DETROIT SEALING COMPONENTS

# Sealing Solutions for Automotive Industry

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# About Detroit Sealing Components

**Detroit Sealing Components (DSC)** is a stocking warehouse and distributor of imported molded rubber goods, with a legacy rooted in the precision molded rubber industry. Leveraging decades of experience, our skilled leadership and technical staff provide innovative and robust sealing solutions, delivering them to your doorstep with exceptional efficiency and value.

Located in Plymouth, Michigan, DSC's headquarters and warehouse are strategically situated near high-traffic shipping lanes, ensuring swift and cost-effective delivery of your goods.

## Our Products

DSC offers a wide range of products, including:

- Standard and Custom O-Rings
- Standard and Custom X-Rings
- Standard and Custom Back-up Rings
- Gaskets
- Washers
- Hydraulic and pneumatic seals
- T-seals
- Oil seals
- Diaphragms
- Grommets
- Rubber ball
- Infinite size O-Rings
- PTFE products
- LSR products
- V-seals

## Industries We Serve

Our products cater to various industries, such as:

- Automotive
- General Industry
- Water and Sanitary
- Healthcare
- Oil and Gas
- Agriculture and Construction
- Aerospace
- Food and Beverage
- Renewable Energy
- Automated Assembly

## Custom Solutions

At DSC, we go beyond standard solutions. We take customer design parameters and bring custom solutions to life. Utilizing tools like computer-aided design and finite element analysis, combined with our extensive experience, we ensure each solution meets the unique needs of your application. Designs can be bench tested under close-to-actual customer test conditions to ensure product viability and robust performance in the final product assembly.



## Materials and Certifications

Materials play a critical role in any molded rubber design. DSC collaborates with top polymer producers, offering access to hundreds of compounds across all rubber types, including:

- Fluorocarbon (FKM)
- Nitrile (NBR)
- Hydrogenated Nitrile (HNBR)
- Carboxylated Nitrile (XNBR)
- Ethylene Propylene Diene (EPDM)
- Polyacrylate (ACM)
- Ethylene Acrylic (AEM)
- Styrene-Butadiene (SBR)
- Chloroprene (CR)
- Perfluoro elastomer (FFKM)
- Fluoroelastomer Propylene (FEPM)
- Fluorosilicone (FVMQ)
- Silicone (VMQ)
- Liquid Silicone (LSR)
- Polyurethane (PU/AU/EU)
- Thermoplastic Polyurethane (TPU)
- Epichlorohydrin (ECO)
- Butyl (IIR)

Additionally, many material certifications exist for different standard specifications across various industries. Multiple material compounds may be certified to the same specification, allowing for the correct compound to be used in specific applications. If a suitable material compound does not exist, we can custom develop and test it in our fully equipped, ISO 17025 accredited lab to meet these requirements cost-effectively.

## Our Commitment

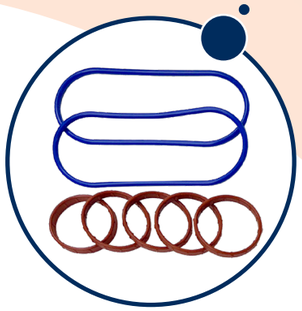
At Detroit Sealing Components, we strive to meet and exceed the challenges of every customer. As a solution-based sealing and molded components supplier, whether you need a standard O-Ring or a custom-designed, tooled, and tested part for the most challenging applications, we deliver robust and cost-effective solutions with exceptional service, speed, and reliability.

# Automotive System and Sealing Solutions

## Intake and Exhaust System

In the era of low-carbon emissions and sustainability, advanced sealing solutions are essential to meet the demands of increasingly harsh environments, such as those found in EGR (Exhaust Gas Recirculation) systems and turbo intercoolers. DSC also offers cutting-edge sealing solutions designed specifically for SCR systems (Selective Catalytic Reduction) and diesel exhaust aftertreatment systems, including AdBlue®. For SCR systems in particular, DSC provides seals crafted from custom-engineered compounds, ensuring superior reliability and comprehensive sealing performance.

| Intake and Exhaust System | Material |
|---|---|
| Intake manifold | Silicone |
| EGR system<br>(Exhaust Gas Recirculation) | FKM<br>HNBR |
| Exhaust manifold<br>(Blow-By gas / AdBlue®) | HNBR<br>EPDM |
| O2 sensor | FKM |



## Seals in Braking Systems

Seals in braking systems are among the most critical components in automotive applications. DSC understands your concerns and needs, offering sealing solutions that ensure reliable control of braking functions. Our solutions are designed to meet the stringent requirements of hydraulic and pneumatic circuits, as well as overall system control. DSC's rigorous process controls guarantee seals that excel under demanding conditions, addressing factors such as compression set, stress, strain, and creep. Furthermore, DSC enhances seal friction and wear resistance to maximize their service life and performance.

