

Sealing Products & Solutions

Overview of Engineered Solutions for Safety and Environmental Compliance



COMPANY PROFILE

The Garlock® family of companies are acknowledged as global leaders in high-performance fluid sealing products for the world's processing industries. Today the companies have 16 global operations employing more than 1,900 people and a distributor network that covers 75 countries. The 12 manufacturing facilities in the U.S., Canada, Europe, Asia and Latin America collectively produce the broadest range of fluid sealing products designed specifically for industrial applications. In addition, we operate the most extensive testing facilities in the industry.

Garlock® continue to develop next-generation technologies that are changing the way processing industries meet their sealing requirements. By combining the most innovative products with unparalleled service and environmental commitment, Garlock® delivers sealing solutions that improve plant productivity, reduce costs and comply with increasingly stringent environmental regulation. Continued investment in research and development, innovative new products, production facilities, customer support and environmental initiatives ensure Garlock® retain their global leadership in fluid sealing technologies.

Garlock® offers a complete range of fluid sealing solutions including:

- Compression Packing
- Diaphragms
- Gaskets
- Metallic Gaskets
- Hydraulic Components
- Rubber & Fabric Expansion Joints
- Metallic Expansion Joints
- Engineered Sheet Rubber
- Oil Seals
- Metal Seals
- Inflatable and Extrusion Seals
- Bearing Isolators

Using some of the most technologically advanced equipment available, Garlock®'s research and development teams explore new opportunities presented by new materials, constructions and applications. The Garlock® family of companies' team technicians are available for problem solving when and where you need them.



Pulp & Paper



Power Generation



Pharmaceutical



Chemical



Primary Metal
Aluminium/Steel



Water Treatment



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Food & Beverage



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High Pressure, Very Critical Service, Fire Safe

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PTFE, Aggressive Labyrinth, Non-Contact Seals
Metallic, Non-contact, Solid or Split Seals
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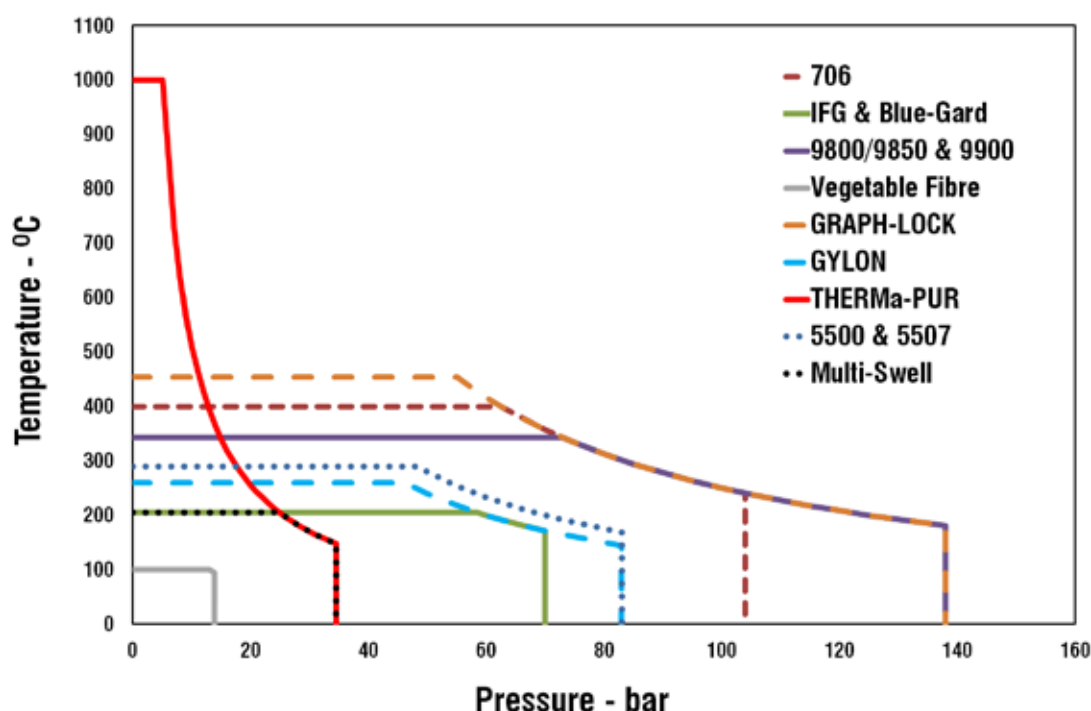
SOFT CUT GASKETS

Garlock® offers a full range of soft cut gasket materials including cork & rubber, compressed fibres, as well as unique PTFE blends. This comprehensive range caters for any requirement from general service to demanding, critical applications. The following table gives an overview of the services covered by Garlock® popular gasket styles.



Popular Gasket Styles		Application Examples - Specific Style dependent
COMPRESSED FIBRE & BLUE-GARD® 2500/2950/3000/3200/3700 5500/ST-706		Mild organic acids, mild alkalis, some saturated hydrocarbons, inert gases, most refrigerants, oils, fuels, salts, alcohols, lubricants, water, saturated and superheated steam.
GYLON® 3500/3504/3510/3545		Mild to aggressive acids, caustics & alkalis, hydrocarbons, oxidizers, gases, aldehydes, ketones, ethers, refrigerants, chlorides, phenols, amines, solvents, oils, fuels, esters, salts, alcohols, lubricants, halogenated compounds, water, food, cryogenics, and saturated steam.
GRAPHITE & CARBON FIBRE 9450/9800/9900		Mild organic acids, mild alkalis, saturated hydrocarbons, ammonia, inert gases, most refrigerants, oils, some fuels, salts, alcohols, water and saturated steam.
GRAPH-LOCK® 3125SS/3125TC		Aggressive acids, caustics & alkalis, hydrocarbons, oxidizers, gases (except fluorine), aldehydes, ketones, ethers, chlorides, phenols, amines, solvents, oils, fuels, esters, salts, alcohols, lubricants, halogenated compounds, cryogenics, and saturated steam.
VEGETABLE FIBRE & CORK: 681/NP50/ACN60		Water, aliphatic hydrocarbons, oils and fuels. General use in automotive and transformer applications.
RUBBER Natural/Neoprene/EPDM/Viton Natural Insertion/Neoprene Insertion		For low pressure gasket applications against water, air and mild chemicals (EPDM is caustic resistant). Recommended for non-metal flange applications.
SPECIAL CONSTRUCTIONS	3760 Multi-Swell™	Oil and water based media. Creates additional load when in contact with just 10% water or oil content.
	4122 Therma-Pur™	Extremely high temperature and thermal cycling applications. Able to seal at 1000°C (continuous). Superior Oxidisation resistance and electrically insulating.
	Stress-Saver®	Aggressive media in low load applications. Unique ribbed design helps to create a tighter seal by concentrating compressive load.

The following graph gives an overview of the temperature & pressure capabilities of Garlock gaskets (1.5mm thickness):



SOFT CUT GASKETS

COMPRESSED FIBRE

Garlock® offers a full range of compressed fibre gasketing materials made from aramid and synthetic fibres to meet most applications. The range includes general service gaskets, the versatile unique blends of Blue-Gard®, and medium-to-high end gaskets. The following table details the capabilities of some popular styles.



General Information	General		Blue-Gard®			High Performance	
	2500	2950	3000	3200	3700	5500	ST-706
Fibre	Aramid	Aramid	Aramid	Aramid	Aramid	Inorganic	Inorganic
Binder	NBR	NBR	NBR	SBR	EPDM	NBR	NBR
Min Temperature °C	-73	-75	-75	-75	-75	-75	-75
Max Temperature °C	-	370	370	370	370	425	540
Max Continuous Temperature °C	205	205	205	205	205	290	400
Max Pressure bar	70	70	70	83	83	83	105
P x T - 0.8 & 1.5mm - 3mm	bar x °C	8,600	12,000	12,000	12,000	14,000	25,000
	bar x °C	5,100	8,600	8,600	8,600	9,600	18,500
Compressibility (ASTM F36)	%	7-17	7-17	7-17	7-17	7-17	7-17
Recovery (ASTM F36)	%	40	50	50	50	40	50
Sealability (ASTM F37) Fuel A	ml/h	1.0	0.25	0.2	0.1	0.1	0.5
Gas Permeability (DIN 3535)	cm³/min	-	-	0.05	0.03	0.04	0.05
Certifications & Approvals	Potable Water	Yes		Yes			
	Oxygen Service			Yes		Yes	
	Gas Storage		Yes	Yes		Yes	Yes
	Shipping		Yes	Yes		Yes	
	Air Emissions		Yes	Yes		Yes	
	Military Fire Safe			Yes		Yes	Yes



GRAPHITE & CARBON FIBRE

Graphite and Carbon fibre gaskets are the most reliable gasketing options for applications where high pressures, temperatures and/or steam are encountered. These gaskets utilise high grade carbon and graphite fibres to ensure gasket integrity and safety. This unique construction ensures superior sealability and **resistance to thermal cycling**.

General Information	Carbon		Graphite
	9800	9450	9900
Fibre	Carbon	Carbon	Graphite
Binder	SBR	NBR	NBR
Min Temperature °C	-75	-75	-75
Max Temperature °C	480	480	540
Max Continuous Temperature °C	340	340	340
Max Pressure bar	138	138	138
P x T - 0.8 & 1.5mm - 3mm	bar x °C	25,000	25,000
	bar x °C	12,000	12,000
Compressibility (ASTM F36)	%	7-17	7-17
Recovery (ASTM F36)	%	55	55
Sealability (ASTM F37) Fuel A	ml/h	0.1	0.1
Gas Permeability (DIN 3535)	cm³/min	0.015	0.015
Certifications & Approvals	Potable Water	Yes	
	Gas Storage	Yes	
	Shipping		Yes
	Military		Yes
	Fire Safe		Yes

SOFT CUT GASKETS

GRAPH-LOCK®

Gaskets made out of graphite flake material excel in extreme conditions; withstanding heat, pressure and aggressive media. **Retains dimensional stability and tight seal in high temperatures and pressure fluctuations.** Available homogenous or with stainless steel wire, foil or tanged core. GRAPH-LOCK® with foil or tanged core are stocked locally.



