



Driving innovation

The North American automotive market has high expectations of its suppliers.

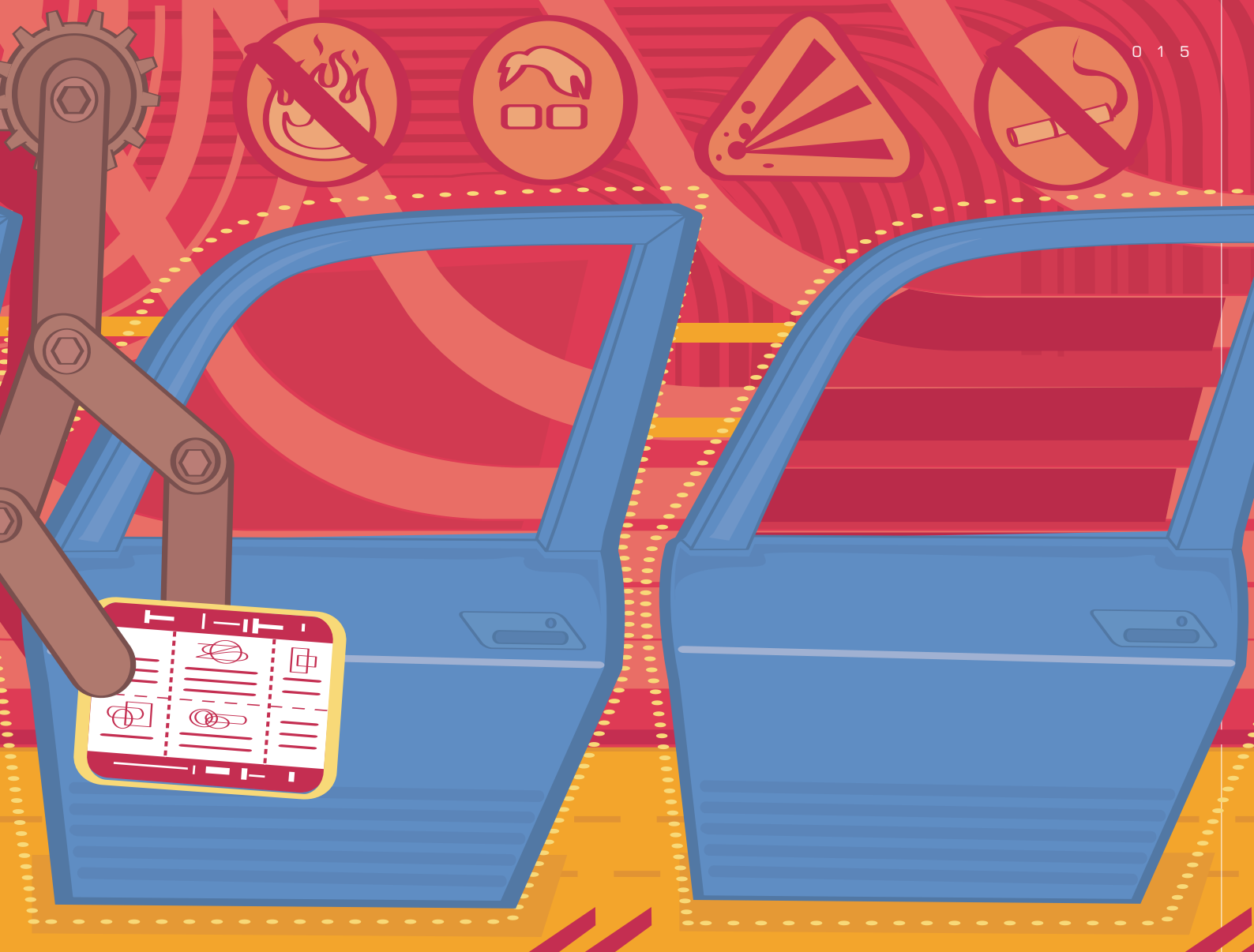
Converters face fines, annual cost-downs and the pressures of a globalized industry.

