

2021

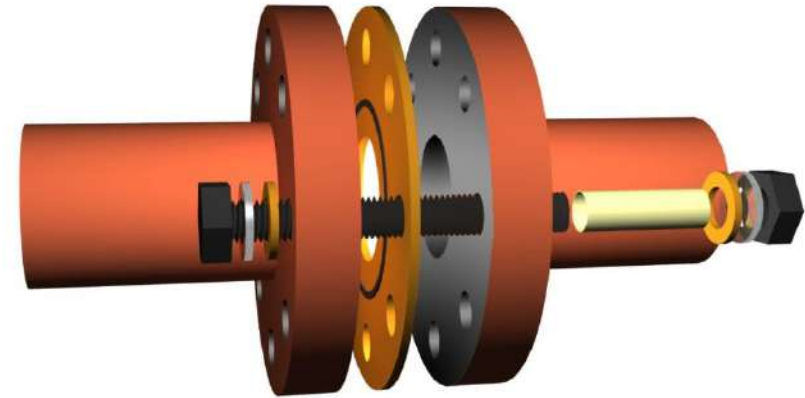
Flange Isolation Kits "101"

Lamons 
MANUFACTURING AND SERVICE CO



Engineered Sealing Solutions for Flanged Pipe Connections

Sealing/Isolating Gaskets
Sleeve and Washer Sets

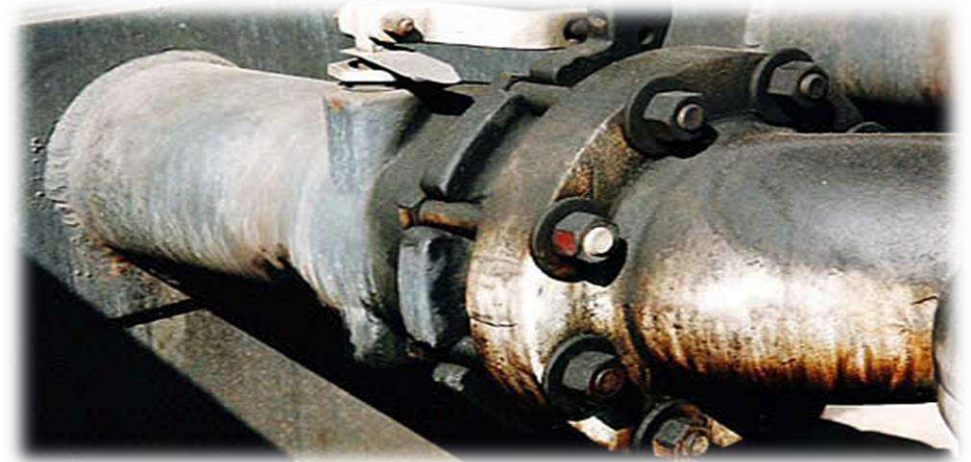
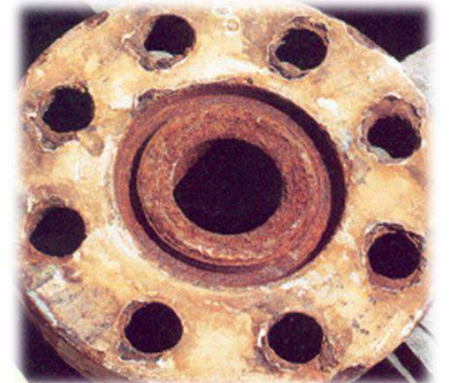


Why? Prevent Corrosion

GASKET = SEAL (No leak)



ISOLATION = NO ELECTRICAL CURRENT



Why? Prevent Corrosion

Dissimilar Metals – Galvanic Corrosion



Stainless steel
valve

Carbon steel
piping

CP Designed System
Using Flange Isolation Technology

Older Technology – Non Engineered Type D Gaskets - Phenolic



Flanged Applications Engineered Applications



Energy Applications



Water and Wastewater
Applications



Basic Performance. An economical
Solution for sealing/isolating applications.
Routine maintenance suggested.



Value Added Performance. Enhanced
Sealing/isolating features for a more
durable solution.



Engineered Performance. Optimized
sealing/isolating characteristics for
high performance and longevity in
critical applications.



An engineered product with advantageous
sealing/isolating features.

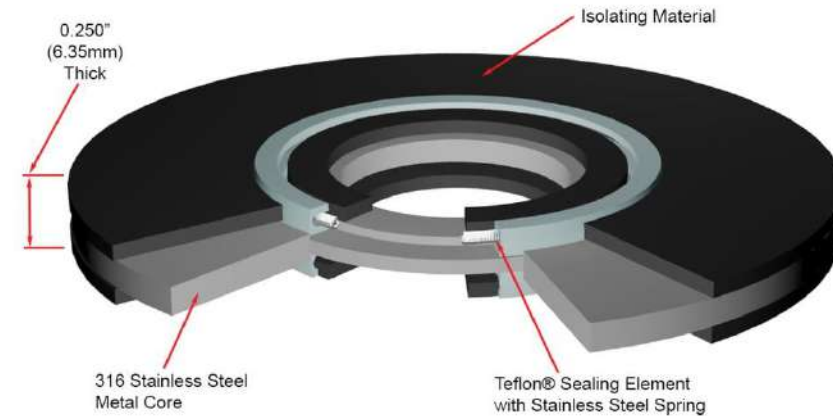
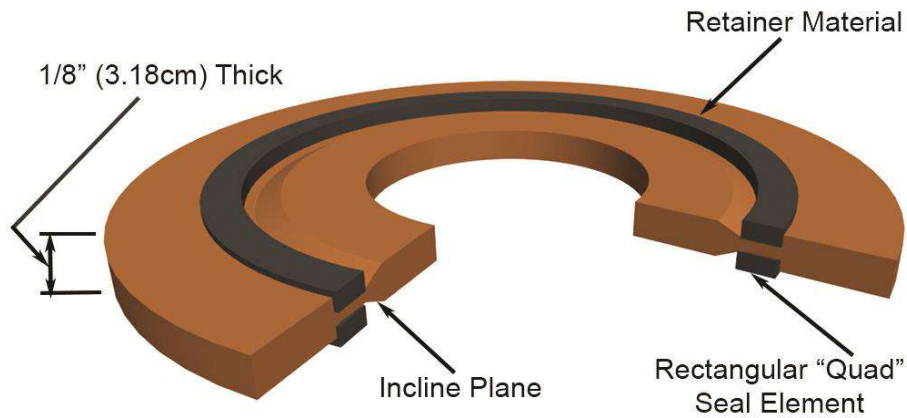


The X-Factor for critical sealing/isolating
applications.



A fire safe gasket (API 6FB 3rd Edition)
engineered for extreme, high reliability
sealing and electrical isolation critical
service applications.

