DURLON®
SEALING SOLUTIONS

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SEALING SOLUTIONS FOR
Primary Metals

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 **Primary Metals**

The primary metals industry refers to a sector of the economy that is involved in the extraction, refining, and processing of raw materials to produce metal products. It plays a critical role in various industries and sectors of the economy, including construction, manufacturing, transportation, and energy.

The main focus is on the production of base metals, such as iron, steel, aluminum, copper, lead, zinc, and nickel. These metals are essential for the production of a wide range of goods, including automobiles, aircraft, appliances, infrastructure, packaging materials, and electrical equipment.

Here are the key processes involved in the primary metals industry:

Extraction
The industry begins with the extraction of metal-bearing ores from the earth's crust. This involves mining activities to access ore deposits, which can be located underground or in open-pit mines.

Refining
Once the ores are extracted, they undergo a refining process to separate the valuable metals from other elements and impurities. Various techniques such as smelting, roasting, and chemical processes are employed to purify the metals and increase their concentration.

Alloying
Many metal products require specific properties that can be achieved through alloying. Alloying is the process of combining two or more metals or adding other elements to a metal to enhance its strength, durability, or other desired characteristics.

Shaping and Forming
After refining and alloying, the metals are shaped and formed into usable products. This can involve processes such as casting, forging, rolling, extrusion, and machining, depending on the desired shape and properties of the final product.

Finishing and Coating
Metal products often undergo additional treatments, such as surface finishing or coating, to enhance their appearance, corrosion resistance, or other properties. Common finishing techniques include painting, plating, galvanizing, and anodizing.

Recycling
The primary metals industry is also involved in metal recycling, where scrap metal is collected, processed, and reused to reduce the demand for virgin materials and minimize environmental impact. Recycling plays a crucial role in conserving resources and reducing energy consumption.

Overall, the primary metals industry is a vital component of the global economy, providing essential materials for various sectors and contributing to economic growth and development.

The production processes for primary metals involve various stages and flow processes.

Here's a brief overview of the flow processes and mechanical components where gaskets are used:

Steel Production

Iron ore is extracted from mines and undergoes beneficiation processes to remove impurities and then smelted in a blast furnace, where it is reduced to molten iron using coke (derived from coal) and limestone. The molten iron is then converted into steel through processes like basic oxygen furnace (BOF) or electric arc furnace (EAF). The steel is then cast and processed through rolling mills to produce desired forms, such as sheets, plates, or bars. Gaskets are used in mechanical components such as piping systems, heat exchangers, pressure vessels, valves, and pumps.

Aluminum Production

Bauxite, an ore containing aluminum, is mined and processed to extract alumina and then smelted in electrolytic cells to produce molten aluminum. The molten aluminum is cast into various forms, such as ingots or billets, and then processed through rolling mills to produce sheets, foils, or extrusions. Similar to the steel industry, aluminum production also utilizes mechanical components like piping systems, heat exchangers, pressure vessels, valves, and pumps.

Copper Production

Copper ores are mined and processed to concentrate the copper content which is then smelted in a furnace, resulting in molten copper. The molten copper is further refined through processes such as electrolysis or fire refining to remove impurities. The refined copper is cast into shapes like anodes or billets, which can be further processed into wires, tubes, or sheets through various forming techniques. The mechanical components of copper production include piping systems, heat exchangers, valves, and pumps.

Lead Production

Lead-containing ores, such as galena, are mined and processed and then smelted in a furnace, producing molten lead. The molten lead undergoes refining processes like softening or de-silvering to obtain high-purity lead. The refined lead is cast into various forms, including ingots or sheets, and can be further processed into products like batteries or solder. In the lead industry, gaskets are commonly used in components such as valves, pumps, and piping systems.

Zinc Production

Zinc-containing ores, such as sphalerite, are mined, processed and then roasted to convert them into zinc oxide, which is then smelted to produce molten zinc. The molten zinc is refined to remove impurities and obtain high-purity zinc and then cast into various shapes, such as ingots or sheets, and can be further processed for specific applications.
Gaskets are used in mechanical components of valves, pumps, and piping systems.

