SECTOR OVERVIEW

THE AUTOMOTIVE INDUSTRY

Baden-Württemberg

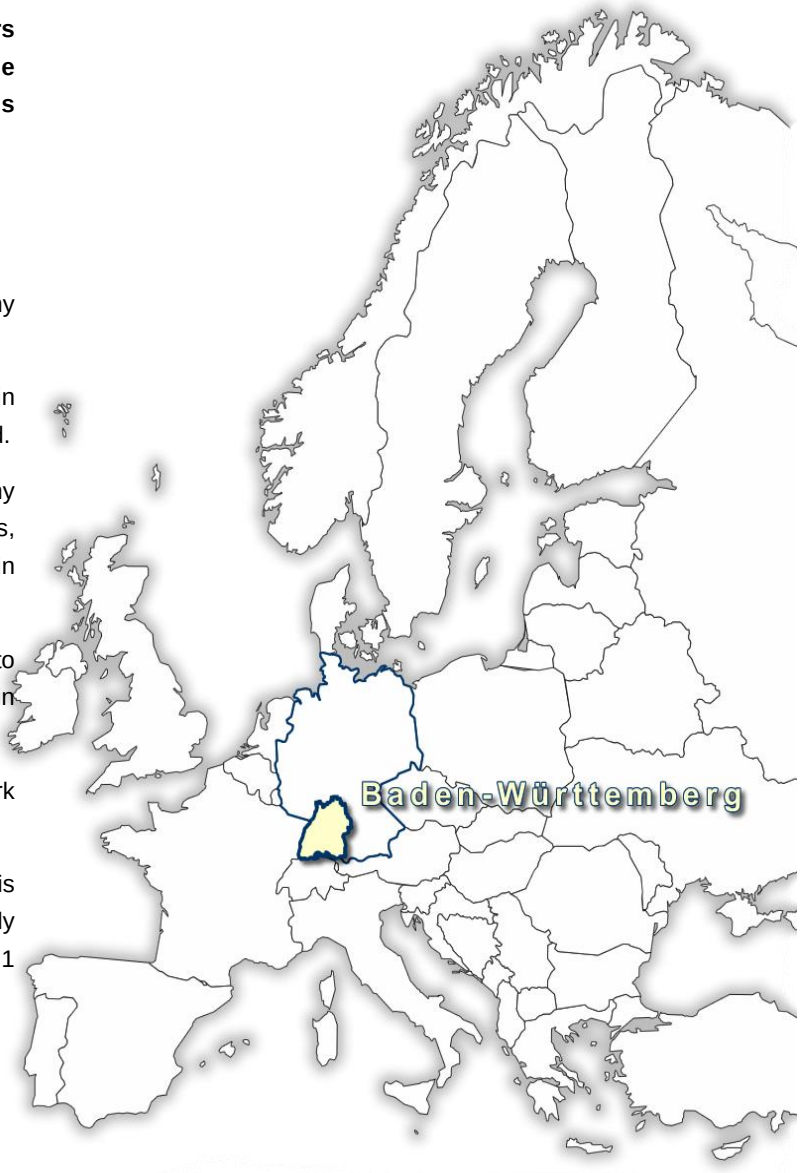
Baden-Württemberg International bw-i

World-class vehicles and innovative car technology from Baden-Württemberg – a global player at the heart of Europe

Baden-Württemberg's location in the centre of Europe offers a significant advantage in that it guarantees access to many important markets.
Baden-Württemberg enjoys an outstanding national and international reputation in the automotive industry. Baden-Württemberg is the home of car manufacturers and suppliers who have had a decisive influence on the history of the automobile, driving it forward in a way which remains unchanged today.

Car sector in Germany

- In terms of the production and sales of motor vehicles, Germany is the largest car market within Europe.
- Around 5.7 million passenger vehicles were manufactured in Germany in 2007, and around 3.1 million new cars were licenced.
- Manufacturers and suppliers in the car sector in Germany generate an annual turnover of more than 338 billion Euros, accounting for more than 43% of the total turnover in the sector in Europe (EU-27).
- 30 final assembly plants with production output amounting to more than a third of total car production in Europe are located in Germany.
- Every fifth new car registration in Europe bears the quality mark "Made in Germany".
- The highly innovative nature of the German automotive sector is underlined by the 1,775 patent applications registered annually for transport technologies. This puts Germany in the no. 1 position – worldwide.