General Information		3125SS	3125TC
Graphite Construction		GRAPH-LOCK®	GRAPH-LOCK®
316SS Insert		Foil	Tanged
Min Temperature	°C	-240	-240
Max Cont. Temperature (steam)	°C	650	650
Max Cont. Temperature (atm)	°C	454	454
Max Pressure	bar	140	140
P x T - 0.8 & 1.5mm	bar x °C	25,000	25,000
- 3mm	bar x °C	12,000	12,000
Compressibility (ASTM F36)	%	43	40
Recovery (ASTM F36)	%	14	15
Sealability (ASTM F37) Fuel A	ml/h	1.0	2.0
Gas Permeability (DIN 3535)	cm³/min	1.5	1.0
Certifications & Approvals	Shipping	Yes	Yes
	Fire Safe	Yes	Yes



GYLON®

Restructured PTFE gasketing materials with outstanding chemical resistance across the pH range. Increased compressibility and **greatly reduced creep relaxation** of GYLON® results in **higher retention of bolt load over conventional PTFE.**

General Information		3500 3502 (for Oxygen)	3504 3505 (for Oxygen)	3510 3503 (for Oxygen)	3545
Colour		Fawn	Blue	Off-white	White
Composition		PTFE with silica	PTFE with glass microspheres	PTFE with barium sulphate	Microcellular (expanded) PTFE with solid PTFE core
Min Temperature	°C	-268	-268	-268	-268
Max Continuous Temperature	°C	260	260	260	260
Max Pressure	bar	83	55	83	83
P x T - 0.8 & 1.5mm	bar x °C	12,000	12,000	12,000	12,000
- 3mm	bar x °C	8,600	8,600	8,600	8,600
Compressibility (ASTM F36)	%	7-12	25-45	4-10	60-70
Recovery (ASTM F36)	%	>40	>30	>40	>15
Sealability (ASTM F37) Fuel A	ml/h	0.22	0.12	0.04	0.15
Gas Permeability (DIN 3535)	cm³/min	<0.015	<0.015	<0.015	<0.015
Certifications & Approvals	Oxygen Service	Yes	Yes	Yes	Yes
	Shipping	Yes	Yes	Yes	
	Air Emissions	Yes	Yes	Yes	Yes
	Food & Pharmaceutical	Yes	Yes	Yes	
	Chlorine Service	Yes	Yes	Yes	
	Agriculture	Yes			

SOFT CUT GASKETS

STYLE 3535 PTFE SEALANT TAPE

Style 3535 PTFE Sealant Tape is ideal for a wide range of applications in almost any media. It is chemically inert, withstands a wide range of chemicals and conforms to FDA regulations. Continuous length on spools is easily cut and formed. Strong adhesive backing aids installation on narrow or hard to reach flanges. Available in widths from 3mm to 25mm.

General Information		3535
Colour		White
Composition		PTFE Joint Sealant Tape
Min Temperature	°C	-268
Max Continuous Temperature	°C	260
Max Pressure	bar	55
P x T - 0.8 & 1.5mm	bar x °C	12,000
- 3mm	bar x °C	8,600
pH Range		0-14
Flammability		Will not burn
Bacterial Growth		Will not support
Sealability (ASTM F37) Fuel A	ml/h	<0.1
Gas Permeability (DIN 3535)	cm³/min	0.05
Certifications & Approvals		Shipping Food & Pharmaceutical

Value & Benefits:

- ✓ Excellent cost/use ratio
- ✓ Superior chemical resistance
- ✓ Excellent sealability properties
- ✓ Easy to remove from flange faces
- ✓ Unlimited shelf life
- ✓ Easy to cut and handle, flexible, durable

Ideal for:

- ✓ Food processing
- ✓ Pharmaceutical
- ✓ Chemical process
- ✓ Brewing, distilling
- ✓ Pulp & paper
- ✓ General industrial use



RUBBER, CORK & VEGETABLE FIBRE

Rubber, Cork and Vegetable fibre sheet suitable for low pressure general service applications.

General Information	Rubber				Rubber Insertion	
	Natural	Neoprene	EPDM	Viton® A	Natural	Neoprene
Insertion	-	-	-	-	Cotton	Cotton
Hardness Shore A	65 ± 5	60 ± 5	70 ± 5	75 ± 5	65 ± 5	60 ± 5
Max Temperature °C	104	120	150	204	104	120
Max Continuous Temperature °C	90	90	110	190	90	90
Elongation, minimum %	250	300	350	175	250	300
Tensile Strength MPa	3.5	5.0	11	8.3	3.5	7.0

Vegetable Fibre & Cork gaskets are ideal for use in automotive and transformer applications.

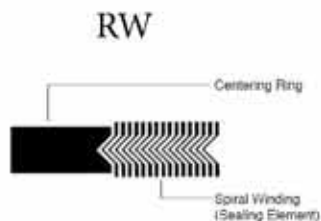


General Information	681	Neocork NP50	Nitrile Cork ACN60
Composition	Vegetable fibre with glue-glycerin binder	High cork content material bonded with neoprene	High cork content material bonded with nitrile
Min Temperature °C	-	-30	-30
Max Continuous Temperature °C	100	110	110
Max Pressure bar	15	-	-
P x T max bar x °C	1,300	-	-
Compressibility (ASTM F36) %	25-40	25-35	20-30
Recovery (ASTM F36) %	>40	>75	>80
Certifications & Approvals	Automotive and Aeronautical Military		

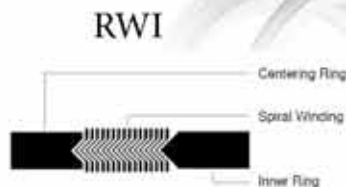
METALLIC GASKETS

FLEXSEAL® SPIRAL WOUND GASKETS

Garlock® manufactures spiral wound gaskets with a variety of materials and fillers to ensure that options are available for all applications. The most popular styles are RW, RWI and SW and can be constructed from the materials shown in the table below.



- » General purpose gasket suitable for flat face and raised face flanges up to Class 2500
- » Centering ring accurately locates the gasket on the flange face, provides additional radial strength, and acts as a compression limiter
- » Spiral winding (sealing element) consists of preformed metal and soft filler material



- » Suitable for flat face and raised face flanges up to Class 2500
- » Recommended for higher pressure applications, for use with PTFE fillers
- » Inner ring acts as compression limiter and protects sealing elements from process media attack



- » Suitable for tongue and groove, male-female, or groove-to-flat face flanges
- » Spiral winding only, containing preformed metal and soft filler material
- » Also available with inner rings—Style SWI

The most popular styles are detailed in the table below.

Style	Inner Ring	Winding/Filler	Outer Ring
RWI	316L	316L/FG	316L
RWI	CS	304/FG	304
RWI	304	304/FG	304
RWI	304	304/PTFE	304
RWI	316L	316L/FG	CS
RW	-	316L/FG	316L

Advantages:

- ✓ Durable; easy installation and removal
- ✓ Seals pressures to flange ratings, in accordance with ASME B16.5
- ✓ Suitable for temperatures from cryogenic to 1,093°C (2,000°F)
- ✓ Guide ring simplifies centering of sealing element on the flange face
- ✓ Designed solutions accommodate a variety of conditions by combining various metals and filler materials

Material	Minimum		Maximum		Abbreviation
	°F	°C	°F	°C	
304 Stainless Steel	-320	-195	1,400	760	304
316L Stainless Steel	-150	-100	1,400	760	316L
317L Stainless Steel	-150	-100	1,400	760	317L
321 Stainless Steel	-320	-195	1,400	760	321
347 Stainless Steel	-320	-195	1,700	925	347
Carbon Steel	-40	-40	1,000	540	CS
20Cb-3 (Alloy 20)	-300	-185	1,400	760	A-20
HASTELLOY® B 2	-300	-185	2,000	1,090	HAST B
HASTELLOY® C 276	-300	-185	2,000	1,090	HAST C
INCOLOY® 800	-150	-100	1,600	870	IN 800
INCOLOY® 825	-150	-100	1,600	870	IN 825
INCONEL® 600	-150	-100	2,000	1,090	INC 600
INCONEL® 625	-150	-100	2,000	1,090	INC 625
INCONEL® X750	-150	-100	2,000	1,090	INX
MONEL® 400	-200	-130	1,500	820	MON
Nickel 200	-320	-195	1,400	760	NI
Titanium	-320	-195	2,000	1,090	TI

Material	Minimum		Maximum COT		Abbreviation
	°F	°C	°F	°C	
Ceramic	-350	-212	2,000	1,090	CER
Flexible Graphite	-350	-212	850	454	F.G.
PTFE	-400	-240	500	260	PTFE

Guide Ring Color Code	
Yellow	
Green	
Maroon	
Turquoise	
Blue	
Silver	
Black	
Brown	
Beige	
White	
White	
Gold	
Gold	
No Color	
Orange	
Red	
Purple	

Stripe Color Code	
Light Green	
Gray	
White	

METALLIC GASKETS

RING TYPE JOINT GASKETS

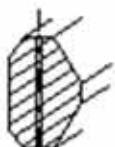
Garlock® offers a range of ring type joint (RTJ) gaskets to be used in applications that involve **extreme pressures and high temperatures**. All ring type joint gaskets are manufactured in compliance with API-6A and B16.2 specifications. Along with standard sizes, custom designs can be made to suit unique applications. These gaskets can be made from the materials table listed below and are available in the following profiles.



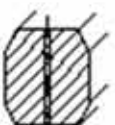
Type R Oval. Designed for flanges with standard ring type grooves to seal pressures up to 345 bar in accordance with API-6A. **Oval design is interchangeable** with the octagonal design. Oval design was originally designed for round bottom groove.



Type R Octagonal. Designed for flanges with standard ring type grooves to seal pressures up to 345 bar in accordance with API-6A. Octagonal cross-section has a higher sealing efficiency due to its shape, than the Oval cross-section.



Type RX. The shape of this joint is designed to be activated by the fluid pressure in order to increase sealability. The outside sealing surface makes the initial contact, and as the internal pressure rises, the contact pressure between the ring joint and the flange increases. Designed for pressures of up to 345 bar, the RX ring joint is more resistant to vibration, pressure surge and shock.



Type BX. Suitable only for use with API type BX flanges and grooves. Designed for pressures up to 1380 bar. The gasket has a square cross-section with bevelled corners. The average diameter of the ring type joint is slightly larger than that of the flange groove to ensure pre-compression on the outside diameter, which creates a high sealing stress.