Nickel Production

Nickel-containing ores, such as pentlandite or laterite, are mined, processed and smelted in a furnace to produce a nickel matte or ferronickel which then undergoes refining processes, such as electro-refining or hydro-metallurgical processes, to obtain high-purity nickel. The refined nickel can be cast into various shapes or further processed for specific applications, such as nickel alloys or plating. Mechanical components in the nickel industry include valves, pumps, heat exchangers, and piping systems**.**

Heavy Industry

Heavy industry refers to a sector of the economy that involves the production of large-scale machinery, equipment, infrastructure-related goods and considered a part of the primary metals industry due to the nature of operations and the products produced. The primary metals industry focuses on the extraction, refining, and processing of raw materials, primarily base metals such as iron, steel, aluminum, copper, and others. These metals are essential for the production of machinery, equipment, and infrastructure required by heavy industry sectors. Here's how the primary metals industry relates to heavy industry:

Supplying Raw Materials

The primary metals industry acts as a major supplier of raw materials to heavy industry sectors. For example, steel manufacturers rely on iron ore and other metals to produce steel, which is used in the construction of buildings, bridges, and infrastructure projects. Aluminum producers provide the metal for aircraft, automotive manufacturing, and other heavy machinery applications. The primary metals industry serves as a crucial source of inputs for heavy industry production processes.

Infrastructure Development

Heavy industry sectors, including construction and infrastructure development, heavily depend on the primary metals industry. The production of metals like steel, aluminum, and copper is essential for constructing buildings, bridges, roads, railways, and other critical infrastructure projects. These metals provide strength,

durability, and other desirable properties necessary for infrastructure development.

Machinery and Equipment Manufacturing
Heavy industry sectors, such as manufacturing, rely on the primary metals industry for the production of machinery and equipment. Metals are used in the fabrication and construction of industrial machinery, mining equipment, agricultural machinery, turbines, engines, and more. The primary metals industry supplies the necessary raw materials that are transformed into various components and structures used in heavy machinery and equipment.

Energy and Transportation
The primary metals industry also intersects with heavy industry sectors related to energy production and transportation. Metals play a vital role in power generation, including the construction of turbines, pipelines, and electrical transmission infrastructure. Additionally, metals are used in the manufacturing of vehicles, including automobiles, ships, and aircraft, which are crucial for transportation and logistics.

The relationship between the primary metals industry and heavy industry is symbiotic. Heavy industry sectors drive the demand for metals, which, in turn, support the growth and sustainability of the primary metals industry. The primary metals industry, through its production and supply of raw materials, enables heavy industry sectors to continue their operations and produce the necessary goods and infrastructure for economic development and growth.

Innovative products
Unparalleled service

Durlon® Sealing Solutions

Industries rely on primary metal manufacturers to provide specialized equipment and components tailored to their specific needs. It's important to note that the selection of gasket types depends on factors such as the operating temperature, pressure, chemical compatibility, and the specific requirements of the equipment.

Durlon®'s versatile types of gaskets are used in numerous heavy and general industrial mechanical systems and play a crucial role in ensuring proper sealing, preventing leaks, and maintaining the integrity of various mechanical components across the different sectors.

Durlon® (CNA)compressed non-asbestos gaskets are exclusively manufactured at Durabla Canada Ltd. These high-density products feature the most homogeneous combination of minerals, synthetic fibers, and elastomers. They are used in a wide variety of industries on a broad range of chemical applications at varying temperatures and pressures. Their excellent flexibility prevents large, narrow flange gaskets from breaking during cutting and installation, and their superior recovery ensures tight sealing during thermal cycling.

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

Durlon® metallic gaskets are manufactured from a combination of metals and designed to withstand extreme temperatures, pressures and chemical exposure. Available in standard and custom configurations, these rugged metal gaskets are made of a wide range of materials to accommodate all types of process applications.