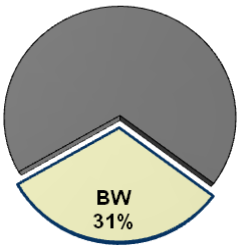
The automotive industry in Baden-Württemberg

Baden-Württemberg is Germany's "No. 1 Car Region"

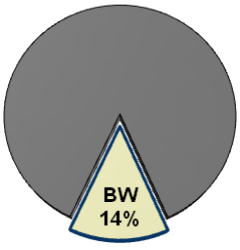
- Baden-Württemberg is the centre of the German motor industry. Almost one third of turnover generated by the whole sector in Germany, around 106 billion Euros, is realised in Baden-Württemberg, more than in any other German state.
- Baden-Württemberg's vehicle manufacturers and suppliers employ more than 342,000 people, which means that almost every fourth job in manufacturing is in this sector. The "car state" of Baden-Württemberg brings together around 41% of the German workforce in the automotive sector, and around one sixth of jobs in the automotive sector within the EU-27.
- The three large OEM works in the state Daimler, Porsche and Audi have a major effect in stimulating innovative suppliers.
- Around 40 vehicle and motor manufacturers, as well as 237 companies which count as direct suppliers to the vehicle industry, are based in Baden-Württemberg. They benefit from the major presence of world-leading OEMs from Baden-Württemberg.
- Daimler AG and Porsche AG, two of the most innovative car manufacturers have their head offices in Baden-Württemberg. Audi AG also maintains a significant production and development site in the state. Important companies in the commercial vehicles sector such as Mercedes-Benz LKW (Daimler AG) and Volvo Busse Deutschland GmbH or Kässbohrer Gelände-Fahrzeuge AG are also represented in the state. In addition to these manufacturers, the state of Baden-Württemberg also has a multitude of renowned and important companies supplying the car sector. As well as large players in the sector such as Robert Bosch GmbH, ZF Friedrichshafen AG and MAN + HUMMEL GmbH, many small and medium-sized companies supplying the car sector have their head offices in Baden-Württemberg.
- In total almost 740 companies are represented in Baden-Württemberg, which corresponds to around one third of all German businesses in the automotive industry.

Baden-Württemberg is "the" car state of Germany – a heavyweight player in Europe

Turnover

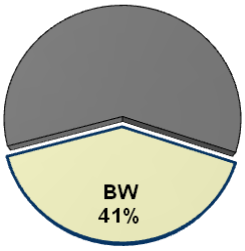


Percentage Baden-Württemberg in Germany

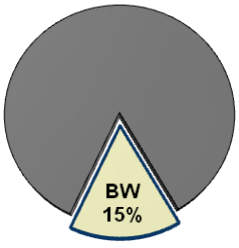


Percentage Baden-Württemberg in EU-27

Employees

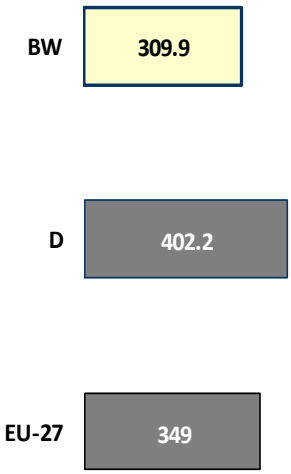


Percentage Baden-Württemberg in Germany

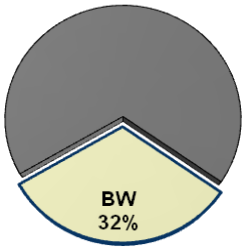


Percentage Baden-Württemberg in EU-27

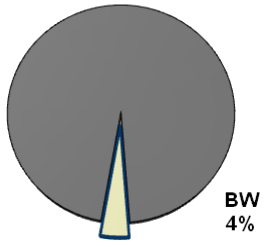
Turnover per employee (K EUR)



