementing innovative manufacturing, materials and supply chain processes will allow this to be reduced.

The shoe will carry the logos of both brands, according to an Allbirds spokesperson. The two companies’ brands have a year to design and create the product, she said.

‘Very excited to share that we’re breaking the traditional rules of collaboration and teaming up with Adidas to redefine the playbook on sustainability by co-creating a performance shoe with the lowest carbon emissions, ever,’ Julie Channing, vice president of marketing at Allbirds, wrote on LinkedIn.

Adidas has already made an effort to increase the recycled contents of sports shoes, and make them easier to recycle. The 100% PU limited edition Futurecraft.Loop shoes it introduced in 2019 were designed so that used shoes could be shredded into pellets, and then used to make new ones.

The brands say the new shoe will meet Adidas performance standards. Its carbon footprint will be measured against both companies’ environmental rubrics.

‘There is an urgent need to reduce our global carbon number,’ said Tim Brown, co-CEO of Allbirds. ‘This mission is bigger than just Allbirds or Adidas.’
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Midland, Michigan – Dow pledged to cut 6% of jobs in 2020 as the effects of coronavirus on its business became clearer in the second quarter. It also plans to slash costs by an additional $150m.

CEO Jim Fitterling said: ‘Based on what we’ve seen in the second quarter and into July, we continue to expect a gradual and uneven recovery.’ The company will, he said, remain intensely focused on the actions within its control. ‘We will upsize our 2020 operating expense reduction target from $300m to $350m to $500m,’ he claimed.

‘This programme includes a 6% reduction in Dow’s global workforce, as well as actions to exit uncompetitive assets,’ Fitterling said.

Dow sales were $8.4bn in the second quarter of 2020. This represents a fall of 24% compared with the same period in 2019. Operating EBIT across the business fell by 95% to $57m. In the same period in the previous year, the figure was $1bn.

Fitterling added that despite the headline falls and losses at EBIT level, Dow had increased cash flow in the quarter. ‘Extended economic lockdowns shifted the infection point for demand recovery in key markets and geographies into June, where we began to see gradual improvements across most industries,’ he said.

‘The growing recovery in China and early signs of improvement in Western Europe are positive indicators for the US and Latin America.’

Sales in the industrial intermediates & infrastructure (I&I) business, which includes polyurethanes, fell by 28% between the first half of 2019 and 2020. Operating EBIT in the division plunged from $154m in the second quarter of 2019 to a loss of $220m in the 2020 quarter.

‘Of this, sales in the polyurethane and construction chemicals segment were down because of lower volumes and prices. Demand was significantly hit by the coronavirus pandemic, with shutdowns in the construction, furniture and bedding, and automotive sectors cited as important influencers. There was some volume growth in the Asia Pacific region, but this was more than offset by declines in other regions.

Fitterling also namechecked the company’s new Mobility-Science platform for the transportation industry as a new way for customers to see his company’s product offerings. See Auto feature, page 20.

Destocking helps sales figures hold up at Carlisle

Scottsdale, Arizona – Sales at Carlisle, which makes insulated panels and construction products, were $2bn in the first half of 2020. This is a fall of 14% compared with the same period in 2019.

Operating income across the business fell by 33% to $216m. In the same period in the previous year, the operating income was recorded at $322m.

Commenting on the second quarter, Carlisle said: ‘Although the quarter began with April’s volumes down in excess of 30%, we started seeing recovery in shipments through May and June, and we continue to benefit from the overall resumption of construction activity.’ He added this was true in the US and Europe.

The company was able to take advantage of its high stock positions at the start of the quarter to continue selling to customers.

Pandemic knocks Graco earnings by 16% in H1

Minneapolis, Minnesota – Graco, which makes a polyurethane spray machinery and spray equipment for paints and contractors, generated first half sales of $740.5m in 2020. This is a fall of 16% compared with the same timeframe in 2019.

Operating earnings across the business fell by 38% to $135m. In the same period in 2019, operating earnings were $217.0m. The company’s businesses were hit by coronavirus shutdowns in a number of downstream industries, notably construction, in the first half of the year.

Patrick McHale, CEO, said: ‘Our factories and distribution centres remained fully operational during the second quarter. High-risk employees remain at home and we have dealt with the positive coronavirus tests that we have experienced at our facilities without disruption.’

Sales in the company’s industrial business, which houses polyurethane spray foam equipment, subsidised by 23% between the first half of 2019 and 2020. Sales reached $292m in the first half of 2020. Operating earnings in the declined by 33% to $87.2m.

Business in this segment fell in the half because coronavirus lockdowns cut activity in key markets. Graco said that margins remained relatively strong, but it could not cut operating expenses fast enough to keep pace with the fall in sales.

Sanuk shoe soles recycle PU

Goleta, California – A new range of footwear from Sanuk incorporates recycled PU foam.

The SustainaSole collection includes two slip-on styles, Donna for women and Chiba for men. Both are being sold for $65.

The company claims that a major barrier to eco-friendly shoes is the foam base that gives comfort and support.

It collaborated with sole specialist Blumaka to integrate its recycled foam technology into the shoes, with the bottom unit consisting of 35% recycled foam by weight and around 75% by volume.

The Ortholite sockliner also includes recycled PU components. The top layer is a 2mm foam, made from 15% recycled and 80% virgin PU foam plus 5% recycled rubber powder, while the bottom layer is a 3mm foam, containing 98% recycled and 2% virgin PU foam.
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Coronavirus impact pushes Trelleborg into restructuring

Trelleborg, Sweden – Trelleborg is extending its previously announced coronavirus-induced restructuring in anticipation of the long-term effects of the pandemic. The Swedish polymer engineering group expects the costs of the reorganisation to amount to SEK700m ($78m) for the full year 2020. This is more than twice the SEK300m previously announced. The measures are expected to bring in savings of SEK700m on a full-year basis from 2022. These initiatives, it said, will cover production and sales structures in all business areas. ‘We believe coronavirus will change the environment long-term in some areas, so we start preparing for a new normal by implementing some extraordinary measures,’ said Trelleborg media relations VP Karin Larsson in a written statement. On the upside, Larsson said, the company is investing SEK1.2 bn in its manufacturing facilities and product innovation this year. That is lower than we expected in 2019 but still a significant figure,’ she said.

In July, the company announced that sales were down 9.4% in the first half of the year at SEK17bn, and EBIT across the business fell 16.8% in the period to SEK2.2bn.

The company’s industrial solutions business, sales declined by 76% between the first half of 2019 and the first half of 2020, to SEK 4.9bn.

