TechSeal Division

Precision Cut Seals for Sensor Applications

Application Bulletin

No. TSD 5419B1-USA

TechSeal's precision cut seals provide reliable, cost-effective solutions in sensor applications

Applications: Automotive, heavy truck, industrial and mobile equipment sensors requiring environmental or media sealing in the sensor body.

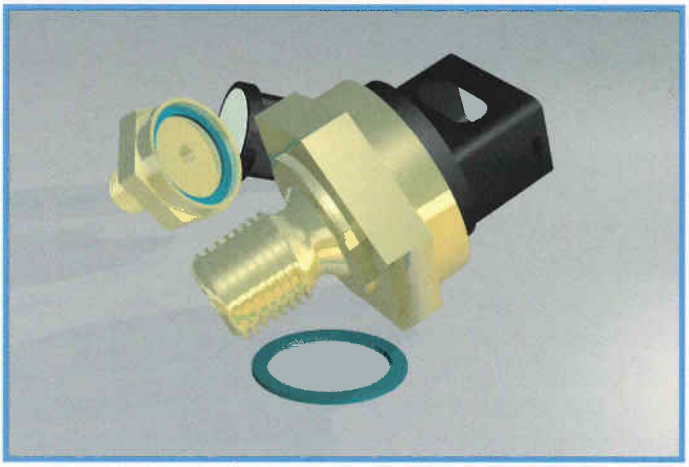
Design Requirements: Seals for high volume sensor application must be cost effective, easily assembled using automatic equipment and free of manufacturing defects. The ability to retain sealing properties in a variety of fluids and temperatures is essential.

The TechSeal Solution: Precision extruded and cut seals are custom designed and manufactured to install and function in a specific sensor application. The unique manufacturing process is typically more cost effective than molded products and does not require tooling. Additionally, TechSeal offers a wide variety of sealing grade compounds including Ethylene Propylene (EPDM), Fluorocarbon (FKM), Fluorosilicone (FVQM), Hydrogenated Nitrile (HNBR), Neoprene (CR), Nitrile (NBR), and Polyacrylate (ACM). The flexibility of the manufacturing process and the broad material offering allows precision cut seals to satisfy the requirements of virtually every sensor application.

Summary: Sensors require high quality, low cost seals that can survive in demanding environments. TechSeal's engineered seals, combined with a broad selection of sealing grade materials, provide a cost effective, custom sealing solution that meets demanding automotive requirements.

Target Sensor Applications:

- Fuel systems
- Brake pressure
- Oil pressure
- Air conditioning
- Power steering
- Suspension systems



Typical TechSeal precision cut seals designed for automotive sensor media and environmental requirements.

Key Features, Advantages, Benefits:

- Material technology (HNBR, FKM, FVQM, NBR, CR, EPDM)
- UL Listed compounds
- Application engineering assistance
- Finite Element Analysis (FEA)
- High volume, precision tolerance manufacturing process
- Part geometry (maximum sealing surface)
- No tooling charges for custom seals
- No molds required
- Speed to market and ease of dimensional changes
- Reduction of failure modes vs. molding
- Lower part cost vs. molding
- QS-9000 Certified facility

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Innovative Sealing Solutions

Parker anything possible

Finite Element Analysis (FEA)

Design Assistance

TechSeal Application Engineering Design Assistance

Reliable, precision-made seals are not the only advantage that TechSeal can offer for sensor applications. The Division also employs a dedicated application engineering staff that assists customers with custom seal designs, often using advanced CAE tools such as Finite Element Analysis. Figure 1 shows an FEA simulation for a static seal used in a high-pressure sensor. In this application, the TechSeal solution offered advantages such as maximum sealing contact area, precision tolerances and competitive pricing. The simulation helped validate the seal design before parts were built and tested.

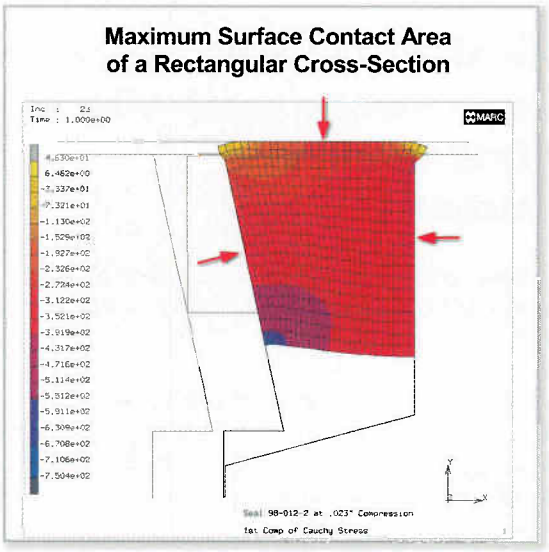

Figure 1

Compound	Recommended For	Average Temperature Range
Ethylene-Propylene (EPDM)	Brake Fluid, Water, Phosphate Ester Type Hydraulic Fluids (Skydrol®), Steam	-70°F to 250°F
Fluorocarbon (FKM)	Petroleum Oils, Acids, Halogenated Hydrocarbons, Fuel	-15°F to 400°F Specials down to -40°F
Fluorosilicone (FVQM)	Broad Temperature Range Petroleum Oils, Fuel	-100°F to 350°F
Hydrogenated Nitrile (HNBR)	ATF Fluids, R134A/PAG Oil, Petroleum Crude Oil	-25°F to 300°F
Neoprene (CR)	Refrigerants, Petroleum Oils	-60°F to 250°F
Nitrile (NBR)	Petroleum Oils/Fluids, Silicone Greases/ Oils, Ethylene Glycol Based Fluids	-30°F to 225°F
Polyacrylate (ACM)	ATF Fluids, Power Steering Fluids, Petroleum Oils/Fluids	-5°F to 350°F

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