Bonded piston seals

Robust one-piece design offers many benefits

One-piece design eases assembly and promotes long service life

The one-piece design of the the rubber-to-metal bonded piston seal lowers total system costs, reduces weight and saves space. On our design, the one continuous rubber seal bonds directly to the metal insert, reducing the overall cost and complexities of installation. The integral one-piece construction reduces the normal tight tolerances required in machined piston designs, while providing superior inner and outer seal characteristics.

Bonded piston seals can easily incorporate addional features such as, check valves, metering orifices, spring retainers and other added attributes.

Contact Information:

Parker Hannifin Corporation
O-Ring & Engineered Seals Division
2360 Palumbo Drive
Lexington, KY 40509

phone 859 269 2351
oesmailbox@parker.com

www.parker.com/oes

Applications:

- Clutch pistons
- Servo pistons
- Balance dam pistons
- Accumulator pistons

Benefits:

- Cost effective
- Ease of installation
- Weight reduction
- Robust design
- Integrated features

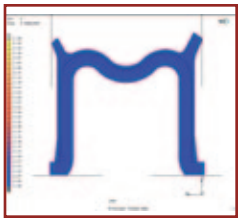
Parker

ENGINEERING YOUR SUCCESS.

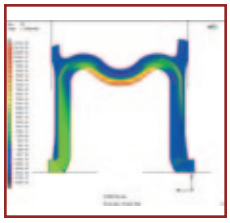
Bonded rubber pistons are primarily made out of two materials; ethylene acrylic (AEM) and fluorocarbon (FKM). Ethylene acrylic displays high resistance to Dex 6 transmission fluid. Fluorocarbon is recommended for applications involving gasoline, ethanol, engine coolant and water up to 200°C. Both of these compounds listed below show outstanding heat stability and resistance to motor oil, AFT, ozone and weather. Additional elastomer compounds are available to custom fit your applications.

Material		**AE513-85 (60111-1)**	**VA514-75(65711)**
Polymer Type		Ethylene Acrylic (AEM)	Fluorocarbon (FKM)
Temperature Range		-40 to 160°C	-30 to 200°C
Original Properties	**Method**		
Specific Gravity, g/cc	D297	1.30	1.86
Hardness, Shore "A" pts.	D2240	82	75
Tensile, MPa	D412	14.0	10.3
Elongation, %	D412	158	225
100% Modulus, MPa	D412	11.6	4.9
Tear Strength, kN/m	D624	40.8	33.3
Compression Set - 70 hrs @ 150°C			
% Deflection	D395 Method B	23.5	14.3
Automatic Transmission Fluid - 70 hrs @150°C			
Hardness Change, pts.	D471	-6	-3
Tensile Change, %	D471	+3.7	-11.7
Elongation Change, %	D471	-7.0	-4.0
Volume Change, %	D471	+9.8	+3.4
IRM - 903 Oil - 70 hrs @ 150°C			
Hardness Change, pts.	D471	-17	-4
Tensile Change, %	D471	-16.9	-4.9
Elongation Change, %	D471	-14.6	-0.4
Volume Change, %	D471	+36.7	+4.6
Heat Aged - 70 hrs		**@150°C**	**@250°C**
Hardness Change, pts.	D865	+3	+6
Tensile Change, %	D865	+2.2	+25.4
Elongation Change, %	D865	-3.8	-28.5
Low Temperature Transition			
TR-10, °C	D1329	-39.5	-17.6

3D Finite element analysis (FEA) provides our engineers with the data needed to achieve a robust, yet cost effective design. The example shown to at the right, considers a 400 psi pressure application and required design materials to minimize piston wall thickness and maximize seal life.



Bonded Piston Seal at 0 psi



Bonded Piston Seal under 400 psi

Parker

ENGINEERING YOUR SUCCESS.