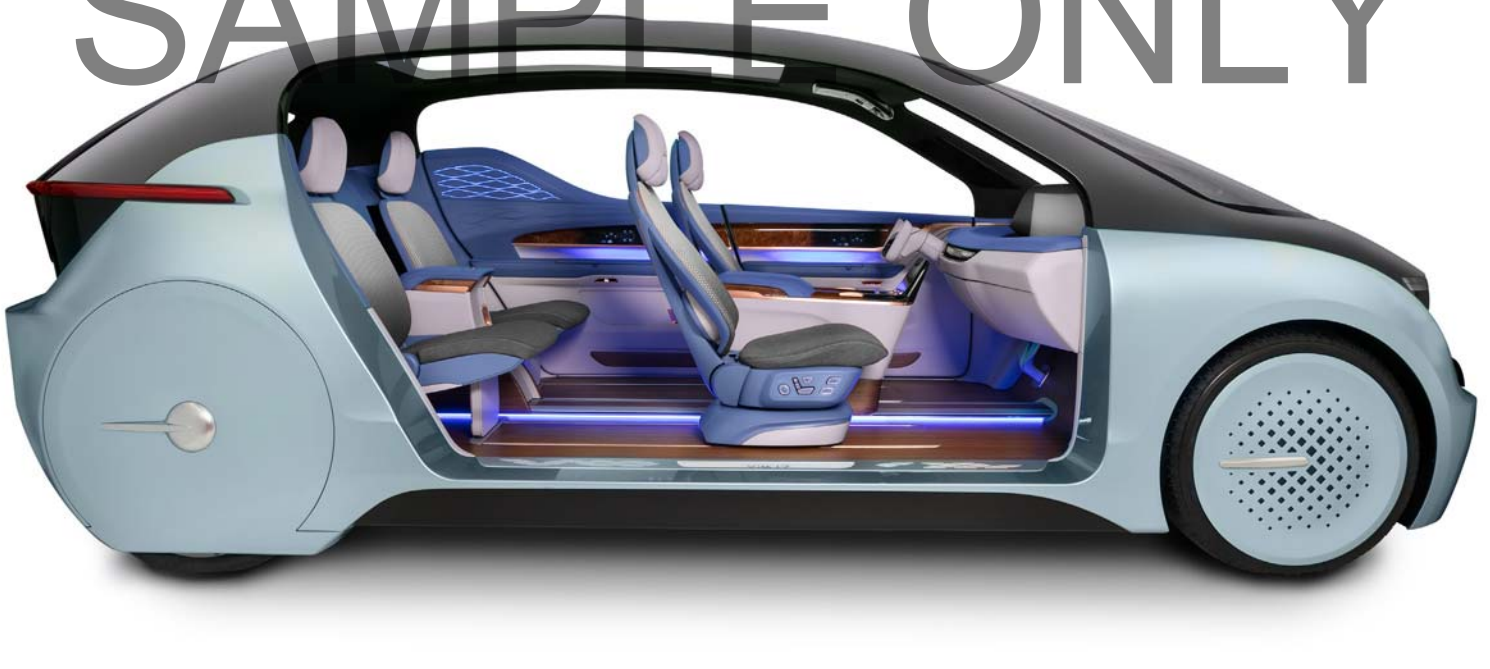
5th Edition

Automotive Textiles
Market Report

Preparing for total transformation



Adrian Wilson

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Automotive Textiles

Preparing for total transformation

5th edition
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1. Introduction

There is currently frenzied activity and investment taking place to commercialise self-driving cars, involving both the established vehicle manufacturers and the technology giants of Silicon Valley. It is not an exaggeration to say that this could completely reshape the landscape of the global automotive industry once again – even after the massive shifts that have occurred since the beginning of the 21st century.

As Swamy Kotagiri, chief technology officer at leading Tier 1* supplier Magna International has observed, both suppliers and automakers are pushing the pace of technology as never before. In the past five years, he notes, more than 1,700 disruptive companies have introduced new technologies that could be applied to the automotive industry. At the same time, millions of students are learning about robotics, user experience design, machine learning, computer science and dozens of other fields that will impact transportation in the future.