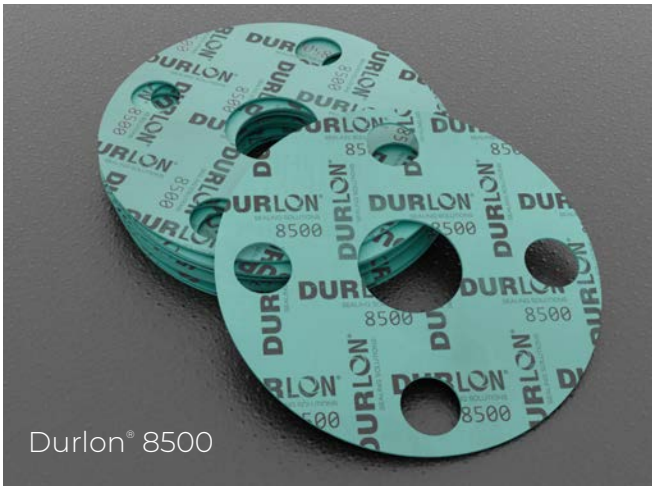
Durlon® semi-metallic gaskets include both metallic and non-metallic components, either containing a metal core with sealing materials on both flat surfaces, or a pliable core encased in a thin metallic casing. They are most popular due to this configuration, and are available in a wide variety of styles and sizes. They can typically be fabricated of any metal which is available in thin strip or sheet, and which can be welded. Therefore, they can be used against virtually any corrosive medium dependent upon the choice of the metal and filler/facing material.

Our computer-aided manufacturing process uses rigorous quality control programs to ensure premium quality product performance. The metallic component gives the gasket superior structural integrity, while the non-metallic element ensures the superior sealing.

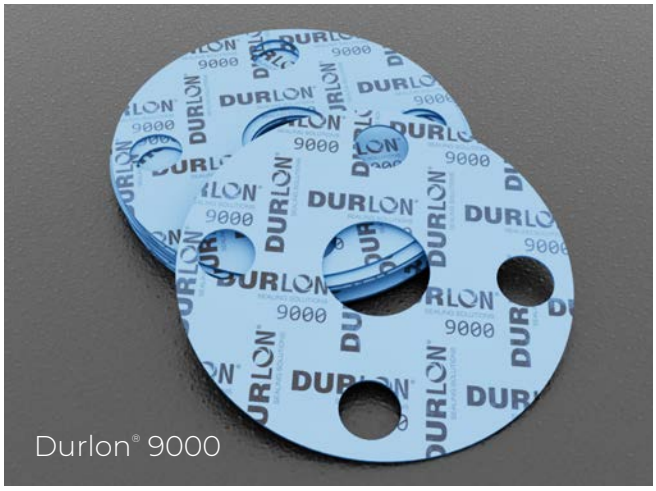
Durlon® products are used in virtually every industrialized corner of the world. Our gasket materials are manufactured to ISO 9001 quality standards and are subjected to continuous testing and rigid quality control, ensuring unvarying performance on the job.

We recognize that today more emphasis is being placed on fugitive emissions via the Clean Air Act in Canada and the United States, as well as various regulations in other countries. One of our prime design objectives is to maximize the sealability of our gasket materials to meet and exceed fugitive emission requirements.

