Sealing Integrity for the Food and Beverage Industry

Leaders in Sealing Integrity

Garlock®

an EnPro Industries family of companies

Meeting and Exceeding your Most Rigorous Sealing Requirements

Garlock® seals help make life better for millions of people around the globe. They play an important role in assuring the safety of food, beverages, cosmetics and many other consumer products. Process engineers and professionals working in Quality, Operations and Maintenance trust the Garlock family of companies to develop industry sealing solutions for a broad range of applications, including process vessel, hygienic pipework, purified water systems, and equipment such as blenders, mixers and homogenizers.

Dependable, state-of-the-art Garlock seals, gaskets, diaphragms and valves meet key operational needs with excellent chemical resistance and remarkably long service life. Garlock is dedicated to helping you guarantee the integrity and reproducibility of the products you create.

A Culture of Safety

Garlock is acknowledged as the global leader in high-performance fluid sealing products. This leadership includes the commitment to a culture of safety and the dedication to making the world a safer, more sustainable and reliable place to live.

Our safety focus stems from our workplace culture and dedication to sealing integrity. We embrace safety both for our employees and our customers. Garlock sealing products and solutions are tested to meet or exceed industry regulatory requirements. Our goal is to go beyond compliance to set a higher standard that defines who we are and what we stand for.

Quality and Compliance are a Top Priority for Food and Beverage Applications

In today's food and beverage industries, cleanliness, traceability and compliance with international regulatory standards are essential to achieve the highest standards of food safety for the consumer. Employing durable, high-performance and precisely engineered sealing solutions is imperative to meeting these goals and preventing contamination.

Garlock assists in this critically important task with sealing products that conform to the highest international regulatory standards, including:

- FDA 21 CFR 177.1550 for fluorocarbon plastics
- FDA 21 CFR 177.2600 for elastomers
- (EU) 1935/2004
- 3-A sanitary standards 18-03 and 20-27
- NSF/ANSI standard 61 for drinking water systems

Food and beverage processing equipment represents a broad range of applications and operating conditions. Garlock's seal designers and engineers are constantly innovating better ways to comply with the full spectrum of regulatory requirements.

Sealing Products for the Food and Beverage Industry

From raw materials to final packaging, Garlock engineers and manufactures a comprehensive range of sealing solutions specifically for the varied conditions and materials used in food and beverage production. Our applications engineers and technical experts work in close partnership with our customers to understand the complexity of their operations and the diversity of their sealing challenges; only then do we begin to prescribe specific products to meet their requirements.

With an emphasis on safety, compliance, traceability, product integrity and lean manufacturing compatibility, Garlock's sealing solutions are designed to provide industry-leading performance while maximizing system uptime and equipment utilization. We understand the unique requirements of food and beverage processing, whether it's the industrial-scale refining of edible oils and sugar or the extreme sanitary requirements of dairy processing. Garlock creates solutions that keep both the pipeline and the bottom line in mind.

GYLON® standard gaskets and GYLON BIO-LINE® sanitary gaskets are well-suited to production of food and beverage products, featuring excellent temperature and chemical resistance in the most aggressive of processing conditions and CIP/SIP regimes.

The wide range of manufacturing processes calls for both fluid and powder sealing solutions on both static and dynamic applications. Products such as PS-SEAL® and KLOZURE® bearing isolators all provide excellent compatibility and durability in any number of challenging applications.

Filling and packaging operations have some of the most critical conditions in the whole food and beverage process. GYLON® diaphragms are ideal for aseptic valve applications, while GAR-SPRING seals provide reliable shaft sealing on filling carousels.

Critical Sealing Conditions

Beverage

In the beverage industry, production processes require careful attention to detail and selection of the correct sealing material in order to ensure performance and lifetime are maintained. Fruit juice production includes low pH fruit, which can create aggressive conditions for process vessels and sealing materials. Additionally, powerful cleaning agents are required to maintain sterility, remove any batch residue and prevent flavor transfer from one product to another—so not just any elastomer or plastic seal can be used. While alcoholic and carbonated beverages both have quite stable chemical compositions, non-carbonated drinking water involves stringent sterilization procedures that make proper material selection critical.

Brewing

Beer production is another operation requiring highly specialized sealing material. Milling of malted barley presents a mechanically abrasive and high dust environment, which presents a challenge for dynamic seals. The brewing and fermentation process creates organic deposits of proteins, gums, yeast, sugars and hop residues, as well as inorganic deposits in the form of carbonate salts. The use of both alkaline and acidic cleaning agents in these environments can greatly affect the seal integrity over time. Thermal strain is another issue; the high temperatures required for steam sterilization contributes to physical degradation of many standard sealing materials. Selecting optimal sealing material is critical throughout the brewing process.

Chocolate

Intensive cleaning processes are involved in the production of chocolate. This is partly due to commonly used additives such as nuts, grains and raisins. These additives can affect the chemical nature of the end product causing additional stress on seals, while flavor additives may alter the resistance of the seal. Sugar crystallization sometimes results in a gritty film that also has the potential to damage seals. Finally, the production of chocolate involves heating ingredients containing fat to elevated and carefully controlled temperatures. Sealing materials must therefore be selected to withstand any extremes without adding unwanted color or flavor to the finished product.

Convenience Foods

The convenience food industry involves a great number of products produced in a variety of forms. Ranging from powders and pastes to solids and liquids, each distinct type of product places a unique type of demand on sealing material. Some convenience foods require seals to have an unusually high tolerance to low temperatures, while others require heat resistance. The cleaning compounds used in open and closed production of convenience foods also pose a great challenge to the longevity and performance of sealing material.

Dairy

When selecting seals for dairy industry applications, several variables must be taken into consideration. Dairy production facilities often utilize intense steam sterilization processes, requiring that sealing material be designed to accommodate higher temperatures and physical strains. Some materials exhibit limited resistance to the high fat content often found in dairy products, which can leave an end product vulnerable to contamination from a compromised seal. In addition, dairy industry applications utilize intensive cleaning processes for eliminating fats from the pipe system, involving both acidic and basic chemicals to remove any residue.

Fruit Preserves

Sealing materials used in this industry must be designed to perform at elevated pressures normally associated with highly viscous products. Commonly used additives containing fat must remain stable in the presence of added flavorings, fruit particles and seeds. Any particulate matter (fruit chunks, seeds, skins, etc.) that might lodge in a seal can damage seal integrity and cause product contamination. The sugar crystallization present with fruit preserves and chemicals used for sanitation also place extra demand on sealing materials.

