

3rd Edition



# Automotive Nonwovens Market Report

At the forefront of new mobility



Adrian Wilson

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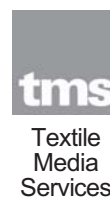
# Automotive Nonwovens

At the forefront of new mobility

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**SAMPLE ONLY**  
By Adrian Wilson

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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.

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Introduction

**Table 4: Estimated value of textiles in 91m cars and light vehicles**

Components	Value (US\$bn)
Carpet, interior trim and headliners	30
Passive safety (airbags and seatbelts)	22
Seating	12
Insulation, NVH materials and exterior textile parts	9
Tyre cord, belts, tubes and tapes	9
Textiles as reinforcements in composite parts	2
Filtration (cabin and engine)	2
<b>Total</b>	<b>86</b>

Source: TMS

## AUTOMOTIVE NONWOVENS

Nonwovens are expanding rapidly in the automotive sector as consumers demand greater comfort and safety, and automakers and their component suppliers seek to decrease costs by reducing the weight of vehicles, as well as lowering fuel consumption and CO<sub>2</sub> emissions.

Although woven and knitted fabrics continue to dominate the total amount of textiles used within the automotive sector, nonwovens are becoming increasingly attractive to designers owing to their low weight and lower cost, as well as other key advantages, such as sound insulation.

Nonwovens are employed in upholstery and headliners, moulded parts and insulation, carpet and floor mats, where needlepunched materials dominate. A wider selection of nonwovens is to be found in automotive filtration and belts, tubes and other high-performance components.

The use of natural fibre nonwovens – often as the reinforcing substrate in composite parts – is also increasing significantly.

More than 40 applications of nonwovens in vehicles have already been identified, from trunk liners and carpets to air and fuel filters (Table 5), and more new end-uses are being developed continually.

By building in essential properties necessary for good performance and safety, nonwovens can assist in reducing the weight of the vehicle, enhance comfort and aesthetics, and provide insulation, fire retardancy and resistance to water, fuels, extremes of temperature and abrasion.

According to EDANA, the international association for the nonwovens and related industries, nonwovens are easy to handle during vehicle assembly. They are tailor-made for their function and can be heat-formed, embossed, lined, coated and printed.

And owing to their versatility and numerous benefits they are also widely used in the design and construction of other vehicles and transportation means, such as aircraft, trains, boats, spacecraft and satellites.

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Introduction

# Autoneum

**Autoneum Holding AG, Schlosstalstrasse 43, Postfach, CH-8406 Winterthur, Switzerland. Tel: +41 52 244 8282. Fax: +41 52 244 8387. Email: info@autoneum.com Web: www.autoneum.com**

Autoneum became a listed company in May 2011, when it was split from the Winterthur, Switzerland-headquartered Rieter Group.

As a global technology frontrunner in acoustic and thermal management solutions for vehicles, it is now a leading partner to the major light vehicle and heavy truck manufacturers worldwide, with a focus on cost-effective solutions for noise reduction and thermal management to increase vehicle comfort and value.

Of the company’s sales of CHF2.28bn in 2018, 43% were achieved in Europe, 41% in North America, 11% in Asia and 5% in South America, Middle East and Africa (SAMEA).

The company has a balanced spread of original equipment manufacturer (OEM) customers as shown in Table 11.

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**Table 11: Autoneum, OEM customers, 2018**

Customer	Sales (%)
Ford	15
BMW	12
Honda	11
Toyota	7
Mercedes-Benz	6
Nissan	6
Fiat Chrysler (FCA)	6
Volvo	6
Renault	6
General Motors	6
PSA Peugeot Citroën	5
Jaguar Land Rover	5
Volkswagen	3
Other	6

*Source: Autoneum*

Autoneum’s key products are now chiefly grouped into four areas: engine bay, interior floor, underbody and body treatment.

## Engine bay

The heat storage in the engine bay achieved with encapsulations reduces fuel consumption at the next cold start, which in turn leads to lower vehicle emissions.

