





GARLOCK DATA SHEETS

3000 Series

Compressed, Non-Asbestos (CNA) Gasketing Line

Garlock: *Blue Gard 3000*

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DESCRIPTION

The Garlock® BLUE-GARD® compressed, non-asbestos (CNA) gasketing line offers a variety of elastomers to excel in a wide range of services. The unique blend of aramid fibers, fillers and elastomeric binders provides improved torque retention and drastically lowered emissions levels. BLUE-GARD® CNA Gasketing offers cost savings by cutting operational costs through reduced waste, maintenance, stocked inventory, fluid loss, and energy consumption.

BENEFITS

Ideal for utility services

- *Excellent Sealability*
- *Unique blend of aramid fibers, fillers, and a NBR rubber binder provides improved torque retention and drastically lowered emissions levels*
- *Cuts Operational costs through reduced: Waste - Maintenance - Stocked inventory - Fluid Loss - Energy Consumption*

DISCLAIMER

All data and statements concerning these products may be considered as being indicative of representative properties and characteristics obtainable. We make no warranty, expressed or implied, concerning actual use or results because of industry specific influences. All of the product data is nominal and does not represent a specification.

Material Properties

Colour:	Blue
Composition:	Aramid fibers with a nitrile binder
Fluid Services ¹ :	Water, aliphatic hydrocarbons, oils and gasoline
Temperature ² , °F (°C)	
Minimum:	-100 (-73)
Continuous:	+400 (+205)
Maximum:	+700 (+371)
Pressure ² , Maximum, psig (bar):	1000 (70)
P × T (max.) ² , psig × °F (bar × °C)	
1/32 and 1/16":	350,000 (12,000)
1/8":	250,000 (8,600)
Meets Specification:	ABS (American Bureau of Shipping) and BS 7531 Grade Y

Physical Properties

Compressibility, range, %:	7-17
Recovery, %:	50
Creep Relaxation, %:	21
Tensile, Across Grain, psi (N/mm ²):	2250 (15)
Density, lbs./ft. ³ (grams/cm ³):	100 (1.60)
Thermal Conductivity (K), W/m °K (Btu.in./hr.ft. ² .°F):	0.29 - 0.38 (2.00 - 2.65)
Dielectric Properties, range, volts/mil.	
Sample conditioning	<u>1/16"</u> <u>1/8"</u>
3 hours at 250 °F:	396 ⁽³⁾ -832 257 ⁽³⁾ -363
96 hours at 100% Relative Humidity:	271 142
Design Factors	<u>1/16" & Under</u> <u>1/8"</u>
"m" factor:	4.2 5.2
"y" factor, psi (N/mm ²):	3050 (21.0) 4400 (30.3)
Line Call Out:	F712102A9B4E22K5L101M5 ⁽⁴⁾

Sealing Characteristics

	ASTM F37B Fuel A	ASTM F37B Nitrogen	DIN 3535- 4 Gas Permeability
Gasket Load, psi (N/mm ²):	500 (3.5)	3000 (20.7)	4640 (32)
Internal Pressure, psig (bar):	9.8 (0.7)	30 (2)	580 (40)
Leakage	0.2 ml/hr.	0.6 ml/hr.	0.05 cc/min

Immersion Properties - ASTM F146 Fluid Resistance after Five Hours

	ASTM #1 Oil 300 °F (150 °C)	ASTM IRM #903 300 °F (150 °C)	ASTM Fuel A 70-85 °F (20-30 °C)	ASTM Fuel B 70-85 °F (20-30 °C)
Thickness Increase, (%)	0-5	0-15	0-5	0-10
Weight Increase, (%)	<8	<20	<8	<15
Tensile Loss, (%)	-	<35	-	-

NOTE:

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

¹ See Garlock chemical resistance guide.

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

³ Indicates current arced around and not through gasket. Dielectric higher than indicated.

⁴ A9: Leakage in Fuel A (Isooctane), Gasket Load = 500psi (3.5N/mm²), Pressure = 9.8psig (0.7bar); Typical = 0.2ml/hr, Max = 1.0ml/hr. A9: Leakage in Nitrogen, Gasket Load = 3,000psi (20.7N/mm²), Pressure = 30psig (2bar); Typical = 0.6ml/hr, Max = 1.5ml/hr.