Fragrances and Flavorings

High value, small batch and high concentrations are typical characteristics of processing, as is the need to avoid flavor or odor transfer. Therefore, integrity, purity and quality are essential to maintain the desired impact of flavors and fragrances in any multitude of food or beverage applications. As such, the need to withstand unique process conditions as well as aggressive cleaning and sterilizing regimes is essential for any seal.

Ice Cream

Temperature requirements and variances involved with ice cream processing make selecting the appropriate sealing material a challenge. The high fat content of ice cream, as well as the addition of fruit chunks and other ingredients, all pose a threat to sealing integrity. The seal must be able to withstand sudden shifts in temperature, from steam sterilization of 284° F (140° C) to product production temperature of 32° F (0° C) or lower, while also proving capable of chemical resistance.

Tomato

Tomatoes and other low pH ingredients are used in many types of food products, involving various types of processing. Stringent hygiene standards apply when processing tomatoes and a reliable seal is vital to maintaining consistent product texture, flavor and color of this sensitive foodstuff.

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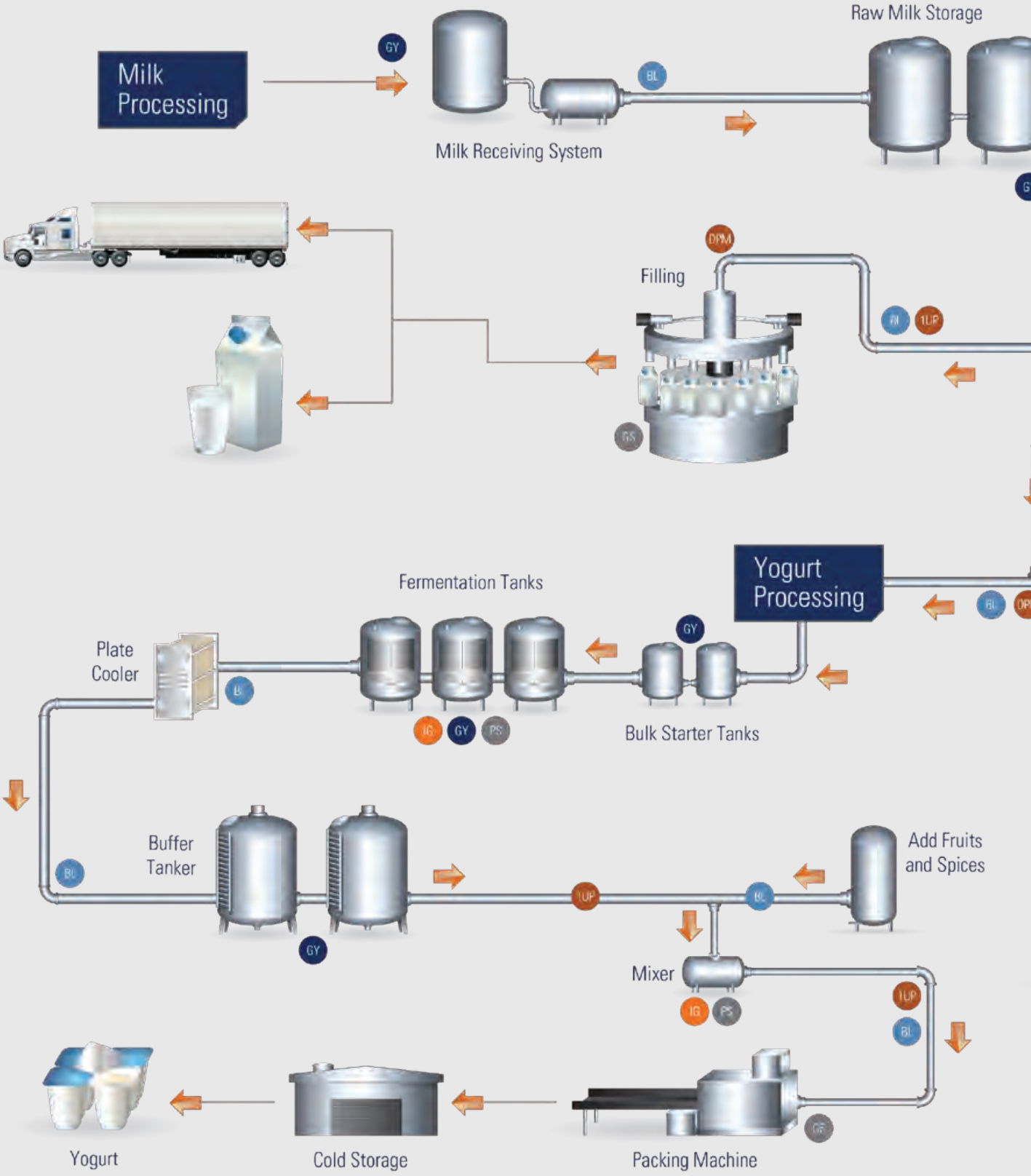
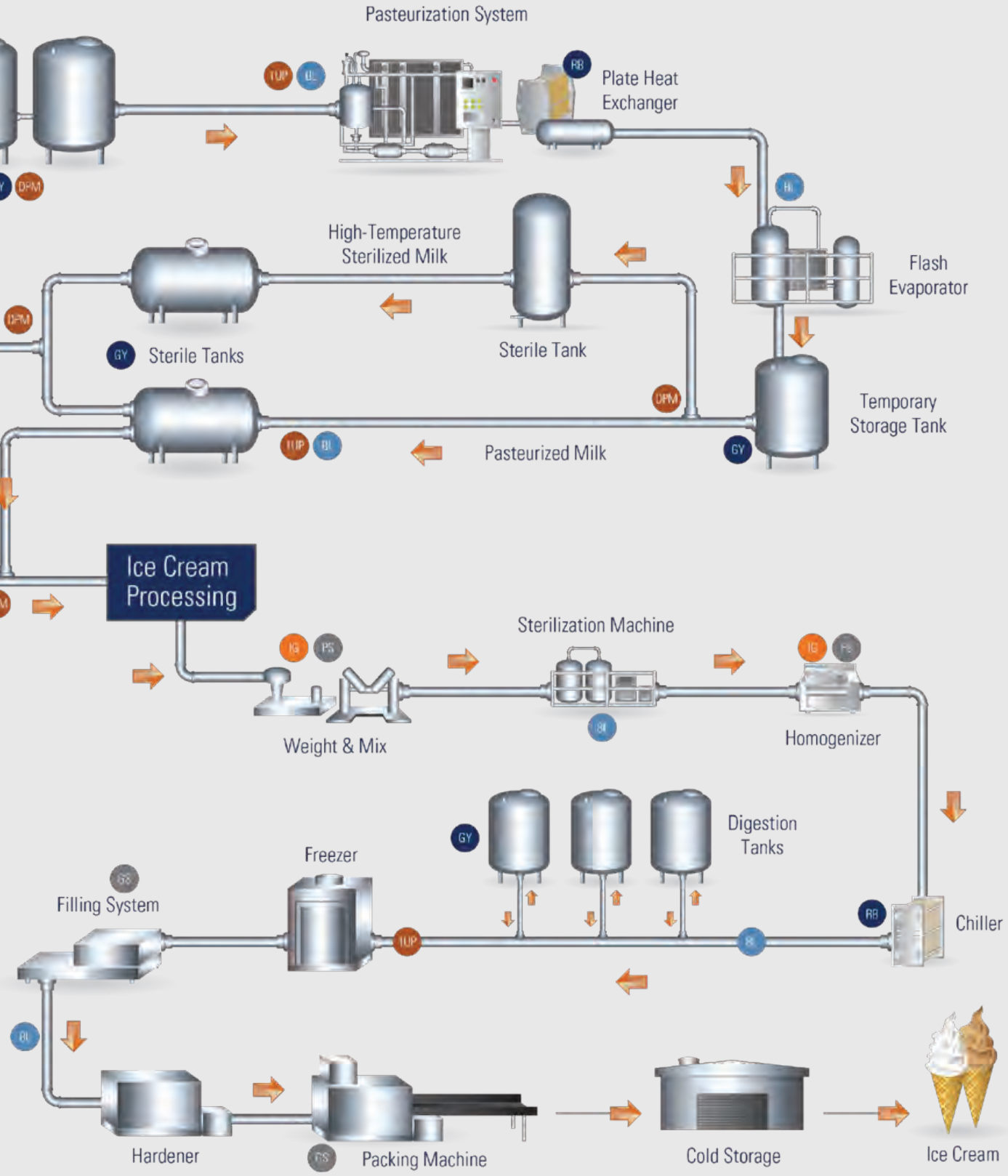