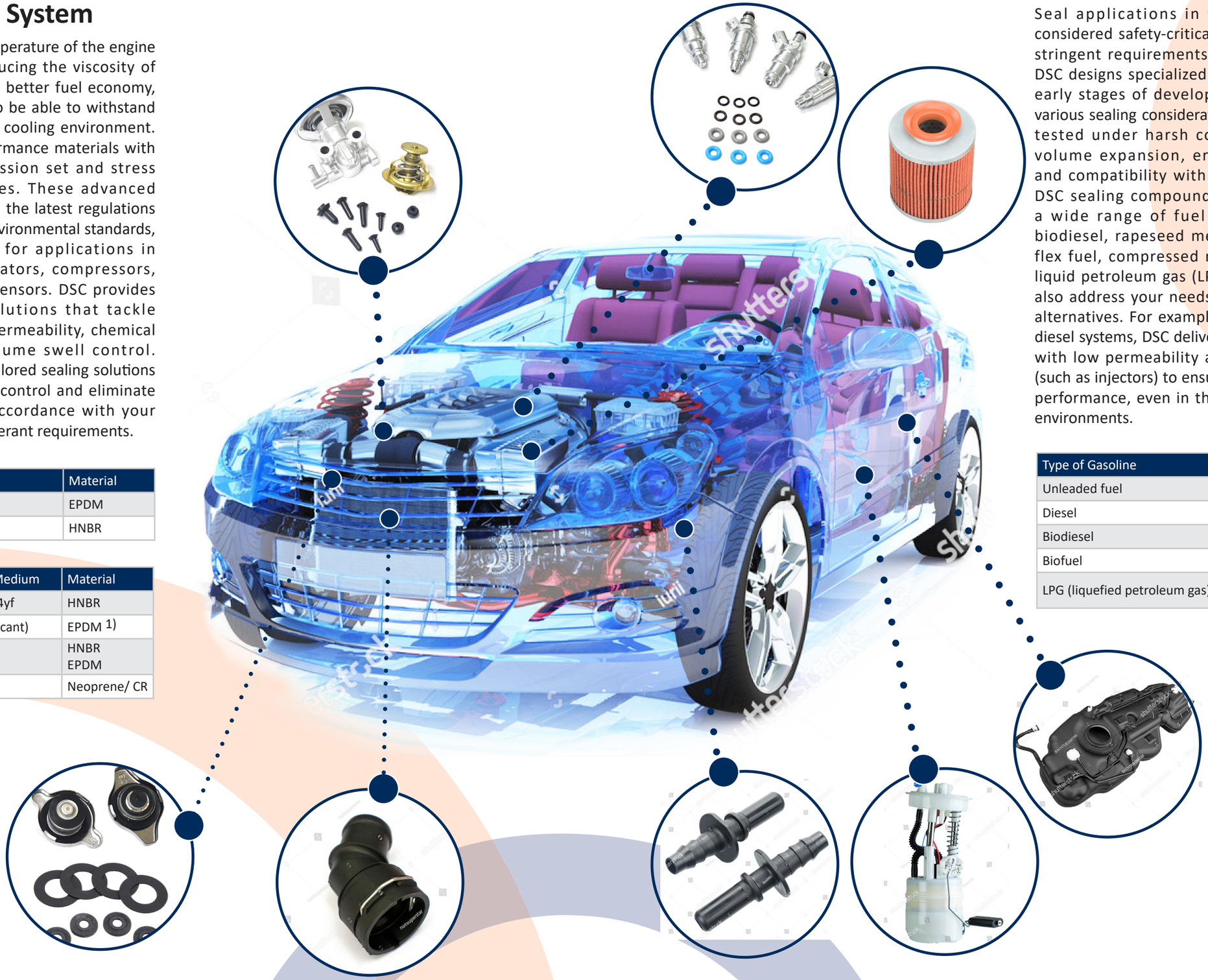
| Braking System | Material |
|---|---|
| Fluid brake DOT#3,4,5 | EPDM |
| Braking system | EPDM |