Compressed, Non-Asbestos (CNA) Gasketing Line

Garlock: *Blue Gard 3200*

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DESCRIPTION

The Garlock® BLUE-GARD® compressed, non-asbestos (CNA) gasketing line offers a variety of elastomers to excel in a wide range of services. The unique blend of aramid fibers, fillers and elastomeric binders provides improved torque retention and drastically lowered emissions levels. BLUE-GARD® CNA Gasketing offers cost savings by cutting operational costs through reduced waste, maintenance, stocked inventory, fluid loss, and energy consumption.

BENEFITS

- *Excellent sealability*
- *Unique blend of aramid fibers, fillers, and a SBR rubber binder provides improved torque retention and drastically lowered emissions levels.*
- *Cuts operational costs through reduced: Waste - Maintenance - Stocked Inventory - Fluid Loss - Energy Consumption*

DISCLAIMER

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Material Properties

Colour:	Off-white
Composition:	Aramid fibers with a SBR binder
Fluid Services ¹ :	Water, saturated steam ⁴ , inert gases
Temperature ² , °F (°C)	
Minimum:	-100 (-73)
Continuous:	+400 (+205)
Maximum:	+700 (+371)
Pressure ² , Maximum, psig (bar):	1200 (83)
P × T (max.) ² , psig × °F (bar × °C)	
1/32 and 1/16":	350,000 (12,000)
1/8":	250,000 (8,600)
Meets Specification:	ABS (American Bureau of Shipping) and MIL-DTL-24696C ⁶

Physical Properties

Compressibility, range, %:	7-17	
Recovery, %:	50	
Creep Relaxation, %:	18	
Tensile, Across Grain, psi (N/mm ²):	2250 (15)	
Density, lbs./ft. ³ (grams/cm ³):	100 (1.60)	
Thermal Conductivity (K), W/m °K (Btu.in./hr.ft. ² .°F):	0.29 - 0.38 (2.00 - 2.65)	
Dielectric Properties, range, volts/mil.		
Sample conditioning	<u>1/16"</u>	<u>1/8"</u>
3 hours at 250 °F:	508	285 ⁽³⁾
96 hours at 100% Relative Humidity:	116	140
Design Factors	<u>1/16" & Under</u>	<u>1/8"</u>
"m" factor:	3.5	6.6
"y" factor, psi (N/mm ²):	2100 (14.5)	3000 (20.7)
Line Call Out:	F712902A9B4E45K5L102M9 ⁽⁵⁾	

Sealing Characteristics

	ASTM F37B Fuel A	ASTM F37B Nitrogen	DIN 3535-4 Gas Permeability
Gasket Load, psi (N/mm ²):	500 (3.5)	3000 (20.7)	4640 (32)
Internal Pressure, psig (bar):	9.8 (0.7)	30 (2)	580 (40)
Leakage	0.1 ml/hr.	0.4 ml/hr.	0.03 cc/min

Immersion Properties - ASTM F146 Fluid Resistance after Five Hours

	ASTM #1 Oil 300 °F (150 °C)	ASTM IRM #903 300 °F (150 °C)	ASTM Fuel A 70-85 °F (20-30 °C)	ASTM Fuel B 70-85 °F (20-30 °C)
Thickness Increase, (%)	0-10	15-30	0-15	5-20
Weight Increase, (%)	<20	-	<25	<30
Tensile Loss, (%)	-	<70	-	-

NOTE:
 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
¹ See Garlock chemical resis
² Based on ANSI RF flanges at our preferred torque. When approaching maximum pressure, continuous operating temperature, minimum temperature or 50% of maximum P×T, consult Garlock Applications Engineering. Minimum temperature rating is conservative.
³ Indicates current arced around and not through gasket. Dielectric higher than indicated.
⁴ These styles are not preferred choices for steam service, but are successful when adequately compressed. 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.
⁵ Fourth numeral 9: % Thickness Increase in IRM Oil #903 = 25-50% max. A9: Leakage in Fuel A (Isocetane), Gasket Load = 500psi (3.5N/mm²), Pressure = 9.8psig (0.7bar); Typical = 0.1ml/hr, Max = 1.0ml/hr. A9: Leakage in Nitrogen, Gasket Load = 3,000psi (20.7N/mm²), Pressure = 30psig (2bar); Typical = 0.4ml/hr, Max = 1.0ml/hr. M9: Tensile Strength = 2,250psi min. (15N/mm² min.).
⁶ To ensure receipt of product branded MIL-G-24696, certification will be required-- fees associated based on quantity. Refer to "Military Specifications" in the Gasketing Terms section of the Engineered Gasket Products catalog for order/inquiry requirements.