Dairy Processing



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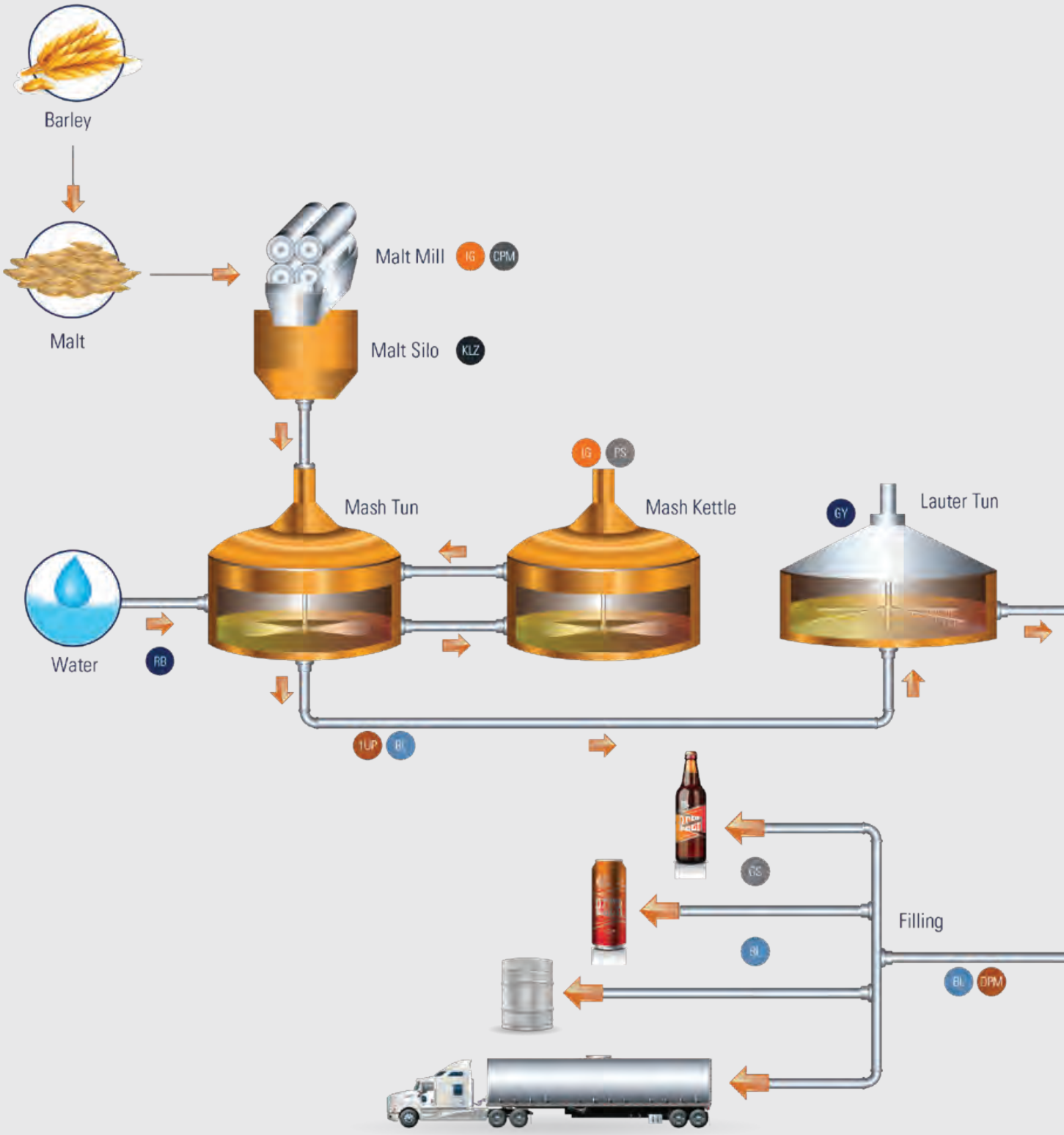
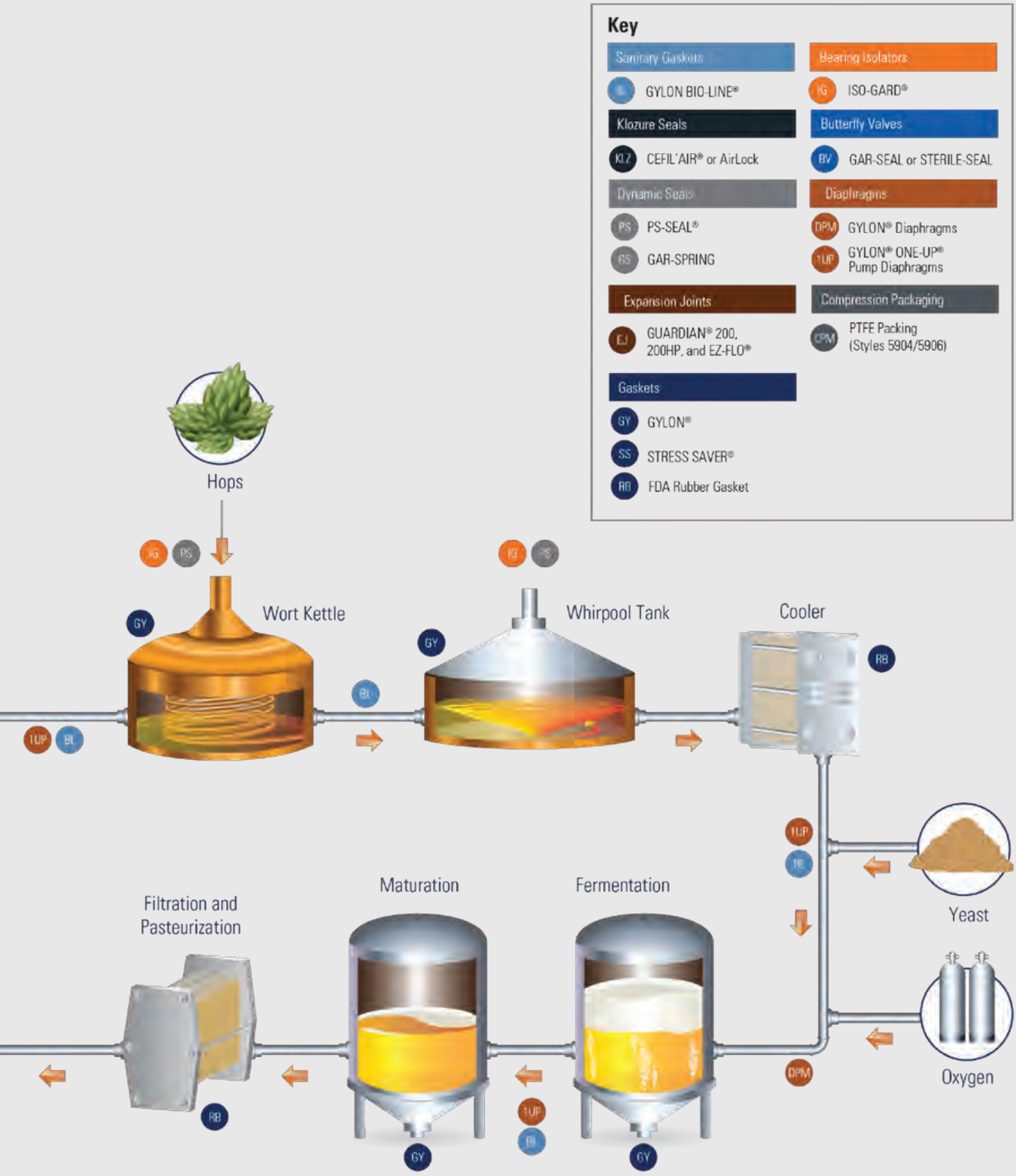


