DURLON®
SEALING SOLUTIONS

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SEALING SOLUTIONS FOR

Chemical Processing

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Our Vision

Evolution isn't a choice in today's business landscape, it's the only way to succeed.

Progress relies on everything moving forward; from people to machinery to production. Everything must flow.

As we engineer our way to a better world, we are breaking down barriers, making sure each process is in place, always reflecting and improving. We are experts at delivering the best sealing solutions to help our customers unlock their highest potential.

Our global community of industry leading specialists drive our innovative production and materials to consistently raise the bar.

Whether through the stress of everyday use, or specialized applications and high-temperature environments, liquid or gas, our products deliver sustainable integrity.

At Durlon, we succeed when you succeed.

DURLON®
SEALING SOLUTIONS

Sealing Solutions for **Chemical Processing**

The chemical industry is one of the most important economic sectors, and in general, can be divided into the following areas:

- Basic chemicals
- Fine chemicals
- Specialty chemicals
- Inorganic chemicals: Acids, Alkalies, Salt
- Organic chemicals: Pharmaceutical, Biochemical, Bioengineering

Each of these areas have different requirements, therefore, specially developed sealing solutions are required. The seals are essential for reliability, as they ensure hazardous, aggressive and corrosive media is controlled securely, regardless of the process or operating conditions.

The basic chemicals segment produces both inorganic and organic chemicals. Organic chemicals are used in the production of other chemicals, such as dyes, plastics, and petrochemical products. Inorganic chemicals usually are used to make solid and liquid chemicals, and industrial gases; sodium, sulfuric acid, and chlorine are some of the most common.

Products in the fine chemical industry are manufactured in discontinuous processes. Successive production steps, such as mixing, reacting and separating are typical here. The batches are often relatively small and the processes are demanding. Flexible, multi-purpose systems, usually equipped with agitators, reactors, filters, dryers and other special equipment, are predominantly applied. These different manufacturing processes often results in crystallizing, paste-like, highly viscous or highly corrosive media under changing pressure and temperature conditions.

Specialty chemicals include individual molecules or mixtures of molecules (i.e., formulations) that are manufactured on the basis of a unique performance or function. Many other sectors rely on specialty chemicals for their products, including automotive, aerospace, agriculture, and cosmetics and food, among others.

In manufacturing and processing, particularly extreme parameters will occur during the handling of inorganic basic chemicals. In addition to aggressive, sometimes toxic media, high pressures prevail. Furthermore, the seals used here must have a wide temperature range. Accordingly, high-quality, robust and chemically resistant materials are in demand. In order to meet the high standards of the statutory emission values in processes, the seal must make a decisive contribution.

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Whether you are dealing with agrochemicals, basic chemicals, specialty chemicals, consumer products, or pharmaceuticals, Durlon® has the products, materials, and expertise you need in your industrial applications. When dealing with fine and specialty chemicals, gaskets that can withstand high temperature and chemical resistance are required. In addition to the use of aggressive and sometimes toxic media, temperatures from +300°C down to a cryogenic range are not uncommon. The material of the finished seal must be able to stand up to these varied conditions.

By combining innovative products with unparalleled service, Durlon® recognizes the potential hazards and critical need for personal safety in chemical processing industries, while also considering the importance of regulatory compliance, reduced downtime, ease of maintenance, integrity, and emission reduction. We invest a great deal in research and development to consistently improve the performance of our sealing products. In addition to outstanding chemical resistance to various aggressive media, our gasket materials must resist high and low-temperature extremes and possess robust mechanical strength.

Innovative products
Unparalleled service

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Polytetrafluoroethylene (PTFE) gasket material

Aggressive chemicals, high pressures and extreme temperatures can all create challenging conditions. Durlon® designs and manufactures high-performance sealing solutions for a wide range of chemical processing applications, including pumps, valves, flange joints, pipelines, and more.

Durlon® filled PTFE gaskets/sheets are exclusively manufactured at Triangle Fluid Controls Ltd. in Belleville, Ontario, Canada. Our compression molded and skived manufacturing process allows for the best control of physical properties and performance characteristics compared to other manufacturing processes. With unique formulas of fillers, Durlon® PTFE products can meet your tough chemical applications and engineering specifications.

PTFE (polytetrafluoroethylene) has excellent chemical resistance and its unique properties lends itself well for use in a variety of industrial, manufacturing, and engineering facilities. The superb chemical resistance and tolerance to vast temperature gradients has not only improved the efficiency of many industries, but the safety for the employees that work around those conditions as well.