Companies*



Percentage Baden-Württemberg in Germany



Percentage Baden-Württemberg in EU-27

WZ-Code: 34

* Businesses with at least 17,500 Euros taxable turnover and/or employees liable for social security contributions

Source: Regional Office of Statistics Baden-Württemberg, Eurostat

“Made in Baden-Württemberg” – worldwide demand for cutting edge technology and products from Baden-Württemberg’s car companies

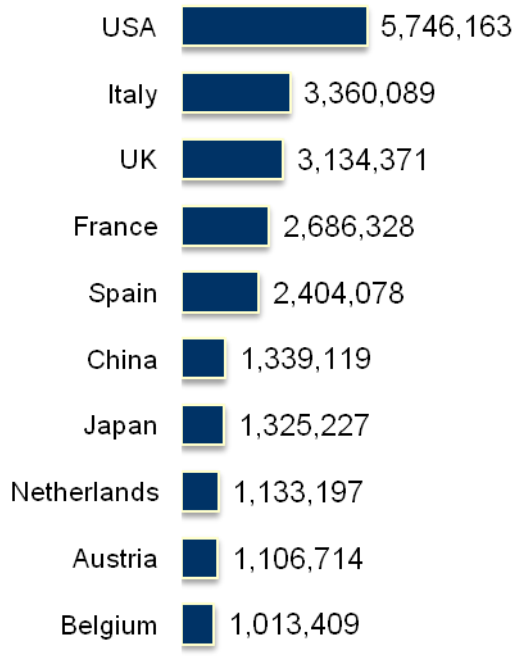
Baden-Württemberg’s automotive sector has a strong international network and its products are sold worldwide.

- Around 36 billion Euros are generated by the Baden-Württemberg car sector abroad.
- Worth more than 5.7 billion Euros, the US market is the largest sales market by some margin for the Baden-Württemberg car industry. Around 16% of total exports from Baden-Württemberg go to the USA .
- More than half - around 52% – of exports remain within the EU-27. The four markets of Italy, England, France and Spain alone import around one third of the exports from Baden-Württemberg.
- In addition to the USA and European countries, sales markets in the far east, particularly the Chinese and Japanese market, are playing an increasingly important role in the Baden-Württemberg car industry.
- In terms of importing, Europe and its countries are also of major importance, which further reinforces the close links within Europe between the Baden-Württemberg automotive sector and the member states of the European Union.

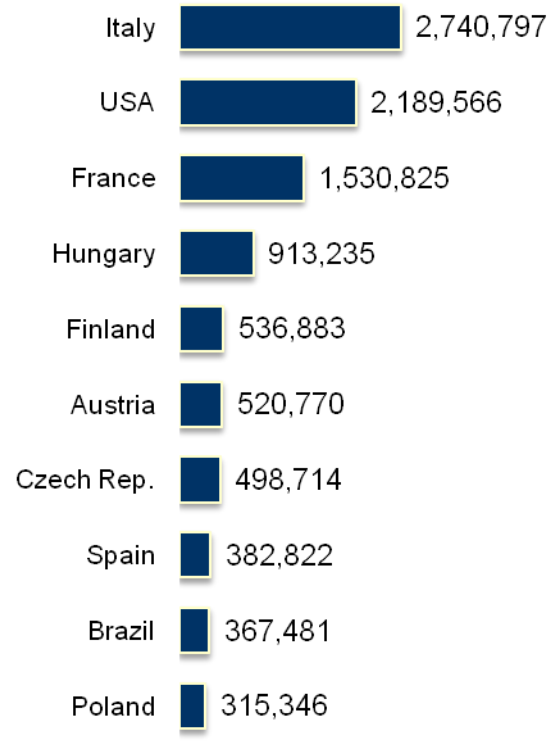

Image: Daimler AG

The Baden-Württemberg car industry‘s international trade links

Exports to …
Details in K Euros



Imports from …
Details in K Euros



Import and export for WZ-Code 34 according to the list of states for external trade statistics
Source: German Office of Statistiics