Duderstadt, Germany – The first parts have been delivered from FoamPartner’s new converting centre. The Duderstadt facility was up and running 12 months after construction started in April 2019. By the end of June this year, more than 1000 different parts and components had been made. The company invested €10m in the 8500 m² facility, where 50 new jobs have been created. The company expects it will gain ISO 9001 certification before the end of 2020. ‘Our project team has worked hard to complete the centre within the shortest possible time frame, and started production in April 2020, despite the difficult circumstances caused by coronavirus,’ said Tobias Gruener, EVP for business in Europe. ‘The centre was purpose-designed as a smart factory, in adherence to Industry 4.0 principles, with a highly digitalised and automated workflow.’ The centre has a modular design, including more than 50 different machines. Capabilities include thermal compression, horizontal splitting and vertical cutting of foam sheets, die cutting and stamping, horizontal and multi-spindle drilling, and milling. Welding, bonding, lamination and impregnation can also be carried out. A small-scale machining centre allows speciality products to be made in lower volumes.

‘By pooling our expertise – R&D, foam production, processing, application engineering, prototyping – we now provide the entire value chain for our customers at once, for the fastest possible order-to-delivery and time-to-market at the highest quality and competitiveness,’ said FoamPartner’s CEO Michael Riedel.

Pandemic fallout set to take 45% off Grammer’s top line in Q2

Ursensollen, Germany – Grammer has predicted its revenue in the second quarter of 2020 revenue could be €281m, down 45% from €517m in the 2019 quarter. It cited the impact coronavirus lockdowns have had on the global economy. The company, which uses significant amounts of polyurethane foam to make seats and interior components, broke the news in a preliminary earnings statement to the German stock exchange. It expects to report a group loss of €50m in the quarter, down from EBIT of €26.12m in the 2019 period.

The company said that coronavirus was the main reason for the significant decrease in revenue and earnings in the quarter.

In particular, Grammer said, the closures of locations in Europe and America from March onwards had a major impact on the business.

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Recticel expects H2 figures to compare with previous year

Brussels – Business at Recticel is rebounding at a faster rate as the year progresses, and the second half should be as strong as the second half of 2020, according to the company’s CEO Olivier Chapelle.

‘After the low activity point of April, our sales progressively rebounded in May and further accelerated in June,’ he said in a statement.

‘Combined with the current strength of our order books, this gives me confidence that we are now emerging from this extraordinary crisis.’

He added that in the second half of 2020, he expects the top line of the retained businesses to be back at the same level as the second half of 2019, provided no second wave of coronavirus occurs.

Recticel recently announced that it had completed the sale of its share in Eurofoam to its joint venture partner Greiner, and that it had also sold a stake in its automotive components business.
IMA welcomes UK stimulus package but wants clarity

London – The Insulation Manufacturers Association (IMA) has cautiously welcomed the UK government’s £2bn ($2.5bn) boost to domestic housing insulation, announced in early July. However, it warns it is a first step, and many questions remain.

‘Let’s welcome it, let’s give credit where it’s due; we’re in difficult times. The government recognises the importance of energy performance and improvement. But this is the start of the journey,’ said IMA chairman Simon Storer.

The announcement was made by Rishi Sunak, the Chancellor of the Exchequer (the minister in charge of finance), among a number of other financial boosts to try to restart the UK economy after the coronavirus lockdown. Storer, whose association was one of nine pushing for such a boost, warned the timeframe is very tight. ‘My concern is that Rishi Sunak has allocated £2bn with a further £1bn for non-housing. This is to be allocated in the space of a year,’ he said.

He said that this could lead to quality problems with installation. ‘There will be a rush to get this done in the last six months, and that’s where you begin to get quality issues,’ Storer added.

Storer said it was not clear how the programme was going to be administered, how funding would be allocated to projects, the criteria for people to access funds to improve their homes, or the standard required for the installation.

IMA chairman Simon Storer

BASF hunts for recycling partners

Ludwigshafen, Germany – BASF has released details of a project to recycle end-of-life mattresses. The company says it wants to develop joint pilot projects later this year. No details have been given about the technology it will use in the project at its Schwarzheide, Germany site.

It claimed that the recovered polyol has a brownish colour. ‘The resulting foam looks similar to a virgin material,’ the company said.

It added that there is a purifying step to remove non-polyol additives, and the functionality of the recovered polyols is the same as in the original formulation. Pilot testing is the current development stage and the polyols are being added to foams in broad ranges.

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Adjustable moulds simplify logistics

Mindelheim, Germany – BBG, which makes mould, machinery and production plants for many different types of polymer, has developed a flexible mould system for rigid polyurethane foam insulation. The company says the moulds have applications in the production of large numbers of products such as water tanks. They are designed so that it only takes a few steps to adapt them to different tank sizes, model versions and connection types. The mould can be operated manually or using a PLC system semi-automatically, hydraulically or pneumatically.

BBG claims that using a few universal moulds can increase the economic efficiency of water tank production, and mould costs can be significantly reduced. The efficiencies are particularly noticeable in plants producing many different types of water tanks in different sizes.

‘Many producers have hundreds of moulds in stock,’ said Gerhardt Hörtich, sales and project manager at BBG. ‘This means that they that many thousands of euros are tied up in moulds that can often be used for a single tank model.’

Several BBG customers are using moulds to encapsulated drinking and process water storage tanks. The company says that the most versatile moulds can be used to insulate up to 15 different tank models with capacity of 100 to 1000 litre.
I man gradually resumed operations, and the market remained weak. Huntsman went into a planned maintenance turnaround at the beginning of June. August is expected to see further upward movement.

The North American MDI market has experienced good supply and improving demand since June. Demand from the construction sector continues to show healthy levels. Low economic growth is still a fear, but housing starts and construction demand continue to firm. Automotive markets are open once again, but the sector is still struggling. Demand from the furniture and bedding sectors has been weak, but is starting to rebound. The market is expected to firm over the coming months, but as supply is long there could be resistance from the buyer side.

The European MDI market continued to recover in June, as economies reopened and demand showed good healthy levels, albeit still behind previous years. The construction market has been the lifeline needed in Europe during the pandemic, as demand has improved significantly since June. August is usually seasonally quiet, as many countries in Europe take time off for summer holidays. Whether Europe carries on improving during the summer break remains to be seen but, so far, demand levels are better than previously forecast when the epidemic first hit Europe. Upcoming turnarounds in August should reduce supply levels, but buyers are likely to be covered as demand is not yet at previous levels.

In China, the MDI market had price fluctuations for most of June, and into July. Huntsman went into a planned maintenance turnaround at the beginning of June. BASF was rumoured to be prolonging its maintenance turnaround, and this led to firmness in the market. Shortly after, the market remained inactive and prices stabilised. Towards the end of June, no obvious improvement in demand was seen, and the market remained weak. Huntsman gradually resumed operations, and supply levels increased. The atmosphere was bearish as sellers tried to clear product from their systems, but buyers were cautious in making purchases. Transaction volumes were low, and the reported price in the market reached low levels.

The North American TDI market has also had some improvement following the downturn caused by the pandemic, but demand is still catching up to previous years. The construction sector, a major end use application for TDI, has been doing well, and there is increasing demand. The automotive and comfort sectors restarted in May, but automotive is still struggling. Comfort is improving as demand was reported to have started to rebound towards the end of May. The increase in demand will almost certainly lead to a push from producers to increase prices as margins have been very poor. However, TDI is long in the US, and this surplus supply will continue to play a part in pricing discussions as buyers are expected to resist price increases.

