



## Garlock 9900

### MATERIAL PROPERTIES\*

<b>Color:</b>	Mahogany
<b>Composition:</b>	Graphite fibers with a nitrile binder
<b>Fluid Services<sup>1</sup>:</b>	Saturated steam <sup>3</sup> , water, oil, inert gases, aliphatic hydrocarbons and gasoline
<b>Temperature<sup>2</sup>, °F (°C)</b>	
Minimum:	-100 (-73)
Continuous Max:	+650 (+343)
Maximum:	+1000 (+537)
<b>Pressure<sup>2</sup>, Maximum, psig (bar):</b>	2000 (138)
<b>P x T (max.)<sup>2</sup>, psig x °F (bar x °C)</b>	
1/32 and 1/16":	700,000 (25,000)
1/8":	350,000 (12,000)
<b>Meets Specification:</b>	ABS (American Bureau of Shipping), STR 508(5) Rev. 2 and Fire Safe

### TYPICAL PHYSICAL PROPERTIES\*

<b>ASTM F36</b>	<b>Compressibility, range, %:</b>	7-17	
<b>ASTM F36</b>	<b>Recovery, %:</b>	65	
<b>ASTM F38</b>	<b>Creep Relaxation, %:</b>	9	
<b>ASTM F152</b>	<b>Tensile, Across Grain, psi (N/mm<sup>2</sup>):</b>	1800 (12)	
<b>ASTM F1315</b>	<b>Density, lbs./ft.<sup>3</sup> (grams/cm<sup>3</sup>):</b>	110 (1.76)	
<b>ASTM F433</b>	<b>Thermal Conductivity (K), W/m<sup>2</sup>K (Btu·in./hr·ft.<sup>2</sup>·°F):</b>	0.87 (6.0)	
<b>ASTM D149</b>	<b>Dielectric Properties, range, volts/mil.</b>		
	Sample conditioning	<u>1/16"</u>	<u>1/8"</u>
	3 hours at 250°F:	<2	-
	96 hours at 100% Relative Humidity:	-	-
<b>ASTM F586</b>	<b>Design Factors</b>	<u>1/16" &amp; Under</u>	<u>1/8"</u>
	"m" factor:	4.5	6
	"y" factor, psi (N/mm <sup>2</sup> ):	4100 (28.3)	4100 (28.3)
<b>ROTT</b>	<b>Gasket Constants, 1/16":</b>	Gb=2,322	a=0.133    Gs=18.0
<b>ASTM F104</b>	<b>Line Call Out:</b>	F712102A9B3E22K9L401M5 <sup>(4)</sup>	

### SEALING CHARACTERISTICS\*

	<b>ASTM F37B Fuel A</b>	<b>ASTM F37B Nitrogen</b>	<b>DIN 3535- 4 Gas Permeability</b>
<b>Gasket Load, psi (N/mm<sup>2</sup>):</b>	500 (3.5)	3000 (20.7)	4640 (32)
<b>Internal Pressure, psig (bar):</b>	9.8 (0.7)	30 (2)	580 (40)
<b>Leakage</b>	<b>0.1 ml/hr.</b>	<b>0.1 ml/hr.</b>	<b>0.015 cc/min</b>

### IMMERSION PROPERTIES\* - ASTM F146 Fluid Resistance after Five Hours

	<b>ASTM #1 Oil 300°F (150°C)</b>	<b>ASTM IRM #903 300°F (150°C)</b>	<b>ASTM Fuel A 70-85°F (20-30°C)</b>	<b>ASTM Fuel B 70-85°F (20-30°C)</b>
<b>Thickness Increase, (%)</b>	0-5	0-10	0-5	0-10
<b>Weight Increase, (%)</b>	<10	-	<7	<15
<b>Tensile Loss, (%)</b>	-	<35	-	-

#### Notes:

This is a general guide and should not be the sole means of selecting or rejecting this material. ASTM test results in accordance with ASTM F-104; properties based on 1/32" (0.8mm) sheet thickness unless otherwise mentioned.

\* Values do not constitute specification Limits

<sup>1</sup> See Garlock chemical resistance guide.

<sup>2</sup> Based on ANSI RF flanges at our preferred torque. When approaching maximum pressure, continuous operating temperature, minimum temperature or 50% of maximum P x T, consult Garlock Applications Engineering. Minimum temperature rating is conservative.

<sup>3</sup> Minimum recommended assembly stress = 4,800psi. Preferred assembly stress = 6,000-10,000psi. Gasket thickness of 1/16" strongly preferred. Retorque the bolts/studs prior to pressurizing the assembly. For saturated steam above 150psig or superheated steam, consult Garlock Engineering.

<sup>4</sup> A9: Leakage in Fuel A (Isooctane), Gasket Load = 500psi (3.5N/mm<sup>2</sup>), Pressure = 9.8psig (0.7bar): Typical = 0.1ml/hr, Max = 0.5ml/hr. A9: Leakage in Nitrogen, Gasket Load = 3,000psi (20.7N/mm<sup>2</sup>), Pressure = 30psig (2bar): Typical = 0.1ml/hr, Max = 0.5ml/hr. K9: Thermal Conductivity = 0.87W/m<sup>2</sup>K (6.0btu·in/h·ft<sup>2</sup>·°F).

<sup>5</sup> Testing and certification required.