

Sealing Integrity for Chemical Processing Industries



Leaders in Sealing Integrity

Garlock
an EnPro Industries family of companies





High Performance Sealing Solutions for Chemical Processing

Personal safety is important in every industry, but when sensitive, hazardous or unstable chemicals are involved, the need to protect employees from exposure becomes paramount. The Garlock® family of companies creates sealing solutions that resist the extreme temperatures and corrosive materials of chemical processing environments to deliver unparalleled safety, performance and reliability.

Our sealing solutions excel in a variety of chemical processing applications — including pumps, valves, reactors, flange joints, heat exchangers and more — through our tireless dedication to understanding our customers' specific needs and designing highly engineered products that exceed their expectations. Never content to rest on past achievements, our scientists and engineers are constantly developing new and innovative sealing technologies that change the way the chemical processing industry meets its sealing requirements. By combining advanced technology products with exceptional service and environmental stewardship, we deliver sealing solutions that improve personal safety and plant productivity, reduce costs and comply with increasingly stringent environmental regulations.



The Leader in Safety

As the global leader in highly engineered sealing solutions, Garlock makes safety the number one priority and driving force behind everything we do. Our products perform critical functions in the industries we serve. We go the extra mile to make sure our sealing solutions conform to best environmental practices in order to prevent unwanted emissions and deliver unmatched reliability and performance in some of the most demanding environments on earth.





Within the chemical processing market we understand the industry's unique needs and potential hazards, and we never stop developing, testing and refining our products to better meet the needs of processing operations around the globe. At the Garlock family of companies, our sealing solutions are not just about productivity and cost control, they're about people. We are all parents, brothers, sisters, sons and daughters, and it's those relationships that motivate us to develop nothing short of the best sealing solutions available. As our customers embrace their families before leaving for work in the morning, we want their loved ones to feel confident in the safety of the environments in which they make their living.

Towers/Reactors

- GYLON®
- Therma-PUR™
- FLEXSEAL®
- GRAPHONIC®

Storage Tanks and Manways

- FLEXSEAL®
- GRAPHONIC®
- GYLON®
- MULTI-SWEL™

Reactors and Glass Lined Equipment

- GYLON® 3545

Mixers

- FLEXSEAL®
- GRAPHONIC®
- Style 1304
- Style 1333
- 3-D mixer/agitator seals
- Type 19 mixer seal
- P/S®-II
- P/S®-II

Pumps

- MULTI-SWELL™
- Style 1333-G
- Style 98
- HYDRA-JUST®
- ISO-GARD®
- GUARDIAN™
- FLUSH-GARD®
- P/S®-II
- GMP-I, GMP-II

Flanges

- BLUE-GARD®
- GYLON®
- Style 5500
- FLEXSEAL® (High pressure application)

Control Valves

- Style 1303-FEP
- 9000 EVSP Simplified®
- Syle 5882

- Expansion Joint Style 214

Gate and Globe Valves Fugitive Emissions

- Style 1303-FEP
- 212-ULE
- 9000 EVSP Simplified®

Valve Bonnets

- FLEXSEAL®
- GRAPHONIC®
- Kammprofile™

WARNING:

Properties/applications shown throughout this brochure are typical. Your specific application should not be undertaken without independent study and evaluation for suitability. For specific application recommendations consult Garlock. Failure to select the proper sealing products could result in property damage and/or serious personal 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 subject to change without notice. This edition cancels all previous issues. Subject to change without notice.

