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SEALING SOLUTIONS FOR
Chemical Processing



We succeed
when you
succeed.



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 exposed to the stress of everyday use, specialized applications, high-temperature environments, liquids, or gases, our products deliver reliable 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 can be generally be divided into the following areas:

- Basic chemicals
- Fine chemicals
- Specialty chemicals

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

The basic chemicals segment produces both inorganic and organic chemicals. Inorganic chemicals include products such as acids, alkalis, and salts, while organic chemicals are widely used in the production of other chemicals, such as dyes, plastics, and petrochemical products. Inorganic chemicals are usually used to make solid and liquid chemicals, and industrial gases; sodium hydroxide, 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 result in crystallizing, paste-like, highly viscous or highly corrosive media under changing pressure and temperature conditions.

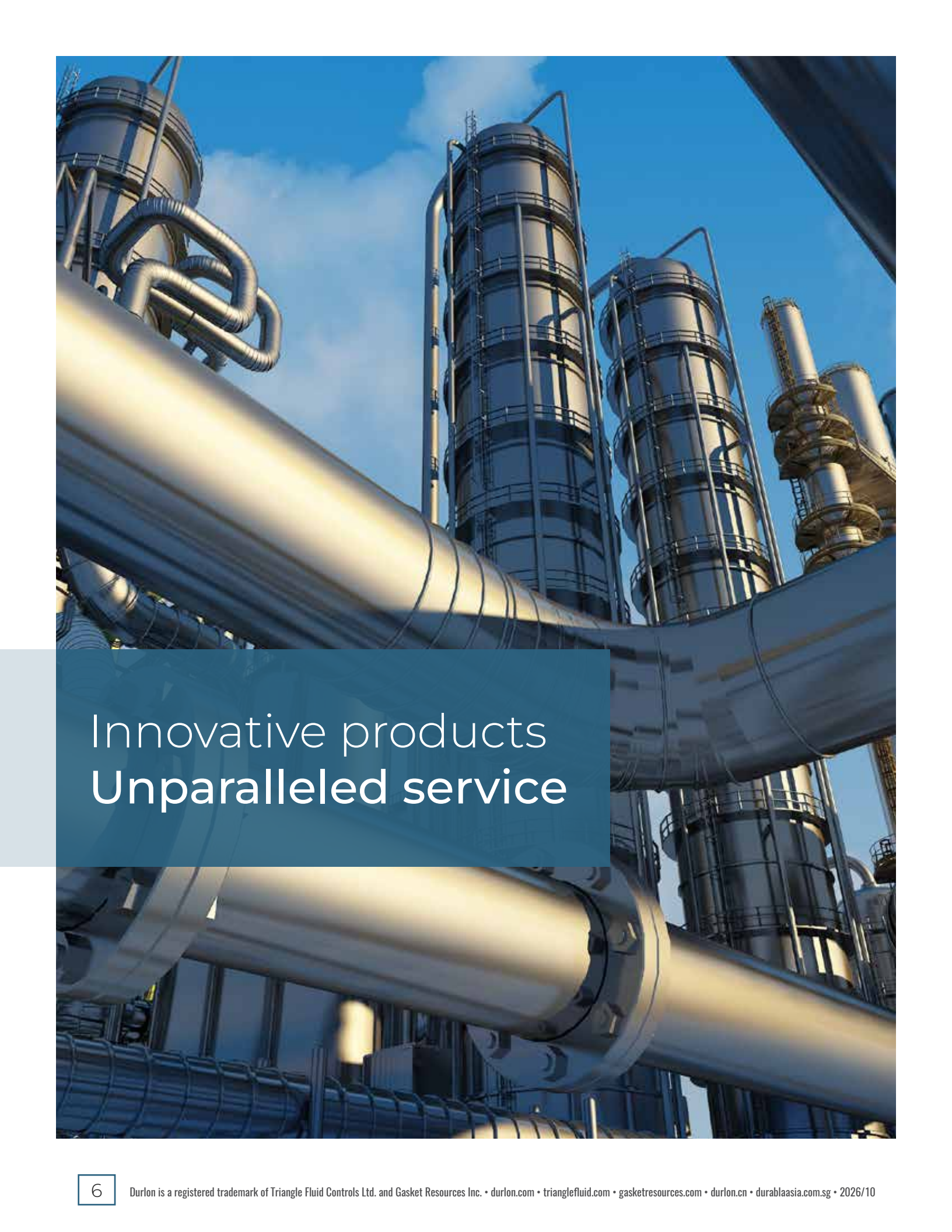
Specialty chemicals include individual molecules or mixtures of molecules (i.e., formulations) that are manufactured on the basis of a unique performance or function. Many other sectors rely on specialty chemicals for their products, including automotive, aerospace, agriculture, cosmetics, and food processing,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

In manufacturing and processing, particularly extreme parameters will occur during the handling of inorganic basic chemicals. In addition to aggressive and sometimes toxic media, applications may involve elevated pressures and a wide range of operating temperatures. 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 stringent regulatory emission limits, the sealing system must make an important contribution to emissions control.