# Cooling and Air Conditioning System

When the coolant temperature of the engine increases, hence reducing the viscosity of the oil and leading to better fuel economy, the seal system has to be able to withstand a higher temperature cooling environment. DSC offers high-performance materials with exceptional compression set and stress relaxation properties. These advanced materials comply with the latest regulations on refrigerants and environmental standards, making them ideal for applications in condensers, evaporators, compressors, various valves, and sensors. DSC provides optimal sealing solutions that tackle challenges such as permeability, chemical resistance, and volume swell control. Furthermore, DSC's tailored sealing solutions are designed to help control and eliminate refrigerant loss in accordance with your system's specific refrigerant requirements.

| Cooling System | Material |
|---|---|
| Radiator | EPDM |
| Thermostat | HNBR |

| Air Conditioning System Medium | Material |
|---|---|
| Freon R-134a [2],HFO-1234yf | HNBR |
| Freon R-134a [2],PAG(lubricant) | EPDM [1] |
| R744($CO_2$) | HNBR<br>EPDM |
| Freon R-12,R-22 | Neoprene/ CR |



# Fuel System

Seal applications in fuel systems are considered safety-critical components with stringent requirements. Recognizing this, DSC designs specialized compounds in the early stages of development, tailored to various sealing considerations and rigorously tested under harsh conditions such as volume expansion, erosion resistance, and compatibility with diverse additives. DSC sealing compounds are suitable for a wide range of fuel types, including biodiesel, rapeseed methyl ester (RME), flex fuel, compressed natural gas (CNG), liquid petroleum gas (LPG), and more. We also address your needs for emerging fuel alternatives. For example, in high-pressure diesel systems, DSC delivers sealing solutions with low permeability and high reliability (such as injectors) to ensure seamless engine performance, even in the most demanding environments.

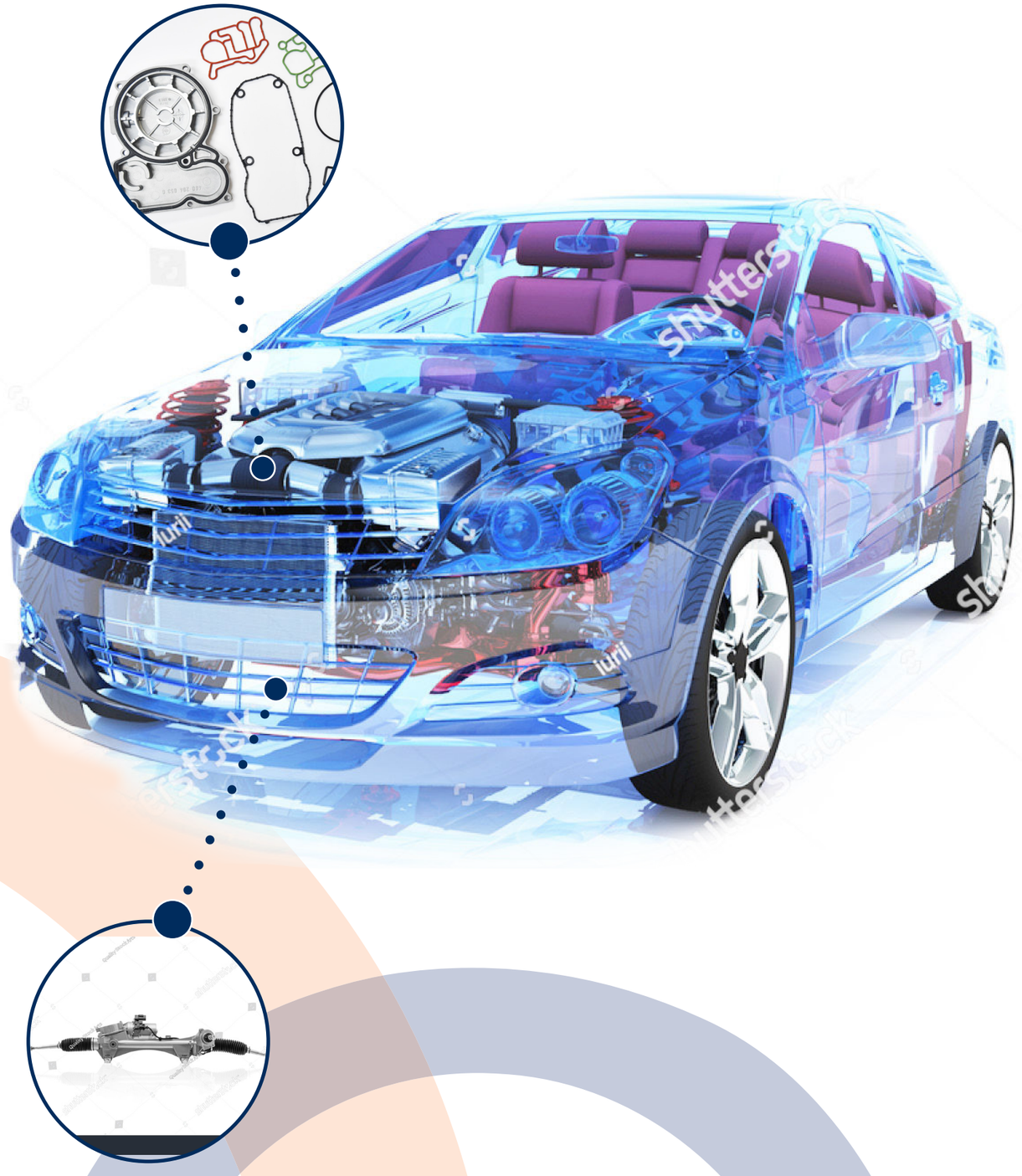
| Type of Gasoline | Material |
|---|---|
| Unleaded fuel | FKM |
| Diesel | FKM |
| Biodiesel | FKM |
| Biofuel | FKM |
| LPG (liquefied petroleum gas) | Fluorosilicone<br>NBR |