Chemical Processing Product & Application Recommendations

Utilities

Cooling Towers

- Rubber Expansion Joints

Turbines

- Therma-PUR™
- GRAPHONIC®
- Kamprofile™
- Spiral Wounds

FRP, PVC, CPVC, Light-Duty

- STRESS SAVER®
- Premium Grade Elastomer Gaskets

Butterfly Valves

- GAR-SEAL®

Diaphragm Pumps

- ONE-UP® Pump Diaphragm

Centrifuges

- GYLON®
- Style 1333-G
- KLOZURE® Oil Seals

Heat Exchangers

- GYLON®
- FLEXSEAL®
- GRAPHONIC®
- Kamprofile™

Dome Lids

- GYLON®
- BLUE-GARD®
- GRAPH-LOCK® 3128 HOCHDRUCK®

Valves

- Style 5888

Key

Compressed Gasketing

Compression Packing

Expansion Joints

Metallic Gaskets

Butterfly Valves

Diaphragms

KLOZURE® Oil Seals & Bearing Isolators

KLOZURE® Mechanical Seals

9000 EVSP Simplified®, BLUE-GARD®, FLEXSEAL®, FLUSH-GARD®, GAR-SEAL®, GRAPH-LOCK®, GRAPHONIC®, GUARDIAN®, GYLON®, HOCHDRUCK®, HYDRA-JUST®, ISO-GARD®, KLOZURE®, ONE-UP®, P/S® and STRESS SAVER® are registered trademarks of Garlock Inc. MULTI-SWELL™ and GUARDIAN™ are trademarks of Garlock Inc.



Compressed Gasketing

POSITIVE SEALS. PROVEN RELIABILITY.

Garlock® gaskets provide positive seals that perform with proven reliability. Our gasketing products are offered in a wide range of non-asbestos materials to meet the diverse needs of the chemical processing industry. For increased durability and longevity, our patented heat welding process enables the production of one-piece gaskets instead of separate segments spliced together.



Applications

Flange Gaskets

In providing the critical links between pumps and processing equipment in a wide variety of chemical plants, piping arrays must transport high pressure, abrasive high temperature and otherwise hazardous materials. Under these types of conditions, the flange sealing solutions play an important role in ensuring safety and reducing downtime. Garlock's gasketing products provide the performance and reliability to meet these exacting demands.



RECOMMENDED PRODUCTS:

High Temperature Sheet Gaskets

- Style 9900
- Style 9850
- THERMa-PUR® Style 4122

Fuel Oil Gaskets

- Style 3760 MULTI-SWELL™

Graphite Gaskets

- GRAPH-LOCK® Style 3128 HOCHDRUCK®

PTFE Gaskets

- GYLON® Style 3504
- GYLON® Style 3545

Metal Gaskets

- FLEXSEAL® RWI spiral wound with inner ring
- GRAPHONIC® spiral wound
- KAMMPROFILE™

Low Load Gaskets

- STRESS SAVER®
- FLEXSEAL® EDGE® spiral wound
- KAMMPROFILE™
- GRAPHONIC®
- Graphite sheet styles 3128, 3125SS, 3125-TC
- FLEXSEAL® Lo-Load Gasket

Piping Systems

Piping systems require proper layout, support systems and equipment to handle vibration, misalignment, and transitions. Elastomeric expansion joints are a critical component in these systems, allowing for thermal movement, vibration and correcting misalignment. Many piping systems also require expansion joints or butterfly valves that offer resistance to severe chemicals.



RECOMMENDED PRODUCTS:

Circulating water, Feed water/Make-up water

- Style 204
- Style 206 EZ-FLO®

Turbine Condenser

- U-Type
- Style 207
- Style 208

Condensate

- Style 204 Extreme Vacuum Service (EVS)
- Style 204 HP

Scrubber

- Style 204
- Style 206 EZ-FLO®

Chemical Resistance

- GUARDIAN® 200
- GUARDIAN® EZ-FLO®
- GAR-SEAL® butterfly valve

Turbines (Gas, Steam), Diesel Generators, Heat Exchangers

This equipment and associated piping have a number of pressure zones and may require connections with high performance and high compressive force. Garlock sealing solutions provide best-in-class performance and safety under a range of temperature and pressure environments.