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 with high-temperature capability and strong chemical resistance are required. In addition to the use of aggressive and sometimes toxic media, temperatures ranging from cryogenic conditions to approximately 300°C 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.



A low-angle, upward-looking photograph of an industrial refinery or chemical plant. The scene is dominated by large, metallic, cylindrical distillation columns and a complex network of thick, insulated pipes. The sun is low in the sky, creating a strong golden glow and long shadows across the metallic surfaces. The sky is a clear, bright blue with a few wispy clouds. The overall impression is one of large-scale industrial engineering and precision.

Innovative products
Unparalleled service

Durlon® Metallic & Semi-Metallic Gasketing

Durlon® metallic gaskets are manufactured from metallic materials selected to withstand demanding temperatures, pressures and chemical environments. Available in standard and custom configurations, these rugged metal gaskets are manufactured from a variety of materials to accommodate a wide range of process applications.

Depending on the gasket design, sealing is achieved through controlled compression of the gasket and its sealing elements against the flange surfaces.

Durlon® semi-metallic gaskets include both metallic and non-metallic components, either containing a metal core with sealing materials on both flat surfaces, or a pliable core encased in a thin metallic casing. These configurations are available in a wide variety of styles and sizes. They can be fabricated from a variety of metals available in strip or sheet form, depending on gasket construction and service requirements. Their suitability for corrosive media depends on the selection of the metal and filler or facing material.

Our computer-aided manufacturing process uses rigorous quality control programs to help ensure consistent product quality and performance. The metallic component provides structural integrity, while the non-metallic element provides the sealing surface. Proper gasket selection is essential to achieving an effective seal. The following factors should be considered when selecting the correct gasket for the application.

Temperature

Semi-metallic gaskets typically incorporate two or more materials, and the allowable service temperature must consider the limits of each component. The overall temperature capabilities of a gasket is determined by the upper and lower temperature limits of its individual components.

There are two parts that need to be considered and verified when selecting the correct gasket material. The first part is to verify the metal component used to ensure the maximum temperature for the material is not exceeded. Secondly, the maximum temperature rating of the filler or facing material must also be considered. In most cases, the filler or facing material will be the governing factor when selecting a semi-metallic gasket.

Chemical Compatibility

The gasket must be resistant to chemical corrosion or chemical attack. The rate of corrosion depends on exposure time, temperature, and concentration of the media and must be considered when selecting both the gasket metallurgy and filler or facing material.

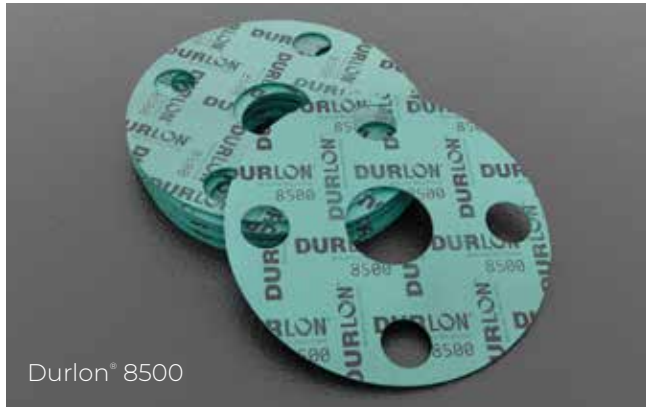
Flange Compatibility

The flange must provide sufficient clamping force and an appropriate surface finish for the selected gasket design. Flange materials should also be evaluated for compatibility with the metallurgy of the semi-metallic gasket. Material compatibility should also be reviewed to minimize the potential for galvanic corrosion when dissimilar metals are used in the presence of an electrolyte.

Gasket Seating Stress

Gasket seating stress is the compressive stress applied to the gasket during assembly to achieve the required level of seating and sealing. Seating stress must also be considered in relation to the gasket type and flange surface finish. The minimum and maximum seating stresses are product-specific and recommended by the manufacturer. The table below shows the recommended minimum and maximum seating stresses for Durlon® metallic gasketing products.