Materials of construction and their sealing stress

Material	Sealing Stress (at 20 °C) (N/mm ²)		
	Minimum	Optimum	Maximum
Soft Iron	235	350	525
Carbon Steel	265	400	600
Stainless Steel	335	500	750

For other material requirements, please contact technical support

HIGH PERFORMANCE GASKETS

MULTI-SWELL™

Style 3760 MULTI-SWELL™ is a proprietary formulation that creates **additional gasket load as the gasket comes into contact with water or oil** based products to produce an ultra-tight seal. The gasket is twice as compressible as standard fibre gaskets and is **highly conformable**. MULTI-SWELL™ stops leakage in gear boxes, compressors, pumps, lube oil systems, access covers, potable water networks and waste water systems.

Value and Benefits:

- ✓ Creates compressive stress in low load flanges in oil and water service
- ✓ Seals where standard fibre gaskets won't - Suitable for irregular surface sealing
- ✓ Wide range of applications providing consolidation opportunity
- ✓ Since MULTI-SWELL™ crush strength is many times higher than a rubber gasket, it can be safely used in applications that would typically crush elastomeric gaskets.
- ✓ Easy to cut and handle - extremely flexible, minimizes waste.
- ✓ Replaces vegetable fiber gaskets in many applications - won't weep or wick system fluids, improving plant safety.



Ideal for:

- » Compressors
- » Generators
- » Pumps
- » Fuel Pumps
- » Gear Boxes
- » Cast Water Flanges
- » Transformers
- » Sight Glasses
- » Access Covers
- » Handhole/Manhole

Typical Physical Properties:

Fibre		Proprietary
Binder		Proprietary
Min Temperature	°C	-75
Max Temperature	°C	205
Max Pressure	bar	35
P x T - 0.8 & 1.5mm	bar x °C	5,100
- 3mm	bar x °C	3,400
Compressibility (ASTM F36)	%	15-30
Recovery (ASTM F36)	%	40
Sealability (ASTM F37) Fuel A	ml/h	0.15
Certifications & Approvals		Potable Water, Nuclear Service



STRESS-SAVER®

The Garlock® Stress Saver® series presents superior low-torque gaskets for metallic or non-metallic flanges. All gaskets in this series have unique moulded raised ribs which **helps to create a tighter seal by concentrating the compressive load**. Ideal for use in **lightweight flanges** including PVC, FRP, PVDF, CPVC, polypropylene, cast iron and duct iron; within chemical, electronics, food, pharmaceutical, pulp & paper, and potable/drinking water industries.

Physical Properties	Style 3504 GYLON®	Style XP	Style 370	Style 6800
Description	Combines unique sealing design with the performance characteristics of the industry recognised GYLON® 3504.	Single piece moulded design made from high performance, proprietary blend of fluoroelastomers.	White EPDM elastomer moulded with virgin PTFE envelope. Proprietary process bonds the PTFE to the elastomer without the use of adhesives.	Made with 100% white EPDM elastomer. Suitable for less critical application where a tight seal is needed.
Colour	Blue	Black	PTFE: Sky Blue EPDM: Off-white	Off-white
Composition	100% GYLON® PTFE with glass microspheres	Proprietary blend of fluoroelastomer (70 durometer)	100% Pure PTFE bonded to EPDM	EPDM only (65 durometer)
Min Temperature °C	-268	-26	-40	-40
Max Cont. Temperature °C	260	204	150	150
Max Pressure bar	55	17	17	17
P x T bar x °C	8,600	1,717	1,717	1,717
Media	All solvents, most caustics and acids, hydrocarbons, refrigerants, cryogenics and potable water	Potable water, steam, most hydrocarbons, gases, solvents	Moderate acids, caustics, gases, water, hydrocarbons	Water, very mild acids and caustics

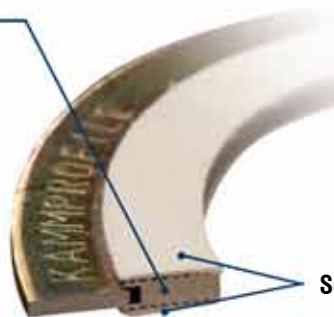
HIGH PERFORMANCE GASKETS

KAMMPROFILE™

A high performance metallic gasket that operates in less than perfect conditions. The gaskets consist of serrated faces with a soft, deformable material layered on either side:

Serrated Solid Metal Core

- » Resists cold flow, overcompression and blowout
- » Provides exceptional stability, even in large sizes
- » Facilitates handling and installation
- » Available in a wide variety of metals



Soft, Deformable Sealing Material

- » Under compression, conforms to surface imperfections to form a tight seal
- » Seals under low stress - ideal for weaker flanges
- » Withstands extreme fluctuations in temperatures and pressures



Value & Benefits:

- ✓ Accommodates standard ASME flanges as well as weaker and non-circular flanges
- ✓ Seals less-than-perfect flanges
- ✓ Suits pressures from full vacuum to very high pressures (refer Garlock® Technical support)
- ✓ Performance replacement for jacketed heat exchanger gaskets
- ✓ Fire safe
- ✓ Facilitates ease of handling and installation
- ✓ Available in a wide variety of metals

GRAPHONIC® SERIES

The superior technology of the GRAPHONIC® family of gaskets ensures excellent sealing performance and reliability, even in the most difficult applications. Each of the three styles combines a corrugated metal core with a compressible sealing element of various materials. GRAPHONIC® gaskets provide **resistance to a wide range of harsh conditions**, including extreme temperature, corrosive chemicals, and thermal cycling.



Compressible Sealing Element



Graphonic® - Flexible Graphite sealing element

- » Application in wide range of temperatures
- » Seals effectively during thermal cycling
- » Fire-safe
- » Chemically resistant (refer Garlock® Technical Support)
- » Long service life
- » Withstands up to 454°C in atmosphere and 650°C in steam
- » Withstands pressures up to 70 bar

Metal Core

- » Minimises extrusion
- » Redirects compressible sealing element into leak paths
- » Adds strength and rigidity
- » Increases sealability under low bolt stress
- » Actively assists in thermal-cycling applications

Tephonic® - ePTFE sealing element

- » Chemically inert
- » Forms a tight seal under low bolt load
- » Conforms to minor sealing surface imperfections
- » Withstands up to 260°C
- » Withstands pressures up to 70 bar

G.E.T.™ - Graphite and ePTFE sealing element

- » Combines fire safety with chemical resistance
- » Conforms to minor sealing surface imperfections
- » Rigid, yet compressible
- » Withstands up to 260°C
- » Withstands pressures up to 70 bar

EXTREME TEMPERATURE GASKETS

THERMa-PUR™

Style 4122 THERMa-PUR™ is a proprietary new gasketing material designed for use in extreme temperature sealing applications. It is produced using an environmentally friendly solvent-free process and combines a unique formulation with a patent-pending fiber core. THERMa-PUR™ is yet another innovative Garlock® sealing solution that provides more than just temperature resistance.

Available in the following constructions:

- » 4122-FC Sheet and Cut Gasket
- » 4122-CMG Corrugated Metal Gasket with THERMa-PUR™ coating
- » 4122-KAMM Kammprofile™ gasket with THERMa-PUR™ sealing surface



4122-FC



4122-CMG



4122-KAMM

Designed for extreme temperatures up to
1000 °C
continuous

Typical Physical Properties:

Max Continuous Temperature (°C)	4122-FC 4122-CMG 4122-KAMM	1000
Max Pressure (bar)	4122-FC 4122-CMG 4122-KAMM	34.5 68.9 Equal to flange rating
P x T (bar x °C)	4122-FC 4122-CMG 4122-KAMM	5,100 21,500 Equal to flange rating
Compressibility (ASTM F36) (%)	4122-FC	35-45
Recovery (ASTM F36) (%)	4122-FC	18
Creep Relaxation (ASTM F38) (%)	4122-FC	25
Tensile Strength (ASTM F152) (N/mm²)	4122-FC	10.34
Density (ASTM F1315) (g/cm³)	4122-FC	1.52
Dielectric Strength (V/mil)	4122-FC	100

Ideal for:

- ✓ Marine and Land-based Exhaust Systems
- ✓ Biomass Gasification Process
- ✓ Oil and Gas Production
- ✓ Mineral and Fertilizer Processing
- ✓ Incineration Process
- ✓ Co-generation Systems
- ✓ Turbocharger Equipment
- ✓ Process Drying Equipment

Value & Benefits:

- ✓ **Extreme Temperature.** Able to withstand high temperature, whether continuous or in thermal cycling conditions.
- ✓ **Oxidation Resistance.** Contains proprietary materials that provide improved weight loss characteristics over other high temperature solutions.
- ✓ **Hydrophobic & Electrically Insulating.** Resists water and provides electrical isolation thus reducing the possibility of corrosion between flanges made of dissimilar metals
- ✓ **Easy Release from Flanges.** Does not stick to flanges making removal of gaskets easy and fast.
- ✓ **Safer Handling.** Patent-pending fiber core makes gaskets safer to handle when compared to traditional high temperature gaskets with steel cores.
- ✓ **Out-performs Vermiculite.** Laboratory testing showed significantly less leakage, even in extreme thermal cycling conditions.

GPT PIKOTEK® FLANGE ISOLATION

Pikotek® products include a wide selection of isolating/sealing gaskets along with a variety of sleeves and washers. For maximum flexibility, components may be ordered separately or as complete flange isolation kits. Flange Isolation Kits are designed to work in conjunction with isolating gaskets to effect the **complete electrical isolation of a flanged assembly**. The Isolation Kits consist of one full-length isolating sleeve, two isolating washers and two steel washers for each the bolt in the flange assembly.



PGE



VCS



VCFS



PGE

The Pikotek® PGE is a non-critical service seal kit designed for electrical flange isolation and/or general sealing applications. This seal is suitable for use in raised-face flanges up to ANSI Class 600 (or equivalent) and is excellent for isolating flanges made of dissimilar metals or where prevention of flange face corrosion is desired. Available in ring (Type F) and full-face (Type E) styles.

VCS

The Pikotek® Very Critical Services (VCS) gasket is a high reliability gasket used for both insulating and general sealing purposes in very critical applications. The gasket has a proven track record of integrity in aggressive sealing situations. The VCS is suitable in all services up to and including ANSI 2500# and API 15,000# classes.