Talent, creativity and innovative strength: the basis of economic success of businesses in the car sector

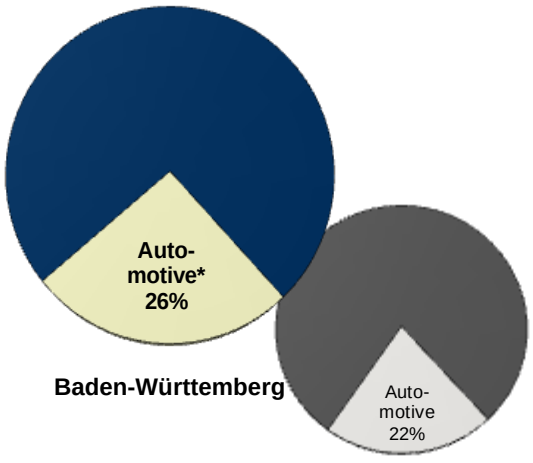
A large pool of potential employees for businesses in the automotive industry due to the excellent higher education network

- A large highly-qualified potential workforce is available to the domestic car industry. At the 9 universities and 23 specialist higher education establishments in the state, roughly one quarter of students study courses related to the car sector.
- In the area of mechanical engineering, the universities of Karlsruhe and Stuttgart and the higher education establishments of Aalen, Esslingen, Karlsruhe, Pforzheim, Ravensburg-Weingarten and Ulm belong to the top-ranked group of universities in Germany. The other higher education establishments also train a highly-qualified workforce, and guarantee a high intensity of research work for mechanical engineers in Baden-Württemberg.
- Almost all higher education establishments in the state have special courses in the areas of mobility, such as construction and process engineering, vehicle technology and industrial mobility design. There are also a multitude of special courses such as car information technology, computational mechanics of materials and structures, vehicle interior design, mechatronics and automotive systems engineering. The training facilities in the state ensure that education is sector-specific and practice-orientated.