RECOMMENDED PRODUCTS:

High Performance

- THERMa-PUR® spiral wound RWI

Crossover Gaskets

- GRAPHONIC® spiral wound
- KAMMPROFILE™
- Metallic Gasket Style 606

Severe Chemicals

- GYLON® Style 3545 and 3510 gasket
- KAMMPROFILE™ gasket (filler: Graphite, GYLON®, 4122)

Damaged Flanges or Thermal Cycling

- Style 3125 graphite sheet
- GYLON® Style 3545
- G.E.T.™ and TEPHONIC® gasket
- KAMMPROFILE™ gasket (Graphite, GYLON®, 4122)
- GRAPHONIC® gasket (Filler: 4122, Graphite)



A Complete Range of Sealing Solutions

Chemical plants place rigorous and unique demands on sealing products. Recognizing that there is no one-size-fits-all solution to fluid sealing in such a wide variety of applications, Garlock engineers and manufactures sealing solutions that are ideally suited to the specific environments in which they must perform.

Our sealing materials undergo extensive testing and documentation at exposures beyond those in the field in order to ensure safety and performance not only at the time of installation, but well after the project is completed.

Garlock strives to provide the full range of your sealing products, allowing for administrative savings and superior customer service throughout the project.







THERMa-PUR® Style 4122-KAMM Gasket

The THERMa-PUR® KAMMPROFILE™ gasket carries the same properties as the THERMa-PUR® gasket family, however it can match the flange rating for pressure and P_xT. An extreme gasket for extreme applications.



Jacketed Gasket

Garlock manufactures a complete range of jacketed exchanger and manhole seals. Custom configurations are available in a wide range of materials and styles to provide solutions for almost any application.



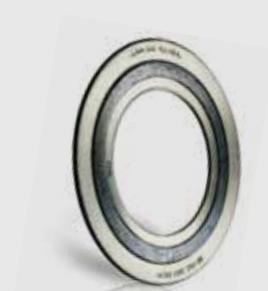
FLEXSEAL® Lo-Load Gasket

The FLEXSEAL® Lo-Load Gasket is engineered with Controlled Density+™ (CD+) to provide consistent, reliable sealing for weak (low bolt load) flange connections. A computerized manufacturing process ensures consistent winding density across entire gasket, providing superior stability and offering exceptional blowout resistance. Complies with all ASME B16.20 dimensions.



FLEXSEAL® Spiral Wound Gasket

Garlock's FLEXSEAL® spiral wound gasket with GARLOCK CONTROLLED DENSITY® technology provides consistent compressibility. This process of precise winding density control provides a gasket designed to meet your specified seating stress and assures consistent sealing of your most critical fluids. Garlock FLEXSEAL® spiral wound gaskets are durable and easily installed and removed. FLEXSEAL® products seal pressures to flange ratings in accordance with ASME B16.5. The FLEXSEAL® family accommodates a variety of conditions by combining various metals and filler materials.



FLEXSEAL® EDGE® Spiral Wound Gasket

The clearest advantage of Garlock's FLEXSEAL® EDGE® Spiral Wound Gasket is no radial buckling. The STABIL-LOCK™ inner wrap construction delivers a tight seal and prevents the sealing element from contaminating the process stream while the CONTROLLED DENSITY® process ensures consistent compression. This dual flange gasket is available in a variety of metallic and filler materials with a full range of temperature capabilities.



FLEXSEAL® TANDEM SEAL™

With two sealing elements, this gasket is made with a PTFE envelope that withstands high pressures, aggressive chemicals and corrosive media. It is also fire safe and significantly reduces corrosion and bacterial contamination of flanges.



GRAPHONIC® Gasket

Able to accommodate a wide range of temperatures, the GRAPHONIC® gasket features a flexible graphite sealing element that provides effective sealing performance during thermal cycling. Fire safe (withstood API and FITT fire tests) and chemically resistant, the GRAPHONIC® gasket also provides a long service life compared to competitive products.



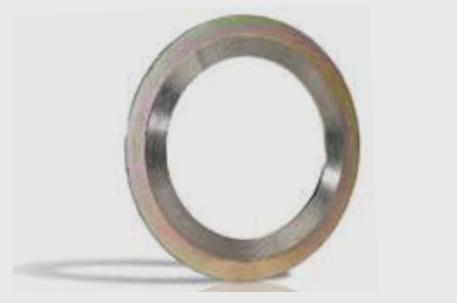
TEPHONIC® Gasket

Chemically inert and able to withstand temperatures up to 500° F (260° C), the TEPHONIC® gasket features an ePTFE sealing element, forms a tight seal under low bolt load and conforms to minor sealing surface imperfections.