Durlon® Product Recommendations



Durlon® 8500



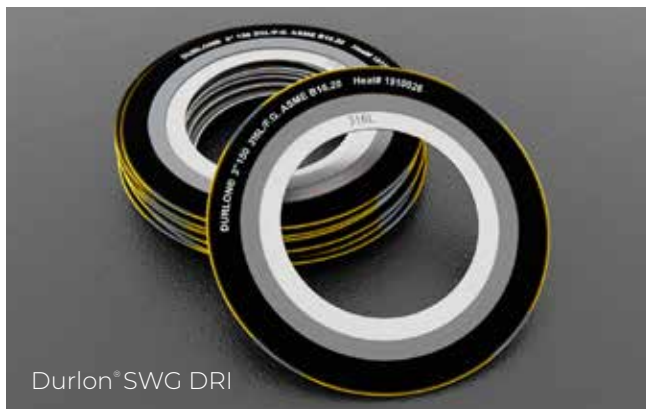
Durlon® 8900



Durlon® 9000



Durlon® 9645



Durlon® SWG DRI



Durlon® Durtec®



Durlon® LT100

Physical Properties & Certifications

Physical Properties	8500	8900	9000	9645	SWG	Durtec®	LT100
Composition	Aramid -Inorganic NBR	Aramid -Inorganic NBR	Inorganic Filler / Pure PTFE Resins	Modified PTFE with rigid PTFE core	Spiral Wound Gasket	Specially Engineered Metal Core Technology	Pure PTFE, Bonded to EPDM
Color	Green	Black	Blue	White	Style: DRI	-	White/Blue
Temperature: Min Max Continuous, Max	-40°C (-40°F) 371°C (700°F) 287°C (548°F)	-40°C (-40°F) 496°C (925°F) 400°C (752°F)	-212°C (-350°F) 271°C (520°F) 260°C (500°F)	-260°C (-436°F) 260°C (500°F) -	-	-200°C (-328°F) 450°C (842°F) 400°C (752°F)	-40°C (-40°F) 150°C (300°F) -
Pressure, max, bar (psi)	103 (1,500)	138 (2,000)	103 (1,500)	60 (870)	-	430.9 (6,250)	17 (250)
Density, g/cm ³ (lb/ft ³)	1.7 (106)	1.6 (100)	2.2 (138)	1.3 (81)	-	-	-
Compressibility, %	8-16	7-17	8-16	>44	-	-	-
Recovery, %	50	50	40	>6.3	-	-	-
Creep Relaxation, %	20	15	30	<26	-	-	-
Tensile Strength, MPa (psi)	13.8 (2,000)	13.8 (2,000)	13.8 (2,000)	-	-	-	-
Nitrogen Sealability ASTM F2378	0.03 mL/min	0.2 mL/min	0.01 mL/min	-	-	-	-
pH range at Room Temperature	-	-	-	-	-	0-14	-

Durlon® SWG - All Durlon® SWGs are manufactured in accordance with ASME B16.20. Quality Assurance complies with API Specification Q1 and ISO 9001 standards. Super-inhibited graphite meets the requirements of Shell Specification MESC SPE 85/203 and the PVRC SCR Flexible Graphite Spec for FG 600 material.