General properties of PTFE

- Excellent chemical resistance
- Wide range of service temperature
- Excellent dielectric properties
- Non-stick, low friction
- No embrittlement or aging
- Smooth surface finish can be achieved
- Non-wetting
- Outstanding corrosion protection
- Electrical insulation
- High thermal stability and flame resistance
- Resistance to weathering
- Food grade compliant

Durlon® 9000 & 9000N PTFE

Various shapes of inorganic fillers have been homogeneously blended with pure PTFE resins to give Durlon® 9000 its physical and mechanical properties. It is suitable for use in steel flanges and will not exhibit the cold flow problems associated with virgin PTFE or the hardness problems of some other filled PTFE products. It cuts easily and separates cleanly from flanges after use. Durlon® 9000 is for use in general industrial applications where resistance to highly aggressive chemicals is required. In addition, the shape of the fillers does not allow wicking which can cause corrosion on flange surfaces.

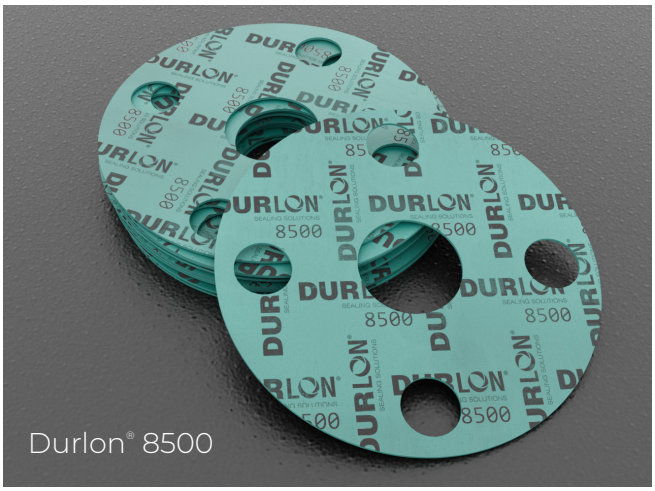
PTFE is highly resistant to corrosion due to its chemical inertness. Unfortunately, that same chemical inertness prevents PTFE from being cross-linked like elastomers and is subject to the phenomenon of cold flow – otherwise known as “creep”. To reduce and diminish cold flow, additives are introduced during the preparation of PTFE compounds. Glass fillers found in Durlon® 9000 and 9000N gaskets, not only reduce creep but also maintain chemical inertness against aggressive and caustic chemicals but are still considered safe for use by food, drug, and medical services.

Certifications

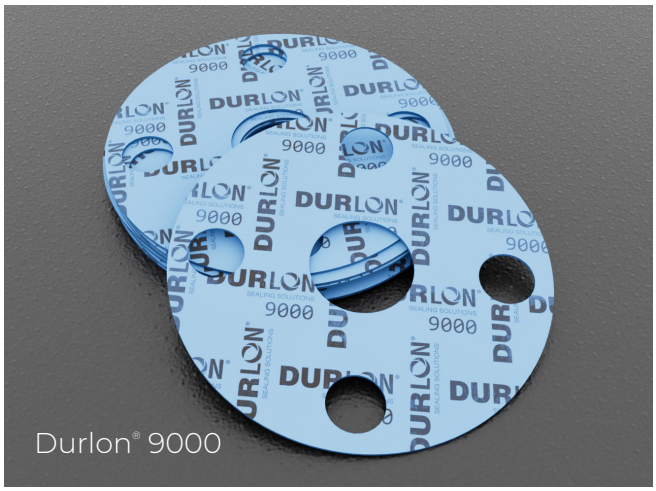
Durlon® 9000 – API 607 Standard 6FA Fire Test, WRAS, TA-Luft (VDI 2440), ASTM G86, Pamphlet 95 (Chlorine Institute), FDA Compliant, USP Class VI Certified, ABS-PDA Certified, EC 1935/2004 Compliant, DNV-GL Accreditation, RoHS Reach Declaration

Durlon® 9000N – FDA compliant, ABS-PDA Certified, USP Class VI Certified, RoHS Reach Declaration