Sealing/Isolation Gasket Retainer – Seal Element



Retainer

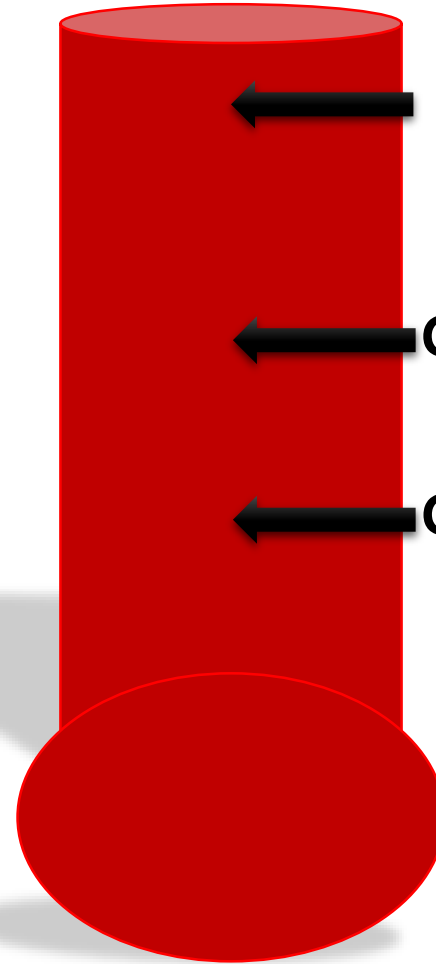
- Phenolic
- GRE – G3, G7, G10, G11

Seal Elements

- PTFE
- Nitirle
- Viton
- Mica
- EPDM

GRE Grades

- G10 vs. G11 vs. G7
 - Temperature



G7 – Max Temp = 450°F, 232°C

G11 – Max Temp = 392°F, 200°C

G10 – Max Temp = 302°F, 150°C

GRE Grades

- Other glass fabric materials the Industry uses:
 - G7
 - Silicon based resin system
 - Max Temp = 450°F, 232°C
 - G3
 - Phenolic based resin system
 - Max Temp = 392°F, 200°C
 - There are MANY types of glass fabric laminates.

Glass Reinforced Epoxy

- Why GRE?
 - Dielectric strength
 - 700-800 Volts/mill
 - Water absorption
 - .1%
 - Compressive strength
 - 50,000psi +
 - Excellent chemical and thermal resistance



Phenolic Materials

- Phenolic
 - Very similar to GRE except Phenolic uses resin to bond layers instead of Epoxy.
 - Does not always mean fiberglass as layers; can also be:
 - Paper (**Rubber Faced Phenolic**)
 - Cotton

Phenolic Materials

- Phenolic Properties
 - Nearly all properties are less desirable when compared to GRE
 - Dielectric strength
 - 500 Volts/mill
 - Water absorption
 - 1.6%
 - Compressive strength
 - 25,000psi + (depends on base layers i.e. cotton, paper, glass)
 - Good chemical and thermal resistance

GRE vs. Phenolic

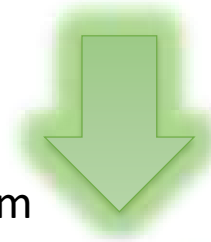
Dielectric Strength

- More provides better isolation



Water absorption

- Less means better isolation over the long term



Compressive Strength

- More means less likely to break gasket when bolting



Flexural Strength

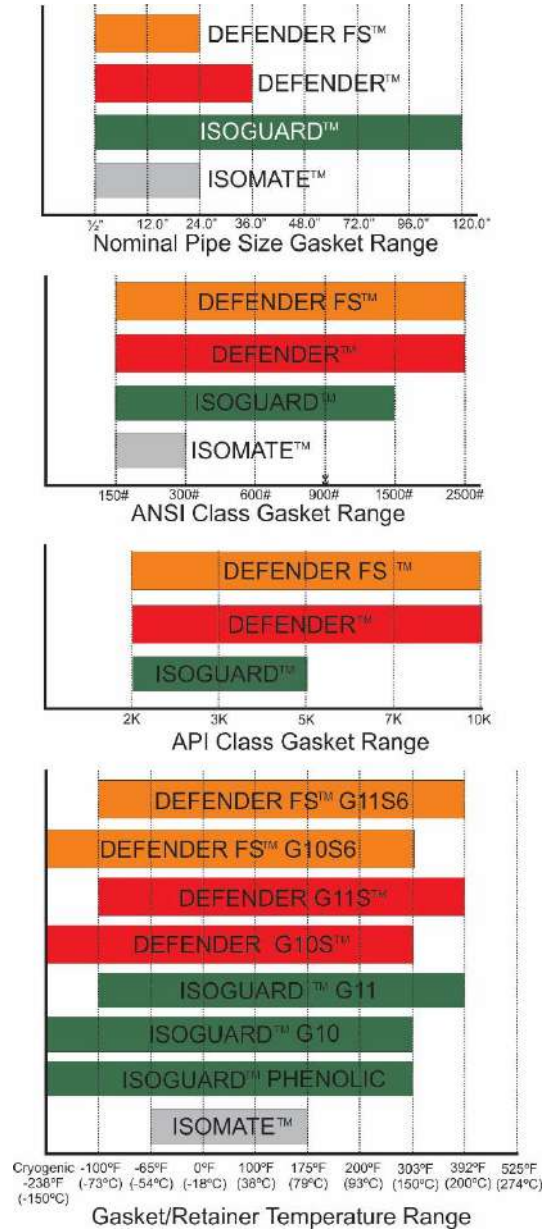
- More means gasket can withstand more bending load



Glass Reinforced Epoxy

- GRE Limitations
 - Use chemical compatibility chart or contact Engineering Department
 - Problem medias include:
 - Steam (>50%)
 - Sulfuric Acid (>75%)
 - Nitric Acid (>50%)
 - Phosphoric Acid (>40%)
 - Sulfur Dioxide (dry)

Four gaskets for all your sealing/isolating needs.



- DEFENDER
- ISOGUARD
- ISOMATE
- DEFENDER FS



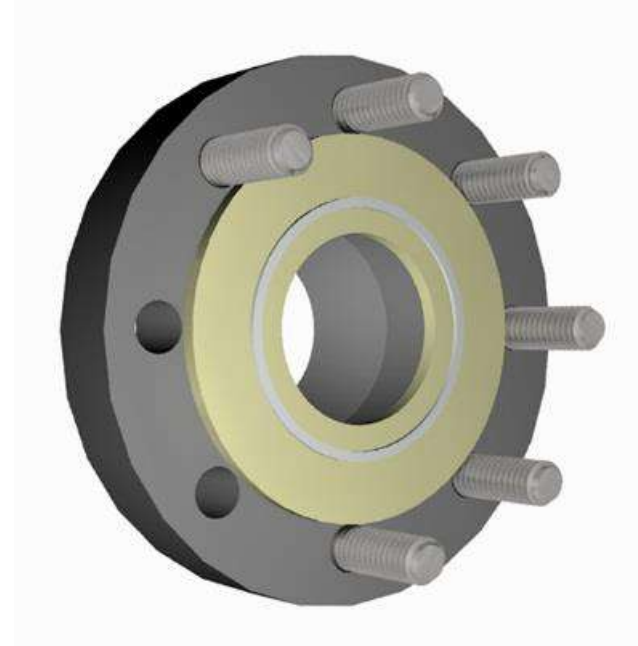
Type “E” Gaskets



Percentage of Type “E” gaskets specified for use:

DEFENDER (Steel Core Gasket) = 1%
ISO GUARD (Incline Plane) = 50%
ISOMATE (Phenolic Rubber) = 80%

Type “F” Gaskets



Percentage of Type “F” gaskets specified for use:

DEFENDER (Steel Core Gasket) = 99%
ISO GUARD (Incline Plane) = 50%
ISOMATE (Phenolic Rubber) = 20%

Flange Compatibility

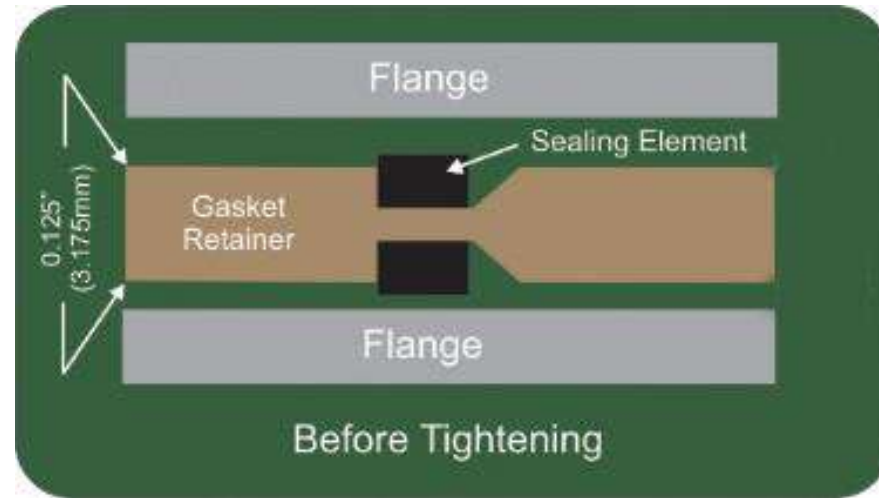


For flange faces greater than 250 micro inches, consult Lamons.