European U-turn
The European TDI market took an unexpected U-turn during July and is now firming. Most sectors which buy TDI are now improving, and looking better than initially expected. Demand from foam buyers is reported to be growing, and June had very healthy levels. Sentiment continues to improve, and more buyers are now venturing to the shops. This has given a boost to the comfort and furniture sectors. Some buying was also a result of restocking, which has not happened since March when the epidemic started. Automotive is slowly rebuilding, but is likely to remain weak. In June, one market participant said markets will struggle in the summer, as there is usually some slowdown during August in Italy and Spain in particular, and an improvement in conditions may not occur until September at the earliest. This has now changed, and demand in July is looking very healthy. It could continue to increase in August as the market is catching up with pent-up demand. In China, the domestic TDI market has been mostly stable. Suppliers tried to maintain the price at high levels, but as demand in the off season, demand has been low. Buyers had good stock levels, reducing the need to buy. In mid June, GanSu YinGuang stopped production, and Wanhua announced that a turnaround was scheduled on 1 July, pointing to upcoming shortages in the market. Producers remained firm on price, but few deals took place and the increase in price was resisted. Traders were more bearish and eager to make sales, gradually lowering their prices. Towards the end of June, although producers had different pricing strategies, the bearish attitude continued to spread.

The North American demand for polyols has been significantly affected by the coronavirus pandemic and levels have been very low. However, demand is moving in the right direction. Construction is steady, and likely to remain so throughout the summer months. Demand into auto applications is heard to be stagnating still. Bedding demand is now showing good levels. Polyether polyols supply is still long, but increases in demand are likely to lead to a push to increase prices in the coming months to improve margins.

The European polyether polyols market started to improve in June, and is showing signs of further firming in July. End-user plants restarted operations as demand is reported to have been better than expected. Demand started to recover towards the end of May, and improved further in June. Most foam plants were reported to be open and operating at about 80% of capacity during July. One supplier said buyers are still concerned about safety and footfall is below previous levels, but it is improving. The Chinese flexible foam polyol market continued to firm following increases in raw material prices. However, downstream factories had stable production levels, and most refused to pay higher prices for feedstock. These meant orders were mostly for small volumes, and new contract agreements were not reported.

Most regions are expected to see good demand levels in the short term as economies recover. A lot depends on whether a second coronavirus wave occurs as winter approaches, but for now activity is ramping up at healthy levels globally.

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A year of shocks for the car industry

These are unprecedented times for the global automotive industry, and the firms that serve it. We take a look at some of the effects the coronavirus pandemic has had on this important market for polyurethanes, both in the short term, and those that may prove more longer-lasting issues for the sector.

The numbers are astounding. In February 2020, passenger vehicle production in China, the world’s largest market, fell by 80%. In March, it recovered somewhat, with production at about 49% of the level it was in March 2019.

As the coronavirus lockdowns bit later in Europe, the fall was 80% in April, and a mere 58% in Western Europe in May. In normal times a 42% annual fall in a market would be seen as calamitous. In May, it was something of a relief.

While this information from consultants LMC Automotive illustrates the very short-term shock of the pandemic on automotive production, its ability to guide about what might happen in the rest of the year is negligible. Neither does it highlight the longer-term impacts on our economies, or the public’s willingness to buy expensive items like cars.

In early July, LMC was suggesting that car production globally in 2020 could be about 26% lower than it was in 2019. By the end of that month, they had crystallised the figures a little more. The selling rate of cars in the US in June 2020 was 26% lower than in the same month last year, while in Western Europe, numbers were down by 27%. They claimed that the recovery is set to continue. ‘Growth will moderate as we approach a lower level of sales than in 2019,’ they added.

In contrast, Korean sales were up 46% on the same month in 2019, partly because of a tax cut designed to boost the economy. Meanwhile, LMC characterised the Chinese situation as a V-shaped recovery in a short time scale. ‘Sales are expected to approach 23m units this year,’ they said.

Level down

If the rate of sales globally in June had been the same for every month in 2020, then the market would be the same size as it was in 2011, when 76m cars were sold. But, the consultants point out, production capacity for cars is 40% higher now than it was back then, and plant utilisation remains very low.

In its first half business report in late July, French auto interiors company Faurecia suggested that automotive production in 2020 could be about 64m vehicles. That would represent a drop of 22.6% on the number built in 2019, when it estimates 85m vehicles were built. The company believes that in 2022 between 76m and 85m vehicles could be built. By 2024, the number could have recovered further, to 85m and 91 million vehicles.
LMC is slightly more bullish, stating that global automotive production in 2019 was 88.8m units, and about 71m cars and other light vehicles could be built in 2020. They forecast that this might rise to 82.4m in 2021.

Whatever level of automotive production actually transpires this year, it is clear that some of the larger Tier 1 suppliers to the OEMs are looking at ways of making their businesses the right size for the future. For example, speaking at a Deutsche Bank investor day, Adient’s Doug Del Grosso said: ‘We are expecting markets to be down, we [aim] to reduce our break-even point to have positive cash flow in 20% down market.’

He added that, in the post coronavirus environment, the action the company is now taking to improve its break-even cost will enable overall margins to improve, and he expects they will be able to deleverage as production returns. ‘We have taken coronavirus as a catalyst for us to move quickly and drive our cost structure even more aggressively, because we are anticipating that buying will be down and we have to be able to respond to that,’ he said.

**Changing shape**

Lear’s president and CEO Ray Scott also spoke at the Deutsche Bank event. While he did not directly discuss likely levels of production in 2020, he did say that the coronavirus pandemic had changed the shape of his company’s order backlog.

‘Overall, there have been delays; these have been pretty modest – mostly two to three months,’ he said. ‘I think a lot of [those orders] will shift into next year’s backlog. Perhaps there will be some offsets to next year’s backlog, because industry volumes look like they will be a little softer than what we have projected for next year.’

However, Lear started 2020 strongly. ‘First-quarter gross growth was strong at 11%’, Scott said. ‘North America was particularly strong for as in both segments in seating we were nine points above the market.’

He added that growth in popular models helped. In 2019, he said, the Ford Explorer seating programme was updated, and his company was benefiting from that in 2020. ‘Even though the market is likely to be down in North America this year, the Explorer is likely to be flat, or constant relative to the market, those things helped us in the first quarter,’ he said. ‘They will continue to help us for the balance of the year.’

**Want to buy a motor?**

Underlying this year’s coronavirus-induced stress is the continuous pressure for change from regulators, which greatly affects the global automotive industry. In particular, there is a move towards greater penetration of electric and hybrid vehicles into the marketplace, driven by the need for car makers to reduce emissions from their fleets, and also individual models. In the absence of scrappage plans and

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Scott: moderately sanguine
other post-virus market stimuli, car makers welcome enforced obsolescence. It is one way to get consumers to change to innovative models.