Durlon® Product Recommendations

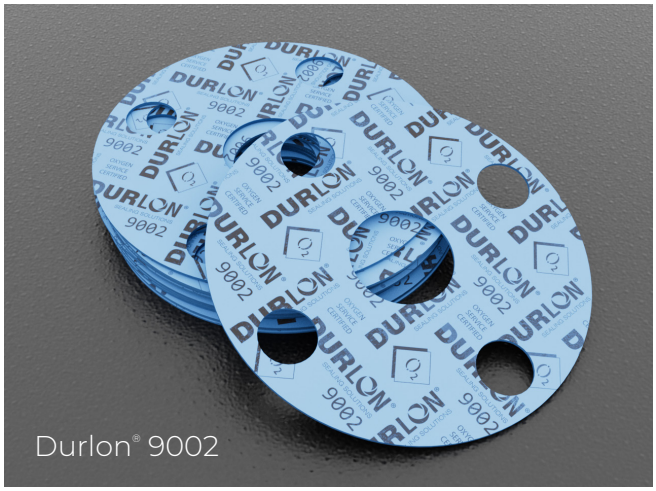


Durlon® 8500



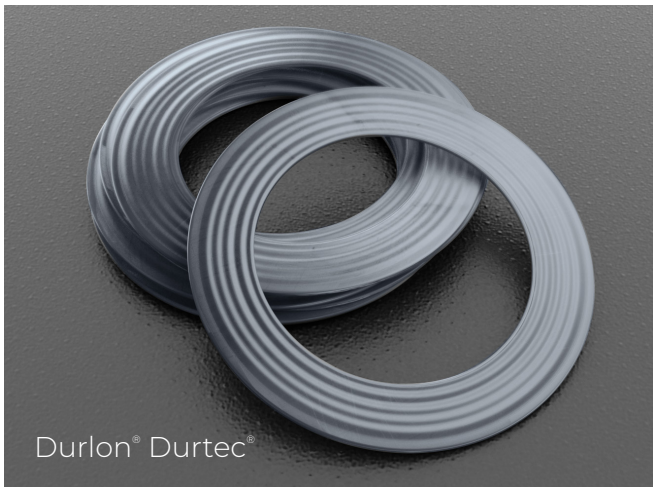
Durlon® 9000

Durlon® 9000N



Durlon® 9002

Durlon® 9200


Durlon® Durtec®

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Physical Properties & Certifications

Physical Properties	8500*	9000/9000N**	9002	9200**	Durtec®
Composition	Aramid-Inorganic NBR	Inorganic Filler with Pure PTFE Resins	Inorganic Filler with Pure PTFE Resins	Barium Sulfate Filler with Pure PTFE Resins	Specially Engineered Metal Core Technology
Color	Green	Blue/White	Blue	Granite White	***Depends on facing material
Temperature: Min Max Continuous, Max	 -73°C (-100°F) 371°C (700°F) 287°C (548°F)	 -212°C (-350°F) 271°C (520°F) 260°C (500°F)	 -212°C (-350°F) 271°C (520°F) 260°C (500°F)	 -212°C (-350°F) 271°C (520°F) 260°C (500°F)	 -200°C (-328°F) 1,000°C (1,832°F) 650°C (1,200°F)
Pressure, max, bar (psi)	103 (1,500)	103 (1,500)	103 (1,500)	103 (1,500)	430.9 (6,250)
Density, g/cc (lbs/ft^3)	1.7 (106)	2.2 (138)	2.2 (138)	2.5 (156)	
Compressibility, %	8-16	8-16	8-16	8-16	
Recovery, %	50	40	40	35	
Creep Relaxation, %	20	30	30	30	
Tensile Strength, MPa (psi)	13.8 (2,000)	13.8 (2,000)	13.8 (2,000)	13.2 (1,920)	
Sealability ASTM 2378 (Nitrogen)	 0.03 cc/min	 0.01 cc/min	 0.01 cc/min	 0.01 cc/min	