VCFS

The Pikotek® Very Critical Fire Service (VCFS) was created by taking a standard VCS configuration and adding a secondary sealing element that maintains a seal while subject to a 800° C fire (API6FB). The VCFS is suitable in all services up to and including ANSI 2500# and is offered for ring type joint (RTJ) flanges. The VCFS consists of a PTFE spring-energized primary sealing element and an E-ring secondary seal, all seated in a metal core.

Pikotek Gasket	Kit Components and Material Options				
	Seal Retainer	Seal Element	Sleeves	Isolating Washers	Metal Washers
PGE	G-10 G-11	PTFE Viton® Nitrile	G-10 Mylar Nomex®	X37 (HCS) G-10 G-11	ZPS SS X37 (HCS)
VCS	G-10 G-11 G-10CR	PTFE Viton® Nitrile Silicone	G-10 Mylar Nomex®	X37 (HCS) G-10 G-11	ZPS SS X37 (HCS)
VCFS	G-10 G-11	PTFE element with secondary Inconel E-ring	G-10 Mylar Nomex®	X37 (HCS)	X37 (HCS)

Material	Description	Operating (cont.) Temperature
G-10	NEMA grade G-10 Glass-Reinforced Epoxy (GRE) laminate.	-130 to 150
G-11	NEMA grade G-11 Glass-Reinforced Epoxy (GRE) laminate.	-45 to 200
G-10CR	NEMA grade G-10 Glass-Reinforced Epoxy (GRE) laminate material. Produced to NIST G10CR process specification for materials used in cryogenic applications.	-273 to 130
PTFE (Spring Energized)	Recommended for all environments. Helical wound spring provides radial load. Encapsulation in the seal groove eliminates creep or cold flow. This sealing system truly distinguishes Pikotek® gaskets from all other flange sealing to systems.	-250 to 250
Viton®	General-purpose oilfield elastomer. Excellent resistance to aliphatic hydrocarbons, glycols and H ₂ S. Good resistance to aromatic hydrocarbons.	-25 to 200
Nitrile	General purpose elastomer only suitable for mild chemical resistance.	-130 to 115
Silicone	Suitable for use in potable water applications.	-55 to 300
Mylar	Spiral wound Mylar is a general-purpose insulating material.	up to 120
Nomex®	Nomex is a high temperature sleeve material manufactured from a solid organic polymer.	up to 220
X37 (HCS)	X37 is a hardened coated steel washer system that retains bolt load when exposed to fire.	-40 to 250
ZPS	Zinc-Plated Steel Washers.	-
SS	Stainless Steel Washers.	-

COMPRESSION PACKING

Garlock® has a comprehensive compression packing range to cater for general services to the most demanding conditions. Construction materials include Graphite, PTFE, Aramid and Synthetic Fibres, combined with engineered lubrication systems. Garlock® can supply **pre-cut packing ring sets** for all sizes of any combination of styles. This is a great option for minimising wastage, costs and for improving equipment management.



Style	Description	Typical Applications		Rotary	Recip.	Valve
1303-FEP	Graphite flakes encapsulated in a very thin non-scouring Inconel® construction to provide an innovative strand design and minimise valve stem scoring. Does not require end rings.	Valves for power generation, chemical, steam service and hydrocarbon processes.	pH	-	-	0-14*
			P (bar)	-	-	310
			T (°C)	-	-	-200 to +455 (650 in steam)
			v (m/s)	20	-	-
1306	Braided from high purity flexible graphite yarns with carbon filament corners. This combination of materials and construction gives Style 1306 added abrasion resistance.	Valves and rotary pumps. Graphite construction ensures stability in high temperature valves. The carbon corners ensure resistance to wear in slurry pumps.	pH	0-14*	-	0-14*
			P (bar)	34	-	200
			T (°C)	-200 to +455 (650 in steam)	-	-200 to +455 (650 in steam)
			v (m/s)	20	-	-
1333-G	All graphite PTFE free construction maximises reliability and stability in high temperatures, provides excellent chemical resistance and also dissipates heat quickly. The reinforcement of the flexible graphite yarns provides greater tensile strength. The graphite filament yarns adds abrasion resistance.	Highly suitable for valves and pumps where minimal friction generation is a pre-requisite.	pH	0-14*	-	0-14*
			P (bar)	35	-	275
			T (°C)	-200 to +455 (650 in steam)	-	-200 to +455 (650 in steam)
			v (m/s)	23	-	-
1965	A blend of Garlock patented fibre infused PTFE yarns with graphite & Synthepak yarns impregnated with PTFE suspenoid. Fibre infused PTFE and Synthepak yarns provide exceptional abrasive resistance and superior shaft deflection recovery.	Rotary pumps, mixers, agitators, crystallisers and filters found in slurry applications throughout industry.	pH	1-13	-	-
			P (bar)	35	-	-
			T (°C)	-270 to +260	-	-
			v (m/s)	12	-	-
5000	Carbon filament packing impregnated with PTFE and treated with a high temperature break in lubricant. This non contaminating packing was developed for long service against strong caustics, acids, slurries and where contamination is prohibited.	Reciprocating & centrifugal pumps, valves, plungers, slip type expansion joints, mixers, agitators, reactors, autoclaves, and hydroelectric turbines.	pH	0-14*	0-14*	-
			P (bar)	35	35	-
			T (°C)	-200 to +315	-200 to +315	-
			v (m/s)	15	-	-
5889	Constructed from a PTFE continuous filament to produce a dimensionally stable and relatively soft and flexible packing. PTFE dispersion and silicone provide a low friction surface and prevents leakage through the body of the braid.	High speed centrifugal and rotary services. Almost all volatile applications across industry, including pulp and paper, chemical, petrochemical, refineries, pharmaceutical, steel, power plants, marine, waste/water treatment and agriculture.	pH	0-14**	-	-
			P (bar)	20	-	-
			T (°C)	-270 to +260	-	-
			v (m/s)	8	-	-
8921-K	Spun Synthetic polymer fibres lattice braided with aramid diagonally braided through the packing to produce abrasion resistance at the corner wear-points. Each individual polymer fibre is PTFE saturated.	Excellent for slurries and abrasive media within pumps, valves and plungers.	pH	0-12	0-12	0-12
			P (bar)	35	35	173
			T (°C)	-110 to +288	-110 to +288	-110 to +288
			v (m/s)	11	-	-
8922	Spun Synthetic polymer fibres lattice braided. Each individual polymer fibre is PTFE saturated and the packing is coated with a proprietary silicone start-up lubricant.	Excellent for use in pumps, valves and plungers where a wide range of chemical compatibility is required. Especially suitable for acids.	pH	0-12	0-12	0-12
			P (bar)	35	35	173
			T (°C)	-110 to +288	-110 to +288	-110 to +288
			v (m/s)	12	-	-

*0-14 except strong oxidizers
 **Should not be used in chlorine

COMPRESSION PACKING



Style	Description	Typical Applications		Rotary	Recip.	Valve
98	This carbon fibre packing offers premium performance and economy in most high speed chemical applications. Style 98 is also an excellent valve stem packing. Style 98 has a low coefficient of friction and high thermal conductivity.	Centrifugal pumps, agitators and valves conducting media such as acids, strong caustics, hot oils, solvents, boiler feed and condensate water.	pH	0-14*	0-14*	0-14*
			P (bar)	35	35	173
			T (°C)	-200 to +455 (650 in steam)	-200 to +455 (650 in steam)	-200 to +455 (650 in steam)
			v (m/s)	20	-	-
2091	Style 2091 consists of pure expanded flexible graphite extruded over a Stainless Steel wire core to form the yarn which is then used in braiding the packing. The finished braid is non-scoring.	On valve stems such as forged steel and stainless steel valves handling steam, water, air, inert gases, oils, solvents, mild acids and alkalis.	pH	-	-	0-14*
			P (bar)	-	-	310
			T (°C)	-	-	-200 to +455 (650 in steam)
			v (m/s)	-	-	-
G-200	Construction consists of flexible braided graphite lubricated with a graphite dispersion. G-200 offers the lowest friction for energy savings, the best sealability against abrasives and the best temperature and chemical resistance. G-200 is the ideal choice for high temperature rotary slurry service.	Almost all rotary pump applications.	pH	0-14*	-	-
			P (bar)	35	-	-
			T (°C)	-200 to +455 (650 in steam)	-	-
			v (m/s)	20	-	-
CARBAE™ 105	Construction consists of 95% carbon assay fibre with PTFE coating. CARBAE™ 105 is designed for long, reliable service where contamination is unacceptable.	Centrifugal pumps, agitators, mixers, reactors and autoclaves conducting acids, caustics and slurries.	pH	0-14*	-	-
			P (bar)	35	-	-
			T (°C)	-200 to +316 (650 in steam)	-	-
			v (m/s)	15	-	-
CARBAE™ 108	Construction consists of 95% carbon assay fibre with graphite dispersion. CARBAE™ 108 is designed for long, reliable service providing a low coefficient of friction and high thermal conductivity.	Centrifugal pumps, agitators, mixers, reactors and autoclaves conducting acids, caustics, hot oils, solvents, boiler feed and condensate water.	pH	0-14*	0-14*	0-14*
			P (bar)	35	35	173
			T (°C)	-200 to +455 (650 in steam)	-200 to +455 (650 in steam)	-200 to +455 (650 in steam)
			v (m/s)	20	-	-
Packmaster 1	Combination of resilient fibres and PTFE offers a true non-contaminating general service packing – ideal where a clean, reliable packing is required. White in colour.	Rotary, centrifugal and reciprocating pumps for mild acids & alkalis, industrial gases, oils, solvents, and fluids where non-contamination is required.	pH	4-10	4-10	-
			P (bar)	20	20	-
			T (°C)	-110 to +260	-110 to +260	-
			v (m/s)	8	-	-
Packmaster 2	Combination of resilient fibres with petroleum lubricants and graphite to produce an economical general service packing. Black in colour.	Rotary & reciprocating pumps for mild acids and alkalis, hot & cold water, alcohol, and steam (up to 150°C).	pH	4-10	4-10	-
			P (bar)	20	20	-
			T (°C)	-110 to +260	-110 to +260	-
			v (m/s)	8	-	-
Packmaster 6	Combination of fine particles of graphite within expanded PTFE and a silicone break-in lubricant. Black in colour.	Rotary & centrifugal pumps for acids & alkalis, solvents, alcohol, esters, petroleum, oils, steam, aqueous solutions, dry industrial gases and compressed air.	pH	0-14**	-	-
			P (bar)	20	-	-
			T (°C)	-130 to +288	-	-
			v (m/s)	15	-	-
Packmaster 8	Constructed from PTFE continuous filament to produce a dimensionally stable, relatively soft and flexible packing. PTFE dispersion and silicone lubricant provides a low friction surface and prevents leakage through the body of the braid.	High speed centrifugal and rotary services. Almost all volatile applications across industry, including pulp and paper, chemical, petrochemical, refineries, pharmaceutical, steel, power plants, marine, waste/water treatment and agriculture.	pH	0-14**	-	-
			P (bar)	20	-	-
			T (°C)	-270 to +260	-	-
			v (m/s)	8	-	-

*0-14 except strong oxidizers

**Should not be used in chlorine

HIGH PERFORMANCE PACKING

9000 EVSP SIMPLIFIED™

Style 9000 EVSP (Emissionless Valve Stem Packing) Simplified™ is designed to provide optimum sealability in even the most severe environments. The combination of unique carbon packing rings and die-formed graphite rings structured to the patented cup-and-cone design ensures a reliable sealing system. 9000 EVSP Sets are specifically recommended for use in critical valve applications in refinery, chemical, petrochemical and power generation industries.