Brewing Process



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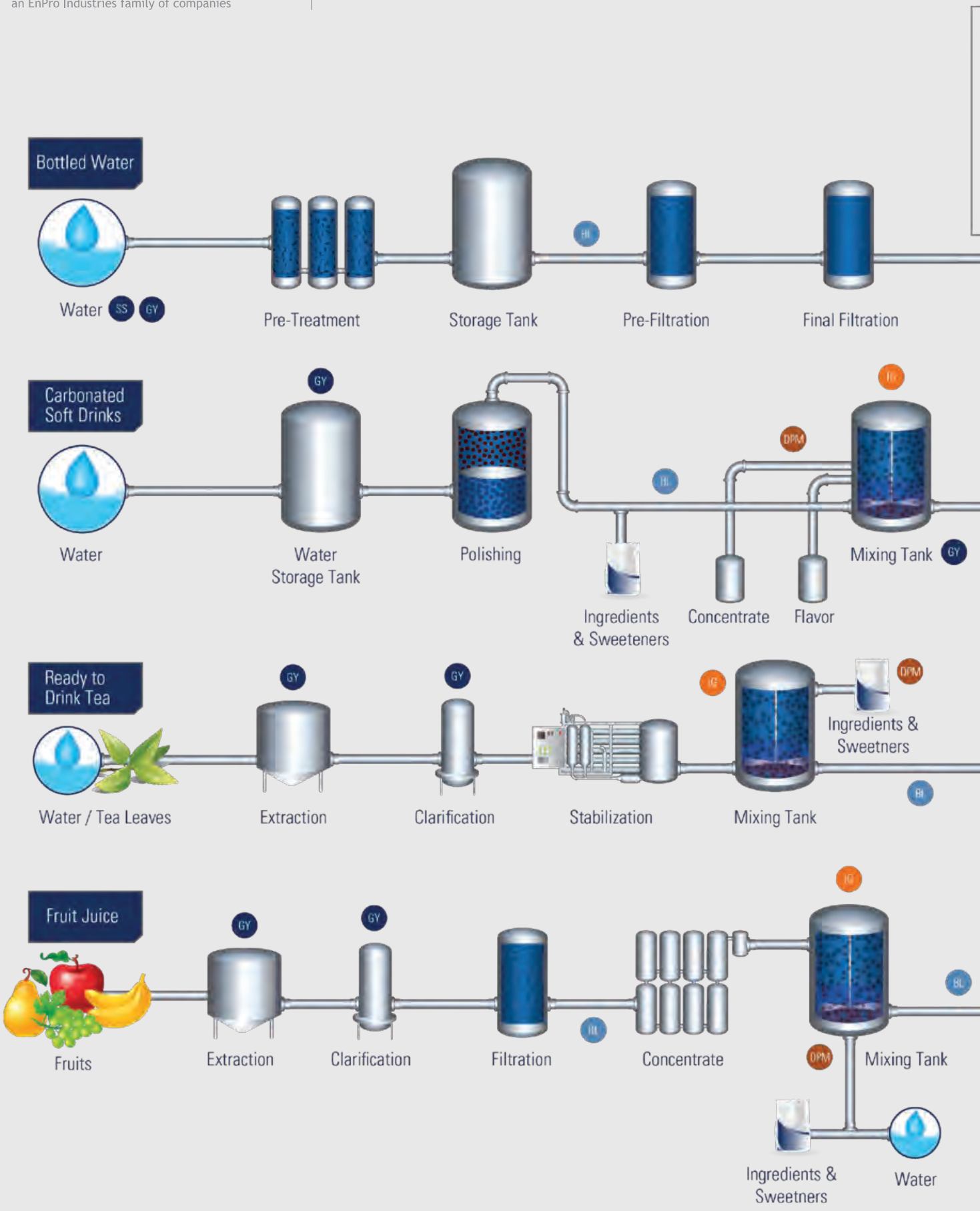
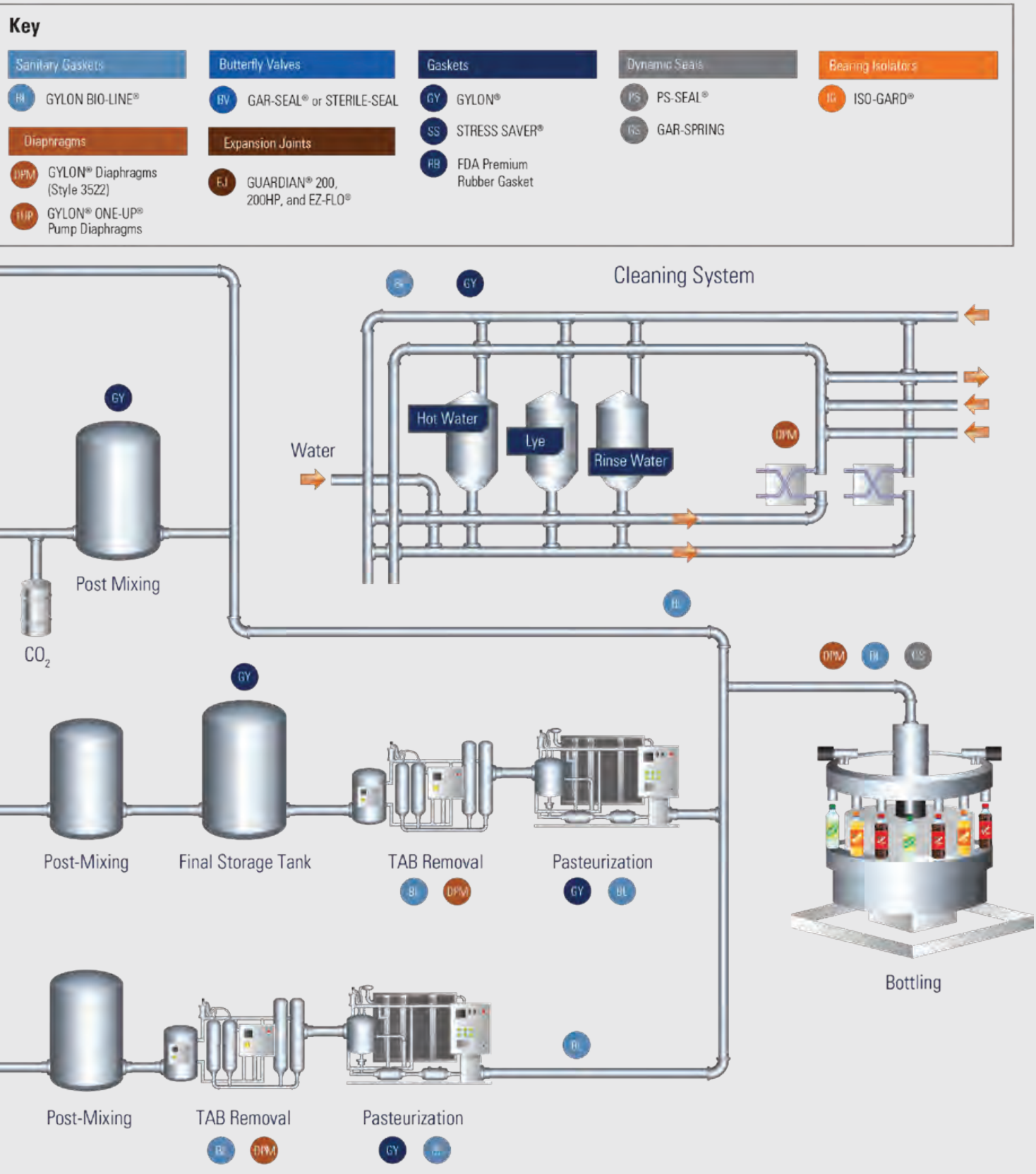


