

ENGINEERED TO STANDARD

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# Innovative Sealing Solutions For the Automotive Industry

Total integrity for the most demanding applications

## Group Presentation



**EASTERN SEALS**

GLOBAL SEALING PROVIDER

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# Sealing Environments

A wide variety of sealing solutions are used throughout today's vehicles.

These include O-rings that withstand high pressures in shock absorbers, sophisticated gaskets in electronic control units (ECUs) and safety critical custom-moulded components in braking systems.

## SEALING ENVIRONMENTS

- Extreme temperatures
- Coolants, refrigerants, brake fluids, ATF, other chemical solvents
- Oil, gasoline, fuel, diesel and grease
- Water, steam, dirt, dust and debris
- Environmental elements: ozone, oxidation, sun light, fungus, etc
- Dynamic operating conditions



## TYPICAL APPLICATIONS

- Transmissions and drivelines
- Diesel engines
- Oil filter and fuel systems
- Valve covers
- Engine oil pans
- Cylinder liners
- Hybrid-electric vehicles
- Sensors
- Steering systems



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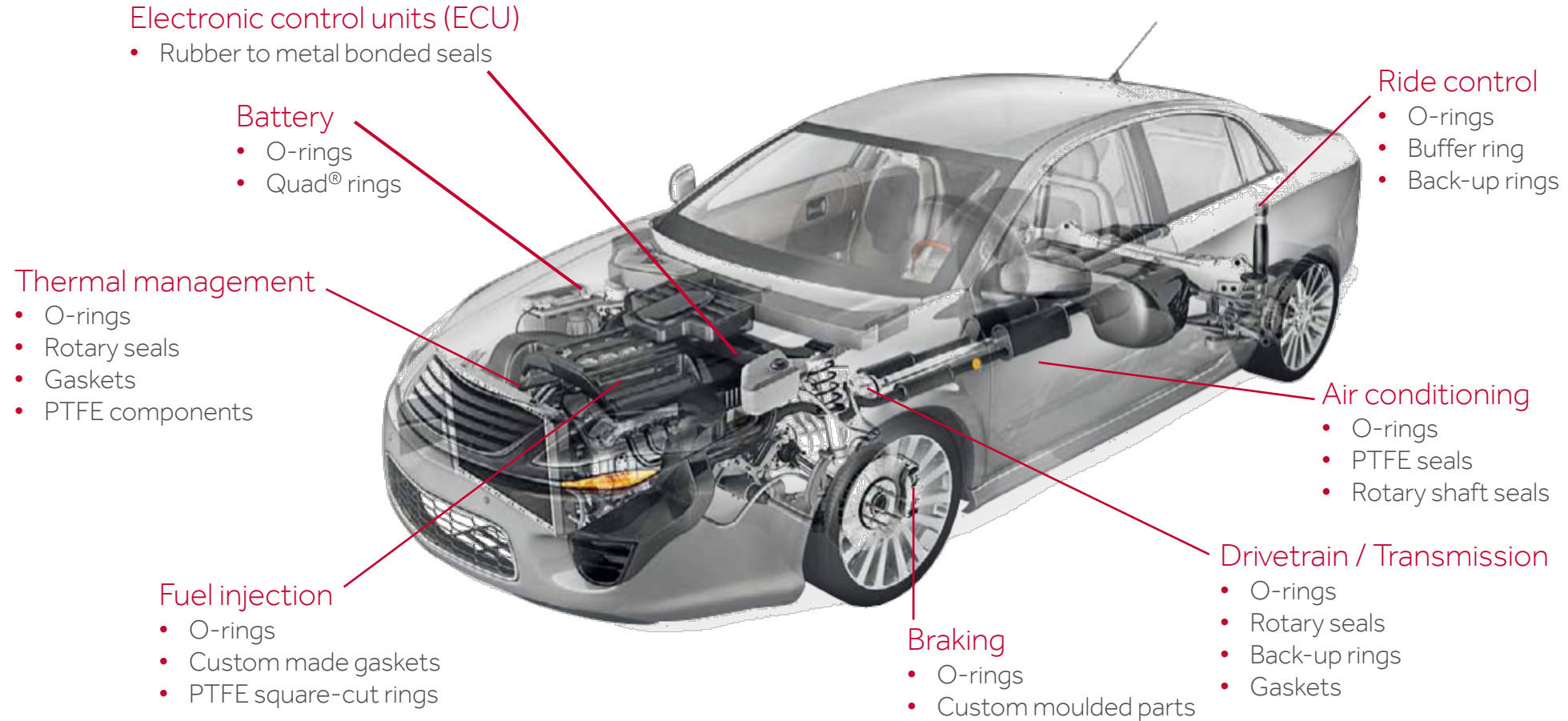
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# Applications