The 9000 EVSP Simplified™ set can be adapted to various stuffing box depths and conditions:

- » The patented design expands radially on both its ID and OD to seal in worn or altered valves.
- » Concept can be engineered to fit stuffing boxes as shallow as two cross-sections.
- » Different end ring material may be used.
- » Machined bushing can be supplied for deep stuffing boxes.

Value & Benefits:

- ✓ Sealability - exceeds the most stringent regulations and emission standards
- ✓ Fire Safe - Passes API 607 and API 589
- ✓ Extreme chemical resistance
- ✓ High pressure capability
- ✓ Resistant to volume loss (oxidisation)
- ✓ Seals worn valves
- ✓ Reduced friction during operation



pH	0-14 (except strong oxidizers)
Temperature (°C)	-200 to +45 5 (+650 in steam)
Pressure (bar)	690
Approvals	Fire Safe - API 607, API 589



HYDRA-JUST™ SYSTEM

The Hydra-JUST™ System is an engineered sealing kit that ensures maximum sealing performance, effective monitoring & maintenance, as well as reduction in product dilution & overall flush water usage. This transforms into a drastic reduction in production and post production costs, as well as reducing other process related costs.

Value & Benefits:

- ✓ Reduction in flush water usage and costs
- ✓ Reduction or elimination of product dilution
- ✓ Reduction or elimination of water evaporation costs
- ✓ Process exclusive service - much longer seal life
- ✓ Low frictional drag on shaft - low power usage
- ✓ Leak-free service
- ✓ Reduction in maintenance costs
- ✓ Improved seal life cycle costs

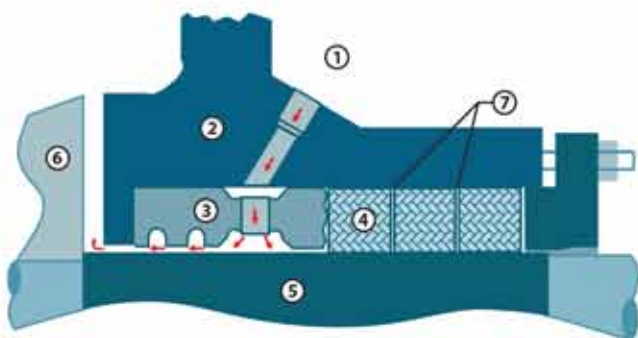
pH	0-14 (except strong oxidizers)
Temperature (°C)	up to 260
Pressure (bar)	35
Shaft Speed (m/s)	20

PACKING SUPPORT PRODUCTS

CROWN BUSH®

The Garlock® Crown Bush® is a hydrodynamic flush control device that **significantly reduces gland water consumption**. The flow control also ensures effective prevention of contaminants from coming into contact with the packing system it is used with. This **reduces shaft wear and maximises the service life of the packing**. In conjunction with Garlock's revolutionary low flush packing and GYLON® Spacers the Garlock® Crown Bush® Sealing System extends pump reliability and significantly reduces shaft/sleeve wear.

The Garlock® Crown Bush® is manufactured in either stainless steel or non-metallic. There are no modifications required to a standard gland packed pump and we also offer a split design to allow quick and easy in place installation.



The figure on the left shows a typical set-up of the Crown Bush® inside a pump stuffing box, combined with a stealth set for maximum efficiency in operation. The unique spiral design of the Crown Bush® ensures that **all contaminants are directed away from the packing arrangement**.

- | | |
|----------------------|-----------------|
| 1. Flush Port | 5 Shaft/Sleeve |
| 2. Stuffing Box | 6. Impeller |
| 3. Crown Bush | 7. Gylon Spacer |
| 4. Garlock Packing | |

STYLE 1004 PTFE LANTERN RING COIL

Economical and easy-to-use PTFE lantern ring providing the following benefits:

- ✓ Costs up to 50% less than original equipment supplied lantern rings
- ✓ Easily cut with knife or saw, and short lengths splice together, eliminating waste
- ✓ Easy to install and remove from stuffing box - reduces costly downtime
- ✓ Has gland water filtering capability
- ✓ High-purity PTFE offers chemical resistance in a broad range of rotary services

pH	0-14
Temperature (°C)	260



COMPRESSION PACKING HANDLING TOOLS

- » **Packing Cutter** - Easy-to-use packing cutters are available for convenient sizing of packing.
- » **Packing Extractors** - Extractors of various sizes are available for the safe extraction of packing.
- » **Tamping Tools** - Flexible tamping tools that make packing positioning and installation easy.
- » **Run-in Lubricant** - Garlock Start-up™ lubricant eases packing ring installation.

FLOW MONITORING & REGULATION

- » **Flow & Pressure Control Units** - Double and single flow/pressure gauges are available for monitoring flow.
- » **Constant Flow Regulators** - The regulator is designed to provide constant flow of medium volume liquid flows.
- » **Pressure Reducing Valves** - Pressure reducing valves are available for pressure reduction in flush flow.
- » **Magnetic Filters** - The magnetic filter will ensure that iron based contaminants are filtered out.



EXPANSION JOINTS

STYLE 10

Style 10 is a versatile rubber expansion joint with two floating flanges. The body is precision moulded from synthetic rubbers reinforced with nylon tire cord. This expansion joint has excellent vibration and sound absorption abilities as well as high pressure resisting abilities. The range of elastomer construction materials ensure resistance to chemical corrosion and ozone attacks.

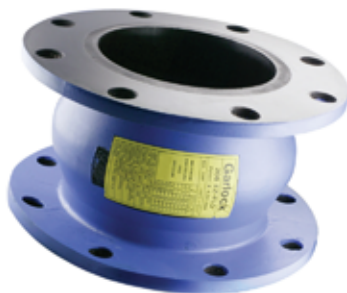
Size (mm)	Temperature (°C)	Pressure (bar)
32-600	up to 110	10
600-1200	up to 110	6



STYLE 204

Style 204 is a spool-type expansion joint that is constructed with a single or multiple arch type. The expansion joint has high pressure (size dependent) and full **vacuum capability**. The body consists of a unique construction of chlorobutyl/polyester with welded, treated metal body rings for dimensional stability. A high pressure design - 204HP, is also available. Other benefits include:

- » Lab and field tested for long life and exceptional reliability
- » Seamless flange face eliminates need for gaskets
- » High pressure & vacuum resistance with a 4:1 safety factor increases safety & ensures a range of applications
- » Can be custom-designed for greater movement capability and easier installation
- » Variety of elastomer/fabric combinations meet demanding operating conditions
- » Chlorobutyl resists cracking due to high temperatures, weathering, oxidation & chemicals



Construction Options	Temperature (°C)
Chlorobutyl/Polyester with Natural Gum	82
Standard Chlorobutyl/Polyester	120
Chlorobutyl/Fibreglass/Kevlar with EPDM tube and cover	150
Fluoroelastomer with Fibreglass/Kevlar	205

STYLE 206 EZ-FLO®

EZ-FLO® expansion joints contain a single wide flowing arch, eliminating the need for filled arches on slurry services. Garlock® EZ-FLO® expansion joints have successfully served all major industries, including pulp and paper, steel, waste and water, HVAC, power generation, chemical, petrochemical and marine. The body consists of a rubber impregnated tire cord and polyester cross-wrapped in bias-ply construction. Advantages include:

- » Lab and field tested for long life and exceptional reliability
- » Self-flushing design eliminates media buildup and reduces fluid turbulence
- » High pressure & vacuum resistance increases safety & ensures a range of applications
- » Flowing arch design adds pressure resistance and reduces product buildup
- » Chlorobutyl resists cracking due to high temperatures, weathering, oxidation & chemicals

Construction Options	Temperature (°C)
Chlorobutyl/Nylon Tyre Cord with Natural Gum	82
Chlorobutyl/Nylon Tyre Cord	120
Chlorobutyl/Kevlar Tyre Cord with EPDM tube and cover	150