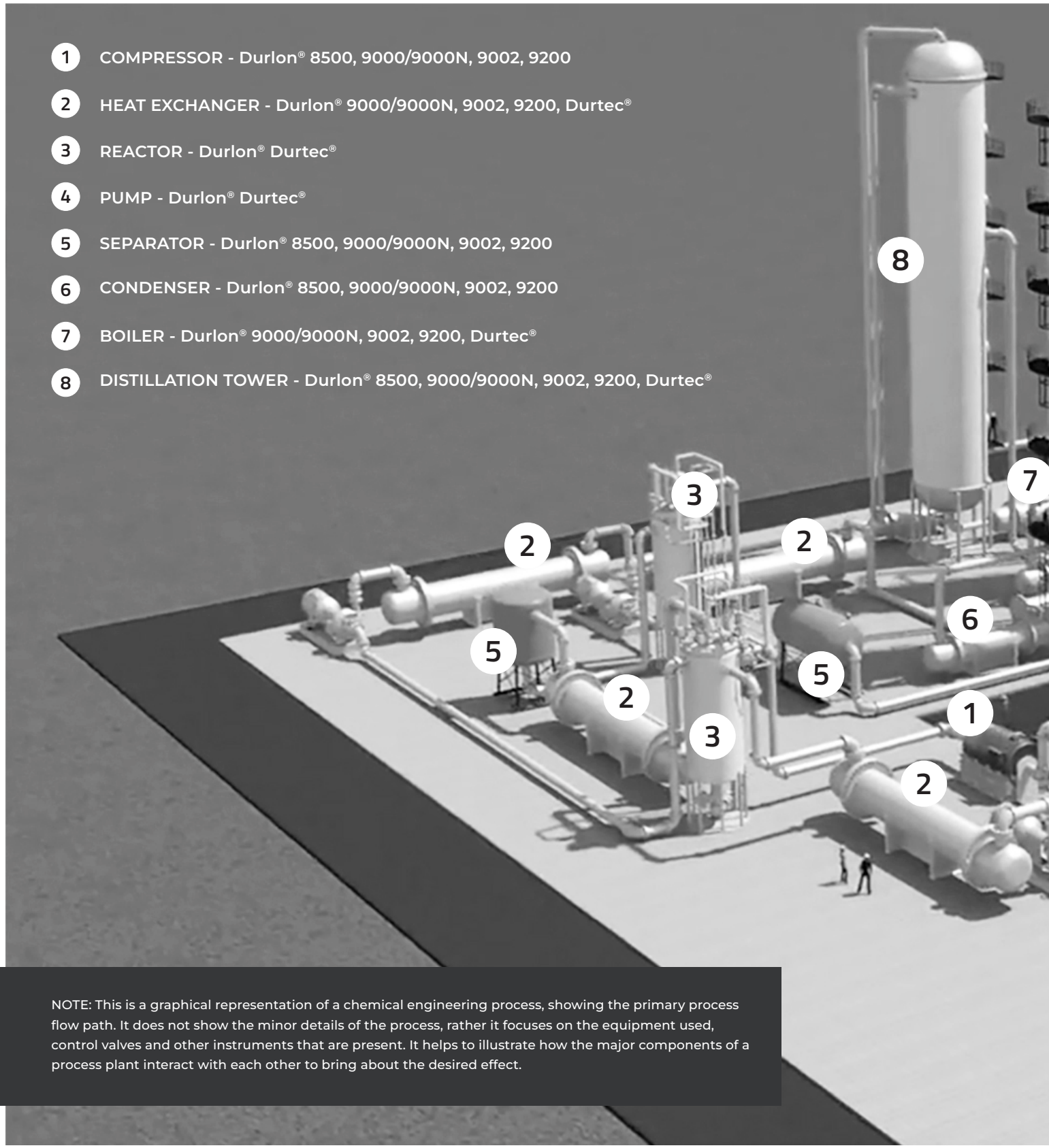
*Much effort has gone into improving the anti-stick release agents of all (CNA) Compressed Non-Asbestos Durlon® products. All Durlon® CNA gasket materials have passed the MIL-G-24696B Navy Adhesion Test (366°F/48 hrs).
**Independent testing has shown the fillers in the Durlon® method to be more homogeneously blended than calendered or layered filled PTFE gasket materials, giving Durlon® filled PTFE's more consistent physical and mechanical properties without voids, separation and chemical compatibility problems found in the layered construction method.
***Depends on facing material and metallurgy of core. **Note:** Data shown is for 316LSS core with HT1000 covering layers. SIZE, TYPES & MATERIALS: Standard ASME, DIN, JIS and BS EN sizes. Non-standard flanges 1/2" thru 157" diameter. Standard core material is 316L stainless steel. Other core materials: SS304, SS321, SS316Ti, Monel®, Titanium, Hastelloy® & Alloy 20 can be manufactured to your specifications on request. Alternate facing material is available upon request. Popular materials include Durlon® 9600 expanded PTFE (ePTFE), mica & ceramic.