G.E.T.™ Gasket

Rigid, yet compressible, the G.E.T.™ gasket features a graphite and ePTFE sealing element that combines fire safety with excellent chemical resistance and conforms to minor sealing surface imperfections.



KAMMPROFILE™

Serrations concentrate bolt load on small area for a tight seal at lower stress. The KAMMPROFILE™ solid metal core resists cold flow, overcompression and blowout. The rigid core provides exceptional stability, even in large sizes, and simple handling and installation.



GYLON® Style 3504

Style 3504 consists of PTFE gasketing with aluminosilicate microspheres to provide a tighter seal, reduced emissions and improved performance over conventional PTFE. Style 3504 withstands a wide range of chemicals for extended service life in a wide variety of applications and reduced operational costs.



GYLON® Style 3510

Manufactured to minimize cold flow problems typical of skived and expanded PTFE sheets, this PTFE gasketing with barium sulfate filler provides improved performance and a tighter seal than conventional PTFE. Suitable for strong caustics, moderate acids, chlorine, gases and hydrocarbons.



GYLON® Style 3545

Our innovative Style 3545 offers a tighter seal by using highly compressible PTFE outer layers that can seal under low bolt load for many non-metallic flanges. The pure PTFE makeup withstands a wide range of chemicals and can easily be cut from larger sheets, reducing inventory costs and downtime.



Style 9850

This high temperature gasket is ideal for harsh conditions, including high heat, pressure, saturated steam and hot oils. It is also laboratory tested for fire safety. Style 9850 is ideal for standard ANSI flange connectors as well as turbine crossover piping connectors.



Style 9900

Style 9900 is ideal for high temperature and oxidizing environments. The graphite fiber gasketing withstands the extreme pressures and temperatures as well as many chemicals. Style 9900 has passed Garlock fire tests and is ABS Fire Safe approved.



Gasket Products



BLUE-GARD® Style 3000

The BLUE-GARD® gasket offers a variety of elastomers that excel in a wide range of services. It consists of aramid fibers with an NBR binder that provides improved torque retention and drastically lowered emissions levels. Ideal for utility services, it has excellent sealability and cuts operational costs through reduced waste, maintenance, inventory and energy consumption.



MULTI-SWELL™ Style 3760

Creating compressive load in lightweight flanges in oil and water services, this gasket will seal where most others will not. MULTI-SWELL™ performs well in flanges that might crush an elastomer gasket and is easy to cut and handle.



GRAPHONIC®

This corrugated metal core encapsulated by soft sealing elements is excellent for high temperatures and corrosive chemicals. It also works well in less-than-perfect flanges and thermocycling applications.



GRAPH-LOCK® 3125

Pure exfoliated graphite material handles extreme temperatures, resists nearly all non-oxidizing chemicals, and offers excellent compressibility and low creep relaxation. Available in homogeneous material, or with metallic or non-metallic inserts.



GRAPH-LOCK® Style 3128 HOCHDRUCK®

High performance multi-layer graphite with 316SS inserts provides high compressive strength, blow-out resistance, excellent handling properties and improved tightness.

Compression Packing



Valve Fugitive Emission Reduction



Style 1303-FEP

Style 1303-FEP braided valve packing is dimensionally stable and impervious to gases and fluids. The non-scoring, self-lubricating, non-hardening spool stock packing is easy to handle and retains integrity when cut and formed. Fire safe and thermally conductive, it is heat, pressure and chemical resistant and complies with the most stringent VOC and VHAP emissions regulations.



212 Ultra Low Emissions (ULE)

Style 212 Ultra Low Emissions (ULE) valve stem spool packing drastically reduces emissions in valve applications (to less than 100 ppm). The customizable design allows you to make your own packing set rather than rely on a manufacturing site, and is delivered in an environmentally friendly, easy-to-use dispensing box. This low stem friction packing includes a planning label for calculating the number of boxes needed and preparing for outages.