Pressure and Vacuum Rating

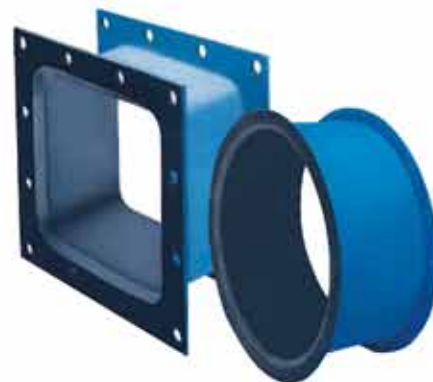
	Pipe I.D.		Pressure Rating		Vacuum	
	Inch	mm	psi	bar	in. Hg	mm Hg
Style 204 [†]	1/2-4	13-100	165	11	29.9	750
	5-12	125-300	140	10	29.9	750
	14	350	85	6	29.9	750
	16-24	400-600	65	4.5	29.9	750
	26-66	650-1,650	55	3.8	29.9	750
	68-96	1,700-2,400	45	3	29.9	750
	98-108	2,450-2,700	40	2.8	29.9	750
Style 204HP [†]	110-120	2,750-3,000	30	2	29.9	750
	1/2-4	13-100	200	14	29.9	750
	5-12	125-300	190	13	29.9	750
	14	350	130	9	29.9	750
	16-20	400-500	110	8	29.9	750
	22-24	550-600	100	7	29.9	750
	26-40	650-1,000	90	6	29.9	750
Style 206 EZ-FLO®	42-66	1,050-1,650	80	5.5	29.9	750
	68-96	1,700-2,400	70	5	29.9	750
	98-108	2,450-2,700	60	4	29.9	750
	110-120	2,750-3,000	50	3.5	29.9	750
	2-10	50-250	250	17	26	650
	12	300	250	17	12	300
	14	350	130	9	12	300
	16-20	400-500	110	8	12	300
	22-24	550-600	100	7	12	300
	26-40	650-1,000	90	6	12	300
	42-66	1,050-1,650	80	5.5	12	300
	68-96	1,700-2,400	70	5	12	300
	98-108	2,450-2,700	60	4	12	300
	110-120	2,750-3,000	50	3.5	12	300

EXPANSION JOINTS

STYLE 8400

Garlock® offers a wide range of flue duct type expansion joints for a range of applications. Style 8400 flue ducts are available in round, rectangular or square configurations, as belt type (without flanges) or U-type (flanged). The belt type expansion joints can be supplied in any size, without flanges, and can be delivered open-ended, or to fit over ducting. A wide range of rubber and fabric materials are available along with insulating pillows to create **many layer combinations to suit most applications**. These flue duct style expansion joints are commonly used in gaseous media such as hot air, chemical vapours, engine exhaust, etc within many industries including:

- » Steam boiler systems
- » Gas turbine exhausts
- » Industrial furnace & chimney construction
- » Refuse incinerators
- » Ventilation & aeration systems
- » HPI, CPI emissions control
- » Pulp & Paper Industry



Body, Cover & Liner Material Options	Temperature (°C)
Neoprene with Fibreglass insertion	120
Chlorobutyl with Fibreglass insertion	150
Fluoroelastomer with Fibreglass insertion	205
Fibreglass Cloth (Styles 650, 800, 1200)	538
Thermo-safe Fibreglass Cloth (Style 110)	750
Abrasion resistant Fibreglass Cloth (Style 115)	1000
Fluorocarbon coated Fibreglass Cloth	260
PTFE Gas Shield	260
Superwool Pillow	1000
Polysil	232










METALLIC EXPANSION JOINTS

Garlock® design and manufacture metallic expansion joints of high quality and high performance, meeting the needs of the most demanding industries including LNG, desalination, chemical, power generation and polypropylene plants, as well as refineries. Garlock® can manufacture joints up to 6 metres in diameter.

KLOZURE® RADIAL LIP SEALS

Garlock® produces an advanced range of lip seals to suit most applications. At the heart of every Garlock® KLOZURE® oil seal you will find the MILL-RIGHT® family of materials. Each of the new **MILL-RIGHT®** (**N**-NBR; **ES**-HNBR; **V**-FKM) elastomers has been specifically engineered to provide the highest abrasion resistance, lowest wear, and exceptional chemical and temperature resistance. The engineered MILL-RIGHT® materials and seal designs, together, create the most advanced sealing solutions available in the heavy industrial market. For the most demanding conditions, the specially designed, **GYLON® based PS-SEAL model** will provide the necessary high performance.

Style	Features	Material	Temp (°C)	Pressure (bar)	Shaft Dia. (mm)	Surface Speed (m/s)	Spring Type	Misalign. (mm@m/s)
Model 23 	<ul style="list-style-type: none"> General service split seal Cover plate required Over 300,000 sizes readily available 	N ES V	-40 to 93 -40 to 150 -30 to 204	N/A	76.2 and up	10.2	Moulded-in stainless steel finger	0.25 @ 5.1 0.13 @ 10.2
Model 26 	<ul style="list-style-type: none"> General purpose seal Solid or split design Reverse bevel lip design Reinforced rubber OD Single & dual lip available Cover plate for bore diameters over 10" 	N ES V	-40 to 93 -40 to 150 -30 to 204	0.4 (N/A if split)	19.0 to 1524.0	25.4	Moulded-in stainless steel finger	0.38 @ 5.1 0.25 @ 10.2 0.20 @ 25.4
Model 53 	<ul style="list-style-type: none"> General purpose assembled seal Heavy-duty metal outer case Single & dual lip available 	N ES V	-40 to 93 -40 to 150 -30 to 204	0.4	76.2 to 1524.0	15.2	Stainless steel finger	0.38 @ 5.1 0.25 @ 10.2 0.13 @ 15.2
Model 59 	<ul style="list-style-type: none"> Severe service assembled seal Heavy-duty metal outer case Reverse bevel lip design Aggressive shaft-to-bore misalignment capability 	N ES V	-40 to 93 -40 to 150 -30 to 204	0.4	152.4 to 1778.0	25.4	Moulded-in stainless steel finger	2.36 @ 12.7 1.19 @ 25.4
Model 63 	<ul style="list-style-type: none"> General purpose assembled seal Heavy-duty metal outer case Single & dual lip available 	N ES V	-40 to 93 -40 to 150 -30 to 204	0.4	6.4 to 76.2	15.2	Stainless steel finger	0.38 @ 5.1 0.25 @ 10.2 0.13 @ 15.2
Model 64 	<ul style="list-style-type: none"> Severe service assembled seal Heavy-duty metal outer case Unique carrier/garter spring combination Industry's highest shaft-to-bore misalignment capability 	N ES V	-40 to 93 -40 to 150 -30 to 204	0.4	203.2 to 1890.0	35.6	Combination of stainless steel garter & stainless steel finger	3.18 @ 25.4 2.36 @ 35.6
PS-SEAL 	<ul style="list-style-type: none"> Specialty seal assembled for high pressure applications GYLON element offers excellent chemical resistance Dry running up to 3.5 m/s Available with a dust lip Also available as a reverse lip, as back-to-back dual lips and as tandem dual lips. 	Gylon® Black Gylon® B (FDA) Gylon® W (FDA) Gylon® F (FDA)	-40 to 204	up to 10 (standard) up to 25 (special)	11.1 to 508.0	up to 15 (pressure dependent)	N/A	0.13 @ 10.2

KLOZURE® BEARING ISOLATORS

The best alternative to radial lip seals. Replacing a lip seal with a KLOZURE® Bearing Isolator will extend equipment life and add profit to your bottom line. Over 90% of bearing failures are caused by contamination where conventional lip seals fail to exclude water and other contaminants from entering into the lubricant. Lip seals also have an unpredictable life, generate frictional heat, score the shaft surface, and cause increased energy consumption due to the frictional drag on the shaft. KLOZURE® Bearing Isolators feature the following popular styles with typical applications in pump bearing frames, electric motors, gear boxes, split pillow block bearings and fans.



Iso-Gard®

The **most aggressive labyrinth isolator** in the industry, for superior contaminant exclusion. Press-fit design allows for easy installation with no requirement for tools. The unique two-piece unitized construction of the Iso-Gard will ensure structural stability. The PTFE material provides **excellent chemical resistance** and wide temperature compatibility. The seal has a non-contact design, which **eliminates shaft scoring, drag and frictional heat, and sparking**. This also negates any lubricant requirements. Available in a broad range of configurations. Used in non-flooded applications.

GUARDIAN™

The high performance Metallic Bearing Isolator utilizing labyrinth technology in conjunction with other dynamic features to protect bearing from contamination ingress, as well as lubrication egress. Design features include the **engineered unitizing element that ensures no internal metal-to-metal contact, eliminating any chance of sparking**. This design also ensures no wear on shaft or metallic components. The patented Cam-Lock® design allows for **easy installation**. The GUARDIAN™ also features enhanced **vapour blocking** capabilities which prevents vapour migration into the bearing housing. Available in a **Split Design**. Used in non-flooded applications.



EnDuro™

The EnDuro™ seal is the first and only bearing isolator designed for **oil mist and flooded conditions**. The patent pending EnDuro™ seal is a unique blend of traditional labyrinth seal technology and new revolutionary sealing technology. The combination results in a seal like no other; IP56 ingress protection while providing complete egress protection.

MICRO-TEC® II

Incorporating the proven GUARDIAN™, the MICRO-TEC® II is designed for applications that require bearing protection in highly contaminated environments. Utilizes microcellular technology to **block out airborne contamination**. Only the MICRO-TEC® II incorporates a unique **microcellular filter to block the ingress** of outside contaminants.



SGi™

Providing the ultimate protection for your bearings, the Garlock® SGi™ incorporates the proven GUARDIAN™ technology with the only maintenance-free shaft voltage mitigation technology, the AEGIS™ SGR. The **SGi™ protects motor bearings from EDM, electronic discharge machining, caused by VFD, variable frequency drive, induced shaft voltage**. Available in split-construction (SGi™-180), and with Micro-tec filter technology (SGi™-MT). Similar to the Guardian™, the **SGi™ is non-sparking**.

Style	Construction	Temp (°C)	Pressure (bar)	Surface Speed (m/s)	Axial Motion (mm)	Shaft-to-bore Misalign. (mm)	Protection
Iso-Gard®	Both the rotor and the stator are designed from 15% glass-filled PTFE providing excellent chemical resistance.	-40 to 204	Atmospheric	22.9	0.38	0.50	IP55, IEEE 841-2001
GUARDIAN™	Bronze construction with patented unitizing ring eliminates metal-to-metal contact. Patented Cam-Lock® design.	-30 to 204	Atmospheric	60.9	0.64	0.50	IP56, IEEE 841-2001
EnDuro™	Stainless steel rotor and engineered proprietary PTFE blend stator.	-30 to 204	Atmospheric	10.2	0.38	0.13	IP56
MICRO-TEC® II	Bronze construction (standard) with unitizing ring and micro-cellular filter.	-30 to 204	Atmospheric	22.9	0.64	0.51	IP56, IEEE 841-2001, NEMA MG 1-2003
SGi™	Bronze construction (standard) with unitizing ring and AEGIS™ shaft grounding ring.	-30 to 149	Atmospheric	60.9	0.60	0.50	IP56

ONE-UP® PUMP DIAPHRAGMS



ONE-UP® DIAPHRAGMS

GARLOCK® ONE-UP® industrial pump diaphragms, containing high performance PTFE GORE® sheet on the wetted side, are a significant advancement over conventional PTFE diaphragms. Considerably stronger, with greater flex life, they provide a dramatic improvement in service life. GARLOCK® ONE-UP® pump diaphragms have been extensively field tested in a wide variety of industries including chemical processing, paint, solvent and detergent manufacturing, and wastewater treatment. Documented case histories show that the average service life is 3.5 times longer than conventional PTFE diaphragms.

