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Auto Suppliers: More Than Chips

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Not all suppliers to the automotive industry are providing semiconductors and system-level products.

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The semiconductor industry is revving up its present and future contributions to advanced driver-assistance systems and autonomous driving. Those areas represent tremendous growth opportunities for chips, modules, and software going into automotive electronics. There's also the development of artificial intelligence and machine learning applications in automotive design, which are brand new commercial opportunities that have never existed in any market.

(<https://semiengineering.com/wp-content/uploads/2017/08/purple-car.jpg>)

Still, there are a number of high-tech companies that provide products and services to the worldwide automotive industry that don't design or make chips, and they don't write software for customers.



Robert Bosch GmbH, also known as the Bosch Group, is ranked as the top supplier of OEM parts to the automotive industry, with \$46.5 billion in 2016 sales. Bosch Rexroth, a Bosch Group unit, was an exhibitor at last month's SEMICON West show in San Francisco. The company provides assembly technology, electric drives and controls, gear technology,

industrial hydraulics, linear motion technology, mobile hydraulics, molding and casting technologies, tightening technology, and welding technology to multiple industries, including semiconductors and electronics.

ZF Friedrichshafen AG, Magna International Inc., Denso Corp., and Continental AG fill out the top five lineup of auto OEM parts suppliers around the world. All are involved in electronics, and some are developing artificial intelligence technology for automated driving, along with vehicle sensors and other components.

There are literally thousands of suppliers to the automotive industry. Most are not as well known as those five corporations. Some have been around for decades. Others are relative newcomers. But the big change underway now is that companies that previously played no part in the automotive supply chain—which until the recent introduction of advanced electronics for assisted and autonomous driving was considered cumbersome, slow and low margin—are now taking an active role.

The industrial gases business of the Linde Group provides a number of specialty gases to the electronics industry, including those for semiconductor manufacturing, and for the production of flat-panel displays, light-emitting diodes for solid-state lighting, and photovoltaic solar cells. Linde Electronics is a long-standing exhibitor at SEMICON West.

The Linde Group also provides a variety of products and services to the automotive industry. These include all-in-one welding, cleaning products, cryogenic gases for molded plastic and rubber components (along with tires), heat treatment processes, refrigerant supplies for mobile air conditioning systems, and thermal spray coating for surface finishes. There are also gases and supporting services for Euro 6 compliance, meeting emission requirements within the European Union.

“It’s a particular case of quality requirements being more stringent,” Paul Stockman, head of market development at Linde Electronics, said about the automotive industry. “The chips that are going into cars have become more responsible for either autonomous function or additional safety functions. The acceptable failure rate, obviously, is much, much lower. But also, the supply chain on these chips has to be guaranteed for a minimum of 20 to 30 years. So, that means the supply chain, as materials go, has much more stringent requirements. You can’t change suppliers as easily, and you need to have a supply chain and follow the manufacturing process over those 20 years.”

He added, “It’s still a developing area, but there are quality requirements being developed, specific to the production of semiconductor chips for automotive applications.”

Also exhibiting at SEMICON West was igus Inc., the American subsidiary of igus GmbH, headquartered in Cologne, Germany. The U.S. company is based in East Providence, R.I.

Iigus was established in 1964 and originally focused on supplying complex technical polymer components. In 1983, igus began turning out reinforced plastic assemblies that it calls Energy Chain Systems and injection-molded polymer bearings. The company’s mission is to replace metal parts that can wear out with durable plastic parts that can stand up better to years of use. Plastic parts may not sound so durable. What igus actually makes are functionally advanced polymer components and assemblies. Its website has an e-commerce element for worldwide purchasing.

Igus provides its iglide brand plain bearings for cars, which go into a number of areas within the vehicle – convertible tops, windshield wipers, steering systems, seats, hinges, pedals, undercarriage, transmission, and the engine compartment. It also provides on-board systems for energy supply in a vehicle, serving headlights, interior systems, and powered windows.

The company is also involved in making energy chains (e-chains) for automotive manufacturing, providing energy supply systems for indoor cranes, robotic arms, and other aspects of production lines.

In addition, igus products are used in 3D printers, agricultural equipment, aviation, beverage production and packaging, bicycles, cameras, construction machinery, cranes, fitness/physical therapy equipment, food production and packaging, hydraulics and pneumatics, heavy machinery, machine tools, medical technology, vending machines, and woodworking.

Igus has an inventory of 28,000 different components, according to Stefan Kombuchen, head of marketing and corporate communications, and tests 1,500 to 2,500 new products each year. There are 100,000 components available online at igus.com.

CoorsTek offers high-performance ceramic components to automotive manufacturers and OEM parts suppliers. It has ballistic door panels and chassis leveling valves for the chassis. It provides balls, bearings, seals, and valves for the powertrain.

On the electronics side, CoorsTek has automotive-grade ceramic substrates and components (including alumina and aluminum nitride substrates), carbon brushes for power motors, and automotive lighting components, such as laser components, light-emitting diode phosphors, and high-brightness LED substrates.

The company, which is owned by the Coors family of beer brewing fame, also offers ceramic sensing components for automotive applications – air conditioning sensors, fluid pressure and temperature sensors, and oxygen sensors in particular.

EAG Laboratories provides industrial goods testing and analysis for the automotive industry, among other markets.

Johnstech International supplies a variety of products for final testing of automotive devices, such as ball grid array sockets and contactors.

And Flex, the company formerly known as Flextronics, has its AGM Automotive subsidiary, which specializes in door lighting (door handle lighting, door lock indicators, light pipes, switches), instrument panels and floor consoles (compartment lighting, footwell lighting, light pipes, shift indicators and mechanisms), overhead systems (assist/grab handles, dome and rail lamps, overhead cargo lighting, overhead consoles), and textiles (carpet rolls, floor mats, trunk and cargo mats).

AGM has done business with Adam Opel, Audi, Fiat, Ford Motor, General Motors, Honda, Hyundai, Infiniti, Mercedes-Benz, Nissan, Porsche, Toyota Motor, and Volkswagen.

While Google, Intel, Nvidia, Qualcomm, and Tesla may grab all the headlines for autonomous vehicle technology, there are many other companies helping to put together the car of the future. And that list continues to grow, incorporating semiconductor IP, EDA tools, chips of all types, as well as advanced cabling and controller chips.



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