But the fundamental question is whether, as the coronavirus-shock plays out, do consumers actually want to own cars? Perhaps the coronavirus pandemic and its lockdowns are pointing to the way that car ownership might change over the coming years.

In the automotive space, according to Automobilewoche, car sharing has become ‘a clear winner’. Tom Gould director of design & technology at Adient, said: ‘Before coronavirus came along, we produced some demonstrator show vehicles. This was spurred on by the idea that shared vehicles could become a bigger part of people’s lives.’

He said that although using robotic vehicles make these business equations look much better, over the past year the date for the introduction of these vehicles has moved out.

A further issue raised by the pandemic is a growth in concerns about sharing vehicles. Coronavirus has shaped research at Adient as a result. ‘We are looking for solutions that will kill the virus or microbes on contact or through other processes,’ Gould said. ‘How do you make the materials more resistant to cleaning and the bacteria?’

Esther Quintanilla, Dow Polyurethanes’ global & EMEAI mobility market segment leader, agrees with Gould. ‘Products that are easy to clean, and with more durability, are more important than ever,’ she said. Her company recently launched a mobility science platform to make the company’s diverse offering of materials even more accessible to the automotive industry.

Galen Greene, marketing manager at Covestro, ‘as we move to completely autonomous cars, where the car becomes a relaxation, work and entertainment area, we see a big step change where there are opportunities for our materials.’

This view is reflected by Irina Bolshakova, market manager for automotive and transportation in EMAI at Huntsman. ‘It is too early to see a real trend toward simpler or cheaper cars,’ she said. ‘It is not a secret that everybody in the automotive industry reduced production volumes.’

Several possibilities

However, she added there are two positives. ‘First, Germany and France are giving subsidies for electric vehicles, and we expect more to come,’ she said. ‘Secondly, OEM and consumers will welcome these, and will react. All our work in electric vehicle technologies is continuing at the same pace as before the coronavirus shutdown.’

While autonomous driving is still in the concept stage, changes are coming. ‘Riding a car could be like sitting in a plane or train, more soft and predictable,’ Covestro’s Greene said.

Fully autonomous level 5 cars could receive a big boost if Germany passes the legislation that is being contemplated there, which would allow them to be used in a number of closely defined roles.

Brent Hodge, director of foam engineering at Adient, believes it will be cost-prohibitive for individuals to buy their own autonomous vehicles, because of the cost of the equipment. ‘But the costs of sensors and key equipment is falling,’ he said. ‘It is coming, and it will happen some day.’

‘But we will share vehicles for some time, if we continue to live in towns and cities.’

Once Level 5 becomes a reality, with the vehicle is managing the drive all by itself, vehicle architecture may well change dramatically. ‘That’s where designers start to look at how people behave as passengers and not as drivers,’ Hodge said. ‘For us, from a seating standpoint, it ups the ante. Our seats move from being a comfort and safety system within a car you are driving, to more of a command centre. The seat will bring the driving to you, and will help you to personalise the car. Simple personalisation will be important if the car is shared.’

His colleague Gould agreed. ‘The functionality we are seeing introduced today is about occupant convenience,’ he said. ‘Several model introductions in the past year feature at-seat massage. I had not heard of that three or four years ago in the US.’

Innovative seats

James Paul, global marketing manager at Evonik, explained that just a couple of years ago, there was optimism that we would go from level 2 – current Tesla technology – towards highly or fully autonomous vehicles at level 4 or 5 within a realistic timetable. ‘Now I think things will be pushed out a little bit,’ he said. He pointed to the way some OEMs are now doing some things differently. ‘For example, the Ford F150 pickup has the option to have a fully reclining seat, and allows users to rest or sleep properly in the cab.’

However, he does not think this will become mainstream, and the idea came from a Ford user poll. ‘Many people wanted to use their vehicle for camping or sleeping when away from home on a job,’ he said. ‘Ford is trying to emulate a first-class airline seat in the trucks.’
Covestro’s Greene said that, despite the fall in sales, car-makers will push ahead with strategically important research. ‘The new fuel economy standards in Europe are still coming; there’s been no announcement to delay them,’ he said. ‘Some OEMs seem to be more in favour of stimulus instead of delays; maybe a cash-in programme to get old cars off the road.’

Lower emissions

He added that everything seems to suggest they will stay fully invested with this e-mobility strategy. ‘They do not want to drop the products that would come onto the market in three to five years’ time when investment today would be realised because environmental requirements are getting stricter,’ he said.

‘We are now in the midst of OEMs working to meet the 95 g CO₂/km standard for 2021. The next big drop is scheduled for 2025. To 81 g CO₂/km. By 2030, it will be 59. Car-makers in Europe have to invest to hit this. E-mobility would be one of the last development topics to be cut.’

While car-maker’s longer-term strategies may be driven by legislation, in the short term, economic uncertainty caused by the unwinding economic shock of coronavirus on consumers could change the way that cars are built and specified in the future.

Huntsman’s Bolshakova believes that in the future we could be talking about much more sustainable materials. ‘It is becoming critical part of automotive agenda,’ she said. ‘There could be a change in focus in the auto companies. Almost every earnings report or investor report today has about one third of the content dedicated to the environment and sustainability.’

In late July, Autoneum announced Autoneum Pure, a labelling system that identifies products with a high proportion of recyclable materials, or those that achieve significant weight savings compared to similar products.

The majority of the products are in noise and heat protection applications, which the company says demonstrate excellent environmental performance throughout the entire product lifecycle. ‘It allows vehicle manufacturers to identify at a glance which products are most suitable for use in future, environmentally friendly models,’ it said.

Covestro’s Greene said that his company has brought a number of sustainability developments to the automotive industry. ‘These include CO₂ Cardyon technology,’ he said. ‘We’re working on that when looking at alternatives in the short-term. As well are somewhat upstream projects which are looking at bio-sources and bringing in chemical recycling to bring waste in. These are very important topics for us as a company.’

Affordable vehicles

However, he said, is too soon to say exactly what OEMs will do to ensure their vehicles are affordable. ‘We see consumers being cost conscious as people’s income is being hit because of coronavirus,’ he said. ‘The question is, “What do they give up?”’ as they try to save money.

Evonik’s Paul suggests there will be more model rationalisation. ‘We will see OEM’s further focus which vehicles they produce and eliminate some models,’ he said. ‘A lot of OEMs have been hit hard. Many were in the process of changing from internal combustion to electric vehicles; some of their plants were already at very low use levels. When you add coronavirus with reduced consumer demands, it is putting more pressure on them, and many will be considering where to invest their money.’

Quintanilla from Dow points to several possibilities: ‘I like the concept of the ABC car which is affordable but cool,’ she said.
Reducing the weight of components that make up a vehicle has been a constant refrain of the European automotive industry over the past 30 years. Other parts of the world have now caught on to the concept, as regulations imposing lower levels of emissions or corporate fuel economy have become more widespread.

Polyurethane innovations in seating and composites can help OEMs rise to the challenge of maintaining comfort and lowering weight. Seats are the largest visible components in passenger cars, and this niche has been owned by moulded polyurethane for many years.