Compressed, Non-Asbestos (CNA) Gasketing Line

Garlock: *Blue Gard 3300*

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DESCRIPTION

The Garlock® BLUE-GARD® compressed, non-asbestos (CNA) gasketing line offers a variety of elastomers to excel in a wide range of services. The unique blend of aramid fibers, fillers and elastomeric binders provides improved torque retention and drastically lowered emissions levels. BLUE-GARD® CNA Gasketing offers cost savings by cutting operational costs through reduced waste, maintenance, stocked inventory, fluid loss, and energy consumption.

BENEFITS

Excellent sealability

- *Unique blend of aramid fibers, fillers and a neoprene rubber binder provides improved torque retention and drastically lowered emissions levels*

Cost savings

- *Cuts Operational costs through reduced: Waste - Maintenance - Stocked inventory - Fluid Loss - Engery Consumption*

DISCLAIMER

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Material Properties

Colour:	Black
Composition:	Aramid fibers with a neoprene binder
Fluid Services ¹ :	Water, saturated steam ⁴ , refrigerants, oils and fuels
Temperature ² , °F (°C)	
Minimum:	-100 (-73)
Continuous:	+400 (+205)
Maximum:	+700 (+371)
Pressure ² , Maximum, psig (bar):	1200 (83)
P × T (max.) ² , psig × °F (bar × °C)	
1/32 and 1/16":	350,000 (12,000)
1/8":	250,000 (8,600)

Physical Properties

Compressibility, range, %:	7-17
Recovery, %:	50
Creep Relaxation, %:	18
Tensile, Across Grain, psi (N/mm ²):	2250 (15)
Density, lbs./ft. ³ (grams/cm ³):	100 (1.60)
Thermal Conductivity (K), W/m °K (Btu.in./hr.ft. ² .°F):	0.29 - 0.38 (2.00 - 2.65)
Dielectric Properties, range, volts/mil.	
Sample conditioning	<u>1/16"</u> <u>1/8"</u>
3 hours at 250 °F:	392 ⁽³⁾ , 517 269 ⁽³⁾
96 hours at 100% Relative Humidity:	78 73
Design Factors	<u>1/16" & Under</u> <u>1/8"</u>
"m" factor:	2.1 4.0
"y" factor, psi (N/mm ²):	3050 (21.0) 3500 (24.1)
Line Call Out:	F712403A9B4E34K5L103M9 ⁽⁵⁾

Sealing Characteristics

	ASTM F37B Fuel A	ASTM F37B Nitrogen	DIN 3535-4 Gas Permeability
Gasket Load, psi (N/mm ²):	500 (3.5)	3000 (20.7)	4640 (32)
Internal Pressure, psig (bar):	9.8 (0.7)	30 (2)	580 (40)
Leakage	0.2 ml/hr.	1.0 ml/hr.	0.08 cc/min

Immersion Properties - ASTM F146 Fluid Resistance after Five Hours

	ASTM #1 Oil 300 °F (150 °C)	ASTM IRM #903 300 °F (150 °C)	ASTM Fuel A 70-85 °F (20-30 °C)	ASTM Fuel B 70-85 °F (20-30 °C)
Thickness Increase, (%)	0-15	15-30	0-10	5-20
Weight Increase, (%)	<15	-	<20	<20
Tensile Loss, (%)	-	<50	-	-

NOTE:
 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
¹ See Garlock chemical resistance guide.
² Based on ANSI RF flanges at our preferred torque. When approaching maximum pressure, continuous operating temperature, minimum temperature or 50% of maximum P×T, consult Garlock Applications Engineering. Minimum temperature rating is conservative.
³ Indicates current arced around and not through gasket. Dielectric higher than indicated.
⁴ These styles are not preferred choices for steam service, but are successful when adequately compressed. 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.
⁵ A9: Leakage in Fuel A (Isooctane), Gasket Load = 500psi (3.5N/mm²), Pressure = 9.8psig (0.7bar): Typical = 0.2ml/hr, Max = 1.5ml/hr. A9: Leakage in Nitrogen, Gasket Load = 3,000psi (20.7N/mm²), Pressure = 30psig (2bar): Typical = 1.0ml/hr, Max = 2.0ml/hr.