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# Innovative Sealing Solutions

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Our group is built on two of the UK's leading suppliers  
in automotive sealing technology

Eastern Seals (UK) Ltd supplies seals to customers around the world.  
Specialist compounds are just one of our renown assets.

UK Seals & Polymers Ltd specialise in hydraulic and pneumatic solutions.

Together, the group boasts over 40 years experience in the Sealing industry.

We stock and supply a vast range of products for cars, motorcycles, motorsport, light duty vehicles, coach, buses, trailers, trucks, and other heavy duty vehicles.

Automotive parts can be supplied with Level 3 PPAP documentation, along with CPK and PPK controls.

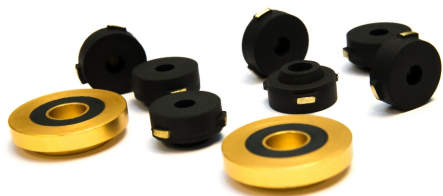
# Products



O-rings



Rubber bellows



Rubber to metal bonded parts



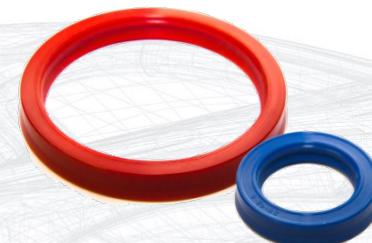
Rotary shaft seals (inc PTFE)



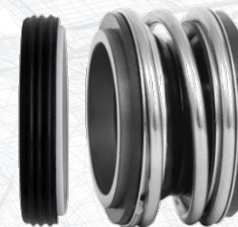
Bonded seals



Custom mouldings



Hydraulic seals



Mechanical seals



Gaskets



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# Case Study – Automotive Battery Manufacturer

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Manufacturer of high voltage automotive grade battery systems for Electric / Hybrid Electric vehicles is developing a new state of the art battery for two car manufacturing giants.

## Situation

Limited space between cells in the battery unit means typical O-ring and back-up ring scenario will not work.

Automotive seals need to maintain long-term high performance under challenging conditions.

## Solution

Chemicals involved in battery production can cause swelling, deterioration and increased permeation.

After reviewing the chemicals involved, Eastern Seals suggested using Viton® for the elastomer material.

Typical property benefits of using Viton® include:

- Low permeability to fuel of any type
- Can withstand temperatures to 225°C (intermittent to 285°C)
- Resists hydrocarbons and sour gasoline
- Solvent and acid-resistant
- Low compression set
- Excellent dynamic properties

After discussing the situation, and why O-rings would not be suitable, Eastern Seals suggested an alternative Viton® seal profile.

This seal would help improve installation over a traditional O-ring / Back-up ring within the battery application.