Foam density specifications change regularly, as Irina Bolshakova, market manager automotive and transportation at Huntsman EMAI explains. ‘If we look at the requests from the customers five to seven years ago, on top of the list was lower density to give a relevant reduction in weight,’ she said. ‘We eventually reached the situation where lower density meant less comfort. Over the past three years, we have seen a return to higher density formulations.’ However, she added, while light weight remains important technology advancement must also help simplify manufacturing and design.

**Thinner seats**

This is echoed by Adient’s director of foam engineering, Brent Hodge. ‘Foams are getting thinner; the volume is falling, and the difference is being accounted for with more active suspension systems. ‘But as the seats are getting thinner, then the density of the foam has to go up. Nobody has developed a magic formulation where 30 kg/m³ foam could support an occupant like a 65-70 kg/m³ foam.’

Evonik’s senior technical manager for automotive in EMEA, Eva Emmrich-Smolczyk, said that thinner seat cushions means filling narrow moulds with high density foam, and this presents a number of technical challenges. ‘During filling, you have slow turbulences in the mould, and in most of them you have design elements like inserts in the seat pads,’ she said. ‘The foam has to flow over these.’ These could be clips, for example, that attach the textile to the seat.

‘All these parts have to be defect-free and sit in the foam, or they could be torn out,’ she said. ‘We are interested in maintaining the cell structure with silicone surfactants. The choice of the right surfactant is important to support flowability and reduce subsurface voiding.’

However, she explained, the thinner seat pads get, the more challenging liquid flowability becomes, and designs are also becoming more ambitious. ‘Silicone
As the seats are getting thinner, then the density of the foam has to go up

Brent Hodge, Adient

Surfactants help improve the flowability in these parts, in combination with well-balanced catalysis gel and blow catalysts,' she said.

Tricky equation
Filling the mould is only one piece of the equation. When the part is moulded, it has to conform to the OEM’s specifications, and these are getting tighter. ‘We have so many requirements from OEMs who need to maintain heat and humidity ageing properties,’ Emrich-Smolczyk said. ‘For this, we also have additives that help to improve and maintain the foam’s physical properties after ageing.’

Huntsman is interested in how the seat cushion and frame interact, and whether there is an opportunity to save weight here, too. ‘We are talking with the people who make the seat frames,’ said Bolshakova. ‘Seats are tremendously complicated parts of the vehicle. We want to see how the foam and the frame can work together to reduce the weight of the vehicle. Foam is important, but it is not the heaviest part of the seat.’

One way to reduce weight could be to replace dense metal springs with less dense polyurethane foam. Huntsman has a variable density technology that it plans to launch later this year.

‘We have technology where you can play with the hardness across and through depth of the seat profile,’ Bolshakova explained. ‘It is possible to make seats with a soft layer near the leather or fabric surface, and a hard layer at the bottom of the cushion. This is done by altering the formulation during the pour. It helps to simplify manufacturing process of more complex seats.’

Conventionally, a changing foam density through the depth of the seat is achieved by bonding two different foams together. ‘Moulding the seat cushions with different densities in one shot enables producers to reduce weight and simplify production. This is our GH, or gradient hardness, technology,’ she said.

Could lightweighting be improved or mitigated if the seats were made with recycled material, or with greenhouse gases as raw materials? Some producers think there...
Could be useful trade-offs.

Esther Quintanilla, global & EMEAI mobility market segment leader at Dow Polyurethanes, suggested that polyols generated using the company’s Renuva programme for mattresses could, potentially, play a part. ‘There is nothing to stop us,’ she said. ‘Why not have that sort of solution for automotive seating or carpets?’ Dow also recently announced a partnership with France’s Eco-Mobilier to take foam from end-of-life mattresses to convert to polyols.

Covestro marketing manager Galen Greene explains that his company has brought a number of sustainability developments to the automotive industry. ‘These include CO2 Cardyon technology; we’re working on that when looking at alternatives in the short term,’ he said. They also have some upstream projects looking at bio-sources, and chemical waste recycling. ‘These are very important topics for us as a company,’ he claimed.

In the matrix

The polyurethane industry has been pushing the change from traditional materials to composites with a polyurethane matrix as a way that the car makers can reduce weight in a number of parts. This is an area where some Tier 1 manufacturers very much rely on their suppliers. As Adient’s director of design and technology Thomas Gould explains, ‘We are not going to develop a level of expertise in composites. We will work with suppliers. In the lightweighting area, composites are interesting, and they creep in through niche areas. Recaro, which was part of Adient from 2010 to 2020, did a lot of work with composites.’ He added that Adient has looked for opportunities in more mainstream uses. ‘There are limitations,’ he said. ‘A lot of the composites we use tend to be lay-ups, and we have hybrid approaches using long strand composites.

You can get some great strength out of those, and they could be alternatives to steel structures.’

Huntsman’s Bolshakova believes that glass fibre composite structure are gaining huge recognition in the interior of the vehicles, particularly in the trunk area as spare wheel covers. ‘These are widely used parts now, and OEMs are comfortable to have parts made like this with polyurethane matrix materials,’ she said. ‘The technology is well developed, and there are advantages of bringing this composite technology into other areas such as headliners, instrument panels and door trims.’

Polyurethane composites are now being tested in new areas, she added. These include dashboards, instrument panels, back seat plates, side pillars, and covers for electric and electronics components.

Covestro’s Greene agrees. ‘Polyurethane composites can help companies support their lightweight initiatives,’ he said. ‘The industry has been addressing lightweighting for a period of time, and we have made a lot of progress over the years.’ His company’s Baypreg polyurethane honeycomb floor panel materials is heavily used in the boot area, for example. Investigations are under way to see where else it might be used, such as the bulkhead between the boot and the rear seats.

This is also of interest to Huntsman. ‘The backseat plate sits between the rear seat and the boot,’ Bolshakova said. ‘This OEMs are comfortable to have parts made like this with polyurethane matrix materials

Irina Bolshakova, Huntsman
is] one of the applications where PU is trying to enable the concept and composite technology."

Other established applications for polyurethane include sun visors and parts in the trunk, Bolshakova added. ‘These are honeycomb structures made using a resin spray process and compression moulding,’ she explained. ‘This can be done quickly, accurately and at high volume and at the costs which the automotive industry likes. This area is where PU has gained significant recognition.’

However, in the more complex part of the composites world, structural and semi-structural parts, a lot of work has been done with epoxy-based matrix materials. ‘PU is gaining wider recognition, but it is still not widely adopted,’ she said. ‘But when we look at processability, PU is good choice for high pressure transfer moulding, wet compression moulding and pultrusion.’

A metal part cannot simply be replaced with a composite part as a one-to-one swap, she explained. ‘It requires a redesign, and this makes the thinking and development process more complex,’ she said. ‘The lightweight contribution is significant, but it needs to be combined with design for manufacturing and part simplification or consolidation to make parts production faster, and lower the total cost.’