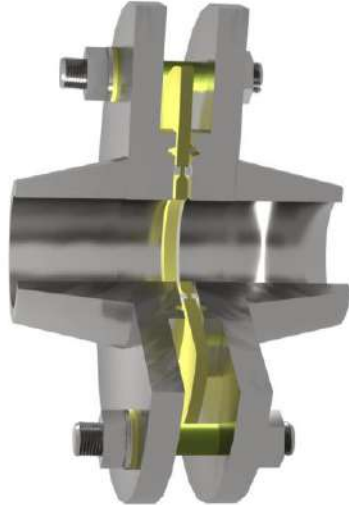
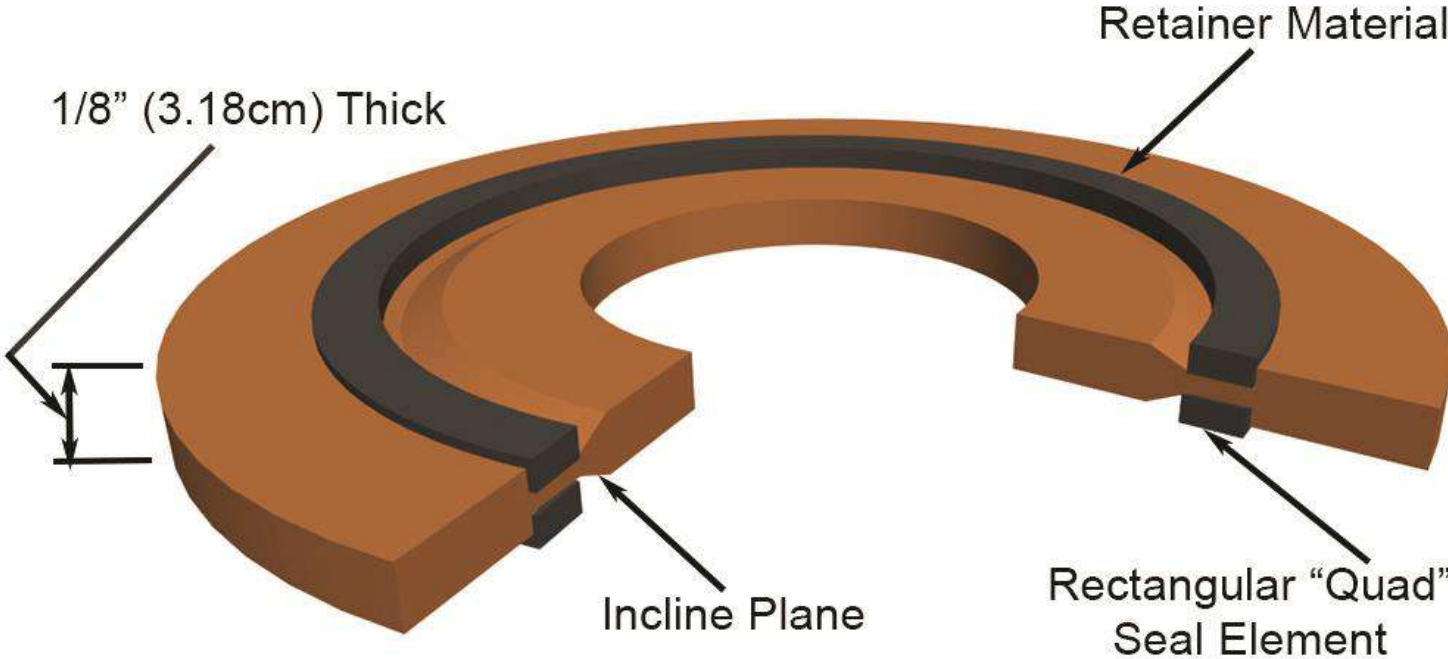
Flange Type	DEFENDER DEFENDER FS	ISOGUARD	ISOMATE
FF = Full Face	X	X	X
RF = Raised Face	X	X	X
RTJ	X	X	
S = Slip-on	X	X	X
Other	Contact Factory	Contact Factory	Contact Factory



Incline-Plane Technology ISOGUARD Sealing/Isolating Gaskets

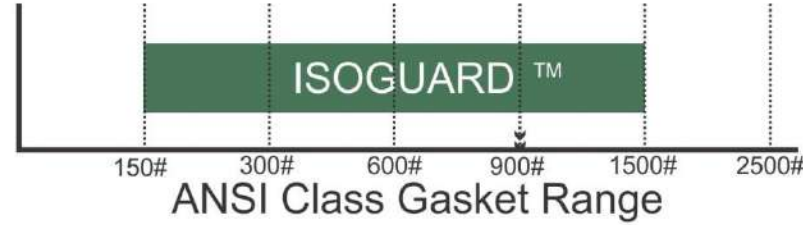
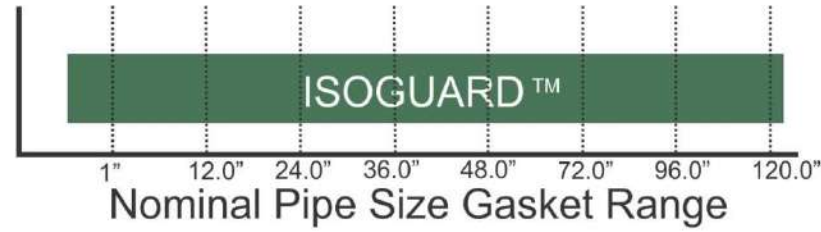


Incline-Plane Technology ISO GUARD Sealing/Isolating Gaskets





Product Range



Cryogenic -100°F -65°F 0°F 100°F 175°F 200°F 303°F 392°F 525°F
 -238°F (-73°C) (-54°C) (-18°C) (38°C) (79°C) (93°C) (150°C) (200°C) (274°C)
 (-150°C)

Gasket/Retainer Temperature Range

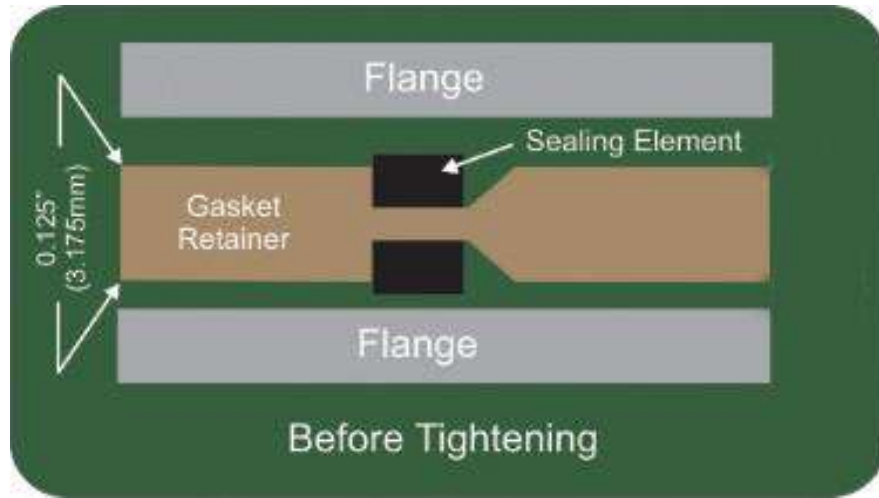
ISOGUARD Features

- For pipe diameters ½” through 120” (NPS).
- Seals/Isolates pressure ratings through ANSI 1500 and API 5,000 psi service.
- Industry proven “incline-plane” groove design and rectangular seal element .
- Self-energizing seal element allows for low bolt loads.