Katy Wight reports

There are only a small number of converters that meet the criteria – and have the guts – to work with the automotive industry in North America. Since Detroit’s heyday in the 1950s, intense competition from abroad and globalization have created an aggressive and just-in-time supply and manufacturing culture. The automotive original equipment manufacturers (OEMs) are increasingly placing heavy burdens on their suppliers – including label converters – to innovate, attain quality and continually save them money.

As a supplier to the OEMs, converters are as highly regulated as other major component suppliers. In fact, labeling plays one of the most crucial roles in optimizing the supply chain through parts marking and tracking, enabling the manufacturer to produce its most competitive vehicle.

‘About 20 years ago, statistical process control was introduced to the automotive industry,’ says Steven Pasbjerg, director sales, Schreiner Label Tech, Michigan. ‘Quality was generally quite poor before this, and about three per cent of parts were faulty and could disrupt basic vehicle systems. American cars got a pretty bad



reputation back then. The objective now is to reach zero faulty parts per million.'

Schreiner Label Tech is a subsidiary of Schreiner GmbH & Co KG of Germany, a company with an annual turnover of \$70 million, half of which is from the automotive industry. The North American office was launched five years ago to support the automotive electronics manufacturers Siemens and Bosch, which were transplanted from Germany to support OEMs like Volkswagen and BMW. Schreiner Label Tech's customers are predominantly tier one suppliers to the automotive industry (75 per cent), but it also supplies directly to the OEMs and would therefore be classified as a tier one supplier itself.

'The OEM requirements are extreme,' says Pasbjerg. 'The auto industry is more stringent than anything other than the pharmaceutical industry. A large percentage of our expenditure is in meeting OEM requirements and it's a big hurdle for any converter that's considering entering the market.'

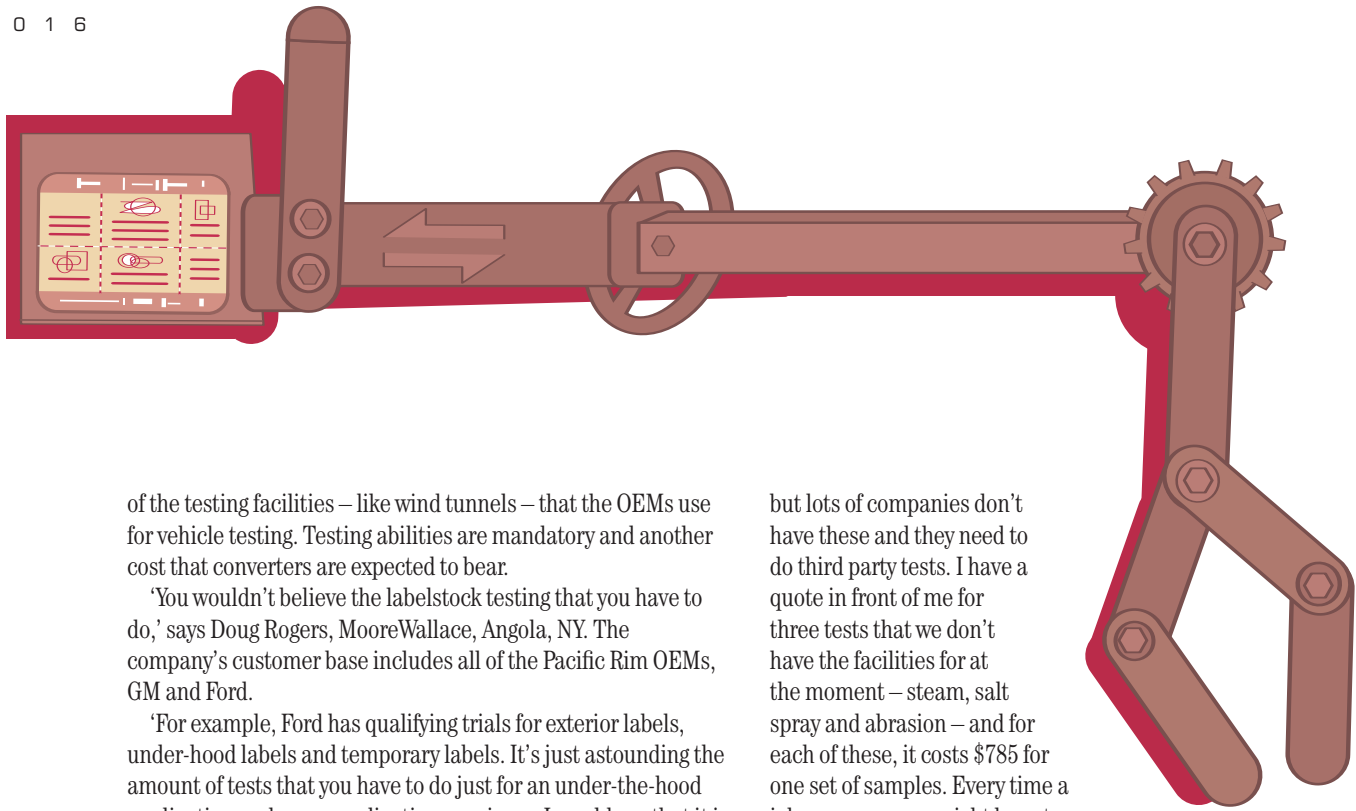
Converters need a high level of certification – ISO 9002, ISO 14001, QS 9000 (which is more difficult and more expensive to attain than ISO) and the newest level, TS 16949. Not only do you have to comply with the standards, but it is actually very expensive to get qualified. Label production itself has to be highly controlled using statistical processes and traceability,