Durlon® Product Recommendations



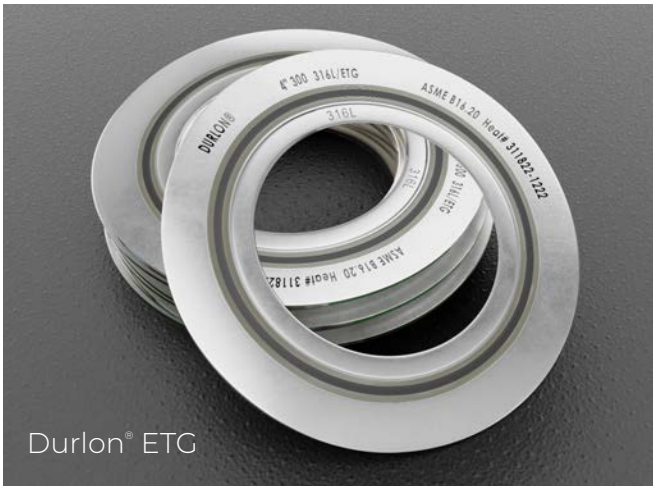
Durlon® 8500



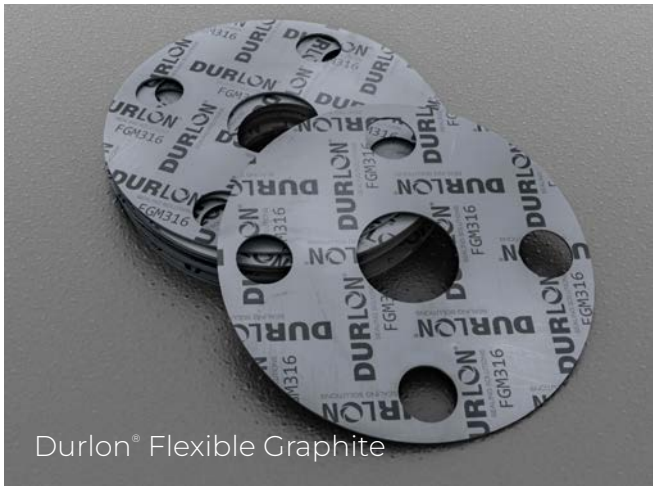
Durlon® 9000

Durlon® SWG DRI

Durlon® Durtec®



Durlon® ETG



Durlon® Flexible Graphite

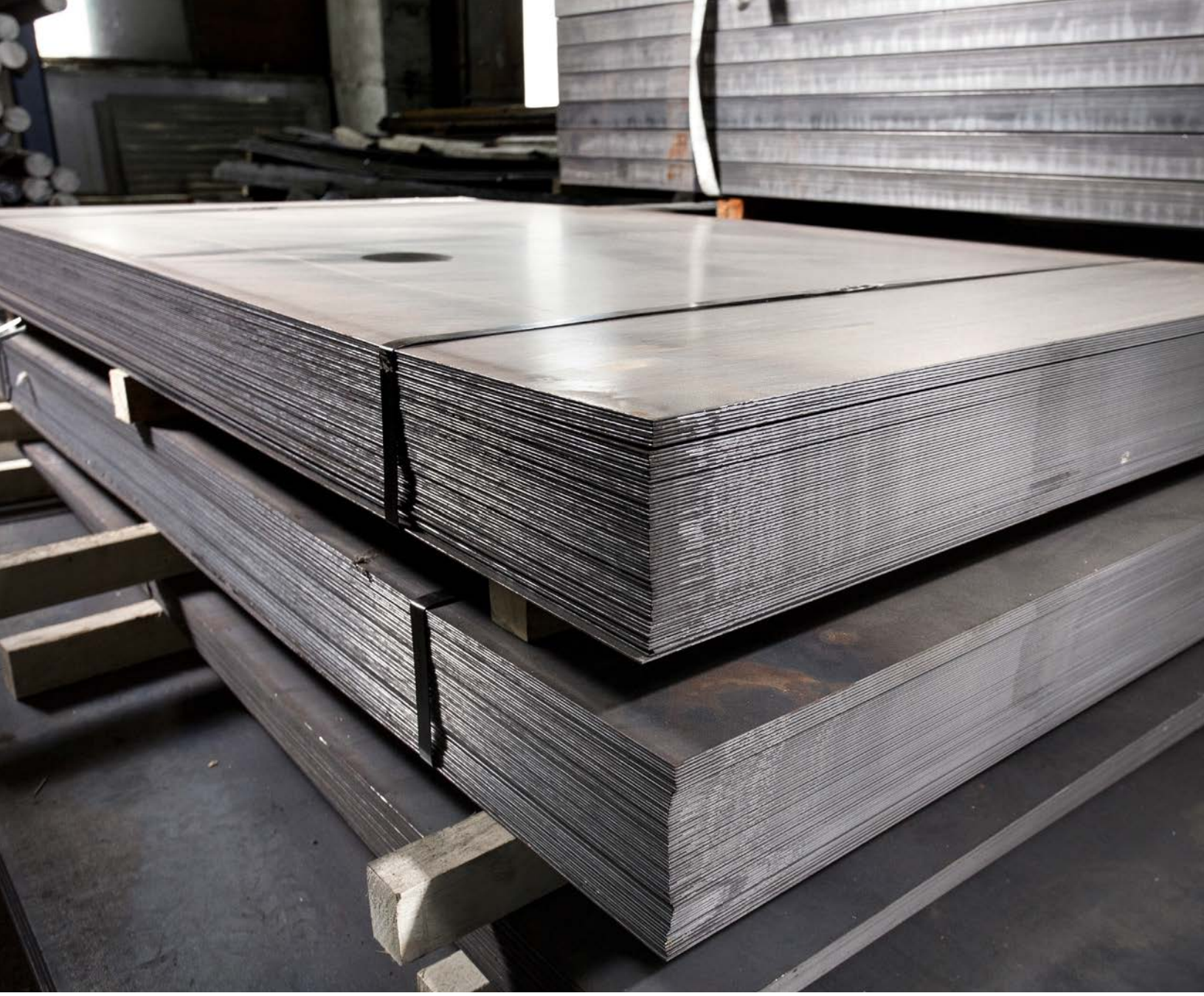
Physical Properties & Certifications

Physical Properties	8500	9000	SWG	Durtec®	ETG	Flexible Graphite FGM316
Composition	Aramid -Inorganic NBR	Inorganic Filler / Pure PTFE Resins	Spiral Wound Gasket	Specially Engineered Metal Core Technology	Extreme Temperature Gasket	Homogeneous, 316SS Foil Insert 316SS Tang Insert, 316SS Multilayer
Color	Green	Blue	Style: DRI	-	SWG / Durtec® / Kammprofile	Graphite
Temperature: Min Max Continuous, Max	-40°C (-40°F) 371°C (700°F) 287°C (548°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)	> 650°C (1,200°F) up to 1,000°C (1,832°F)	-260°C (-450°F) 550°C (1,022°F) 650°C (1,200°F)
Pressure, max, bar (psi)	103 (1,500)	103 (1,500)	-	430.9 (6,250)	-	250 (3,625)
Density, g/cc (lbs/ft³)	1.7 (106)	2.2 (138)	-	-	-	-
Compressibility, %	8-16	8-16	-	-	-	30-40
Recovery, %	50	40	-	-	-	10-15
Creep Relaxation, %	20	30	-	-	-	5
Tensile Strength, MPa (psi)	13.8 (2,000)	13.8 (2,000)	-	-	-	-
Sealability ASTM 2378 (Nitrogen)	0.03 cc/min	0.01 cc/min	-	-	-	0.4 cc/min
pH range, Room Temperature	-	-	-	0-14	-	-

Durlon® SWG - All Durlon® SWG's are manufactured according to ASME B16.20 standards. Quality Assurance complies with API Specifications Q1 and ISO 9001 standards. Super Inhibited Graphite meets the requirements of Shell Specification MESC SPE 85/203 and meets PVRC SCR Flexible Graphite Spec for FG 600 material.