Soft Drink Manufacturing



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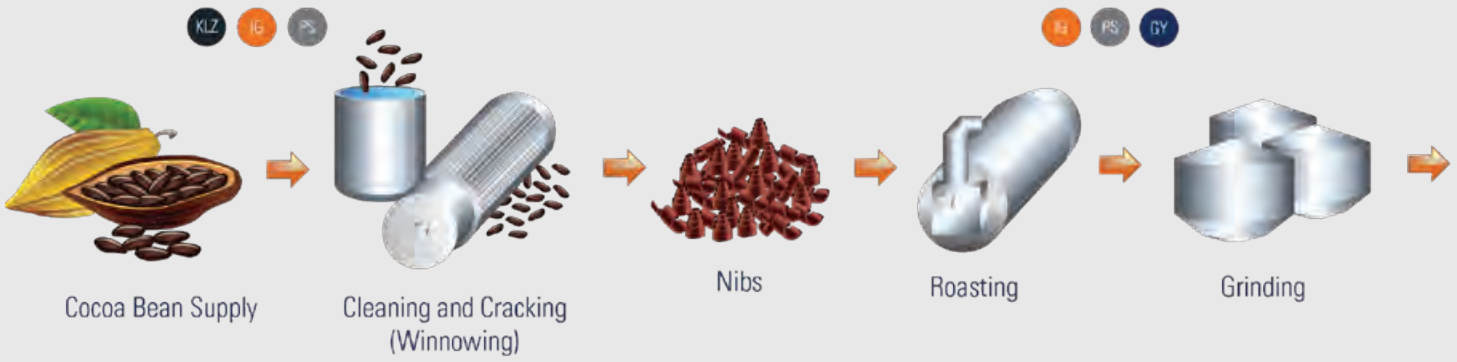
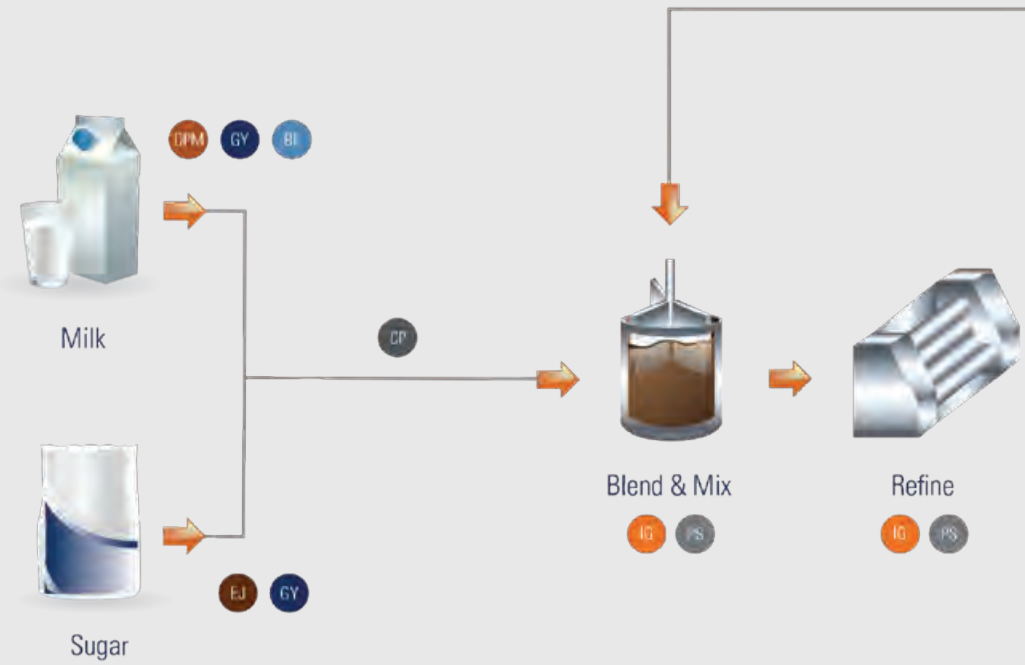