from raw materials right the way through to the customer. You can't afford to make a mistake.

'We have a culture where it doesn't matter what time the OEM calls, we are there for them. We understand that they cannot afford to shut down a production line,' says Keven Hayes, executive vice president sales and marketing, Whitlam Label, Michigan. 'As a supplier, we understand that substantial rework penalties can occur. That means if you have an error or a label that can't be read, it can be very financially expensive – particularly if it is a two-cent label that has caused the problem. We have a number of controls to make sure that this never happens'

Whitlam label was the first label converter in North America to get TS 16949 certification for its manufacturing process and ability to supply customer satisfaction metrics, and also achieved UL/CSA in 2004, which is a quality mark for the electronics industry. Over 30 years old, Whitlam has been servicing all of the major OEMs since the 1980s and now also supplies other tier ones like Johnson Controls, Visteon and Delphi. Whitlam has over 20 flexo presses in its Michigan facility and recently beta-tested and invested in the new Jetrion 3025 drop-on-demand inkjet system for variable data labels.

Whitlam has a complete in-house testing facility, but operating just outside Detroit means that it also has access to all



of the testing facilities – like wind tunnels – that the OEMs use for vehicle testing. Testing abilities are mandatory and another cost that converters are expected to bear.

‘You wouldn’t believe the labelstock testing that you have to do,’ says Doug Rogers, MooreWallace, Angola, NY. The company’s customer base includes all of the Pacific Rim OEMs, GM and Ford.

‘For example, Ford has qualifying trials for exterior labels, under-hood labels and temporary labels. It’s just astounding the amount of tests that you have to do just for an under-the-hood application and as an applications engineer, I would say that it is a major trauma.

‘If we are looking at printing the frame label for a Ford truck, it might require \$14,000 worth of testing. The sales team is pushing hard to pick up the Detroit big three – Ford Motor Company, DaimlerChrysler and General Motors – but you have to weigh up, after the cost of all the tests, what you have to gain.’

The under-hood label is the most durable application in a car. Ford has an A4-sized under-hood label which MooreWallace tested for its appearance and adhesive performance at 125 degrees centigrade after 72, 121 and 1,000 hours. The label also has to be tested against steam, air pressure, chemicals, battery acid, humidity and then it goes through numerous environmental cycles – ten hours each at –40 and 121 degrees centigrade. The OEMs want to ensure that the labels will be more than good enough for the job.