9000 EVSP Simplified®

The patented "cup and cone" design of 9000 EVSP Simplified® custom valve packing permits selective component compression and controlled radial flow for effective I.D. and O.D. sealing. End rings act as wiper rings to restrict graphite particle transfer, prevent extrusion and provide extra resiliency. For deep stuffing boxes, machined/split carbon bushings can shorten box depth.

Compression Packing

Carbon



Style 98

Style 98 carbon pump or valve packing is tough and versatile with high thermal conductivity, allowing packing to last longer and processes to run cooler. Capable of withstanding a variety of chemicals, Style 98 offers a low coefficient of friction for longer equipment life. A low chloride certification is available.

Graphite



Style 1333-G

Style 1333-G braided flexible graphite pump or valve packing is ideal for valve, steam and rotary applications and offers excellent chemical resistance and maximum reliability and stability in high temperatures. An all-graphite, PTFE-constructed, offset square design, Style 1333-G is an easy-to-install spool stock packing that reduces inventory and downtime and resists extrusion in high-pressure applications.

PTFE Packing



Style 5888 PTFE Packing

Style 5888 PTFE pump or valve packing is high density, dimensionally stable and resistant to most chemicals. Ideal for valve and slower shaft speed applications, the PTFE dispersion ensures a low friction finish and prevents leakage through the braid.

Expansion Joints and PTFE-Lined Butterfly Valves



Style 204

Style 204 spool-type expansion joints can be constructed as single- or multiple arch types. They connect pipe flanges in concentric or eccentric tapers, to join piping of unequal diameters. Fully lab and field tested for long life and exceptional reliability. High pressure and vacuum-resistance increases safety and ensures suitability for wide range of applications.



Style 204EPS

Style 204EPS (Extreme Pressure Service) is a fully customizable abrupt arched expansion joint for rigid piping systems. This rubber expansion joint can be used in applications where necessary rated pressures exceed those of the Garlock Style 204 designs. Style 204EPS is available in concentric or eccentric designs.



Expansion Joints and PTFE-Lined Butterfly Valves



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.



GUARDIAN® 200

GUARDIAN® 200 and 200HP expansion joints consist of a chemically-resistant Fluorinated Ethylene Propylene (FEP) liner mechanically bonded to an abrupt arch. A chlorobutyl cover and blue protectant coating add resistance to environmental effects (alternate cover materials available). The high-density FEP liner reduces permeation and offers optimal chemical resistance while the high pressure and vacuum resistance ensure suitability for a broad range of processing applications, including exposure to acids and use in positive displacement pumps.



ABRA-LINE™

The ABRA-LINE™ family of products was developed for highly abrasive applications typically found in the power generation, fertilizer, mining and chemical industries. These may include flue gas desulphurization systems, phosphate mining, dry bulk power transfer systems, tailings and slurry applications. Our proprietary urethane formula was designed to reduce wear and extend service life.



GAR-SEAL® Butterfly Valves

Known throughout many industrial sectors for their quality, performance, and reliability in arduous conditions, GAR-SEAL® butterfly valves are used extensively where corrosive, abrasive, and toxic media need to be reliably controlled. They are typically used for accurate control, throttling, and shut-off duties in the chemical, petrochemical, chlorine, paper, electroplating, and many other industries. GAR-SEAL® butterfly valves offer reduced maintenance requirements and increased operational reliability.

Other Garlock Products

As an industry leader in gaskets, expansion joints, pipeline corrosion mitigation products, and PTFE-lined butterfly valves, Garlock products support the pumps, valves, hydraulic systems, and other rotating or reciprocating equipment you may be designing and installing for your projects. Other products Garlock supplies include:



Compression Packing



Hydraulic Components



KLOZURE® Mechanical Seals



KLOZURE® Bearing Isolators



KLOZURE® Oil Seals



Pump Diaphragms



Molded Rubber Products



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