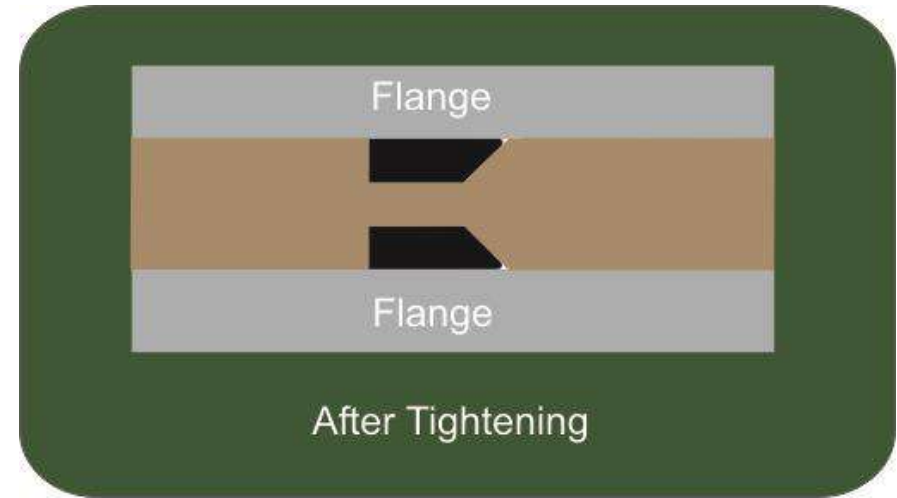
ISOGUARD Applications

- Engineered to provide high reliability sealing and electrical isolation.
- Engineered for applications where end users prefer an integral seal element.
- Based on an industry proven design.
- May be used for a wide variety of energy and water related media.
- May be used for a wide temperature range.
- Industries (Oil, Gas). Production Fields, Petroleum Marketing Facilities, LNG/SNG Systems, Pipeline and Distribution Piping, Refineries.

Incline-Plane Technology ISO GUARD Sealing/Isolating Gaskets



Before Tightening



After Tightening

Rectangular Seal Element: Better control of Durometer and seal element elasticity, so it retains ability to recover. Seals cut from cured sheets.

Retainer Materials (G10, G11, Phenolic)

- 1/8" (3.18cm) Thick.

ASTM	TEST METHOD	G10	G11	Phenolic
D149	Dielectric Strength, Volts/Mil Short Time	750-800	550	500
D695	Compressive Strength (psi)	65,000	63,000	25,000
D570	Water Absorption (%)	0.05	0.10	1.60
D790	Flexural Strength	65,000	60,000	22,500
D256	IZOD Impact Strength (Ft-Lbs/Inch)	14.00	12.00	1.20
D638	Tensile Strength	50,000	42,000	20,000
D732	Shear Strength (psi)	21,000	21,000	10,000
D952	Bond Strength (lb)	2,600	2,200	1,500
	Temperature – Operating	Cryogenic -238°F (-150°C) to +302°F (+150°C)	-100°F (-73°C) to +392°F (+200°C)	-65°F (-54°C) to +220°F (+104°C)

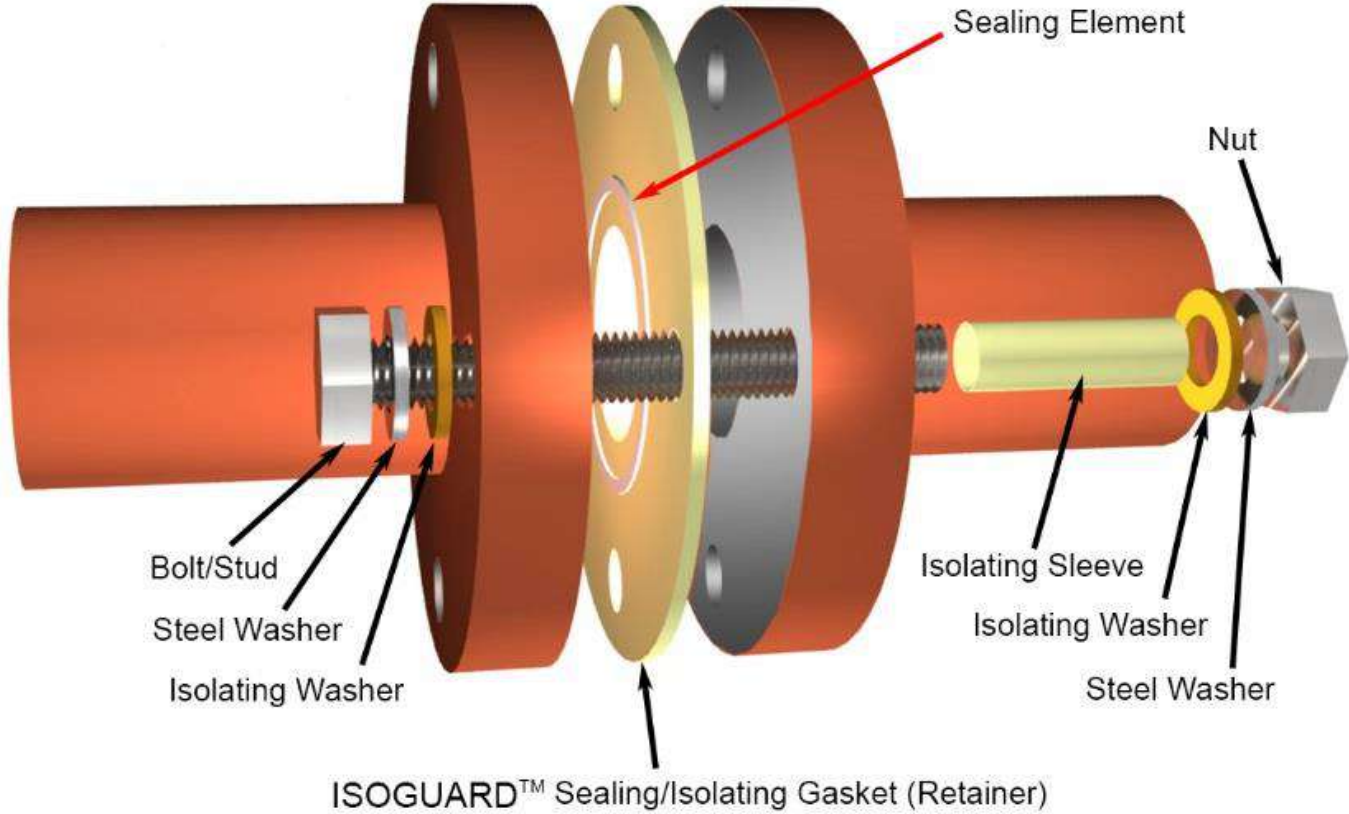
Seal Element Materials (Teflon, Nitrile, Viton)

- Teflon
- Nitrile
- Silicone
- Viton
- EPDM

SEALING ELEMENT	TEMPERATURE - OPERATING
Teflon®	Cryogenic to +525°F (+274°C)
Nitrile	-40°F (-40°C) to +250°F (+121°C)
Silicone	-75°F (-115°C) to +392°F (+200°C)
Viton®	-20°F (-29°C) to +392°F (+200°C)
EPDM	-65°F (-54°C) to +250°F (+200°C)

Gasket Operating Temperature is based off Retainer Temperature Limits.

ISOGUARD Flange Isolation Kit



Generally, 95% of ISOGUARD flange isolation kits are sold with G10 sleeves and G10 washers – double washer sets.