Durlon® ETG adds an inner and outer protection boundary in the form of a mica-phyllosilicate based sealing material - Durlon® HT1000® : consists of phlogopite mica paper impregnated with an inorganic binder at less than half the binder amount found in a typical vermiculite-phyllosilicate filled product. This lower binder content allows for superior weight retention and results in ultimate extreme temperature sealing performance.
Durlon® Durtec® - Physical Properties: dependent on facing material and metallurgy of core, data shown above is for Inconel® 625 core and HT1000® covering layers.
FGM316 - Inhibited grade sheet laminated with multiple layers of 0.004" thick 316 stainless steel foil core. This product is used in applications with high mechanical stress or pressure, above average burst resistance, exceptional rigidity, and suitable to cut gaskets with narrow strips.

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.
9000	Passed API 6FA, 3rd Edition Fire Test, Met requirements of 121°C (250°F) for USP for Plastic Class VI, Conforms to required 21 CFR 177.1550 for FDA, TA-luft (VDI Guideline 2440) approved material, ABS-PDA & Pamphlet 95 approved material - chlorine institute, (EC) 1935/2004 & EU (10/2011) 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.
ETG	API 6FB, Fourth Edition 2019,Type 1 (Onshore Test), API 6FB, Fourth Edition 2019,Type 2 (Offshore Test), API 607, 4th edition Fire Test with Exxon modifications.

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.



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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