**Jump the barriers**

Adient’s Gould said that, aside from design, there can be other barriers to overcome. ‘When you have industries that are really set up to manufacture in a specific way, be it auto bodies or seat structures, making a switch is a big deal,’ he said. ‘This applies not just to the product, but the infrastructure and legacy methods are really difficult to displace. When new materials come into the automotive industry it is often through niche products.

Production runs [for these] are often much smaller, so the commitment is less. If we decided to make a seat back in a composite and if it did not meet expectations or failed, the cost to backtrack could be huge.’

It’s important to remember that a seat is a safety product, he added. ‘It has to keep people safe and comfortable,’ he said. ‘Seats cannot endanger anyone and, as we have seen over the past few years, when a safety item goes wrong it has a devastating effect. The last thing car makers need is recalls.’

This explains the rate of adoption of polyurethane composites in automotive applications.

Not only do the materials have to prove themselves in a wide range of non-safety critical products like parcel shelves, a well-understood manufacturing infrastructure needs to be in place so that car makers feel confident in specifying them in high-volume, safety-critical applications.

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Gould: overcome the obstacles
It may be far from the most high-profile component in an electric vehicle, but the battery box performs a key safety and lightweighting role. Polyurethane can help.

Slung underneath the floorpan, it’s a hard life for the humble battery box on an electric or hybrid car. To survive, the box has to be tough enough to deal with damage from the road or to survive a side impact crash. Safety concerns meant that relatively heavy metal parts were normally used. But pultrusions using glass fibre and polyurethane matrix materials are gaining traction.

Galen Greene, marketing manager at Covestro, explained the attraction of battery boxes. ‘In the beginning, we looked at where else PU could be used, and at industry trends. E-mobility is quickly rising to the top.’

For Galen, the key question was whether polyurethane pultrusion offers strength benefits for electric vehicle battery packs. ‘We carried out a feasibility study where we looked at pultrusion in several different components,’ he said. ‘We looked at using polyurethane pultrusion in multiple locations, including the steel box which holds the batteries, the inner struts which add further structural strength and the bottom of the box. The last of these is the winning part so far.’

Irina Bolshakova, market manager automotive and transportation, Huntsman EMAI, added that pultrusion could be used for long, flat components, such as under-floor battery holders or the centre console. ‘That’s where pultrusion can be used as good technology,’ she said.

Good volume
Covestro has carried out work to find the best combination of metal and composite components for the structural elements of the boxes. ‘There is the potential to use polyurethane pultrusions as the outer box,’ Greene said. ‘In our evaluation, there was a slight detriment in crash performance by changing all components, including side walls, inner struts and bottom, to pultrusion. However, this design showed a weight benefit.’

But he said that while there is a weight advantage, it would need to be implemented in an actual car. ‘For this initial design, our evaluations found the best crash performance came from making the bottom section out of the material,’ he said. ‘This offered a significant crash performance benefit over a benchmark battery pack made from traditional materials.’

In a crash, the car provides front and back crash protection, but the box itself protects the battery from side impacts. Here, the uni-directional strength of pultrusions comes to the fore. ‘In this design, the pultrusion plates are 1.5 cm thick, and around 30 cm wide... seven panels side-by-side would equal the length of the passenger section where the batteries sit between the wheels,’ he said. ‘This aligns the fibre across the car so that it provides strength against side impacts.’

Mechanical fixing
The panels are mounted to the vehicle using bolts, and adhesive is used to seal the panels together and keep the weather out. In the Covestro design, the adhesive could also be a structural component, but its main function is to seal the box.

If an OEM is developing an electric vehicle from a blank piece of paper, they can position battery packs and motors in the ideal spot at the design stage. However, when converting an existing gasoline or diesel model to hybrid or electric power, batteries and motors have to fit in an existing chassis that was designed to house an internal combustion engine. These designs often will not accept a large battery pack and ancillaries. Manufacturers focusing on hybrids will face an additional challenge when trying to fit in the additional drive train. Many OEMs offer most models with either single or dual motors and different battery capacities, dependent on the performance and range requirements of their customers.

The battery box is the outer covering for a series of smaller internal boxes which house individual batteries. Usually, these compartments are separated with a number of struts.

Batteries are attached to the vehicle in a number of ways, they can be fastened to the struts, directly to the floorpan or they can be attached to the pultruded panels, explained Galen.

Stop the rattle
Esther Quintanilla, global & EMEAI mobility market segment leader at Dow Polyurethanes, said her company is interested in protecting battery components from vibrations, and the passengers from noise. This can involve innovative polyurethane foams.

‘It is important to protect the battery packs from shocks and vibration to ensure that they perform well for a long time, she said. ‘Foams used in these applications have to be temperature resistant,'
and have good resilience to protect the batteries.’

One of the issues with batteries is the thermal run-away effect, she added. ‘This is where batteries get very hot quickly when power is drawn from them, compared to a conventional combustion engine which gets gradually warmer over time,’ she said. ‘The temperature rises very quickly, almost in a step rather than any ramping action and this can cause a thermal shock.’

OEMs are already introducing new flammability requirements for battery insulation applications, for example the PV 3357 from Volkswagen. ‘Encapsulating the battery with thermally resistant foam helps to make the structure more stable,’ she said. ‘The foam used can be very similar to hood liners, and this battery packing application has grown tremendously over the past years. The foam is ultra-light, and can be produced similarly to a slabs block, or in a box controlling same acoustics and performance distribution very carefully all around the block.’

**Cushion the blow**

Densities can range down to 12–13g/l, Quintanilla said, but thin sheets of higher density foam may be needed to protect batteries in narrow gaps. Here, foams can be up to 300kg/m³ in density.

This is confirmed by Evonik, which has a range of Tergostab surfactants aimed at producers making insulation foams between 200 and 800kg/m³. Global marketing manager James Paul said that polyurethane foam can do more than insulate batteries from vibration.

‘Batteries have an optimal temperature, and if they get too hot or too cold it can notably impair performance,’ he said. ‘In regions such as Scandinavia, range can be notably lower than in warmer climates. This is made worse by the drain on batteries when occupants turn on the heat. In contrast, with a combustion engine, heat is a by-product which can be used to maintain a comfortable cabin climate. A team within our Advanced Polyurethane PL is working on solutions to insulate battery packs to help maximise the range of an EV.’

Quintanilla added that it is very important that the foam has the same properties in all directions in all parts of the block. ‘Although polyether or polyester polyols can be used, our formulations are based on polyether and they are usually MDI foams,’ she said. ‘OEMs don’t care if it’s TDI or MDI, but the foams need to perform following the OEM’s critical requirements for powertrain. Dow’s focus here is through its Voratron range of materials for battery packing, she added.

Why are materials companies interested in battery covers? Apart from the light weight and safety implications, it has a lot to do with volumes. As Covestro’s Greene said: ‘In the battery concept we have developed, there are kilogrammes of polyurethane. This could become the largest PU application in the car. Looking at projections for e-mobility, the maths quickly shows it can be very attractive.’
The traditional smell of a new car quite often depends on where you are from. It is either the smell of success, or something rather unpleasant. The molecules that make up the smell may be the same, but people’s perception of that smell will vary depending on where in the world they are.