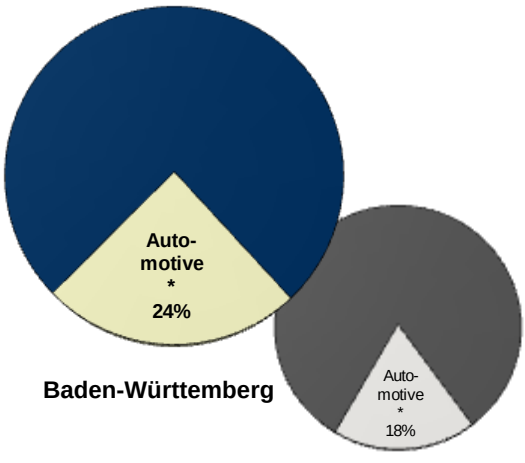

Image: Daimler AG

Potential employees for the automotive industry in Baden-Württemberg

Students in disciplines related to the automotive industry



Graduates in disciplines related to the automotive industry



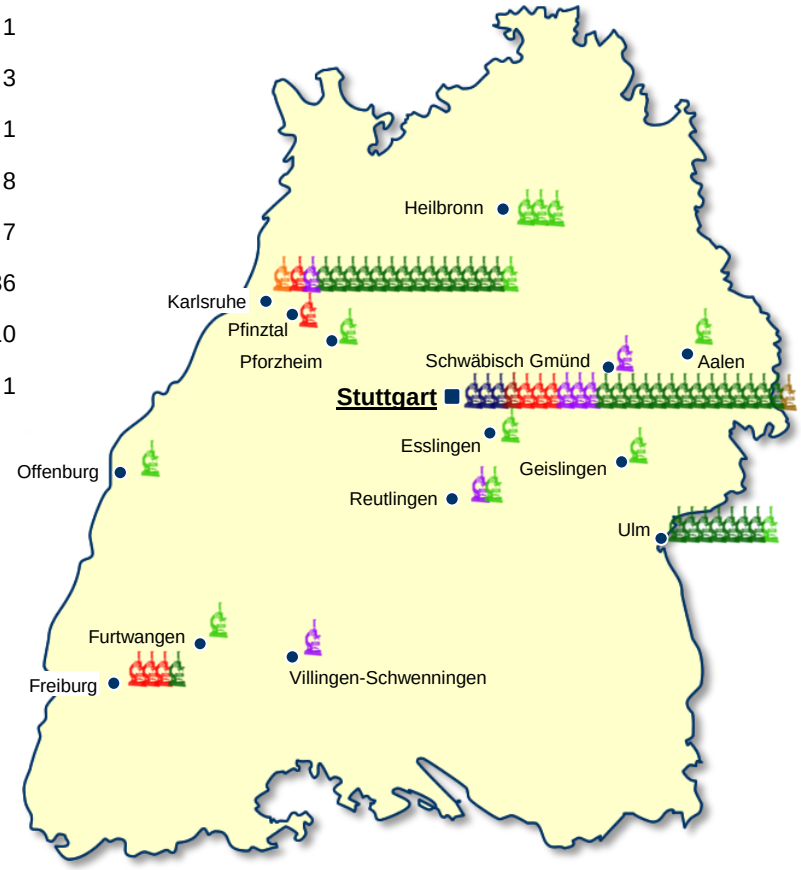
	Baden-Württemberg	Germany	Precentage Baden-Württemberg in Germany
Students	63,152	426,220	**15%**
Graduates	9,111	48,864	**19%**

* Courses of study related to the car indsutry: mathematics, IT, general engineering, mechanical engineering/process engineering, electronics, traffic engineering/nautical
Source: German Office of Statistics

Research and development activities of the automotive industry in Baden-Württemberg

Major research facilities	1
Helmholtz-Gemeinschaft e.V. Research centres	3
Max-Planck Institutes	1
Fraunhofer Institutes	8
Contract research facilities	7
University research faciltities	36
Higher educational establishment research institutes	10
Other research facilities	1

Symbol stands for an institute/specialist area/centre



Baden-Württemberg – an excellent location for research and development

Vehicle manufacture in Baden-Württemberg is supported by a high-performance, multi-faceted research network

- The worldwide success of "Made in Baden-Württemberg" products, which have been developed and produced in the state and the high level of dynamic innovation in the Baden-Württemberg car industry can be partly explained by the huge effort put into research and development.
- In no other federal state in Germany is more invested in R&D expenditure or on R&D personnel in the area of vehicle manufacture. Companies in Baden-Württemberg spend 40% of the total invested in vehicle manufacture R&D in the whole of Germany and around 37% of all R&D personnel are employed here.
- Baden-Württemberg is Germany's most important driving force in terms of innovation: Germany's "Car Electronics Innovation Alliance" – a research initiative for car electronics sponsored to the tune of 600 million Euros by BMBF is co-ordinated scientifically by the Research Institute for Motor Transport and Vehicle Engines in Stuttgart (FKFS). With Daimler and Bosch on board, this means that two of the most important businesses in this sector in Baden-Württemberg have a significant involvement in the project.
- Many of the highly-rated research institutes in the state are also involved in projects connected with vehicle construction and traffic. As well as the Karlsruhe Institute for Technology (KIT) and the research facilities of the DLR in Stuttgart, there are numerous Fraunhofer Institutes and also the Max-Planck Institute for Metal Research in Stuttgart.
- A total of 67 Institutes carry out research and development in branches of the automotive industry.

Those who network are more successful – the highly networked economic structure offers an ideal environment for the innovative automotive sector

In Baden-Württemberg numerous co-operation projects and initiatives which cross company and institutional boundaries generate new market potential and competitive advantage.