Cocoa & Chocolate Processing

Key

Sanitary Gaskets
- GYLON BIO-LINE®

Butterfly Valves
- GAR-SEAL® or STERILE-SEAL

Gaskets
- GYLON®
- STRESS SAVER®
- FDA Premium Rubber Gasket

Dynamic Seals
- PS-SEAL®
- GAR-SPRING

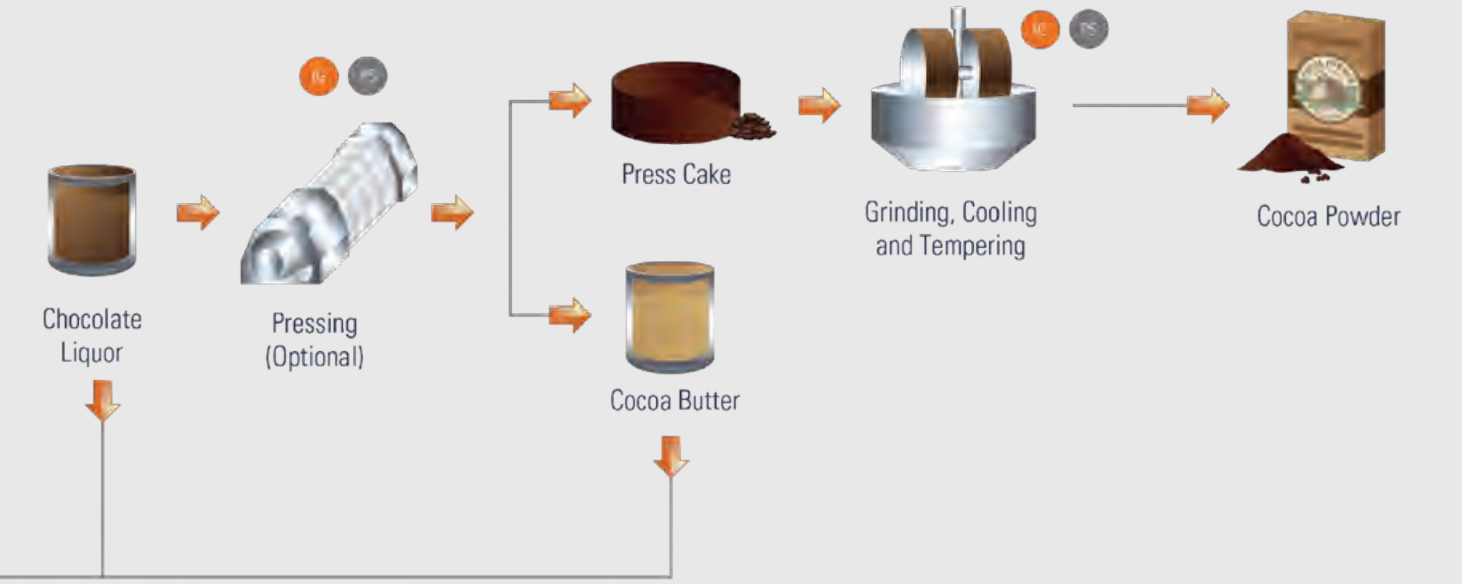
Bearing Isolators
- ISO-GARD®

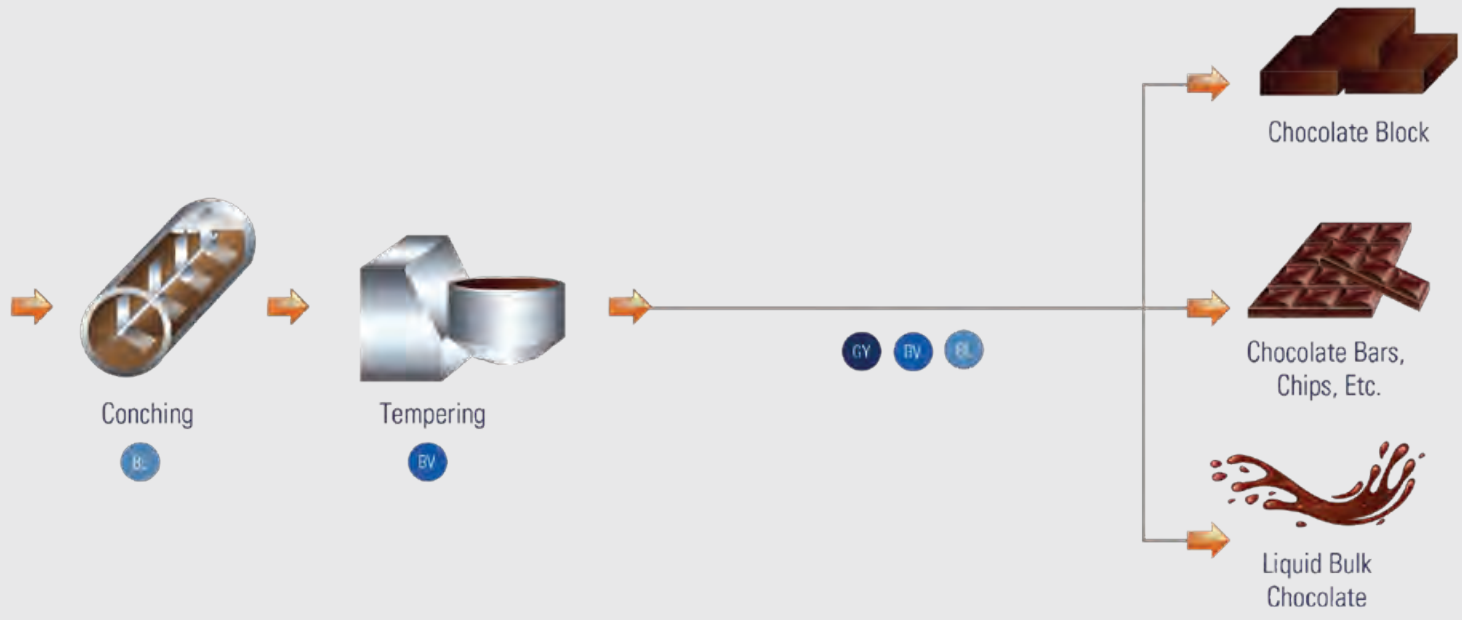
Diaphragms
- GYLON® Diaphragms (Style 3522)
- GYLON® ONE-UP® Pump Diaphragms

Expansion Joints
- GUARDIAN® 200, 200HP, and EZ-FLO®

KLOZURE® Seals
- KLOZURE® Seals

Compression Packaging
- PTFE Packing (Styles 5904/5906)





Sanitary Gaskets - GYLON BIO-LINE®

Performance materials for demanding applications

GYLON BIO-LINE® PTFE seals offer an alternative to traditional elastomer materials and better withstand the harsh conditions found in many food and beverage applications. GYLON BIO-LINE® seals also resist intrusion, which can lead to material contamination and flow irregularities.

GYLON BIO-PRO®

GYLON BIO-PRO® gaskets are pre-formed to fit tri-clamp type joints precisely and ensure a smooth "no trap" internal surface. Dimensionally stable over a wide range of process temperatures, GYLON BIO-PRO® gaskets do not creep or relax and lose their high-integrity seal. Meets EN 1935/2004, FDA compliant and KTW approved. Seal dimensions in accordance with DIN 32676, DIN 1850, ISO1127, ASME BPE – 2009, ISO 2852, SMS 3019.

GYLON BIO-ASEPT®

For aseptic flange connections in accordance with DIN 11853 and DIN 11864 (Form A), GYLON BIO-ASEPT® seals offer high stability and a specific elasticity. Our seals are pre-formed and stress controlled for solid sealing in piping systems. High-performance PTFE sealing materials prevent chemical degradation or brittleness, even under ever-increasing process and sterilization demands.

GYLON BIO-ECO®

The necessity for adequate sealing stress and simultaneous recovery makes GYLON BIO-ECO® the ideal solution for couplings in accordance with DIN 11851 and SMS1149. All of the disadvantages associated with standard elastomeric seals regarding temperature, chemical resistance and re-usability are eliminated by the modified PTFE material. GYLON BIO-ECO® seals are available in all dimensions without inner collar (M1) or with inner collar (M2).

Butterfly Valves

Quality regulation for maximum productivity

Regulation of caustic, abrasive and aggressive chemicals and materials can prove challenging in food and beverage operations. Garlock's GAR-SEAL® and STERILE-SEAL butterfly valves provide the performance and maintenance features needed to ensure material integrity and maximize uptime.

GAR-SEAL®