‘We have a certain amount of testing equipment here,’ explains Rogers. ‘We have a hot and cold cycle from freezing to humidity, heavy duty UV exposure and paper testing equipment,

but lots of companies don’t have these and they need to do third party tests. I have a quote in front of me for three tests that we don’t have the facilities for at the moment – steam, salt spray and abrasion – and for each of these, it costs \$785 for one set of samples. Every time a job comes up you might have to undertake 13 lots of jobs and it costs to farm them out.

‘As a company we are having an internal fight,’ he adds. ‘From my point of view as an applications engineer and that of the sales department, there are tremendous opportunities to follow, but manufacturing is the one who will have to bear the cost.

‘The market is shrinking as former players are bowing out because they don’t have ISO or they don’t want to pay for all the required tests.’

The past twenty years has seen a major shift in responsibility from the OEM to its tier one suppliers. Automotive Engineering 2010, a research report prepared by Roland Berger Strategy Consultants in 2004, predicts that suppliers will be responsible for nearly 60 per cent of the industry’s research and development work by the end of the decade, compared with 40 per cent today. This has thrown up a number of challenges for label converters.

Lisa Koval, director of marketing, Automotive Products Division, Avery Dennison, explains how working practices have adapted: ‘Most of the North American labels are driven by government regulations and not because the OEM necessarily wants them,’ she says. ‘The OEMs have pushed a lot of that responsibility onto the tier ones. Now that we are providing labels directly to the parts supplier, we have had to adjust to labeling different materials. For example, we have had to work out how to label a plastic component at origination, when it is fresh out of the mold. As a result we have had to develop new adhesives and techniques.’

Despite significant increases in product content and complexity, OEM research and development budgets have remained flat and are expected to remain so in the future – the price of an average vehicle, based on the US producer price index of motor vehicles has remained virtually unchanged since 1993. Who is bearing the brunt of the costs?

‘Over the last five years, the OEMs have insisted on cost-downs,’ says Hayes of Whitlam Label. ‘After a while you can’t achieve the reductions though price cuts alone and we have had

RFID

The Automotive Industry Action Group has a standards committee that has been educating the industry about RFID so that when the technology is mature enough, it will be ready. Avery Dennison is an AIAG sponsor member.

‘There is a lot of interest in RFID, but the automotive industry hasn’t proved the business case yet,’ says Koval. ‘Everyone talks about the cost of the tags, but it is the cost of installing the necessary infrastructure that is inhibiting.

‘In terms of the tags, we have a solution in place. We have been working on tags that will work in an automotive environment, where there is a lot of metal, heat, dirt and oil. The products are here, so the prices will start to go down.’

In the short term, RFID will really make sense for tracking non-line of sight and security components like airbag systems. Eventually, RFID could be the cornerstone of customized cars, chosen online and shipped within days.

Jim Williams, founder of Polyonics, outlines some of the harsh environments that automotive labels must withstand:

Catalytic converters

In the manufacture of catalytic converters, barcode labels can be used to identify the ceramic materials used throughout the manufacturing process. The labels must also be made from a ceramic material, so that when the 'green' or unfired ceramic core is fired to become a true hard ceramic, the barcode information is fused into this core. The information is permanently available for automatic identification further downstream, as the catalytic converter assembly becomes part of a vehicle.

Batteries

Barcode labels are commonly used in the manufacture of batteries for automotive products. The labels may be made of polypropylene which resists sulfuric acid spills encountered in the battery manufacture. Acid resistant adhesives are required for the same reason. High temperatures may also be encountered due to the heat generated in the battery charging process.

Masking

Special label constructions are very common in painting and metal finishing operations. Labels are often masked with a protective lamination as they are applied to a metal part, prior to painting. After the painting operation is complete, the lamination layer, now covered with paint, is removed to reveal the pristine label underneath.

Historically, these labels and laminations have been made from special heat resistant polyesters. With the advent of higher temperatures required for powder coating

operations, alternative films may be required, such as PEN or PEI. Special adhesives are also often required due to the rough or porous nature of the cast metal parts (such as axles) prior to the metal finishing operation.