Compressed, Non-Asbestos (CNA) Gasketing Line

Garlock: *Blue Gard 3400*

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DESCRIPTION

The Garlock® BLUE-GARD® compressed, non-asbestos (CNA) gasketing line offers a variety of elastomers to excel in a wide range of services. The unique blend of aramid fibers, fillers and elastomeric binders provides improved torque retention and drastically lowered emissions levels. BLUE-GARD® CNA Gasketing offers cost savings by cutting operational costs through reduced waste, maintenance, stocked inventory, fluid loss, and energy consumption.

BENEFITS

Excellent Sealability

- *Unique blend of aramid fibers, fillers and a SBR rubber binder provides improved torque retention and drastically lowered emissions levels*

Cost savings

- *Cuts operational costs through reduced:- Waste- Waste- Maintenance- Stocked inventory- Fluid loss- Energy consumption*

DISCLAIMER

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Material Properties

Colour:	Grey-black
Composition:	Aramid fibers with a SBR binder
Fluid Services ¹ :	Water, saturated steam ³ , inert gases
Temperature ² , °F (°C)	
Minimum:	-100 (-73)
Continuous:	+400 (+205)
Maximum:	+700 (+371)
Pressure ² , Maximum, psig (bar):	1200 (83)
P × T (max.) ² , psig × °F (bar × °C)	
1/32 and 1/16":	350,000 (12,000)
1/8":	250,000 (8,600)

Physical Properties

Compressibility, range, %:	7-17	
Recovery, %:	50	
Creep Relaxation, %:	18	
Tensile, Across Grain, psi (N/mm ²):	2250 (15)	
Density, lbs./ft. ³ (grams/cm ³):	100 (1.60)	
Thermal Conductivity (K), W/m °K (Btu.in./hr.ft. ² .°F):	0.29 - 0.38 (2.00 - 2.65)	
Dielectric Properties, range, volts/mil.		
Sample conditioning	<u>1/16"</u>	<u>1/8"</u>
3 hours at 250 °F:	603	422
96 hours at 100% Relative Humidity:	101	58
Design Factors	<u>1/16" & Under</u>	<u>1/8"</u>
"m" factor:	3.5	6.6
"y" factor, psi (N/mm ²):	2100 (14.5)	3000 (20.7)
Line Call Out:	F712902A9B4E45K5L102M9 ⁽⁴⁾	

Sealing Characteristics

	ASTM F37B Fuel A	ASTM F37B Nitrogen	DIN 3535-4 Gas Permeability
Gasket Load, psi (N/mm ²):	500 (3.5)	3000 (20.7)	4640 (32)
Internal Pressure, psig (bar):	9.8 (0.7)	30 (2)	580 (40)
Leakage	0.1 ml/hr.	0.4 ml/hr.	0.03 cc/min

Immersion Properties - ASTM F146 Fluid Resistance after Five Hours

	ASTM #1 Oil 300 °F (150 °C)	ASTM IRM #903 300 °F (150 °C)	ASTM Fuel A 70-85 °F (20-30 °C)	ASTM Fuel B 70-85 °F (20-30 °C)
Thickness Increase, (%)	0-10	15-30	0-15	5-20
Weight Increase, (%)	<20	-	<25	<30
Tensile Loss, (%)	-	<70	-	-

NOTE:
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¹ Values do not constitute specification Limits
² See Garlock chemical resistance guide.
³ Based on ANSI RF flanges at our preferred torque. When approaching maximum pressure, continuous operating temperature, minimum temperature or 50% of maximum P×T, consult Garlock Applications Engineering. Minimum temperature rating is conservative.
⁴ These styles are not preferred choices for steam service, but are successful when adequately compressed. 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.
⁵ Fourth numeral 9: % Thickness Increase in IRM Oil #903 = 25-50% max. A9: Leakage in Fuel A (Isocetane), Gasket Load = 500psi (3.5N/mm²), Pressure = 9.8psig (0.7bar); Typical = 0.1ml/hr, Max = 1.0ml/hr. A9: Leakage in Nitrogen, Gasket Load = 3,000psi (20.7N/mm²), Pressure = 30psig (2bar); Typical = 0.4ml/hr, Max = 1.0ml/hr. M9: Tensile Strength = 2,250psi min. (15N/mm² min.).