# Donaldson

**Donaldson Co Inc, 1400 West 94th Street, Bloomington, MN 55431, USA.  
Tel: +1 952 887 3131. Fax: +1 952 887 3155. Web: www.donaldson.com**

Donaldson is one of the largest users of nonwoven filter media and has regularly made bolt-on acquisitions throughout its 100-year history. Within the US\$80bn filtration market, Donaldson’s target markets are within eight categories with a combined value of around US\$35bn, but interestingly, the company does not directly compete in the conventional automotive filtration market, despite the use of its products in many other kinds of engine.

However, in specialising in filter media, and having pioneered the use of nanofibres, there is naturally plenty of spill-over, and Hollingsworth & Vose, for example, has a global patent licence to employ Donaldson Ultra-Web nanofibre media technology for use in filter media and filter elements for pleated air filters for on-road vehicle applications.

Donaldson achieved overall sales of US\$2.73bn in its financial year to the end of July 2018.

**Table 18: Donaldson financial performance, 2014-2018**

	2014	2015	2016	2017	2018
Net sales (US\$bn)	2.47	2.37	2.22	2.37	2.73
Net earnings (US\$m)	260.2	208.1	190.8	232.8	180.3

year ending 31 July  
Source: Donaldson

In its latest annual report, Donaldson notes that expenditure on filter media constitutes 20% of its raw material costs.

The company’s cost of sales for the 2018 financial year is reported at more than US\$1.8bn, of which raw materials accounted for 60-65%. This means Donaldson spends around US\$210-230m on filter media annually. Further, the company reports that it buys its filter media from just two suppliers and works closely with them on the development of proprietary nonwoven processes and products.

In the year to July 2018, Donaldson committed US\$55.5m to research and development (R&D) activities and has a global network of scientists and engineers, along with internal resources that include a corporate library, design verification centres, prototype capabilities and an advanced manufacturing technology group. The company plans to increase its R&D spend in the coming years.

Donaldson employed around 14,000 people at its worldwide operations as of 31 July 2018. Products are manufactured at 53 plants around the world.

Donaldson



# Auria

**Auria Solutions Ltd, Highway Point, Gorseley Lane, Coleshill, Birmingham B46 1JU, UK. Tel: +44 1675 464999. Web: www.auriasolutions.com**

Auria Solutions is now the second largest global supplier of automotive acoustic and textile solutions, formed in 2017 as a joint venture between Shanghai Shenda (70% ownership) and IAC Group (30% ownership).

With financial headquarters in Coleshill, Birmingham, UK, and operational headquarters in Southfield, Michigan, USA, and Düsseldorf, Germany, Auria is built on a 150-year transportation industry heritage.

The company currently operates 27 manufacturing plants and four technical facilities in 10 countries, has interest in three joint ventures and employs nearly 7,000 people worldwide.

The company breaks down its product range into four key areas as shown in Table 32.

**Table 32: Auria product range**

Product area	Product	Function
Acoustics	Dash insulators and absorbers, airlay and densified fibre, vertical lapped fibre, mass back extrusion, foam in place and custom sheeting	Acoustic solutions block and absorb road noise and reduce engine noise in the interior
Flooring	Carpeted floors, utility flooring, accessory mats, tufted and nonwoven textiles, utility vacuum forming and compression moulding	The major trim feature and the carrier for a significant portion of the interior trim system
Fibre-based products	Trunk trim, package trays, acoustic mapping and lightweighting services	Comfort, style, safety and functionality for interiors
Aerodynamic	Wheel liners and underbody shields	Create streamlined airflow effect between the vehicle's undercarriage and the road, resulting in reduced or eliminated low-pressure zones and drag on the vehicle

*Source: Auria Solutions*

## Expansions in 2019

In February 2019, Auria opened its latest manufacturing plants in Vrable, Slovakia, and Wuhan, China.

The Slovakian plant will produce automotive flooring systems and fibre-based decorative trim components for Jaguar Land Rover and other premium original equipment manu-

# 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)

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