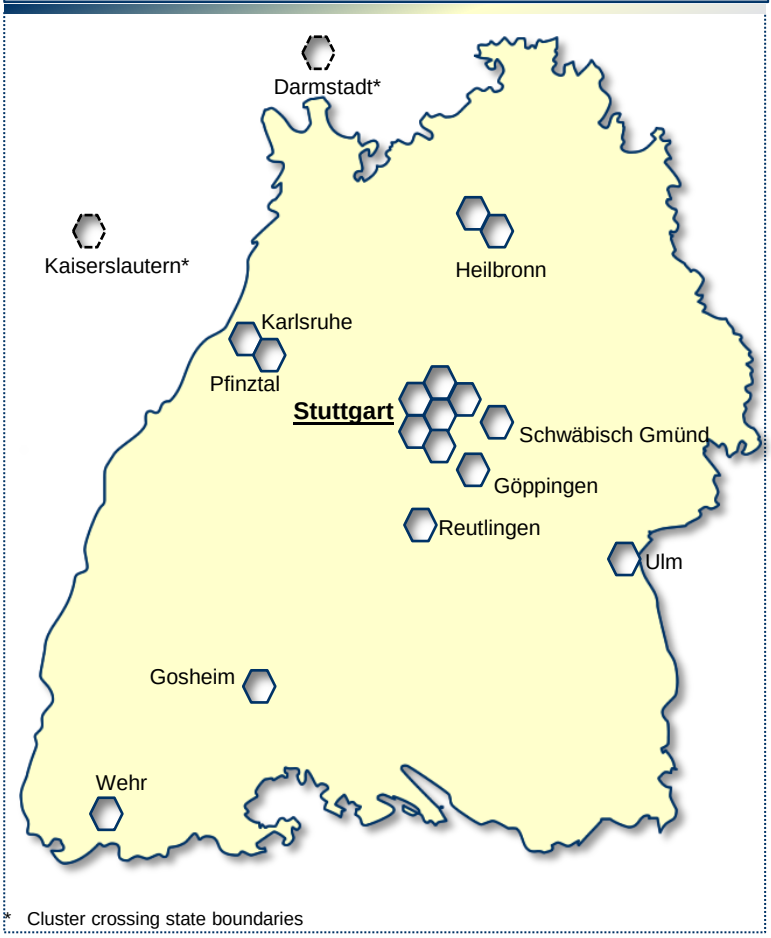
- A further building block for the success of the car state of Baden-Württemberg is its well-developed co-operation and network structure. There are 16 cluster initiatives and sector networks throughout the state which actively drive forward innovation and concentrate synergies, thereby strengthening the competitive capability of the car sector. This is reinforced further by Baden-Württemberg's active involvement in two additional networks outside the state.

- The centre point of the state-wide network is in and around the conurbation of Stuttgart. In this region alone there are six active networks with more than 300 member companies and research institutes.

- As an example of the driving force of networks within the Baden-Württemberg automotive sector, we can point to the Baden-Württemberg Brennstoffzellen-Allianz (*fuel cell alliance*) in Stuttgart. This alliance forms a network around the topic of fuel cell technology and informs and initiates companies who manufacture vehicles as well as suppliers on this topic, so that they can manage their adaptation to the changing requirements of the market in good time.

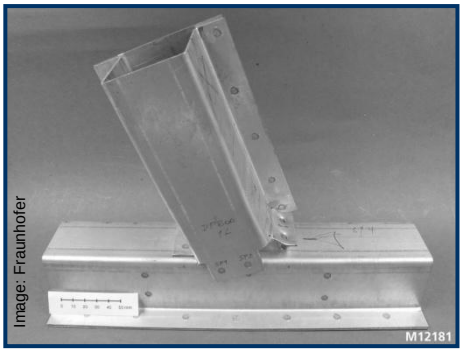
- According to an analysis carried out by the European Cluster Observatory of the European Union, the Stuttgart region is the most significant "automotive cluster" in Europe by a large margin. The Karlsruhe region is in seventh place in the Top 10 automotive clusters.

The dense network of organisations with competency in the car sector in Baden-Württemberg



* Cluster crossing state boundaries

- The Karlsruhe and Heilbronn regions also have a well-developed network and co-operation structure.



More reality in virtual crash tests

Simulations are a useful, but not always completely realistic alternative to the crash test: it is assumed, for instance, that welded and bonded connections never come apart in a collision. A new simulation also takes the failure of these connections into account. The number of joints is large: a medium-sized car is held together by approximately 5,000 spot welds and over 120 metres of bonded joints, as well as numerous rivets. If these burst, the obstacle can penetrate deeper into the car during a collision and magnify the danger for passengers. Researchers at the Fraunhofer-Institut for Materials Mechanics IWM in Freiburg have succeeded for the first time in simulating this reliably. "We have developed an alternative model for crash simulation which simulates the characteristics of spot welds – including their failure."