Compressed, Non-Asbestos (CNA) Gasketing Line

Garlock: *Blue Gard 3700*

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DESCRIPTION

The Garlock® BLUE-GARD® compressed, non-asbestos (CNA) gasketing line offers a variety of elastomers to excel in a wide range of services. The unique blend of aramid fibers, fillers and elastomeric binders provides improved torque retention and drastically lowered emissions levels. BLUE-GARD® CNA Gasketing offers cost savings by cutting operational costs through reduced waste, maintenance, stocked inventory, fluid loss, and energy consumption.

BENEFITS

Excellent Sealability

- *Unique blend of aramid fibers, fillers and an EPDM rubber binder provides improved torque retention and drastically lowered emissions levels*

Cost savings

- *Cuts operational costs through reduced:- Waste- Waste- Maintenance- Stocked inventory- Fluid loss- Energy consumption*

DISCLAIMER

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Material Properties

Colour:	Light grey
Composition:	Aramid fibers with a EPDM binder
Fluid Services ¹ :	Water, saturated steam ⁴ , and mild chemicals
Temperature ² , °F (°C)	
Minimum:	-100 (-73)
Continuous:	+400 (+205)
Maximum:	+700 (+371)
Pressure ² , Maximum, psig (bar):	1200 (83)
P × T (max.) ² , psig × °F (bar × °C)	
1/32 and 1/16":	350,000 (12,000)
1/8":	250,000 (8,600)

Physical Properties

Compressibility, range, %:	7-17
Recovery, %:	40
Creep Relaxation, %:	25
Tensile, Across Grain, psi (N/mm ²):	2500 (17)
Density, lbs./ft. ³ (grams/cm ³):	100 (1.60)
Thermal Conductivity (K), W/m ² K (Btu.in./hr.ft. ² °F):	0.29 - 0.38 (2.00 - 2.65)
Dielectric Properties, range, volts/mil.	
Sample conditioning	<u>1/16"</u> <u>1/8"</u>
3 hours at 250 °F:	451 ⁽³⁾ -620 291⁽³⁾
96 hours at 100% Relative Humidity:	134 71
Design Factors	<u>1/16" & Under</u> <u>1/8"</u>
"m" factor:	3.5 6.7
"y" factor, psi (N/mm ²):	2800 (19.3) 4200 (28.9)
Line Call Out:	F712902A9B4E45K5L102M9 ⁽⁴⁾
Gasket Constants, 1/8":	Gb=1,318 a=0.258 Gs=0.60

Sealing Characteristics

	ASTM F37B Fuel A	ASTM F37B Nitrogen	DIN 3535-4 Gas Permeability
Gasket Load, psi (N/mm ²):	500 (3.5)	3000 (20.7)	4640 (32)
Internal Pressure, psig (bar):	9.8 (0.7)	30 (2)	580 (40)
Leakage	0.1 ml/hr.	0.7 ml/hr.	0.04 cc/min

Immersion Properties - ASTM F146 Fluid Resistance after Five Hours

	ASTM #1 Oil 300 °F (150 °C)	ASTM IRM #903 300 °F (150 °C)	ASTM Fuel A 70-85 °F (20-30 °C)	ASTM Fuel B 70-85 °F (20-30 °C)
Thickness Increase, (%)	20-35	60-100	10-40	20-50
Weight Increase, (%)	-	-	-	-
Tensile Loss, (%)	-	-	-	-

NOTE:
 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.
¹ Values do not constitute specification Limits
² See Garlock chemical resistance guide.
³ Based on ANSI RF flanges at our preferred torque. When approaching maximum pressure, continuous operating temperature, minimum temperature or 50% of maximum P×T, consult Garlock Applications Engineering. Minimum temperature rating is conservative.
⁴ Indicates current arced around and not through gasket. Dielectric higher than indicated.
⁵ These styles are not preferred choices for steam service, but are successful when adequately compressed. 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.
⁶ Fourth numeral 9: % Thickness Increase in IRM Oil #903 = 60-100% max. A9: Leakage in Fuel A (Isocetane), Gasket Load = 500psi (3.5N/mm²), Pressure = 9.8psig (0.7bar); Typical = 0.1ml/hr, Max = 1.0ml/hr. A9: Leakage in Nitrogen, Gasket Load = 3,000psi (20.7N/mm²), Pressure = 30psig (2bar); Typical = 0.7ml/hr, Max = 2.0ml/hr. E99: % Increase in ASTM Fuel B: Weight: 100% max., Thickness: 20-50% max. M9: Tensile Strength = 2,250psi min. (15N/mm² min.).