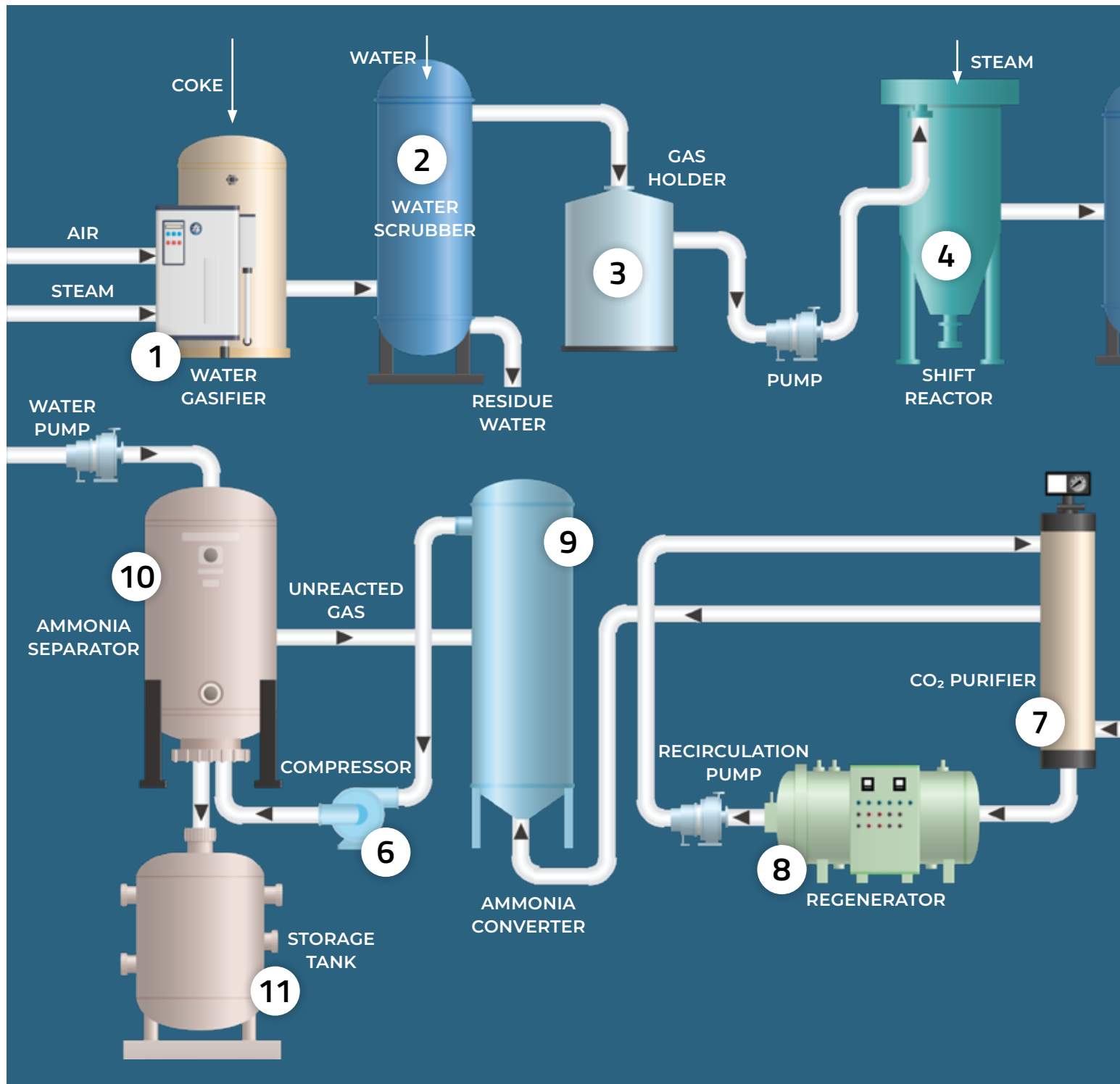
Durlon® Durtec® - Actual performance and service life are dependent upon material selection, operating conditions and environmental factors.

Style	Certifications
8500	California Proposition 65 and RoHS REACH Declaration compliant, API 6FB Fire Test with avg. temperature >650°C, 30 minutes, 40 bar, 1 mL (inch/min.) max allowable leakage, Conforms to the FDA requirements of 21 CFR 177.2600, ABS Tier2 - PDA Issued.
8900	Tested to ANSI/API 607, 6th Edition, in a 6 in. Class 300 flange test assembly; measured leakage: 0 mL/min., RoHS REACH Declaration compliant.
9000	Passed API 6FA, 3rd Edition Fire Test, Meets USP Plastic Class VI requirements at 121°C (250°F), Conforms to required 21 CFR 177.1550 for FDA, TA-Luft (VDI Guideline 2440) approved material, ABS-PDA & listed in Chlorine Institute Pamphlet 95 as a gasket material that has achieved user acceptance for chlorine service, (EC) 1935/2004 & EU (10/2011) approved material.
9645	Conforms to FDA requirements of 21 CFR 177.1550 for food and drug contact, TA-Luft (VDI Guideline 2440) approved material.
SWG	TA-Luft (VDI Guideline 2440), API Standard 6FB Fire Test - 6 inch Class 300 SWG FG
Durtec®	Passed modified API 607 fire test and meets the requirements of Shell Specification MESC SPE 85/203 & PVRC SCR Flexible Graphite Specification for FG 600 material, RoHS REACH Declaration compliant.
LT100	Manufactured with FDA-compliant materials. LT100 delivers a technically advanced, regulatory-compliant sealing solution designed to meet the stringent demands of modern low-torque, high-integrity gasketing applications.