For Patrick Koller, chief executive officer of another leading Tier 1 automotive components supplier, Faurecia, China holds the key, having set its sights on becoming the technology and innovation leader in the new domains of artificial intelligence, the internet of things, 5G, etc. Koller believes China's giant communication and consumer electronics companies, such as Alibaba, Baidu, Huawei, Tencent and Xiaomi, will become as internationally ubiquitous as Ford or General Motors or even Amazon, Facebook and Google in the coming years. (Faurecia is one multinational that has rapidly repositioned itself in response to the anticipated changes.)

Silicon Valley and the tech industry have poured billions of dollars into partnerships and design teams in the push to create self-driving cars and the traditional original equipment manufacturers (OEMs) were not immediately ready for this. They have, however, been faced with a simple choice:

- surrender a lucrative portion of business to Silicon Valley and risk ending up becoming mere subcontractors, making the shells to which sensors and software are added. In the longer term, this implies not only much lower profits, but also the loss of revenue from maintenance and service and a lesser relationship with car buyers;
- treat the technology companies as suppliers and learn how to build autonomous vehicles in-house.

Not surprisingly, they are going for the second option.

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* The terms Tier 1 and Tier 2, which are most widely, but not exclusively, employed in the automotive industry, are not official designations and neither do they reflect how big or influential a company may actually be.

Generally they refer to who the end-user of a company's products is, with Tier 1 manufacturers supplying directly to the OEMs – the name-brand car makers – often on a "just in time" or "in-sequence" basis, with materials and components assembled to specific orders and delivered on a pre-determined schedule directly to an automotive assembly line. As a result, the manufacturing plants of Tier 1 companies are generally in close proximity to their customers.

In turn, a Tier 2 supplier will sell to a Tier 1, and a Tier 3 to a Tier 2, often on a much less carefully structured basis and on negotiable current market price points.

It also should be noted that the two industries have very different objectives and agendas. The wish of the established automotive industry is naturally for business as usual, with car ownership continuing to grow, which now seems unlikely in the long term. The unstated goal of the tech industry, meanwhile, is the complete elimination of car ownership and its eventual substitution with fleet-owned autonomous vehicles as a super-networked global public transport system.

How these two very different objectives will be reconciled is the story yet to unfold.

Electric vehicles

In the nearer term for the automotive industry, battery electric vehicles (BEVs), hybrids and hydrogen fuel cell developments are the focus of intensive research and development initiatives and a field in which combined Chinese companies currently have a significant lead.

Several initiatives have served to boost development work, such as the introduction in 2017 of the EV30@30 campaign by energy ministers and other high-level delegates from 24 member countries and the EU.

This aims to speed up the deployment of electric vehicles – including battery-electric, plug-in hybrid and fuel cell vehicle types – to the extent that they account for at least 30% of all new vehicles sold globally by 2030. Individual countries, including both the UK and France, have also announced that the sale of petrol and diesel vehicles will be banned by 2040.

Some 1.3m BEVs were manufactured in 2018, representing less than 1% of total car and light vehicle production.

At the same time, this represented growth of 51% on 2017 BEV production, compared

Table 1: OEM shares in battery electric vehicle production, 2018

Company	Volume ('000)	%
Renault-Nissan-Mitsubishi	299	23
Tesla	195	15
BMW	140	11
BAIC	130	10
Geely	78	6
Hyundai	52	4
BYD	52	4
Chery	39	3
Jiangling	39	3
JAC	39	3
Changan	39	3
General Motors	39	3
Others	159	12
Total	**1,300**	**100**

Source: TMS

Adler Pelzer

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In March 2016, the Adler Plastics Group took full ownership of German company HP Pelzer to create an automotive components powerhouse, Adler Pelzer, with 60 plants in 21 countries, around 11,000 employees and a turnover in 2018 of €1.47bn.

Adler Plastics was founded 63 years ago in Ottaviano, Italy, a town of 23,000 people, 20 km from Naples under the shadow of Mount Vesuvius. Over the years it has specialised in components, such as rubber-based mouldings and airbag housings, and has also been responsible for developing carbon chassis structures for Alfa Romeo and Ferrari sports cars.

Founded in 1969 in Witten, Germany, HP Pelzer expanded into a global organisation with plants and research and development (R&D) centres in Europe, North and South America, and Asia.

Specialising in the production and development of acoustic and trim parts employing various materials, it was the development of special technology for the application of polyurethane foams and materials, such as advanced nonwoven fabrics, in the 1970s that led to HP Pelzer's continuous growth in international sales and global expansion.

