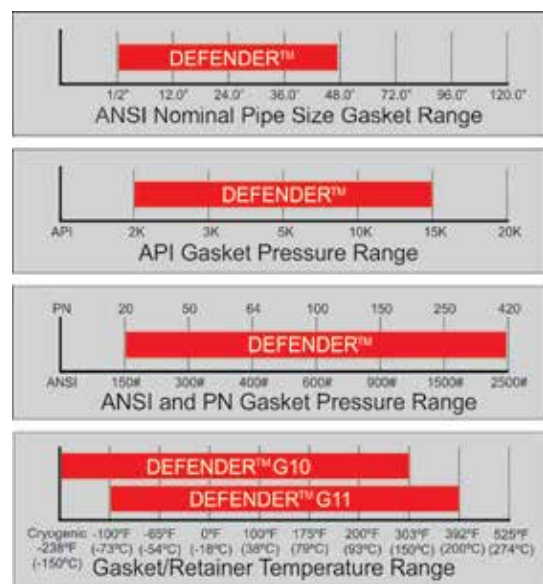
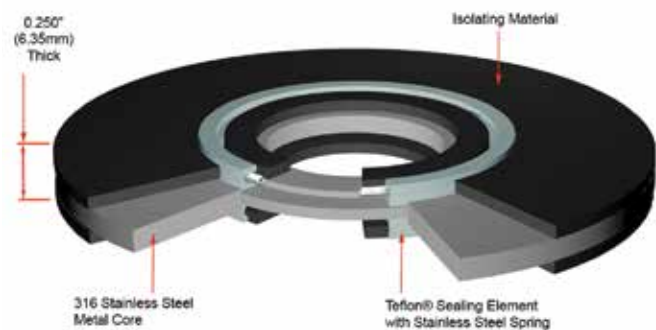


DEFENDER™ Sealing/Isolating Gaskets and Flange Isolation Kits



For applications outside ranges shown, consult factory.

The DEFENDER™ sealing/isolating gasket system is designed for critical/extreme applications. Manufactured with a 316 stainless steel core retainer and laminated on both sides with high strength laminates, the DEFENDER™ gasket is resistant to deforming under load and is used when electrical isolation and corrosion control are required on pipes containing gas, natural gas, oil and other hydrocarbon based medias up to 392°F (200°C).

Available for flat face, raised face and ring type joint flanges from 1/2" to 48" (including corresponding API and DN diameters), ANSI 150-2500#, API 2-15K and PN20-PN420, the DEFENDER™ gasket is an engineered solution for trouble-free operation that eliminates costly leaks and provides a solution for fugitive emissions.

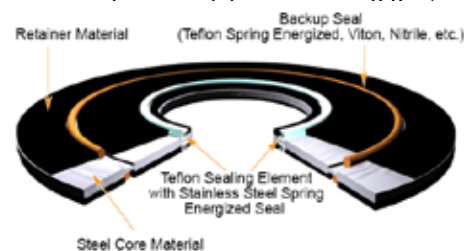
Manufactured with an innovative industry first Press-n-Lock™ "Glue-Less Seal & Groove Technology" that combines a press-in, pressure activated and spring energized seal with a unique groove that retains the seal element without the use of glue on key contact surfaces! The Press-n-Lock™ feature provides a higher confidence in sealing.

Applications

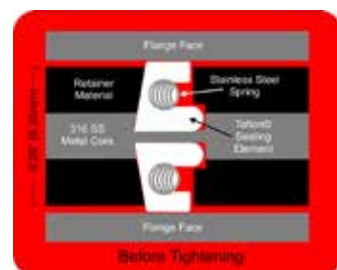
- DEFENDER™ gaskets were engineered for extreme, high reliability sealing and electrical isolation critical service applications.
- High Pressure Flanges: Up To 2500#, API 15K or PN420.
- Critical/Extreme Service
- High pH Service.
- H₂S/CO₂ Service.
- Locations where end users prefer an integral seal element.

General Features

- Seals/isolates pressure ratings through ANSI 2500#, API 15K and PN420 service.
- Spring energized seal element.
- Press-n-Lock™ "Glue-Less Seal Groove Technology".
- Inconel and Super Duplex Steel Cores available upon request.



The DEFENDER™ Tandem Sealing/Isolation Gaskets utilizes Tandem Seal Configuration (two seals per gasket face) for subsea and API 10K-15K applications. The backup Viton O-ring Seals are bidirectional and can thus stop external pressure from the sea water while the Spring Energized PTFE main seal stops the internal pipe pressure.

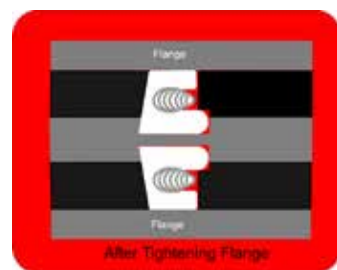


Before Tightening

The flange face makes initial contact with the sealing element which protrudes above the gasket retainer surface (isolation material) laminated on both sides of the stainless steel core.