Suggested Sleeve/Washer Sets



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

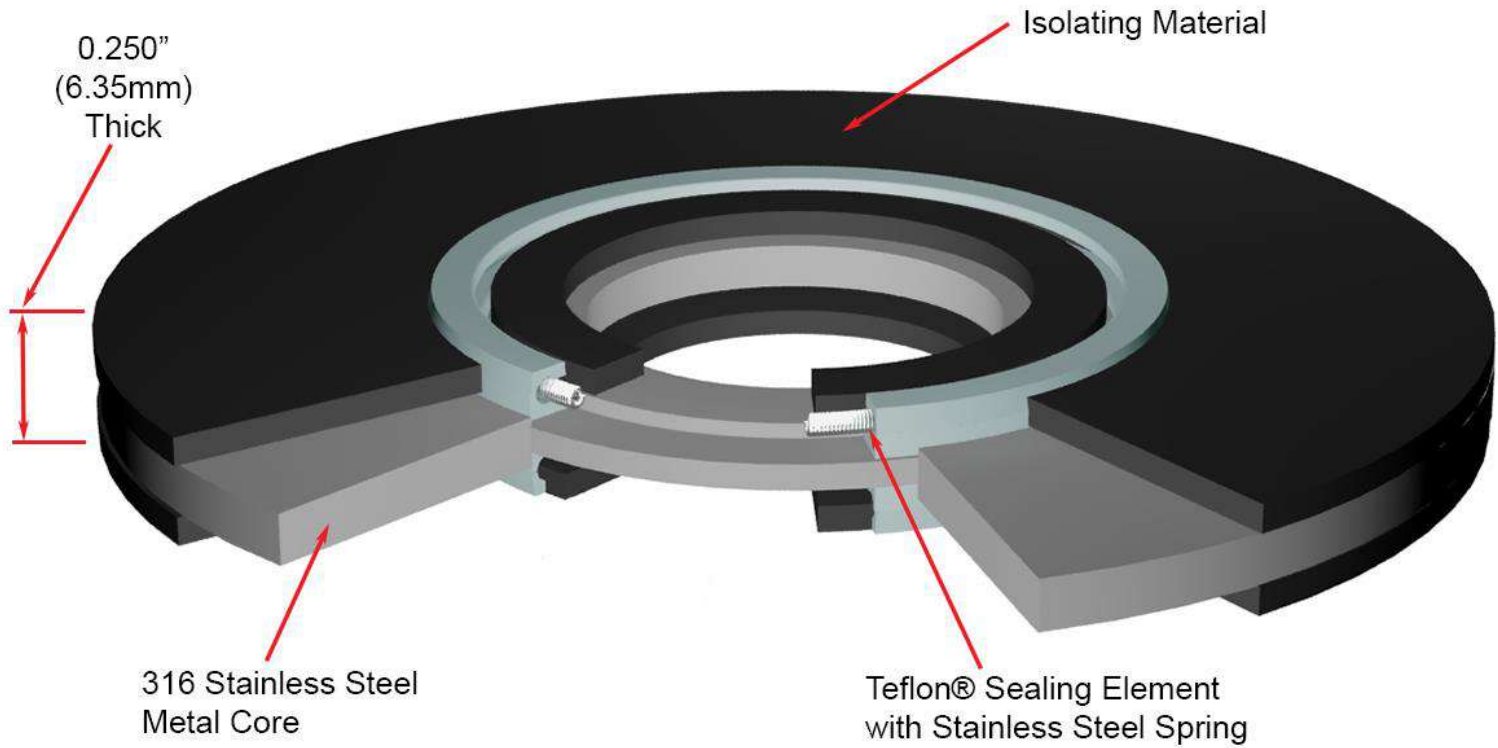


ED = Economy (Mylar Sleeves, Steel ZP Washers and Phenolic Washers) – Double Washer Set.

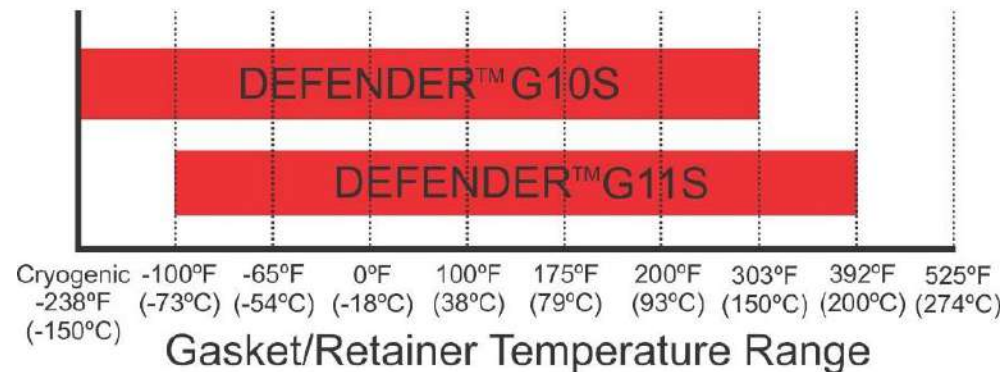
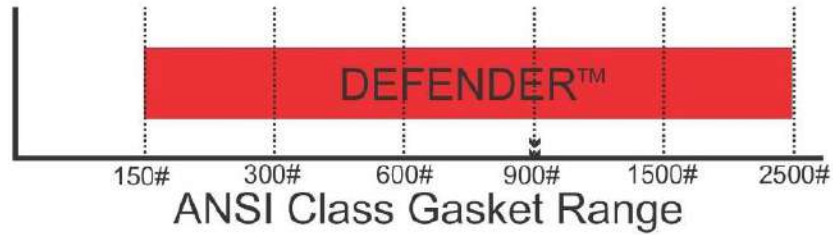
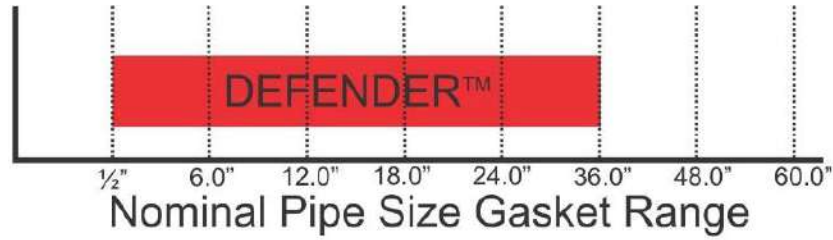
DEFENDER Sealing/Isolating Gaskets



DEFENDER Sealing/Isolating Gasket



Product Range



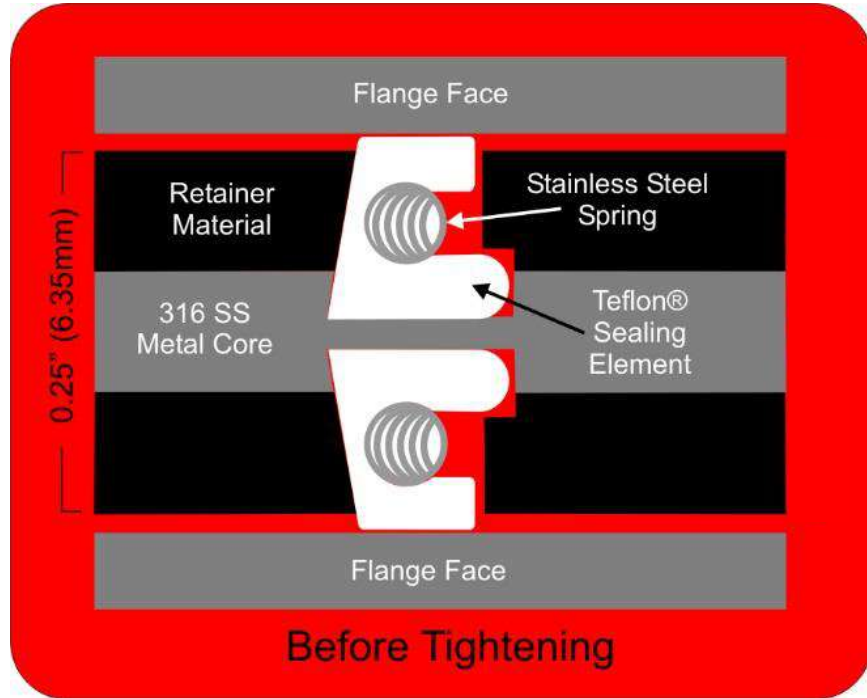
DEFENDER Features

- For pipe diameters ½” through 36” (NPS). Consult Factory for larger Sizes.
- Seals/Isolates pressure ratings through ANSI 2500 and API 10,000 psi service.
- Spring energized seal element.
- Press-n-Lock “Glue-Less Seal Groove Technology”. An industry first!
- May be used for a wide variety of energy related media.
- Proven design based on the industry leader.
- Tested to Shell Certification Standards