James Paul, global marketing manager at Evonik, explained that odour is a big topic for his company. ‘People want to reduce the odour inside the cabin, with strong pressure coming from China and Japan,’ he said. ‘In Europe, if you buy a vehicle and the interior smells of leather, you think of it as prestigious. In China, the demand is for no odour at all.’

It’s also an important subject for Huntsman. ‘From our perspective, everything to do with emissions is not a nice to have it is a right-to-play issue,’ said Irina Bolshakova, the company’s market manager for automotive and transportation in EMAI.

**Impurity control**

Huntsman’s approach to reducing the chances of developing VOC in the seat moulding process, she said, is to look at everything they can control within the materials for polyol blends and MDI. ‘This means we have looked at impurities and compounds that were intentionally added, such as formulation components, or things which were not added deliberately, like contamination,’ she said. ‘These are the areas where we are working to reduce everything to a reasonable minimum. We make sure that we use intermediates and materials that have the minimum or make a minimum contribution to VOC creation.’

Evonik’s Paul said that this was a fairly common approach. ‘To reduce odour, formulators typically start with the main components first, such as polyols, before trying to eradicate odour from every single component, including additives,’ he said. ‘There’s a lot involved in trying to take down the odour rating.’

According to Bolshakova, Huntsman has extended this concept. ‘We conducted research internally to ensure there is a clear understanding what the primary and secondary sources of emissions are, and what are the effects of material degradation on the foams,’ she said. ‘This has given us a high confidence how we can meet growing OEM specifications.’

A number of chemicals have to be controlled; these are primarily acetaldehyde and formaldehyde precursors, and some flame retardants. ‘Unfortunately, VOC and FOG chemicals are not all created during the moulding process,’ she added. ‘That could be hard to manage, but would be a single stage in the process, their precursors can develop over time.’

Huntsman is also looking into materials manufacturing and storage, she said. The aim is to exclude the negative effects of storage, and the possibility of contamination of raw materials. All of these could lead to an increase in the emissions.

Additive manufacturers are already aware of the need to reduce VOC and FOG levels. ‘Formulators are placing an ever-increasing focus on emissions, with a continuing drive to lower aldehyde levels,’ Evonik’s Paul said. ‘We have projects in place to further optimise our established DABCO NE catalyst range, and are developing new scavengers that can remove acetaldehyde and formaldehyde from systems.’

His colleague Eva Emmrich-Smolczyk, senior technical manager for automotive in EMEA, said it is important to remember that the perception of odour is more complicated than it might first appear. ‘To significantly improve it, you have to reduce the amount of odour-bearing substances by about 95%,’ she said. ‘It is a logarithmic function, and not a linear function. This has a big impact on the odour improvement process.’

Another important factor in odour is not only the concentration, but the threshold, she claimed. ‘You might already achieve a very low concentration of a substance, but the smell is so intense that even with such a low threshold it can still be smelled at a very low concentration,’ she said.

**Driving down aldehydes**

However, if that substance is an additive that is an important component of the formulation, it may not be possible to eliminate it – and the associated odour – completely. Another approach is to neutralise unwanted molecules. Evonik is close to launching a second-generation product that will be much more capable of scavenging all aldehyde types including formaldehyde and acetaldehyde. This has been developed using technology that Evonik acquired with its purchase of AirProducts in 2017.

Scavengers are designed to be used in formulations at levels which are typically between 0.2 and 1.0 parts per hundred polyol (pphp), depending on the polyol being used, Emmrich-Smolczyk said. They need to react with the aldehyde, without influencing the reactivity profile. ‘Our latest development has involved finding a substance which is process friendly and does not interfere with the kinetics of the polyurethane reaction,’ she said.

Like comparing the comfort of the seats, comparing smell is a direct, simple comparison that consumers can make between brand. So car makers, seat makers and raw material suppliers are searching for a level playing field with the interior smell of cars reduced to a minimum.
To do this the industry needs some common ground. You need good regulations like a bedrock across the industry,’ said Brent Hodge director of foam engineering at Adient. ‘That is really needed right now.’

The current situation, where there are up to 150 different OEM standards in the area, is complex. This complexity leads to high testing burdens, complicated raw materials and parts logistics, and potentially higher costs.

For Tier 1 suppliers like Adient, which are at the interface between chemistry and car makers this is important.

‘You end up with custom tailored chemistry which does not suit a large manufacturing plant that supports multiple customers. It is very difficult to meet all of the requirements,’ Hodge explained.

A testing problem

But, help could be at hand. Work is underway in the US to help forge a global consensus on VOC and FOG. The independent Molded Polyurethane Foam Industry Panel’s VOC workgroup is in the process of developing a roadmap as an industry standard to guide companies testing PU foam emissions. The plan is that this will provide detailed protocols for best practice across all the steps involved. These include demould, sample preparation and harvesting, packaging, shipping to the analytical lab, which analytical method to select, and how the results should be expressed.

Importantly, it will provide a proposed industry standard that will address the needs of OEMs across all three of the major markets: Europe, North America and Asia. It will make use of consensus standards from ASTM International, ISO, SAE International and VDA, alongside existing automotive test methods.

Since the group’s presentation at the 2019 CPI meeting in Orlando, significant progress has been made. ‘We have collected and categorised more than 50 VOC standards,’ said John Sebroski, who is a principal scientist in environmental analytics at Covestro, and chairs the VOC committee at SAE International. This committee supports the development of global specifications and procedures for the determination of volatile organic compounds from road vehicle interior materials, components and vehicle cabin air.

The panel has now developed a protocol for a comprehensive review of the standards, and also a template containing key parameters for review, to identify similarities, conflicts and potential areas that might require further clarification or research.

Work in progress

SAE Work Item J3233 has been created. This is a standard that is now under development, and will describe a harmonised approach to measuring VOCs from polyurethane foam used in automotive seating. ‘The standard will address the interests and requirements of OEMs and other stakeholders,’ said panel member Jennifer Holtz, an analytical chemist in the advanced materials and system research group at BASF.

It will leverage existing consensus standards combined with current automotive OEM test methods to address four important points. The first of these is foam processing and handling, sample production, conditioning, packaging, storage, shipment, and specimen preparation. Secondly, there will be test methods to measure VOC emissions, such as chambers, air sampling and analytical methods. The third point includes data analysis and expression of results. Finally, there will be a unification document, including a description and flowchart of combined documents. The result will be a comprehensive VOC roadmap.

The foundation for building the new roadmap is SAE J2989, Handling and Packaging of Materials and Components for Emissions Testing. This is a general standard applicable to a variety of materials, and the panel is working to create a document specific to polyurethane foams. ‘To accomplish that, we are reviewing existing standards to identify similarities and derive best practices. Sebroski said.