In 2007, experiencing financial problems, Pelzer, a German family-owned business, was taken over by a group of finance investors led by investment bank Goldman Sachs, but a year later – and the year after that – suffered heavy losses.

HP Pelzer was consequently the subject of a management rescue package takeover backed by Adler Plastics, aiming to get it back into profit, along with restructuring measures to save more than €100m in the period from mid-2009 to 2012. Any expansion by acquisition was put on hold during that period, as the group sought to get back into shape.

Progress was subsequently brisk, and between 2009 and 2011 Adler upped its stake in the business to 52% and acquired the remaining 48% in March 2016.

By 2012, HP Pelzer was reportedly producing more than 350,000 automotive parts a day, with insulation materials accounting for 40% of its output, carpet 30%, trim parts 20% and miscellaneous other automotive and non-automotive materials the remaining 10%.

Adler Pelzer says it is now producing more than 1m parts per day while repositioning itself as a supplier of acoustic packages for new energy vehicles (NEVs).

Product programme

As a systems integrator for original equipment manufacturers (OEMs), Adler Pelzer seeks to solve acoustic problems by considering the entire construction of the vehicle and the range of acoustic materials used.

The precise use of nonwoven felts and foam is further supported by virtual methods, such as the statistical energy analysis system developed in-house, with which it is able to develop and simulate materials, components, subsystems and full vehicles years before the prototype itself is being built.

A main focus is the development of multilayer single-polymer material systems of nonwoven felts and foam in special constructions, which optimise acoustic performance while reducing costs and minimising weight.

The production of the company's non-combustible light foam has gained in importance, while the development of micro-perforated heat shields in combination with high-temperature absorber materials has led to a significant reduction in the exterior and interior noise levels of many vehicles.

Adler Pelzer's key products are shown in Table10.

Table 10: Adler Pelzer, key products, 2019

Engine compartment	Engine encapsulation for acoustic and thermal insulation
Passenger compartment	Carpets, headliners and premium interiors, including cockpits and door panels
Trunk compartment	Solutions combining light weight with optical and acoustic comfort; light composite, sandwich structures reinforced with glass fibres or recycled carbon fibres and surface materials with tufted or Simlour or Diluor needlepunched solutions, multilayer substrates
Exterior	Under-engine shields, under-body shields and wheel arch liners

Source: Adler Pelzer

Recent progress

Between 2013 and 2015, Adler Pelzer opened four new plants in China, as well as a further plant in Athens, Georgia, USA.

In June 2017, the company opened its latest production facility in Devínska Nová Ves, Bratislava, Slovakia, for serial production with up-to-date process technology, including compound injection moulding (CIM), which allows selective material distribution for optimal acoustic efficiency in vehicle dash silencer parts and has rapidly grown in popularity among OEMs. A carpet moulding line, meanwhile, integrates the latest process improvements owing to in-house machinery development.

All installed machinery integrates Industry 4.0 remote monitoring, the recording of machine status and production parameters. The facility delivers just-in-time parts to Volkswagen Group cars assembled nearby, as well as Daimler in Germany and other customers in Slovakia, Czech Republic and Hungary.

In July 2017, Adler Pelzer further acquired CAB Automotive based in Tipton, West Midlands, UK, a manufacturer of automotive interior solutions for both vehicle manufactur-

Magna International

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Magna International is the largest manufacturer of automotive parts in North America and the second globally behind Robert Bosch.

The company has complete vehicle engineering and contract manufacturing expertise, as well as production capabilities including body, chassis, exterior, seating, powertrain, advanced driver assistance, electronics, vision, mechatronics and roof systems. Magna also has electronic and software capabilities across many of these areas.

The company was previously a leader in automotive trim, but in 2015 sold substantially all of its automotive interiors operations, excluding its seating systems business, to Grupo Antolin of Burgos, Spain, for US$525m. The transaction included 36 manufacturing operations and around 12,000 employees in Europe, North America and Asia. Full year 2014 total sales for these operations were US$2.4bn.

Today, Magna has 174,000 employees globally, with sales of almost US$41bn in 2018 and US$5.5bn of which US$5.5bn was accounted for by its seating systems business. It has 348 manufacturing and assembly facilities and 91 engineering/product development/sales centres in 28 countries. And with an eye to future developments in the automotive industry, the company has evaluated some 2,400 start-up companies over the past couple of years.