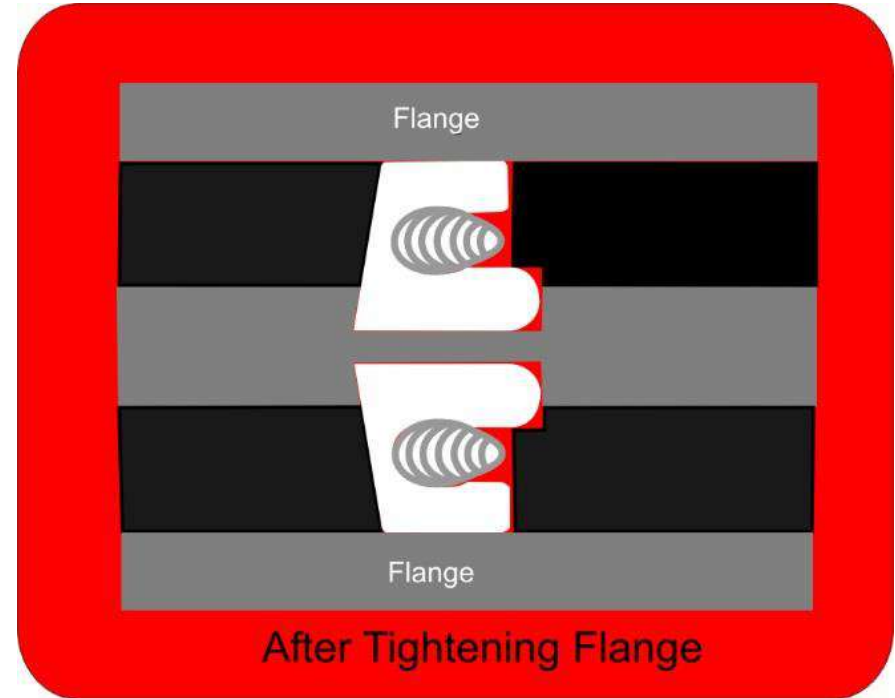
DEFENDER Applications

- Engineered for extreme, high reliability sealing and electrical isolation of critical service applications.
- High Pressure Flanges: Up to 2500# or API 10K.
- High pH service.
- H₂S/CO₂ service.
- Locations where end users prefer an integral seal element.
- Industries (Oil, Gas). Production Fields, Petroleum Marketing Facilities, LNG/SNG Systems, Pipeline and Distribution Piping, Refineries.

Before Tightening



After Tightening



Retainer Materials (G10, G11)

- ¼" (0.250" total thickness
- Metal Core 0.120" thick – 316 Stainless Steel (Duplex, Inconel and others available upon request.)
- Laminate 0.065" per side

ASTM	TEST METHOD	G10S	G11S
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)	14.0	12.0
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)

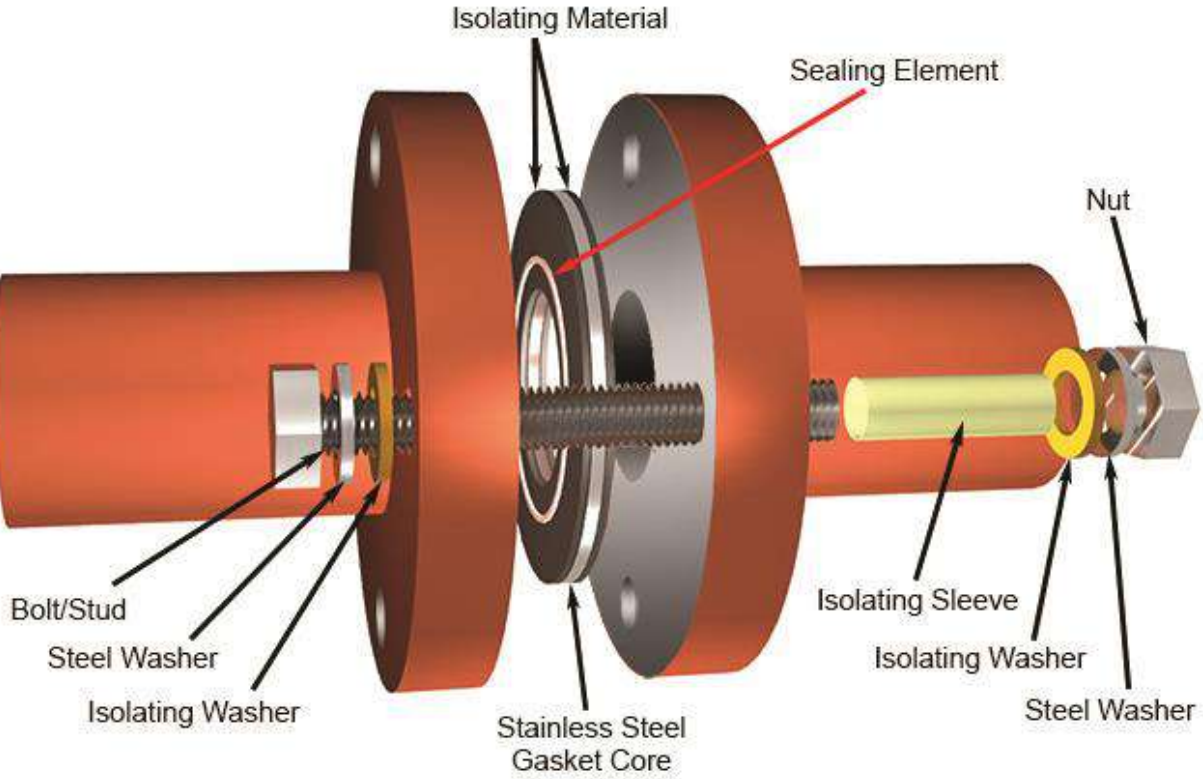
Seal Element Materials (Teflon, Nitrile, Viton)

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

SEALING ELEMENT	TEMPERATURE - OPERATING
Teflon® (Spring Energized)	Cryogenic to +525°F (+274°C)
Nitrile	-40°F (-40°C) to +250°F (+121°C)
Viton®	-20°F (-29°C) to +392°F (+200°C)

Gasket Operating Temperature is based off Retainer Temperature Limits.

DEFENDER Flange Isolation Kit



Generally, 95% of steel core gasket flange isolation kits are sold with G10 sleeves and G10 washers – double washer sets.

