VG109-90: Low Temperature FKM

Sealing to -50°F with Excellent Compression Set, RGD, and Extrusion Resistance



Low Temperature and Compression Set Resistance

In the demanding global environments of the Oil and Gas industry, seal materials are pushed to extreme limits. Parker develops innovative rubber materials providing improved sealing capabilities in a broad range of temperatures, pressures, and chemistries. Parker's newest cutting edge FKM material, VG109-90, is formulated for services requiring low temperature, rapid gas decompression (RGD) and excellent compression set resistance.



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Features:

- Wide temperature range: -50°F to 400°F
- Very low compression set
- Outstanding retained resiliency
- 90 durometer
- RGD resistant per ISO 23936-2
- H₂S resistant per ISO 23936-2 (up to 10%)

- Extrusion resistance
- Wide range of chemical compatibilities
- Low temperature performance without reducing high temperature capabilities



ENGINEERING YOUR SUCCESS.

VG109-90

Original Physical Properties Test Method Results Results Hardness, Shore A, pts. Tensile strength change, % Ultimate elongation change, psi Specific gravity Compression Set 70 hrs. @ 392°F (1/2 inch buttons) Percent of original deflection, max Heat Resistance 168 hrs. @ 392°F Hardness change, Shore A pts. Tensile strength change, % Weight loss, % Fluid Immersion 70 hrs. @ 212°F Di Water Hardness change, % Ultimate elongation change, psi Wolume change, % Hardness change, Shore A pts. Tensile strength change, % Ultimate elongation change, psi Wolume change, % Hardness change, Shore A pts. Tensile strength change, % ASTM D471 -3 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -13 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -13 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -13 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -13 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -13 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % Hardness change, Shore A pts. ASTM D471 -4 Tensi			VG109
Hardness, Shore A, pts. Tensile strength change, % Ultimate elongation change, psi Percent of original deflection, max Heat Resistance 168 hrs. @ 392°F Hardness change, % Weight loss, % Fluid Immersion 70 hrs. @ 212°F Diesel #2 Hardness change, % Ultimate elongation change, psi Nodulus at 100% elongation change, psi Results ASTM D412 2314 ASTM D412 22014 ASTM D412 2014 ASTM D412 2014 ASTM D412 2014 ASTM D295 1.73 Compression Set 70 hrs. @ 392°F (1/2 inch buttons) Percent of original deflection, max ASTM D395 Method B Percent of original deflection, max ASTM D395 Method B Percent of original deflection, max ASTM D865 42 ASTM D865 42 ASTM D865 42 417 Ultimate elongation change, % Weight loss, % Fluid Immersion 70 hrs. @ 212°F DI Water Hardness change, Shore A pts. ASTM D471 -3 Tensile strength change, % Ultimate elongation change, psi Volume change, % Fluid Immersion 70 hrs. @ 212°F Diesel #2 Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % H10 Modulus at 100% elongation change, psi Volume change, % H10 Modulus at 100% elongation change, psi Volume change, % Fluid Immersion 70 hrs. @ 75°F Methanol Hardness change, Shore A pts. ASTM D471 -13 Tensile strength change, % Ultimate elongation change, % ASTM D471 -13 Tensile strength change, % Ultimate elongation change, % ASTM D471 -13 Tensile strength change, % Ultimate elongation change, % Ultimate elongation change, % Ultimate elongation change, % Ultimate elongation change, % Oldimate elongation change, % Ultimate elongation change, % Oldimate elongation change, % Ultimate elongation change, % Oldimate elongation change, % Oldimat			(Platens)
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Modulus at 100% elongation change, psi Specific gravity ASTM D295 1.73 Compression Set 70 hrs. @ 392°F (1/2 inch buttons) Percent of original deflection, max ASTM D395 Method B Heat Resistance 168 hrs. @ 392°F Hardness change, Shore A pts. ASTM D865 +2 Tensile strength change, % Ultimate elongation change, psi Weight loss, % Fluid Immersion 70 hrs. @ 212°F DI Water Hardness change, Shore A pts. ASTM D471 -3 Tensile strength change, % Ultimate elongation change, psi Wolune at 100% elongation change, psi Volume change, % Fluid Immersion 70 hrs. @ 212°F Diesel #2 Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % -22 Ultimate elongation change, psi Volume change, Shore A pts. ASTM D471 -4 Tensile strength change, % -22 Ultimate elongation change, psi Volume change, % -22 Ultimate elongation change, psi Volume change, % -30 Wolulus at 100% elongation change, psi Volume change, % -31 Tensile strength change, % -32 Ultimate elongation change, psi Volume change, % -33 Ultimate elongation change, % -34 Ultimate elongation change, % -35 Ultimate elongation change, % -36 Ultimate elongation change, % -37 Ultimate elongation change, % -38 Ultimate elongation change, % -39 Ultimate elongation change, % -30 Modulus at 100% elongation change, psi	Tensile strength change, %	ASTM D412	2314