GAR-SEAL® valves are used for accurate control, throttling and shut-off duties where corrosive, abrasive and toxic media must be reliably controlled. GAR-SEAL® butterfly valves offer reduced maintenance requirements and increased operational reliability over competitive products.

STERILE-SEAL

STERILE-SEAL valves are used in the food and beverage industries to maintain a sterile environment without the need for unnecessary and costly overhauls and replacements. The special characteristic of this valve is its external sterilization capability. The design allows the critical "dead" areas of the valve, along with the disc, body liner and seals, to be steam sterilized without the risk of contaminating the material being processed.

Gaskets

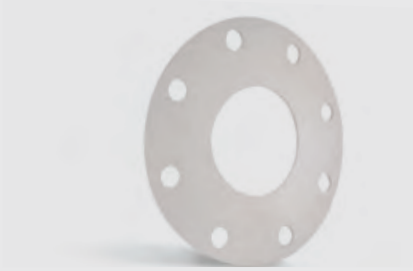
Positive Seals and Proven Reliability

Our gasketing products are offered in a wide range of materials, including GYLON® restructured PTFE gaskets, an industry standard for resistance to aggressive chemicals. A patented thermal bonding process enables the production of one-piece gaskets instead of separate segments or dovetailed gaskets.

Gaskets

GYLON®

GYLON® gaskets deliver improved performance over conventional PTFE. GYLON® advantages include reduced creep relaxation and the ability to withstand a wide range of chemicals for extended service life in a wide range of applications.



Premium Rubber

Garlock premium rubber gasketing sheets are manufactured with a wide range of natural and synthetic rubbers, including 8316 FDA compliant EPDM. They can be deformed, but not reduced in volume. Highly impermeable Garlock rubber gasketing can serve as a tight barrier against the infiltration of gases or liquids.

GYLON® Style 3504 STRESS SAVER®

Since 1996, the Garlock family of companies has successfully sealed low load flanges with our STRESS SAVER® family of products. The molded raised ribs help to create a tighter seal by concentrating the compressive load, making STRESS SAVER® ideal for lightweight piping. Our new Style 3504 GYLON® STRESS SAVER® combines these proven sealing advantages with the performance characteristics of the industry recognized GYLON® 3504.

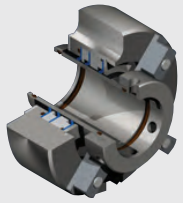
STRESS SAVER® XP

A single piece molded design made from a high-performance proprietary blend of fluoroelastomers, STRESS SAVER® XP is suitable for use in potable water, steam and most chemical applications. This formulation outperforms traditional fluoroelastomers in severe chemical and steam applications that require improved heat resistance.

Dynamic Seals

Specialty seals for challenging applications

Garlock's dynamic seals are engineered to meet the demanding temperature and chemical requirements of challenging and specialized food and beverage applications, including mixers, blenders, homogenizers and filling carousels.