Suggested Sleeve/Washer Set

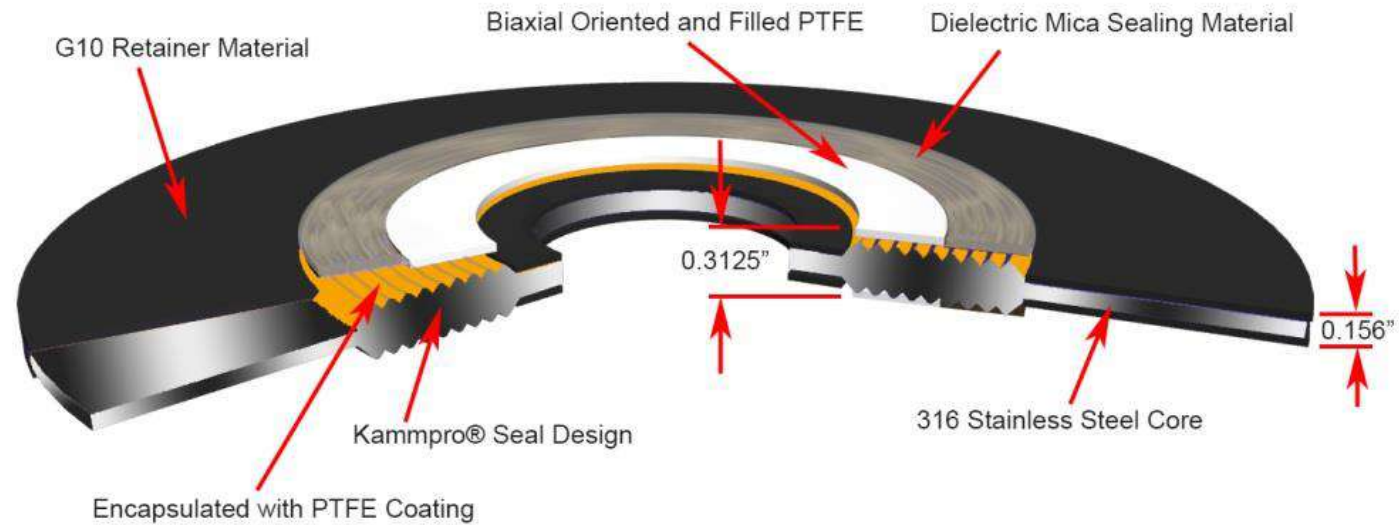


SD = Standard (G10 Sleeves, Steel ZP Washers and G10 Washers – Double Washer Set).

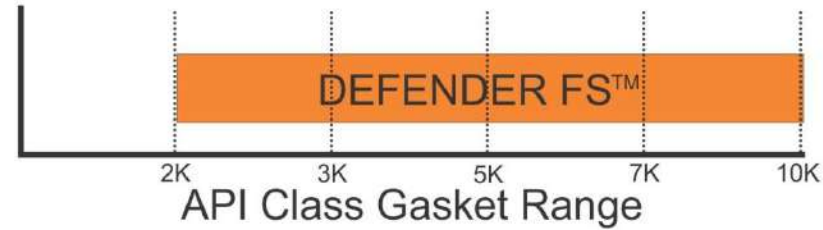
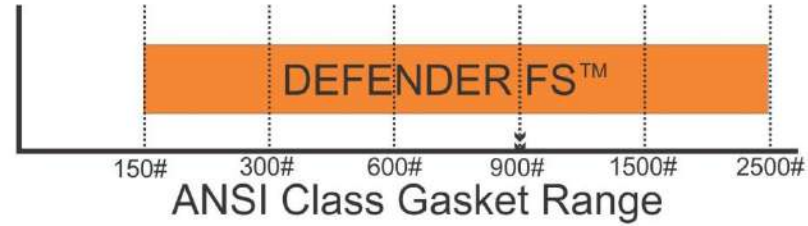
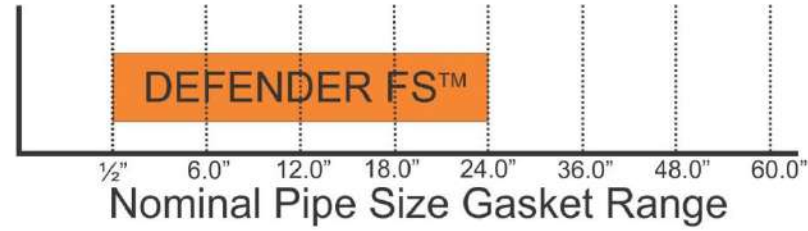
DEFENDER FS Sealing/Isolating Gaskets



DEFENDER FS Sealing/Isolating Gasket



Product Range

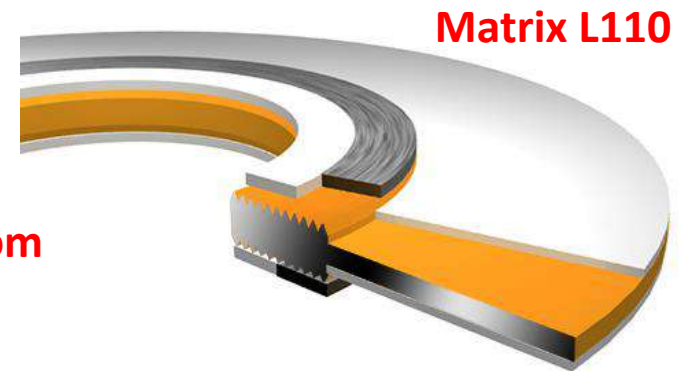


Cryogenic -100°F -65°F 0°F 100°F 175°F 200°F 303°F 392°F 525°F
-238°F (-73°C) (-54°C) (-18°C) (38°C) (79°C) (93°C) (150°C) (200°C) (274°C)
(-150°C)

DEFENDER FS Features

- Tested and Certified to API 6FB (Third Edition).
- Two integral robust sealing elements for sealing and isolating in an engineered Fire Safe design.
- Serves as a sealing/isolation for Fire Safe Applications.
- Incorporates industry proven Kammpo[®] sealing technology.

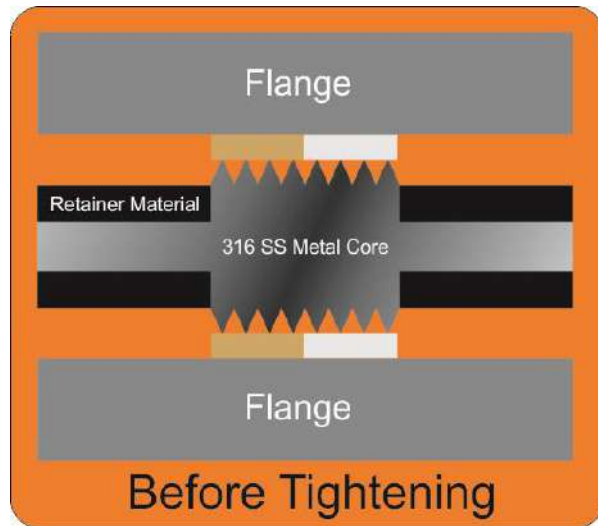
**Utilize Sheet
Material for Custom
Applications**



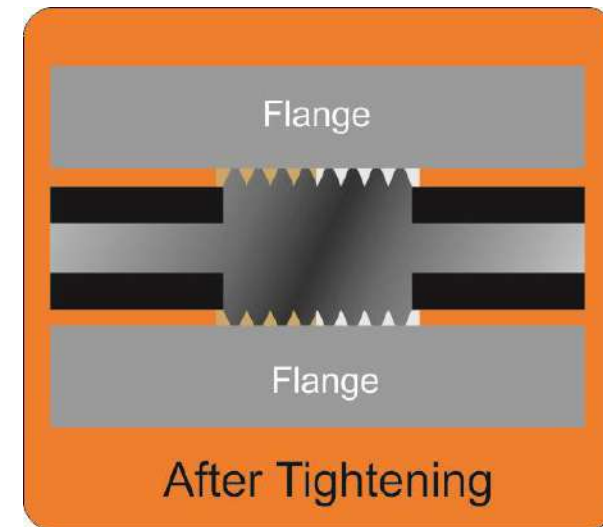
DEFENDER FS Applications

- Engineered to provide high reliability sealing and electrical isolation.
- DEFENDER FS gaskets were engineered for Fire Safe, extreme, high reliability sealing and electrical isolation critical service applications
- High Pressure Flanges: 2500# or API 10K.
- Critical/Extreme service
- High Ph service.
- H₂S/CO₂ service.
- Locations² where end users prefer an integral seal element and high volatile fluids are present.