Tires

Special adhesives, coupled with polyester films are required in tire manufacturing. The label is printed, and often laminated, and applied to the 'green' rubber of the tire before it is vulcanized. It must withstand the high temperatures (300-400 F) encountered in vulcanization to be useful for product identification and inventory control in the value chain of the final vehicle. Similarly, labels have been used for identification of fan belts, rubber hoses, or other rubber components necessarily used in the vehicle.

Exhaust

Labels are also used to identify tailpipes, mufflers, or other parts of the exhaust system which will encounter higher temperatures. Polyester materials tend to be used, although in some cases polyimide labels have been used, when temperatures exceed 400 F for extended periods of time. In some cases aluminum labels with silicone adhesives have been used.

Interior

Labels for use in the passenger compartment must be flame retardant in accordance with FVSS 302 (Federal vehicle safety standard). Identification tags for cloth covers or upholstery, and labels for seat belts must be durable and wear resistant. Flame retardant Tyvek (DuPont), Tedlar (DuPont), vinyl, and polyester are commonly used, depending on the precise requirement.

to achieve our targets through innovation.'

Supplier integration is seen as critical, as suppliers assume a larger role in the vehicle development process. Avery Dennison has been supplying to the North American automotive assembly plants for forty years and is realigning its working practices to meet the needs of the industry today.

'The growing demands of the OEMs has changed the way that we do business,' says marketing director Koval. 'Labels are a low-spend component and we are always at the back end. At the end of a model launch they decide that they need a label, but it is actually a very critical component. In 2004 we revamped our APQP (advanced product quality planning) process to get involved at the design stage with our customers. We aim to maintain close ties with design at the OEM and through the supply chain. Our more sophisticated clients have already

caught on to this.'

Thirty per cent of Avery Dennison's Automotive Products' sales revenue comes from new products that have been introduced in the last five years. Koval explains that continuing to drive innovation is a challenge. Consolidation between the tier one and two suppliers is frequent and the buyers that Avery Dennison usually works with are entry-level employees with a fast turnover. The company continually has to plough effort into re-qualifying products every time there is a merger, acquisition or staff change.

Another problem arises when tier one and two suppliers go to non-certified label converters. Hayes of Whitlam Label says that OEMs are unlikely to purchase from unqualified suppliers, but it is possible that a tier one supplier could do it unwittingly.

'There is a definite lack of quality and consistency where tier

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Pressures from supplier integration:

Steven Pasbjerg, director sales, Schreiner Label Tech

- When you are submitting a part, you need to have a PPAP (production part approval process). This requirement was introduced about 12 years ago. A PPAP for a label costs just as much as it would for a major component.
- DaimlerChrysler requires that we check their website five times a day to check our products haven't incurred a non-conformance. They won't call you anymore. Instead of the four or five engineers that did the job in the past, now they just have one.
- Now, all of the engineering diagrams have to be in the individual OEMs' specified format and everybody's drawing formats are naturally different. We have to be able to provide every format.

one and twos have gone to non-certified printers,' he says. 'I recently did some label surveys with OEMs and there was a number of issues we saw in cars that had been used for several years – the labels were peeling off, fading, yellowing, they weren't resistant to oils, brake fluids, engines shampoos, abrasion and other problems cropped up that stemmed from environmental factors such as extremes of temperature.'

The Globalization of the automotive industry

'At present, the capacity to supply products to any part of the world and to solve problems that may arise, is a required condition for any company working in the automotive industry,' says Roger Puente, marketing manager, DISA Autoadhesivos, Spain. Converter DISA was founded in 1963 and has focused its activity on the development and marketing of specialized, high performance self-adhesive products. It has an annual turnover of Euro 22 million and exports to 51 countries. Spain is ranked sixth in world vehicle production volumes and DISA converts labels for all of the major global vehicle OEMs, as well as domestic European brands. Puente says that OEMs in Europe have the same high requirements and suppliers face the same pressures as the North American industry.