After Tightening

The Spring Energized, Pressure Activated Sealing System is initiated. The base of the Teflon® seal is



contained within the stainless steel core to provide superior sealing strength for critical/extreme sealing applications. The spring prevents over-compression of the Teflon® seal thereby allowing the pressure of the media within the pipe to activate the seal.

G10 or G11, laminated on both sides, provides the dielectric strength needed to isolate the flanged application and has the compressive strength to easily withstand high bolt loads.



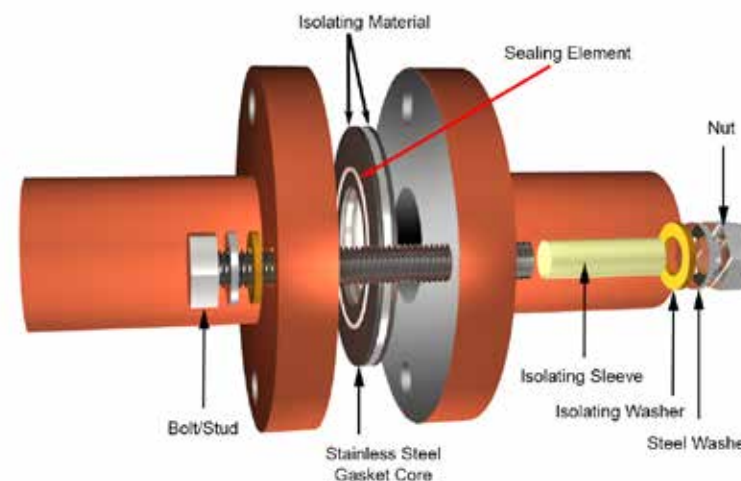
Type "E" Gasket

Fits over the bolt holes and extends to the O.D. of the flange to assist contractors as the bolt holes automatically center the gasket. Provides excellent protection against shorting out of the corrosion mitigation hardware.



Type "F" Gasket

Fits within the bolt hole circle of the flange and extends to the I.D. of the bolt circle providing good protection against shorting out of the corrosion mitigation hardware.



DF Retainer Material (G10S, G11S)

- 1/4" (.250") total thickness
- Metal Core .120" thick - 316SS
- Laminate .065" per side

DFT Retainer Material (G10S, G11S)

- 0.314" total thickness.
- Metal Core 0.250" thick - 316SS.
- Laminate 0.032" per side.

Gasket/Retainer Material Specifications

ASTM	TEST METHOD	G10	G11
D149	Dielectric Strength Volts/Mil Short Time	750-800	550
D695	Compressive Strength (psi)	65,000	63,000
D570	Water Absorption (%)	0.05	0.10
D790	Flexural Strength (psi)	65,000	60,000
D256	IZOD Impact Strength (Ft-Lbs/Inch)	14.00	12.00
D638	Tensile Strength (psi)	50,000	42,000
D732	Shear Strength (psi)	21,000	21,000
D952	Bond Strength (lb)	2,600	2,200
	Temperature - Operating	Cryogenic -238°F (-150°C) to +302°F (+150°C)	-100°F (-73°C) to +392°F (+200°C)

Note: Operating Temperature for Gaskets and Flange Isolation Kits is based off the Gasket Retainer Temperature. Seal element temperature does not dictate the min. and max. gasket operating temperature.

Seal Element Materials

- PTFE (Teflon®) Spring Energized. Spring is Stainless Steel
- Nitrile
- Viton®

Sealing Element Material Specifications

Sealing Element	Temperature - Operating
Teflon® (PTFE)	Cryogenic to +525°F (+274°C)
Nitrile	-40°F (-40°C) to +250°F (+121°C)
Viton®	-20°F (-29°C) to +392°F to (+200°C)

Facts

- Proven design based on the industry leader.
- Enhanced with innovative engineered features.
- Tested to Shell Certification Standards.
- Industry First! The Press-n-Lock™ "glueless seal & groove technology, an engineered design, has significant sealing advantages versus other brands."
- Made in the U.S.A.

Industries (Oil, Gas)

Production Fields, Petroleum Marketing Facilities, LNG/SNG Systems, Pipeline and Distribution Piping, Refineries.

DEFENDER™ Flange Isolation Kits

For a flange isolation kit, sleeves and washers are needed. Generally, 95% of steel core gasket flange isolation kits (DEFENDER™ Kits) are sold with G10 sleeves and G10 double washer sets.

Suggested Sleeve/Washer Set

SD = Standard (G10 Sleeves, Steel ZP Washers and G10 Washers) - Double Washer Set.



DEFENDER Sealing/Isolation Gaskets are suggested for RTJ Applications vs. Phenolic Ring Type Gaskets.