GYLON® ONE-UP® pump diaphragms, made using the exclusive GYLON® PTFE Diaphragm material and a proprietary EPDM rubber backing, are FDA compliant and will have the same chemical resistance and long life as the industrial ONE-UP. This allows high performance in food and regulated applications. Your solution for sanitary applications in air operated diaphragm pumps.

Chemical resistance is the property that makes ONE-UP® pump diaphragms so versatile. Suitable for use with most chemicals and in elevated temperatures and pressures, these diaphragms are ideally suited for those general service pumps that are likely to be put to one use today and another use tomorrow. You can expect **long, effective service life and reduced maintenance costs** with these durable one-piece diaphragms. Strength and chemical resistance make ONE-UP® pump diaphragms perfect for most of your pumping requirements.



Key Features:

- ✓ Contains high performance material: PTFE GORE® (Industrial) or GYLON® (food & pharmaceutical)
- ✓ Bonded to a reinforced rubber backing
- ✓ Patented rib construction
- ✓ Chemically inert & temperature resistant
- ✓ Greater flex life
- ✓ Available for most brands of pumps & sizes

Key Benefits:

- ✓ Lasts Longer: Replace diaphragms less often
- ✓ Versatility: Diaphragms work with most chemicals
- ✓ Cost: Lowers maintenance and operating costs

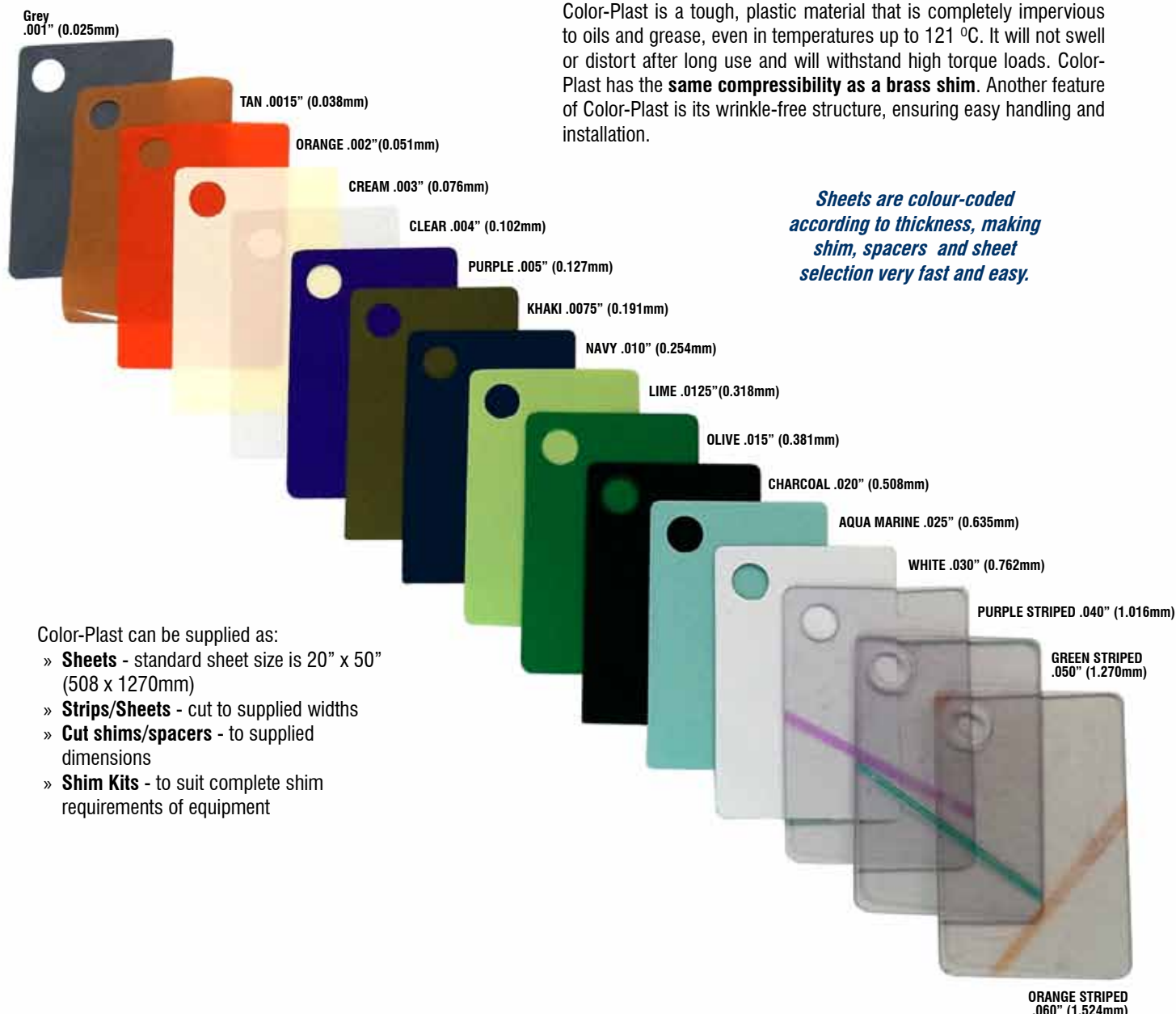
Properties	GARLOCK® ONE-UP®	GYLON® ONE-UP®
Construction	One-piece composite design with a proprietary 100% GORE® PTFE on wetted side fused to a Neoprene, EPDM or Viton® backing	One-piece composite design with a proprietary GYLON® on wetted side fused to a EPDM backing
Chemical Resistance	Chemical resistance to all media in pH 0 – 14 range, except molten alkali metals and elemental fluorine.	Chemical resistance to all media in pH 0 – 14 range found in FDA compliant applications
Temperature Range	Neoprene backing: -10 to 93°C EPDM backing: -10 to 137°C Viton® backing: 0 to 176°C	-10 to 149°C
Applications	Industrial applications involving chemicals	Food and pharmaceutical industries, and other applications where FDA compliance is required.
Certifications & Approvals		GYLON: Food & Pharmaceuticals, Potable Water, Medical, TSE Free EPDM: Food & Pharmaceuticals

COLOR-PLAST SHIMS

COLOR-PLAST SHEETS, SHIMS AND SPACERS

Color-Plast is a tough, plastic material that is completely impervious to oils and grease, even in temperatures up to 121 °C. It will not swell or distort after long use and will withstand high torque loads. Color-Plast has the **same compressibility as a brass shim**. Another feature of Color-Plast is its wrinkle-free structure, ensuring easy handling and installation.

Sheets are colour-coded according to thickness, making shim, spacers and sheet selection very fast and easy.



Color-Plast can be supplied as:

- » **Sheets** - standard sheet size is 20" x 50" (508 x 1270mm)
- » **Strips/Sheets** - cut to supplied widths
- » **Cut shims/spacers** - to supplied dimensions
- » **Shim Kits** - to suit complete shim requirements of equipment

Construction Material	POLYESTER	TRI-ACETATE	VINYL
Thicknesses	0.025mm (0.001") Grey 0.038mm (0.0015") Tan 0.076mm (0.003") Cream 0.10mm (0.004") Clear	1.02mm (0.040") Stripe Purple. 1.27mm (0.050") Stripe Green. 1.52mm (0.060") Stripe Orange.	0.051mm (0.002") Orange 0.127mm (0.005") Purple 0.191mm (0.0075") Khaki 0.254mm (0.010") Navy 0.318mm (0.0125") Lime 0.381mm (0.015") Olive 0.508mm (0.020") Charcoal 0.635mm (0.025") Aqua 0.762mm (0.030") White
Distortion Temperature	121 °C	93 °C	74 °C
Applications	For applications against oil, petroleum, aromatic and non-aromatic fuels. High compressibility useful when lightweight sheet metal flanges are involved. For use with gear case, crankcases and oil pans and containers.		

HIGH TEMPERATURE TEXTILES

HIGH TEMPERATURE CLOTH, ROPE AND PACKING

A wide range of fibreglass insulation cloth, tape, ladder tape, lattice braided packing, tubing, and rope are available for **insulation, sealing and protection against temperatures up to 1000° C**. Styles include Thermo-sure, Poly-sil, Thermo-sil, Thermo-safe and Thermo-temp.



Style	Description	Max Cont Temp (°C)	Availability	Applications
Thermo-sure	Woven fibreglass cloth coated with high temperature rubber compound	204	Insulation Cloth: Style 6250 - with Brass wire reinforcement Style 6251 - without wire	Gaskets for manholes, handholes & flanges on boilers & air receivers. Door seals for ovens and autoclaves Media: Steam, air & dry gases, aqueous solutions
Poly-sil	Woven fibreglass cloth coated with white silicone rubber for sealability	230	Insulation Cloth: 1-Ply (2mm) 2-Ply (4mm)	Flue duct expansion joints Flue duct gaskets Gaskets for worn/uneven flanges Media: mild acids & alkalis, oils & greases, air & some gases, salt & fresh water
Thermo-sil	Textile product manufactured using acid-etched e-glass fibre yarns. Finished material is treated to minimise emission and unravelling	538	Insulation Cloth (by weight - g/m ²): Styles 650, 800, 1200, 1550 Plain Tape: Styles 1210 (1.5mm), 1410 (6.5mm), 1810 (3.0mm) Ladder Tape: Style 1910 Lattice Braided Packing: Style 5450 (Square, Rectangular) Style 5481 (Round) Tubing, Rope, Knitted Rope, Matting	Welded blankets/curtains, jacketing for insulation batts, liquid, air & gas filtration, tadpole tapes, channel seals/block packings, furnace door seals, high temperature pillows Media: most acids & dilute alkalis, solvents, molten metals, sparks & slag
Thermo-safe	High tensile strength and abrasion resistant textile products manufactured using calcium silicate fibre yarns	750	Insulation Cloth: Style 110 - 1100 g/m ² Style 955 - 950 g/m ² Lattice Braided Packing: Round, Square, Rectangular Tape, Tubing, Matting	Welded blankets/curtains, jacketing for insulation batts, liquid, air & gas filtration, tadpole tapes, channel seals/block packings, furnace door seals, high temperature pillows Media: most acids & dilute alkalis, solvents, molten metals, sparks & slag
Thermo-temp	High tensile strength and abrasion resistant textile products manufactured using high purity (93.5%) silica fibre yarns	1000	Insulation Cloth: Style 115 Tubing, Packing, Matting, Aluminised Cloth	Welded blankets/curtains, jacketing for insulation batts, liquid, air & gas filtration, tadpole tapes, channel seals/block packings, furnace door seals, high temperature pillows Media: most acids & dilute alkalis, solvents, molten metals, sparks & slag

SPRAY-STOP SAFETY COVERS

SPRAY-STOP COVERS

Garlock® Spray-Stop safety covers provide a much needed early-warning, visible indication of leakage. A colour change triggered only from the inside by a leak enables even untrained employees to see that a leak has occurred. Even a single drop of acid will bleach the inside coating; an outside spray will not affect the colour. **Visible from a distance, the colour change hastens discovery and reduces damage.** Everyone, in effect, becomes an inspector.