INNOVATIONS FROM BADEN-WÜRTTEMBERG


Image: Fraunhofer

Save energy with light construction

The development of prototypes made from composite fibre materials began in the new innovation cluster “KITe hyLITE” to which three Fraunhofer Institutes belong, as well as the University of Karlsruhe, vehicle manufacturers and medium-sized companies. In this cluster materials are analysed and approved, methods for calculating vehicle behaviour are developed, manufacturing processes optimised and the production steps automated: at the Fraunhofer Institut für Werkstoffmechanik IWM (Institute for Material Mechanics) IWM researchers test and model how components bear loads. The researchers at the Fraunhofer Institut für Betriebsfestigkeit LBF (Institute for Operational Reliability) analyse how the material behaves under dynamically alternating stress conditions. Such calculations are then put to good use by the material developers. One result of this development process is, for example, a light car wheel rim made of a carbon fibre-reinforced plastic compound, reinforced with infinite fibre structures which can therefore withstand the stresses in operation.

Baden-Württemberg – a trade fair centre

Baden-Württemberg is one of the most dynamic trade fair locations in Germany. The federal state’s nine trade fair centres have established Baden-Württemberg as a central market platform and are characterised by their excellent innovative and multifunctional hall and area designs.

- For businesses in the field of motor manufacture, Baden-Württemberg has proved to be an attractive destination for exhibitions and has hosted nationally and internationally important trade fairs and conferences.
- The forward-looking range of topics covered by the various trade fairs gives motor manufacturers and automotive suppliers a unique opportunity to provide detailed information on the current range of products and services offered in the area of development and manufacture, as well as to present themselves and their products at internationally renowned trade fairs.

Baden-Württemberg manufacturers and suppliers active in the automotive sector:

Audi AG | August Läpple GmbH & Co. KG | Automotive Lighting Reutlingen GmbH | Behr Industrietechnik GmbH & Co. KG | Bertrandt AG | Beru AG | BOS GmbH & Co. KG | Daimler AG | Dr. Ing. h.c. F. Porsche AG | Dürr AG | ebm-papst Mulfingen GmbH & Co. KG | Festo AG & Co. KG | Freudenberg & Co. | Friedrich Boysen GmbH & Co. KG | GETRAG Getriebe- und Zahnradfabrik Hermann Hagenmeyer GmbH & Cie KG | Gustav Wahler GmbH & Co. KG | Harman-Becker Automotive Systems GmbH | Hirschmann Car Communication GmbH | J. Eberspächer GmbH & Co. KG | KS KOLBENSCHMIDT GmbH | LuK GmbH & Co. oHG | MAHLE GmbH | MANN + HUMMEL GmbH | Peguform GmbH & Co. KG | PWO Progress-Werk Oberkirch AG | Robert Bosch GmbH | Tognum AG | TRUMPF GmbH & Co KG | ZF Friedrichshafen AG

Trade Fairs in the automotive industry sector in Baden-Württemberg

- **Automobil –** New cars – sales and information exhibition, Messe Freiburg
- **Automotive Testing Expo** – Europe‘s leading specialist trade fair for test and development procedures in the automotive industry, Neue Messe Stuttgart
- **Car + Sound –** International Trade Fair for mobile electronics, Messe Sinsheim
- **Crash Test Expo Europe** – Specialist trade fair for test procedures in the automotive industry with open technology forum, Neue Messe Stuttgart
- **European Automotive Components Expo** – Trade Fair for automotive suppliers, Neue Messe Stuttgart
- **INNOtex –** Trade Fair forum for the functionalisation of textile materials, Neue Messe Stuttgart
- **Interpart –** International suppliers trade fair for the vehicles industry and mechanical and plant engineering, Messe Karlsruhe
- **IT-TRANS -** IT Solutions for Public Transport, Messe Karlsruhe

Further information on research establishments and networks available on request.

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