Style	Certifications
8500	California Proposition 65, RoHS Reach Declaration, API 6FB Fire Test with avg. temp >650°C, 30 mins, 40 bar, 1 ml (inch/min.) max allowable leakage, Conforms to the FDA requirements of 21 CFR 177.2600.
9000	RoHS Reach Declaration, ANSI/API 607 Fire Test* 6th edition, Zero leakage, Approved material for WRAS (Water Regulations Advisory Scheme), USP Class VI 121°C (250°F) for 30 min., TA-luft (VDI Guideline 2440), ABS-PDA & Pamphlet 95, the chlorine institute, DNV-GL, (EC) 1935/2004 & EU (10/2011), and conforms to FDA requirements of 21 CFR 177.1550 for food and drug contact.
9000N	RoHS Reach Declaration, USP Class VI 121°C (250°F) for 30 min., Approved material for ABS-PDA, (EC) 1935/2004 & EU (10/2011), and conforms to FDA requirements of 21 CFR 177.1550 for food and drug contact
9002	BAM oxygen service: gaseous & liquid up to 260°C (500°F) at 52 bar (754 psi), and conforms to FDA requirements of 21 CFR 177.1550 for food and drug contact. Lox Mechanical Impact (ASTM G86 & ISO 21010) with zero reactions out of 20 at a test reaction frequency of 0%. RoHS Reach Declaration.
9200	RoHS Reach Declaration and approved material for ABS-PDA & Pamphlet 95, the chlorine institute, DNV-GL and TA-luft (VDI Guideline 2440). BAM oxygen service: gaseous & liquid up to 260°C (500°F) at 52 bar (754 psi), and conforms to FDA requirements of 21 CFR 177.1550 for food and drug contact.
Durtec®	Passed modified API 607 Fire Test**, 4th edition with Exxon modifications. Meets the requirements of Shell Specification MESC SPE 85/203 & PVRC SCR Flexible Graphite Spec for FG 600 material. RoHS Reach Declaration.

*API 607 6th edition fire test: The test fixture was subjected to an external flame of 875°C (1607°F) average for 30 minutes. The measured leakage was 1.8 ml/min, where the max allowable limit is 1200ml/sec.
**API 607 4th edition fire test: Average bolt torque loss (with no adjustments): Upstream 45%; Downstream 33%. Fire, Cool-Down & Post-Burn: Combined Leak Rate (2 gaskets) 0 mL/min at 30 psig avg. Exxon requirements post burn: Combined Leak Rate (2 gaskets) with no flange bolt re-torques at any test pressure 0 mL/min at 30 psig, 0mL/min at 50 psig, 0 mL/min at 100psig and, 0mL/min at 200 psig.

Durlon® 9000 and 9000N are made with Teflon™ fluoropolymer. Teflon™ is a trademark of The Chemours Company FC, LLC used under license by Triangle Fluid Controls Ltd.
Note: ASTM properties are based on 1/16" sheet thickness, except ASTM F38 which is based on 1/32" sheet thickness. This is a general guide only and should not be the sole means of accepting or rejecting this material. The data listed here falls within the normal range of product properties, but should not be used to establish specifications limits nor used alone as the basis of design. For applications above Class 300, contact our technical department.
Warning: Durlon® gasket materials should never be recommended when both temperature and pressure are at the maximum listed. Properties and applications stated are typical. No applications should be undertaken by anyone without independent study and evaluation for suitability. Never use more than one gasket in one flange joint and never reuse a gasket. Improper use or gasket selection could cause property damage and/or serious injury. Data reported is a compilation of field testing, field service reports and/or in-house testing. While the utmost care has gone into publishing the information contained herein, we assume no responsibility for errors. Specifications and information contained within are subject to change without notice. This edition cancels and obsoletes all previous editions.

Chemical Process Flow Diagram



NOTE: This is a graphical representation of a chemical engineering process, showing the primary process flow path. It does not show the minor details of the process, rather it focuses on the equipment used, control valves and other instruments that are present. It helps to illustrate how the major components of a process plant interact with each other to bring about the desired effect.

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More than 96% of all manufactured goods are directly touched by the business of chemistry. Just about every scientific discipline is put to work to harness the transformative power of chemistry by combining raw materials such as natural gas and oil with heat, air, and water through a variety of processes to make basic building block chemicals.

Most chemical plants involve the reaction between two or more materials or molecules which is controlled in a vessel called a reactor to create a new material. The final result flows from the reactor where the desired product is separated from side substances and is then purified and concentrated.

A facility will contain numerous racks of pipes of various sizes which are used to feed the chemical process with raw materials and move finished product to storage tanks. The contents can at times be moving through pipes under high pressure and/or at high temperatures.

The core of the Durlon® brand is to provide fluid sealing solutions that make sense, both financially and strategically. We accomplish this through process-oriented design, sector-specific knowledge, and extensive testing. Our goal is to ensure performance and safety while adhering to the quality management system registered to ISO 9001:2015.

At Durlon, we offer specially developed sealing solutions tailored directly to your specific needs.

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