If leakage does occur—whether drops, spray or stream—Garlock® Covers deflect it from spraying adjacent areas and personnel. All models of **valve and flange covers are fully-indicating** (meaning the actual material changes colour) except PTFE flange covers which indicate through a patch, and PTFE valve covers.



All Garlock Spray-Stop Covers are made from patented high temperature fabrics coated with special formulation of indicators and polymers that will change colour when contacted by acid or caustic. All can replace any old-fashioned made-on-the-job covers at a fraction of the cost. **Exclusive contoured shape makes a secure fit around flanges and valves;** they won't fall off under any circumstances, even in a fire! Lightweight and compact, they fold flat for shipping and storage. Covers are available in durable Vinyl or PTFE fabrics, both of which are UV, weather, chemical and fume resistant:

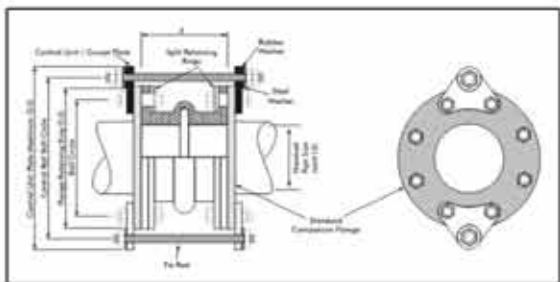
Style	Features
Vinyl	Used in moderate temperatures and are fully-indicating (meaning the actual material changes colour, not just a patch) for installations where temperatures do not exceed 104°C . You can actually see where a leak occurs by the colour change on that part of the cover! Resists acids, caustics and most other industrial chemicals. Available in most sizes for valves, and from ¼" up to 36" for flange covers.
PTFE	Used in high temperature applications for continuous protection on pipelines carrying fluids with up to 260°C temperatures. Made from PREMIUM GRADE PTFE material, these unique covers withstand high temperatures and, like vinyl, are resistant to external acids, caustics, and most other industrial chemicals. An indicating swatch is built-in to flange cover bottoms to provide the same early-warning of leakage as the Vinyl fully-indicating models.



Value & Benefits:

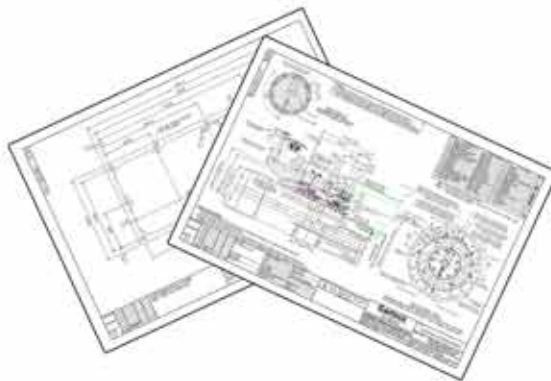
- ✓ Obvious colour change makes spotting leaks easy
- ✓ Acts as a safety cover as the covers are impervious to most reagents
- ✓ High temperature fabric - PTFE - covers most chemical applications
- ✓ Colour change occurs for internal leakage to accurately determine leak point
- ✓ Suitable for exposed operating conditions as the covers are UV and water resistant
- ✓ Exclusive contour shape captures all leakage and cannot be easily dislodged
- ✓ Lightweight and compact - easily handled and stored
- ✓ Minimises damage, injury and downtime
- ✓ Reduction in inspection costs
- ✓ Reduction in repair costs

CAPABILITIES AND SERVICES



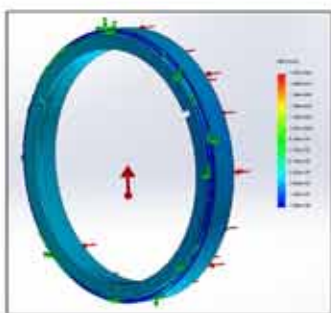
ENGINEERING SERVICES

The Garlock® applications engineering team can provide engineering support for all sealing applications. Garlock® also specialises in providing sealing solutions for unique applications where existing products are not suitable. A worldwide applications engineering team is also available for more challenging cases.



SURVEYS

Garlock® can conduct complete sealing and associated component site surveys to assist our clients in inventory rationalisation and plant reliability improvements. These include surveys of pumps, expansion joints and many more. A site survey provides information that can significantly improve process efficiencies by highlighting problem areas and preempting equipment failure.



PRODUCT DEVELOPMENT AND ANALYSIS

Using some of the most technologically advanced equipment available, the Garlock® family of companies' research and development teams explore new opportunities presented by new materials, constructions and applications. Garlock® has product development and testing facilities to create new sealing solutions for unique applications. The use of modeling and analysis software such as SolidWorks® allows a comprehensive design process. A testing rig that can replicate many operating conditions is set-up to test new (and old) designs.



CUTTING SERVICES

Garlock® utilizes Water-Jet Cutters and Blade Cutters to cut gaskets and shims to any shape that can be drawn on a CAD file. These machines can also be used for cutting variety of materials. Great for prototyping and small run jobs. Garlock® also uses travelling head and clicker presses for die cutting.



TRAINING

Garlock® provides training for the packing of pumps, valves and also gasket installation. This training is carried out for both company and contract personnel. Garlock® is committed to providing product installation training to maximise the service life of our products and improve plant equipment reliability.

COST SAVINGS ANALYSIS

Garlock® Prophet® is a software dedicated to analysing production costs and how they vary according to the sealing product used. This cost saving analysis can be customised to provide savings advice to all production processes. Garlock® is committed to identifying and eliminating unnecessary costs within the supply chain and within production and maintenance environments.



Customer-Driven Innovation

We believe by centering our world around our customers, we are able to bring better solutions and services to the market. Exceptional engineering begins first with understanding your needs and providing a solution that extends beyond the norm. Today's value-proposition demands first quality and then commitment. At Garlock®, our commitment includes not only providing the most innovative solutions but also the most progressive. Our focus and the key to our success is clear and direct: To be respectfully focused on you, our customer.



Quality Commitment

TCV is our culture of continuous, everyday improvement that focuses on Total Customer Value by eliminating waste in pursuit of perfection. The Garlock® family of companies continually monitors its progress towards perfection by measuring key performance indicators including low customer complaint & return levels, zero delivery defects, continued scrap reduction, high customer satisfaction rating and strong delivery performance.



Safety & Environment

Garlock® is completely involved in creating an injury-free work place. The dedication to create a safe workplace free of all injuries will be absolute and clear through the policies, procedures and practices within the Garlock® family. The Garlock® family of companies is focused on improving its operations and product offerings demonstrating its commitment to a cleaner environment. We set high standards to reduce environmental impact taking care of our planet by preserving its beauty and resources.



More than just great products...

Beyond offering you the widest available range of products for packing and sealing, Garlock® enhances the value of its products with technical services and comprehensive training programs:

- » ISO 9001:2008 registration for Industrial Gasketing, Industrial Packing, KLOZURE® Oil Seals, Bearing Protectors, Expansion Joints and Industrial Rubber Products.
- » A global network of stocking Authorised Garlock® Distributors.
- » Factory sales representatives and applications engineers available for problem solving when and where it is needed.
- » 1800 GARLOCK telephone number for immediate product information and technical support.
- » Technical field seminars on all Garlock® products.
- » The most sophisticated and most comprehensive test facilities available.
- » Factory-sponsored product training programs including hands-on seminars, to ensure that Garlock® representatives and their distributor personnel are the best in the industry.
- » Technical Bulletins to keep you up-to-date on product enhancements and changes.
- » In-plant surveys of equipment and processes, providing the customer with recommendations to identify and eliminate sealing and packing problems before they start.

Customers who specify Garlock® fluid sealing products get, at no extra cost, the high quality support needed to run a profitable operation. For more information or for technical assistance please call 1800 GARLOCK in Australia or 95745651 in New Zealand.

Garlock

an EnPro Industries family of companies



ISO 9001:2008



www.garlock.com

AUSTRALIA

Head Office: 6/165 Rookwood Road, Yagoona,
NSW 2199, Australia
Phone: 1800 GARLOCK
Fax: +61 2 9793 2544
E-mail: austsales@garlock.com

NEW ZEALAND

Head Office: 47B Mt Wellington Hwy, Mt Wellington,
Auckland 1060, New Zealand
Phone: +64 9 574 5651
Fax: +64 9 574 5636
E-mail: nzsales@garlock.com

WARNING: Properties/applications shown throughout this brochure are typical. Your specific application should not be undertaken without independent study and evaluation for suitability. Refer to specific product data sheets for detailed specifications and information. For specific application recommendations, consult Garlock® Engineering. Failure to select the proper sealing products could result in property damage and/or serious injury. Performance data published in this brochure has been developed from field testing, customer field reports and/or in-house testing. While the utmost care has been used in compiling this brochure, we assume no responsibility for errors. Specifications are subject to change without notice.

Bring Garlock® to all your sealing requirements

Pulp & Paper
Power
Pharmaceutical
Chemical



Primary Metal
Water Treatment
Mining
Food & Beverage

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