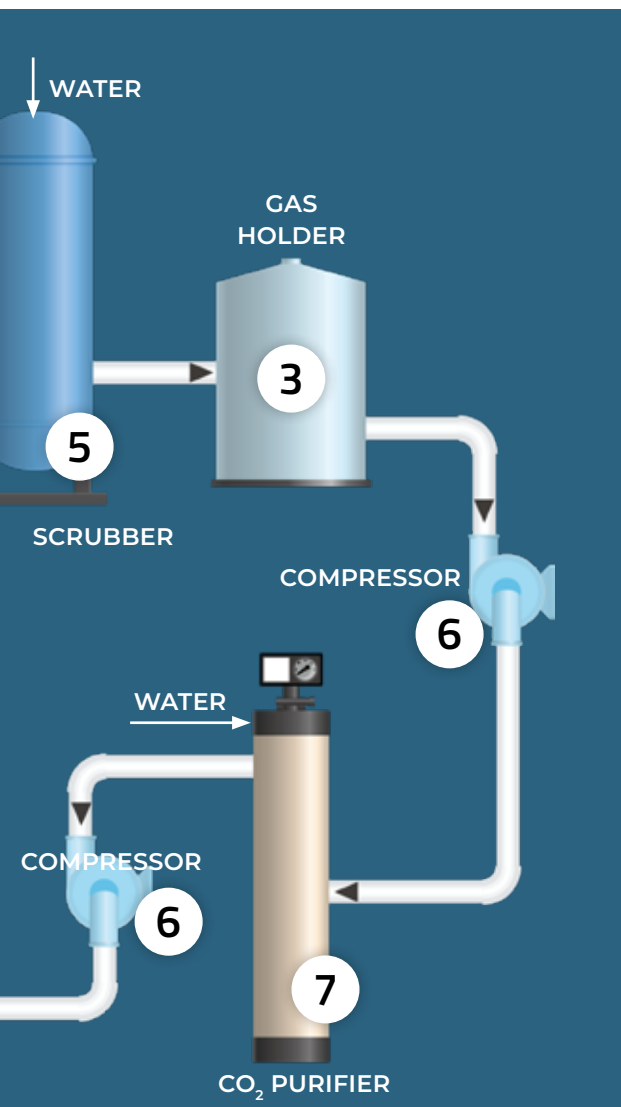
Note: ASTM properties are based on 1/16" sheet thickness, except ASTM F38 which is based on 1/32" sheet thickness. This is a general guide only and should not be the sole means of accepting or rejecting this material. The data listed here falls within the normal range of product properties, but should not be used to establish specification 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.

Ammonia Production Process Flow Diagram



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



Durlon® Product List

- 1 8300, 8900, SWG
- 2 79XX, 8500
- 3 8300, 8500
- 4 9000, SWG
- 5 SWG
- 6 9000, SWG
- 7 SWG
- 8 SWG, Durtec®, HT1000®
- 9 SWG
- 10 9000, SWG
- 11 9000

Ammonia Production Flow Process:

- 1. WATER GASIFIER:** Steam, air, and carbonaceous feedstock react at elevated temperature to produce synthesis gas containing primarily hydrogen (H_2), carbon monoxide (CO), and other gaseous components.
- 2. WATER SCRUBBER:** The process gas passes through a water scrubber to remove particulates and other contaminants before further processing.
- 3. GAS HOLDER:** The cleaned process gas is temporarily collected in a gas holder to help stabilize flow before further processing.
- 4. SHIFT REACTOR:** Carbon monoxide reacts with steam to produce additional hydrogen and carbon dioxide.
- 5. SCRUBBER:** Following the shift reaction, carbon dioxide and other impurities are removed from the gas stream before further treatment.
- 6. COMPRESSOR:** The conditioned synthesis gas is compressed for downstream purification and ammonia synthesis.
- 7. CO₂ PURIFIER:** The compressed synthesis gas is further purified to remove remaining carbon dioxide and other contaminants that could interfere with ammonia synthesis or affect catalyst performance.
- 8. REGENERATOR:** The purification system is regenerated to remove accumulated contaminants and restore its ability to treat the process gas.
- 9. AMMONIA CONVERTER:** Nitrogen and hydrogen react over an iron-based catalyst at elevated temperature and pressure to form ammonia.
- 10. AMMONIA SEPARATOR:** Ammonia is separated from unreacted synthesis gas, which is then recirculated through the process.
- 11. STORAGE TANK:** Recovered ammonia is stored under appropriate temperature and pressure conditions for later use or distribution.



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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