# Transmission and Steering System

Designing transmission and steering systems often presents challenges such as improving performance, reducing size, integrating application structures, and enhancing overall system efficiency. This makes seals with multifunctional capabilities essential. The DSC engineering team is equipped to meet your needs for the design and development of new products, offering seals that deliver low noise, minimal friction and wear, and extended service life, among other desirable attributes. Even under high-pressure and high-speed working conditions, our comprehensive sealing solutions can also be designed to effectively eliminate noise and vibration as necessary.

| Transmission Fluid Resistance | | Material |
|---|---|---|
| DEXRON III | DEXRON VI | |
| V | | FKM |
| V | V | |
| V | V | VAMAC |
| V | V | ACM |

| Steering System | Material |
|---|---|
| Columns | HNBR |
| Half shaft | HNBR<br>NBR |
| Hose | HNBR |
| Int Gear | HNBR<br>NBR |
| Pump | HNBR |
| RP Gear | HNBR |





# Sensors

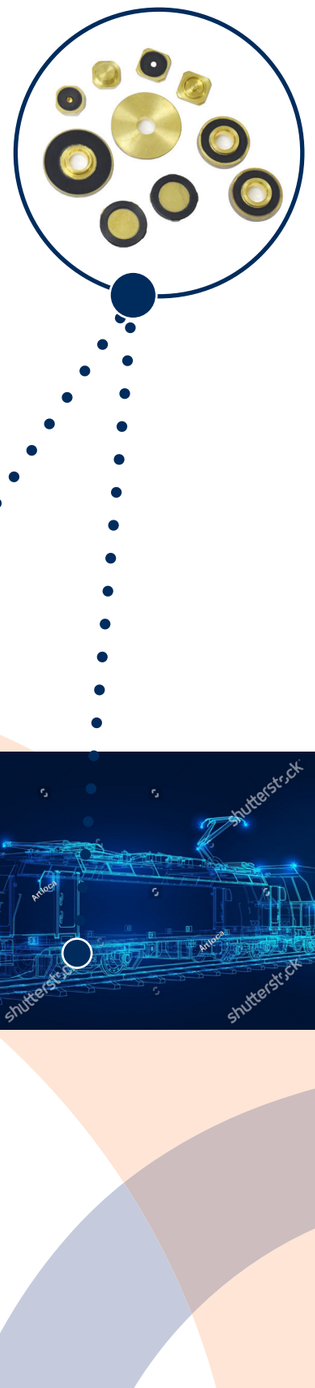
A sensor is a detection device that converts environmental information into electrical signals, transmitting it to an ECU or control modules to monitor conditions such as temperature, pressure, airflow, and vehicle speed. Sensors enable inanimate objects to function as though they possess human-like senses, such as touch, taste, and smell. These devices are designed to meet specific operational requirements, including resistance to temperature, water, shock, oil, gas (gasoline or diesel), urea-based AdBlue, and coolant.
DSC provides specialized rubber formulations to meet the sealing needs of sensor manufacturers, ensuring reliability and optimal performance under a variety of demanding conditions.

| Sensor | Material |
|---|---|
| Engine<br>Exhaust after-treatment<br>Transmission<br>Tire pressure monitoring<br>Air conditioning<br>Electronic stability | EPDM |
| | Fluorosilicone |
| | HNBR |
| | NBR |
| | Silicone |
| | FKM |