Collaborative effort

The process has had its issues. ‘It was challenging to identify and collect the various VOC standards in use from consensus organisations or OEMs, but a collaborative effort was made by the industry panel and the OEMs,’ said Kelly Kiszka, a PU applications development chemist at Dow, and another panel member. ‘Publicising the effort and soliciting feedback was accomplished by participating in conferences, distributing surveys, and publishing scientific papers and journal articles.’

Representatives from the industry have expressed concerns, too. [Some have said] they do not want to write material specific standards for evaluating every material used in the interior of a vehicle cabin,’ Holtz added. And it may be difficult to change standards because it would cause difficulties with comparison to historical data.’

The roadmap is an ongoing endeavour, and the target date for publishing this SAE standard is 2022, Kiszka explained. ‘Progress has been made towards the harmonisation of global VOC standards, and collaborative efforts by global automotive manufacturers and suppliers continue,’ he said.

The panel continues to work with OEMs, suppliers, and key contributors to the industry to communicate the importance of harmonisation of VOC standards and relevance to the business. And they are optimistic that harmonised specifications that are acceptable across all three regions will be achievable. ‘Results from the survey showed overwhelming support for harmonising standards,’ Sebroski said. ‘We are optimistic because we see a strong interest across the industry.’
Hennecke and Frimo: in partnership

Just before coronavirus paralysed Europe with a series of national lockdowns, Hennecke and Frimo announced they were pooling their expertise in an automotive alliance. Has the cooperation frozen solid, or have the companies been able to progress the project? Simon Robinson finds out.

The cooperation includes machinery and equipment to make instrument panels, door panels, armrests and the whole interior, including seats. Overmoulding injection moulded parts with polyurethane is also included in the cooperation agreement. Machinery to make battery enclosures using polyurethane technologies could be important in the future, Wildt said.

The agreement is worldwide, and Bonsch explained that, despite coronavirus, the first projects have been won, and the first products delivered implemented and ramped up. The cooperation has been going on for five months and they are already working on 100 opportunities and projects.

Nice surprise

'We were positively surprised by seeing that number today,' Wildt added. 'We expected a much lower number because of coronavirus. We thought that customers would resist placing orders or may not plan orders, but it seems that a lot of things moved in the right direction.'

Bonsch added that there are some nice projects coming up in China. 'The cooperation in Europe is working very well,' he said. 'In the US, there is also huge potential, and the teams are getting closer together.

Wildt believes that a lot of the products are enablers for the automotive industry to survive the current crisis. 'They need new products and models around e-mobility, where we have a lot of applications,' he explained. 'Without this the automotive industry won’t survive. They need our technologies.'

The two CEOs are in agreement that the cooperation is working well around the world. 'We spent a lot of due diligence to make the cooperation right,' Wildt said. 'We burnt a lot of midnight oil between last year between October and December. We took a lot of time to define the cooperation and how we would communicate it into both companies and the market at the same time.'

Cross sell

Thomas Wildt, Hennecke’s CEO, added: ‘At Hennecke, we concentrated our mixing and dosing technology here in Germany. We have much more horsepower at the headquarters in Sankt Augustin; we have many more people and a strong R&D lab that supports the Automotive Alliance.’

The companies decided that something was missing from their individual approaches to the automotive market. Frimo had invested in the dispensing, metering and mixing side of the business. But, as Bonsch explained: ‘We carried out a lot of development, but much more effort would be needed to really become the best expert in that area. That’s why we bundle strengths in the alliance and focus on our core business.’

For Hennecke, Wildt said: ‘We always purchased tooling and we had to integrate it into our machines. This cooperation means we have now in Sankt Augustin, a centre of competence for mixing-dosing technologies.’

Bonsch said that Frimo’s R&D team was now focused on the engineering side of the business. Wildt, meanwhile, said that his company had given up some revenue in the third-party market. But, he added, the cooperation should help both companies to grow their profits. ‘We concentrate on the things we are good in and we rely on a strong partner on the other side where we are not that specialised. It also gives us a margin expansion,’ he said.

Expand margins

This growth comes in several areas. First, it helps the companies to deal with the competitive pressures in the automotive supply chain. As Bonsch said: ‘Customers expect a perfect adaption of our system to their component [and] they have very, very strong ideas on pricing and are very economical.’

He believes they can have the best of two worlds. ‘We can have a system which is very individual to the customer,’ he said. ‘And we are using standardised parts of the system, like the Hennecke wet part. That helps us to be fast, flexible and address customer needs very directly. I think that the market has been missing this.’

In addition, the alliance brings benefits because both company’s sales forces can pitch it to their clients. ‘It is very important that we drive the cooperation so that one plus one is more than two,’ Wildt said. ‘By adding our capabilities, we want to create more than we could have done in the past separately.’
Many automotive components, such as steering wheels and seat cushions, are commonly made from moulded polyurethane components. If getting the polyurethane formulation into the mould in the right way is an art form, so is extracting the moulded part. Release agents are often required to assist in this process, and to help ensure that the part has the correct surface finish.

Concentrol has developed a range of hybrid mould release agents that contain 30% solvent. The company said this gives products that maintain efficient mould emptying, and also reduce the amount of VOC in the workplace. This is good for employees on the shop-floor and also the environment, it claimed. They also have lower flammability ratings than solvent-based release agents, making them easier to transport and store.

The products are emulsions that contain water, emulsifying agent, 30% solvent, and 4-8% hydrocarbon waxes, which act as the release agent. The solvent is important, and must have a flash point greater than 62°C. Concentrol said its solvents do not contain benzene, and have levels of aromatic compounds below 20ppm. This means there is almost no odour, and the emulsions have low surface tension and low electrical conductivity.

Companies switching from existing release agents to these hybrid materials need to make minimal changes to the production line, Concentrol claims. Drying times may be longer than conventional release agents, and stainless-steel moulds and pipework are preferred. The release agents should be applied using an aero graphic or air-mix nozzle at between 0.3-0.5 mm diameter and 2-4 bar pressure.

‘Moving to a 30% system reduces the cost of the release agent, as there is less solvent in the formulation, and a further 20% reduction in VOC released to the atmosphere [compared to 50:50 systems],’ it said. Finally, because the release agents are less volatile than solvent-based systems, they are easier to transport and store.

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London – The total production of polyurethane products in the Americas was set to reach 5.29 MT in 2024 before coronavirus hit, according to IAL Consultants. This represents an 11% increase on the 2018 figure of 4.75 MT. North America accounts for the lion’s share of this, with a 2019 output of 3.58 MT, nearly three-quarters of the total. The US is by far the largest individual producer, followed at some distance by Brazil and Mexico.

Although South America has been affected by economic woes in recent years, PU production has been recovering, apart from in Venezuela. Growth rates are highest in countries including Peru and Colombia, albeit from a low base. The region remains susceptible to raw material price increases, and supply shortages with a lack of domestic producers.

Rigid foam predominates in the North American end-use market, followed by flexible foam. Production volumes for CASE are considerably lower. Mexico remains the growth driver for the region.

The report, PU Chemicals and Products in the Americas 2020, is available from IAL Consultants, priced €12,250.
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