P/S®-II Multi-Lip Seal

This high-pressure multi-lip cartridge seal is ideal for sealing viscous materials in a variety of chemical processing applications. It is suited for pressures up to 150 psi (10 bar) and vacuums of 28 inches Hg (711 mm), and can withstand temperatures up to 300˚F (149˚C). It is also field repairable.

GAR-SPRING

GAR-SPRING products are suitable for a wide variety of uses including Rotary and Static applications. GAR-SPRING is primarily PTFE, energized by either springs or elastomer material. GAR-SPRING is designed to withstand temperature extremes ranging from cryogenic temperatures up to 340°C. Available in sizes from 2mm I.D. up to 2000mm.

PS-SEAL®

High performance PS-SEAL® products operate with a sealing lip of modified PTFE, making them highly elastic and flexible with a very low coefficient of friction. They suffer little wear and require no metallic spring element. PS-SEAL® is specially designed for reliably sealing rotating shafts with high peripheral speeds, high pressure, temperature fluctuations and aggressive media.

3-D Mixer Seal

Featuring a cartridge-style design, the 3-D Mixer Seal compensates for extreme shaft movement, can run dry, and can handle up to 1.000-inch of total indicated runout (TIR), compression and elongation. Custom designed for each application, these seals are rated to 300˚F (148.8˚C), vacuums of 28 inches Hg (711 mm), and pressures up to 150 psi (10 bar).

KLOZURE® SMALL SEALS

Garlock's MILL-RIGHT® elastomer sealing material provides the highest abrasion resistance, lowest wear, and exceptional chemical and temperature resistance. Style 61 is a general-purpose assembled seal for high-pressure applications. Style 63 is a general-purpose assembled oil seal that is available in single and dual lip configurations, featuring a heavy-duty metal outer case and stainless steel finger spring.

KLOZURE® SPLIT SEALS

MILL-RIGHT® elastomer sealing material provides the highest abrasion resistance, lowest wear, and exceptional chemical and temperature resistance. Style 23 spring configuration general purpose split seal offers good protection from misalignment and runout. Offering excellent chemical resistance, superior sealability and reduced creep and cold flow, Model 25 is an ideal low-speed service PTFE Split Oil Seal.

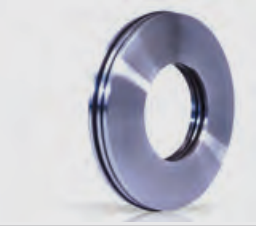
Bearing Isolators

Exceptional fluid sealing for demanding applications

Garlock bearing isolators feature a labyrinth design that forms a non-contacting seal with no wearing parts for exceptional service life and contaminant prevention. Outboard and inboard drain grooves collect and expel contaminants through drain ports to achieve unmatched contaminant prevention and lubricant retention.

ISO-GARD®

ISO-GARD® bearing isolators provide excellent chemical resistance within a wide temperature range, making them suitable for bearing protection in many applications. A press fit design allows for ease of installation without the use of tools, reducing production downtime and saving maintenance costs. As with all Garlock Isolators, ISO-GARD® comes in a variety of configurations; both flanged and non-flanged designs are available.



GUARDIAN® BEARING ISOLATOR

GUARDIAN® Bearing Isolators provide exceptional bearing protection for pumps, motors, and bearing supported industrial material under the harshest conditions. The GUARDIAN® 316 Stainless Steel bearing isolator is FDA compliant, and provides extended bearing life by excluding liquid and solid contamination while retaining bearing lubrication.

Diaphragms

Innovative designs for long life & less maintenance

Garlock's proprietary materials and designs and high-quality construction give our diaphragms exceptional service life and reduced maintenance for a wide variety of food and beverage applications. From pure PTFE to one-piece bolt-on PTFE-bonded rubber diaphragms, if you have a difficult or critical application, Garlock has the diaphragm to meet your needs.

GYLON® ONE-UP® Pump Diaphragm

Made using our exclusive GYLON® PTFE Diaphragm material and a proprietary EPDM rubber backing, this product has the same patented rib construction of our standard industrial ONE-UP® and complies with FDA regulations.

GYLON® PTFE Diaphragm Style 3522

Exclusive to Garlock, this proven product is made using a proprietary process that optimizes quality and uniformity. Through the use of the best available technology, GYLON® PTFE diaphragms offer the longest cycle life in the industry, and continue to outperform all competitive materials.

High-Performance Rubber Diaphragms

Offering a variety of compounds to meet your needs, Garlock's high-performance rubber diaphragms comply with the strictest standards. We have compounds that comply with FDA standard 21CFR177.2600 and NSF 61.

Expansion Joints

Highly engineered joints for increased piping safety

Garlock expansion joints offer superior performance, reliability and service life. This in turn improves plant safety and increases the mechanical integrity of equipment.

GUARDIAN® Style 204

Style 204 expansion joints are typically supplied with a filled arch configuration for full vacuum service on the suction side of pumps. It is designed with a seamless tube is available as an FDA compliant EPDM, Neoprene or Nitrile compound. It is also customizable to include extended face to face lengths, offsets and custom drilling patterns.

GUARDIAN® Style 206 EZ-FLOW®

Style 206 EZ-FLO® expansion joints contain a single wide flowing arch designed to eliminate media build up and fluid turbulence. This lightweight design is made with a seamless tube that is available as an FDA compliant EPDM, Neoprene or Nitrile compound. It is also customizable to include extended face to face lengths, offsets and custom drilling patterns.

Style 214/215

These PTFE concentric spool-type flexible couplings are designed to reduce noise and compensate for expansion, contraction and minor piping misalignment in food & beverage processing systems. The multi-laminated convolutions provide flexibility and durability at high temperatures while the FDA compliant PTFE body withstands corrosion, water, steam, and most chemicals and gases. Flanges are available in various grades of stainless steel.

Compression Packing

Cutting edge technology for changing demands

PTFE compression packing is known for its exceptionally high resistance to chemicals and low friction and provides excellent performance in terms of leakage control, service life, and dependability. Garlock's compression packing is rigorously tested to ensure reliable, cost-effective sealing in valves, pumps, agitators and other rotary equipment.

PTFE Packing Style 5904/5906

Style 5904 is made from high purity PTFE filament lubricated with mineral oil – both of which conform to USDA and FDA standards. It is also highly chemical resistant and suitable for use in caustic service. Style 5904 is recommended for use in rotary food processing equipment such as pumps, dryers, blenders, mixers and cookers as well as acidic mining pumps.

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