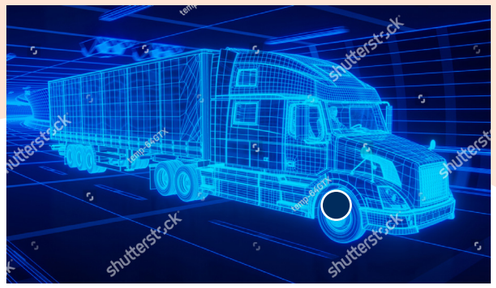
# Trucks and Railway Air Brake System

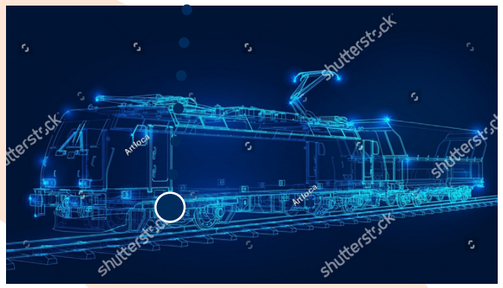
The components of an air brake system consists of an air storage tank, safety valve, low pressure indicator, a compressor, pressure governer and release valve, brake valve, relay valve, quick release valve and brake chamber.

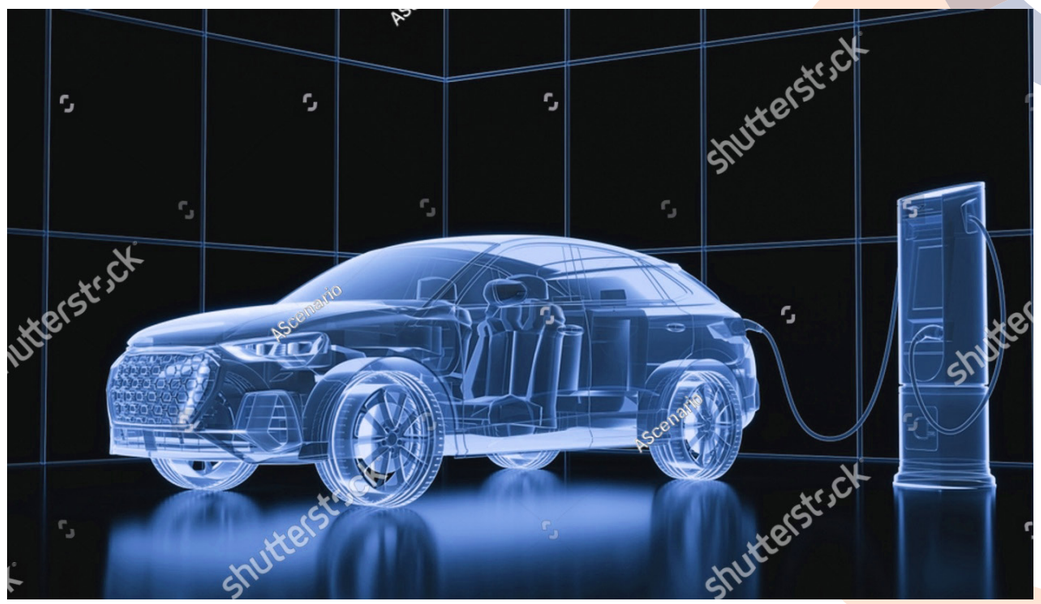
The air brake system makes use of air intake and exhaust at high pressure to generate braking efficiency for trucks and trains. The rubber material that is used is generally NBR. General product design is rubber sintered with copper. While the working environment under high pressure, DSC Seals are designed to perform under conditions of high pressure through a process of sintering with materials like copper and fabric.



| Air Brake Systems | Material |
|---|---|
| Air Brake | NBR |







# Electric Vehicle System

The Automotive Industry is moving through a pivotal transformation, driven by the emergence of new technologies and increasingly diversified components. Compared to traditional fuel-driven vehicles, electric vehicles (EVs) feature key systems such as batteries and battery thermal management systems (BTMS).

Batteries powering modern electric and hybrid vehicles have significantly higher amperages and energy capacities, requiring them to be more robust and of superior quality compared to those used in consumer applications. These batteries must operate under demanding temperature and pressure conditions while remaining protected against environmental factors like dust and moisture. DSC elastomeric seals are designed to extend battery service life under these challenging conditions, ensuring optimal performance and reliability for electric vehicle systems.

| Electric Vehicle System Components | Material |
|---|---|
| Battery pack application | Silicone |
| Thermal management system | Silicone<br>EPDM |
| Cooling system | EPDM |
| Air conditioner fittings | EPDM |
| Temperature Sensor | Silicone |
| Car suspension | EPDM |

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