Specific gravity Compression Set 70 hrs. @ 392°F (1/2 inch buttons) Percent of original deflection, max ASTM D395 Method B Heat Resistance 168 hrs. @ 392°F Hardness change, Shore A pts. Tensile strength change, % Ultimate elongation change, psi Weight loss, % Fluid Immersion 70 hrs. @ 212°F DI Water Hardness change, Shore A pts. ASTM D471 ASTM D471 -3 Tensile strength change, % Ultimate elongation change, psi Wolume change, % ASTM D471 -3 Tensile strength change, % Litimate elongation change, psi Wolume change, % Fluid Immersion 70 hrs. @ 212°F Diesel #2 Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % Fluid Immersion 70 hrs. @ 212°F Diesel #2 Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % Litimate elongation change, psi Volume change, % Fluid Immersion 70 hrs. @ 75°F Methanol Hardness change, Shore A pts. ASTM D471 -13 Tensile strength change, % -3 Ultimate elongation change, %	Ultimate elongation change, %	ASTM D412	126
Compression Set 70 hrs. @ 392°F (1/2 inch buttons) Percent of original deflection, max Heat Resistance 168 hrs. @ 392°F Hardness change, Shore A pts. Tensile strength change, % Ultimate elongation change, psi Weight loss, % Fluid Immersion 70 hrs. @ 212°F DI Water Hardness change, Shore A pts. Tensile strength change, % Ultimate elongation change, psi Wight loss, % Fluid Immersion 70 hrs. @ 212°F DI Water Hardness change, Shore A pts. Tensile strength change, % Ultimate elongation change, psi Volume change, % Fluid Immersion 70 hrs. @ 212°F Diesel #2 Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % Last M D471 -4 Fluid Immersion 70 hrs. @ 75°F Methanol Hardness change, Shore A pts. ASTM D471 -13 Tensile strength change, % Last M D471 -14 Tensile strength change, % Last M D471 -15 Tensile s	Modulus at 100% elongation change, psi	ASTM D412	2014
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Tensile strength change, % +17 Ultimate elongation change, % -27 Modulus at 75% elongation change, psi +36 Weight loss, % 0 Fluid Immersion 70 hrs. @ 212°F DI Water Hardness change, Shore A pts. ASTM D471 -3 Tensile strength change, % -8 Ultimate elongation change, psi -10 Volume change, % +3 Fluid Immersion 70 hrs. @ 212°F Diesel #2 Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % -22 Ultimate elongation change, psi -30 Volume change, % -30 Modulus at 100% elongation change, psi -30 Volume change, % -30 Ultimate elongation 70 hrs. @ 75°F Methanol Hardness change, Shore A pts. ASTM D471 -13 Tensile strength change, % -3 Ultimate elongation change, % -3 Ultimate elongation change, % -3 Ultimate elongation change, % -3 Modulus at 100% elongation change, psi -30 Modulus at 100% elongation change, psi -31	Heat Resistance 168 hrs. @ 392°F		
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Volume change, % +3 Fluid Immersion 70 hrs. @ 212°F Diesel #2 Hardness change, Shore A pts. ASTM D471 -4 Tensile strength change, % -22 Ultimate elongation change, % +10 Modulus at 100% elongation change, psi -30 Volume change, % +4 Fluid Immersion 70 hrs. @ 75°F Methanol Hardness change, Shore A pts. ASTM D471 -13 Tensile strength change, % -3 Ultimate elongation change, % -30 Modulus at 100% elongation change, psi -31	Ultimate elongation change, %		-3
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Fluid Immersion 70 hrs. @ 75°F Methanol Hardness change, Shore A pts. Tensile strength change, % Ultimate elongation change, % Modulus at 100% elongation change, psi ASTM D471 -13 -3 -30 -31	Modulus at 100% elongation change, psi		-30
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Tensile strength change, % Ultimate elongation change, % Modulus at 100% elongation change, psi -3 -30 -30 -31	Fluid Immersion 70 hrs. @ 75°F Methanol		
Ultimate elongation change, % -30 Modulus at 100% elongation change, psi -31	Hardness change, Shore A pts.	ASTM D471	-13
Modulus at 100% elongation change, psi -31	Tensile strength change, %		-3
3 71	Ultimate elongation change, %		-30
Volume change, % +23	Modulus at 100% elongation change, psi		-31
	Volume change, %		+23

VG109-90 continued

Fluid Immersion 70 hrs. @ 212°F Erlfon 818			
Hardness change, Shore A pts.	ASTM D471	-4	
Tensile strength change, %		-8	
Ultimate elongation change, %		+5	
Modulus at 100% elongation change, psi		-16	
Volume change, %		+6	
Fluid Immersion 70 hrs. @ 212°F Zinc Bromide, (ZnBr ₂)			
Hardness change, Shore A pts.	ASTM D471	-1	
Tensile strength change, %		-3	
Ultimate elongation change, %		-10	
Modulus at 100% elongation change, psi		+2	
Volume change, %		+1	







VG109-90 provides improved performance at low temperatures, resistance to rapid gas decompression, and high temperature sealing performance. It also provides outstanding long term compression set resistance and retained resiliency while maintaining fluid compatibility. This material was developed to seal in environments ranging from -50°F up to 400°F.

The unique characteristics of this FKM elastomer allows VG109-90 to meet many of the demanding requirements found in such industries as Oil and Gas, Automotive and Aerospace.

For more information on this innovative material, please contact a Parker O-Ring Division Applications Engineer by calling 859-335-5101 or e-mail at ordmailbox@parker.com.



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