'Manufacturing moving offshore is one of the present challenges,' says Puente. 'The moving of factories toward zones

Why are the OEMs labeling?

- Warning and safety labels to ensure passenger safety and reduce liability and insurance costs
- Security, anti-counterfeit or anti-theft
- Parts marking or tracking to produce competitive vehicles by optimizing the supply chain
- Branding



(Bottom right) Roger Puente, marketing manager, DISA Autoadhesivos, Spain



of lower production costs is at the same time a threat and an opportunity, depending on how this change is confronted.'

The automotive centers of engineering remain in Detroit, Japan and Germany whilst the manufacturing side has definitely seen a shift to Latin America, China and Korea. Detroit still attracts OEMs because of all the engineering, testing and





outsourcing resources available in the area, but manufacturing has definitely slipped somewhere south of that.

As many of the OEMs and tier ones have moved to Mexico to exploit lower labor costs, the label converters have been forced to follow. Like Whitlam, who acquired a plant along the Mexico border at the end of 2004, many converters see the benefits of 'maquiladoras' (also known as 'twin plants'). Maquiladoras are manufacturing plants in Mexico owned by a parent company in the US. Companies operating in the US can send equipment, supplies, machinery, raw materials and other assets to Mexico for assembly without paying import duties. The goods can then be exported back to the US or another country.

In the past ten years, two significant regional trends have been the decline in Japan's share of world production and the increase in Asia and other developing markets. The decline in Japanese production is to some extent the result of deliberate decisions by Japanese makers to invest in production facilities closer to their main markets.

'It's difficult penetrating the Japanese market without having manufacturing in Japan,' says Koval of Avery Dennison, 'but the Japanese OEMs that have come to North America to manufacture or assemble have been a significant opportunity for us. We are expecting this business to grow.'

'The Japanese big three (Toyota, Honda and Nissan) are very different to the Detroit big three. It's difficult to get qualified with the Japanese, but once they're with you, they'll stick with you. They are more profitable and they value innovation. The Detroit three are very aggressive. Their cost pressures must be very acute as it is a declining market, but they are driven by short-term thinking in comparison to the Japanese.'

Counterfeit parts

It's estimated that counterfeit parts cost the automotive aftermarket over \$12 billion in lost sales and if these losses were eliminated, the auto industry could hire 200,000 additional workers. Even more pressing, is the inferior quality of some of the fake parts in circulation. There have been cases where crucial safety components such as brake pads have been made of materials like cardboard and OEMs are finding ways to crack down.

'Counterfeit parts and reimportation are potentially a very big issue,' says Pasbjerg. 'We believe that this area could be a significant opportunity for Schreiner and could account for up to 20 per cent of our business in the US.'

Kevin Hayes of Whitlam adds: 'We produce a number of security solutions for the OEM. The need for security solutions has emerged in the last five years, mainly due to the "gray" market: the first two shifts are producing genuine parts, while the third shift is going off to the gray market.'

Cultural differences can also be a barrier to growth. Koval says that Avery Dennison has easily influenced Ford and GM in Europe, but has found that the domestic European OEMs already have their own well-established suppliers and are resistant to change. But, Avery Dennison is well placed to conquer foreign business.

'Avery Dennison has manufacturing, sales and distribution worldwide and we can leverage ourselves on that presence,' says Koval. 'You need to have dedicated business development resources regionally.'

These resources have enabled Avery Dennison to enter the Chinese market. Koval says that China has become a significant growth area for the company because of all the new car parts that are being manufactured there. With the famed rise of the Chinese middle class, OEMs like Ford, GM, DaimlerChrysler, Mercedes and BMW have all moved into the region.

'The cost of labor is so cheap,' says Pasbjerg of Schreiner Label Tech. 'I believe that in the next ten years it will be one of the biggest exporters of cars in the world. At the moment production is just serving the local region. We are looking at China in terms of establishing another manufacturing plant. With the projected growth in the Chinese market, it is only logical. This might also give us the ability to supply to Indonesia, Korea and possibly India.'

'You have to be able to cater to the whole world in order to survive,' he concludes. ■