# Materials

Nitrile / Buna-N	Aflas® (FEPM)	PTFE (Teflon®)	AEM / Vamac® and Polyacrylate (ACM)	Ethylene Propylene (EPDM)	Fluorocarbon (Viton®, FKM, FPM)	Fluorosilicone (FVMQ)	Hydrogenated Nitrile (HNBR, HSN)	Perfluoro-elastomers (FFKM)	Silicone (VMQ, PVMQ, PMQ)
-40 to +110°C	-10 to +204°C	-200 to +250°C	AEM -25 to +170°C ACM -32 to +149°C	Peroxide Cure: -60°C to +150°C	-25 to +204°C Special compounds: -40 to +230°C	-60 to +177°C	-40 to +150°C	-25 to +316°C	-55 to +204°C Special compounds: -100 to +204°C
Good general purpose elastomer. Good mechanical properties. Excellent resistance to petroleum-based fluids. High wear resistance.  Relatively low ozone and weather resistance.	Outstanding resistance to high temp dry air and coolants.  Good oil and fuel resistance.  Limited low temp flexibility.	Lowest friction co-efficient and has self-lubricating capabilities.  Chemically inert PTFE resists the most aggressive organic and inorganic chemicals and solvents over a broad temperature range.	Outstanding resistance to oils, automotive transmission fluids and power steering fluids. Good resistance to high temp, wear, oxidation and ozone.  Limited resistance to water, steam, fuel, gasoline and automotive brake fluids.	Outstanding resistance to ozone, weathering, steam and hot water. Excellent resistance to brake fluids, ketones, alcohols and other aggressive solvents.  Not recommended for use in petroleum fluids.	Wide-spectrum chemical resistance. Excellent high temp resistance. Commonly used in fuels and oils. Bio fuel and coolant resistant versions are also available. Good ozone and weathering resistance.  Low resistance to brake fluids.	Good low temp capability and excellent chemical resistance. Good resistance to petroleum oils, hydrocarbon fuels, lubricants and petroleum-based greases.  Not recommended for dynamic applications.	Improved high temp capabilities / ozone resistance. Excellent resistance to thermo-oxidative ageing / petroleum-based fluids. Excellent wear resistance. Compatible with HFC refrigerants, oil soluble and water soluble substances.  Low ACN content is not recommended for gasoline, CFC refrigerants or aggressive solvents.	Extreme high temp capability. Excellent resistance to the broadest range of chemicals.  Limited low temp flexibility.  Not compatible with fluorinated refrigerants or other fluorinated chemicals.	Excellent choice for environmental seals. Wide temp range and good resistance to dry heat. Good ozone and weather resistance.  Good insulating properties. Relatively limited wear resistance and low resistance to fuels and oils.  Not recommended for dynamic applications.
Transmission and engine cover seals, sensor seals, steering seals, anti-drain back valves and oil filter seals.	Coolant resistant seals and cylinder liner seals.	Fuel cell seals, fuel injection pumps, steering wheel seals, air conditioning, compressor seals, hydraulic seals.	Pump-to-case seals, clutch seals, transmission cover seals and fluid transfer seals.	Battery seals, sensor seals, bumpers, isolators, sleeves, water / coolant resistant seals, radiator pump seals, environmental seals and cylinder liner seals.	Cover seals, cylinder liner seals, sensor seals, cap seals, oil pan seals and steering system seals.	Sensor seals, cap seals and compressed natural gas resistant seals.	Shock absorber seals, oil pan / cover seals, power steering, water pump seals, cap seals, sensor seals, bumpers, isolators, sleeves, under bonnet applications, HFC refrigerant resistant / oil filter seals.	Turbo charger seals and exhaust system seals.	Cover seals, sensor seals, battery seals, cap seals, bumpers, isolators, sleeves, steering system seals, anti-drain back valves, oil filter seals and environmental seals.



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# Hydrogenated Nitrile (HNBR, HSN)

HNBR is widely known for its physical strength and retention of properties after long-term exposure to heat, oil, and chemicals. HNBR offers a range properties including:

- Superior heat resistance (up to +150°C)
- Superior environmental resistance
- Improved resistance to polar fluids

Common uses of HNBR include:

- A/C seals and hoses
- Engine seals, grommets, and gaskets
- Fuel system seals and hoses
- Serpentine (multi-V) belts
- Suspension seals
- Synchronous (timing) belts Transmission system bonded piston seals



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# Quality Accreditation

We stock and supply a vast range of sealing solutions for cars, motorcycles, motorsport, light duty vehicles, coach, buses, trailers, trucks, and other heavy duty vehicles.

Automotive parts can be supplied with Level 3 PPAP documentation, along with CPK / PPK controls.

- Our Quality Management System has been approved by LRQA to **ISO 9001:2008**
- All products are supplied and tested within our **ISO 9001:2008** Quality Assurance Management System



# Group Vision

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## We're more than just a sealing supplier.

By applying years of engineering experience and expertise, we provide a comprehensive service and quality engineered sealing solutions.

We strive to be the first choice within our chosen markets, working across the globe.

We will continue to build long-term relationships with customers and suppliers by providing leading solutions and excellent service.



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# Thank you

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For more information on our products and services  
please get in touch



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