Table 78: Magna International, financial performance, 2014-2018

(US$bn)	2014	2015	2016	2017	2018
Sales	34.4	32.1	36.4	36.6	40.8
Net income	2.30	2.20	2.03	1.95	1.02

Source: Magna International

Table 79: Magna International, sales by division, 2017-2018

(US$m)	2017	2018	Change 2018/17
Body Exteriors and Structures	16,613	17,527	914
Power and Vision	11,629	12,321	692
Seating Systems	5,224	5,548	324
Complete Vehicles	3,547	6,018	2,471
Corporate and Other	-425	-587	-162

Source: Magna International

As is apparent in Table 80, Magna's prime business is with six key customers worldwide.

Table 80: Magna International, business by customer, 2017-2018

(US$m)	2017	2018
General Motors	6,481	6,303
Ford	5,760	5,721
Fiat Chrysler	5,311	5,693
BMW	3,676	4,826
Daimler	4,474	4,687
Volkswagen	3,849	4,128
Other	7,037	9,469
Total	**36,588**	**40,827**

Source: Magna International

The company has achieved significant growth in Asia, and specifically in China, where it now has 55 manufacturing facilities and 13 engineering centres and more than 22,000 employees.

Table 81: Magna International, sales by region, 2017-2018

(US$m)	2017	2018
North America	19,838	20,547
Europe	13,606	17,055
Asia Pacific	2,491	2,540
Rest of the World	653	685
Total sales	**36,588**	**40,827**
Total net income	**2,196**	**2,296**

Source: Magna International

Seating systems

Between 2017 and 2018, Magna's Seating Systems business increased its sales by 6% or US$324m to US$5.5bn compared with US$5.2bn in 2017, primarily as a result of new launch programmes, including the Ford Expedition, Lincoln Navigator, BMW X5, Lynk & Co 01 and 02, Chevrolet Traverse and Buick Enclave. However, adjusted earnings before interest and taxation (EBIT) fell by US$9m to US$425m in 2018 as a result of higher operating and commodity costs.

Magna has been a pioneer in reconfigurable seating such as its Stow'n Go seats, which have now been used in four generations of Chrysler minivans, and the new Pitch Slide EZ Entry, which first appeared on the GM Acadia in 2018.

It is currently developing new seating systems designed for flexible collaborative interiors with a view to an increase in car and autonomous ride sharing. Magna believes re-

Glossary

AA&E

Aunde Achter & Ebels

A-B-C pillar

The A-pillar is a name applied by car stylists and enthusiasts to the shaft of material that supports the windshield (windscreen) on either of the windshield frame sides. By denoting this structural member as the A-pillar, and each successive vertical support after a successive letter in the alphabet (B-pillar, C-pillar, etc.), this naming scheme allows those interested in car design to have points of reference when discussing design elements. In the most usual configuration, the C-pillar supports the rear window.

ABL

active buckle lifter

ABS

anti-lock braking system; acrylonitrile butadiene styrene

ACC

Advanced Composite Center (Toray Industries)

ACF

Advanced Carbon Fibers (SGL)

ACR

active control retractor

ACRS

air cushion restraint system

ACU

airbag control unit

AE

Automotive Experience (Johnson Controls)

AFBG

Aramid Fibers Business Group (Teijin)

AFN

Advanced Fiber Nonwovens (Hollingsworth & Vose)

AFS

Aerospace Filtration Systems

AGV

automated guided vehicle

airbag

A flexible membrane or envelope, inflatable to contain air or some other gas. Airbags are most commonly used for cushioning, in particular after very rapid inflation in the case of an automobile collision. Also known as a supplementary/secondary restraint system (SRS), an air cushion restraint system (ACRS) or the supplemental inflatable restraint (SIR).

AKST

Asahi Kasei Spunbond (Thailand)

AMC

Autoliv Mando Corporation (South Korea); Automotive Center (Toray Industries)

ANFA

Asia Nonwoven Fabrics Association

APM

APM Automotive Holdings Berhad; Automotive Performance Materials

AREP

American Real Estate Partners

ASCI

Automotive Safety Components International

ASHRAE

American Society of Heating, Refrigerating and Air-Conditioning Engineers

ASR

auto shredder residue

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