Before Tightening



After Tightening



Retainer Materials (G10, G11)

- 0.3125" (7.94MM) total thickness.
- Metal Core ¼" (0.250" – 6.35mm) thick – 316SS (Duplex, Inconel and others available upon request.)
- Laminate 0.032" (0.812mm) per side

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	65,000	60,000
D256	IZOD Impact Strength (Ft-Lbs/Inch)	14.00	12.00
D638	Tensile Strength	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)

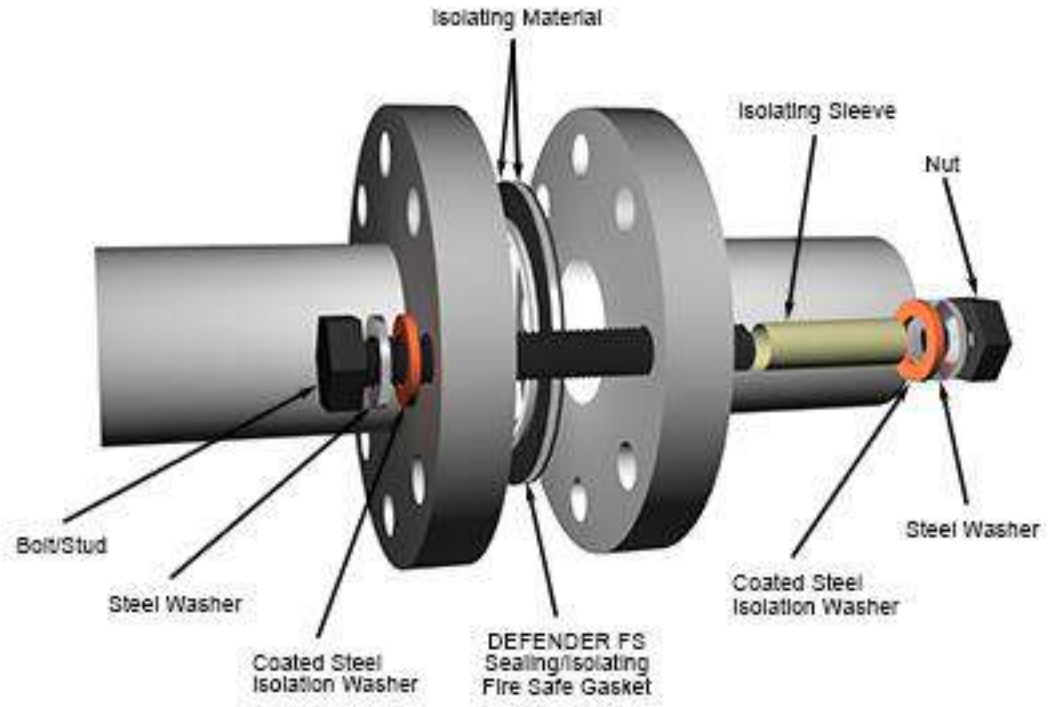
Seal Element Materials (Teflon, Nitrile, Viton)

- Mica (Hi-Temp)
- Biaxial Oriented PTFE
- Kammprofile PTFE Coating

SEALING ELEMENT	TEMPERATURE - OPERATING
Mica (Hi-Temp)	+1,832F. (+1,000C.)
Biaxial Oriented PTFE	-450°F. (-268°C) to +500°F. (+260°C.)
Kammprofile PTFE Coating	-58°F (-50°C) to +350°F (+176°C)

Gasket Operating Temperature is based off Retainer Temperature Limits.

DEEFENDER FS Flange Isolation Kit



Sleeves and Washers Engineered for Isolation



Critical Sleeve

- Cut through resistance
- Sleeve Length
- Temperature

Critical Washer

- Compressive Strength
- Temperature

Non - Critical

- Media



Sleeves – Cut Through

- Cut Through Resistance – 3,500 ft-lbs Mylar



Damage to mylar sleeves, typical through out.

Photos show the condition of mylar sleeves removed for replacement at the jobsite.



Promote G10 as a Standard.

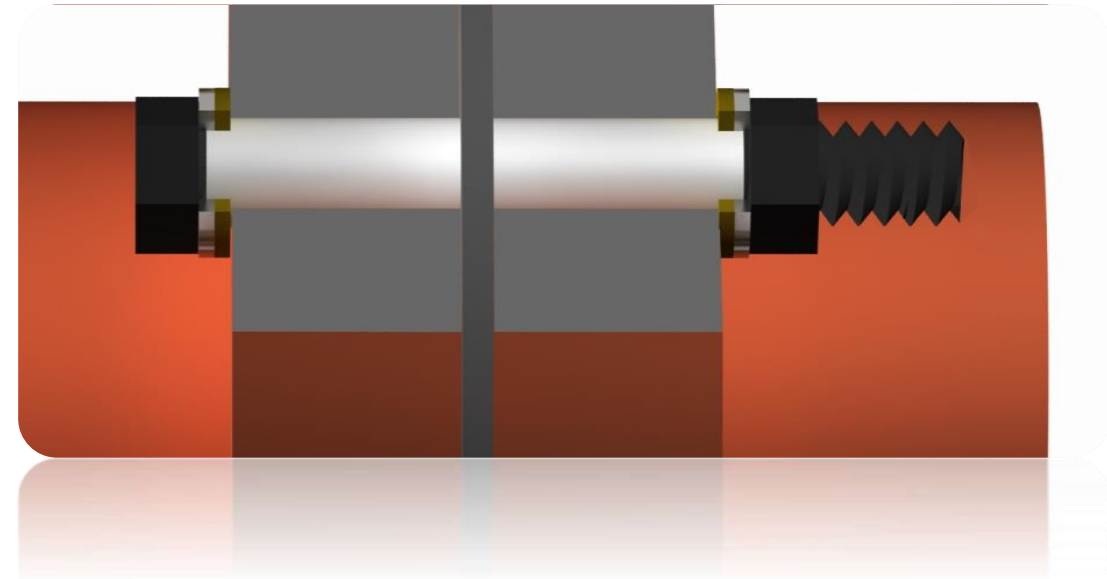
Sleeves and Length

- Sleeves Manufactured too Long or Cut-n-Field too Long, will Break.



Note: Pictured Sleeve and Washers not Manufactured by Lamons.

- Through Both Flanges
- Through Gasket – Thickness can vary depending on Gasket Technology
- Through Isolation Washer and **Half Way Through Steel Washer**





Washers

Promote G10

- Compressive Strength – 50,000 psi G-10

ASTM	Test Method	G10	G11	Phenolic	Steel (ZP)	Steel (HC)	G3
D149	Dielectric Strength Volts/Mil Short Time	750-800	550	500	N/A	800	500
D695	Compressive Strength (psi)	65,000	63,000	25,000	>65,000	>65,000	55,000
D570	Water Absorption (%)	0.05	0.1	1.6	N/A	0.3	1.0
	Temperature - Operating	Cryogenic to +302°F (+150°C)	-100 to +392°F (-73 to +200°C)	-65 to +220°F (-54 to +104°C)	Crogenic to +500°F (+260°C)	Cryogenic to +302°F (+150°C)	-100 to +392°F (-73 to +200°C)

(ZP) = Zinc Plated (HC) = Harden Steel – Isolation Coating



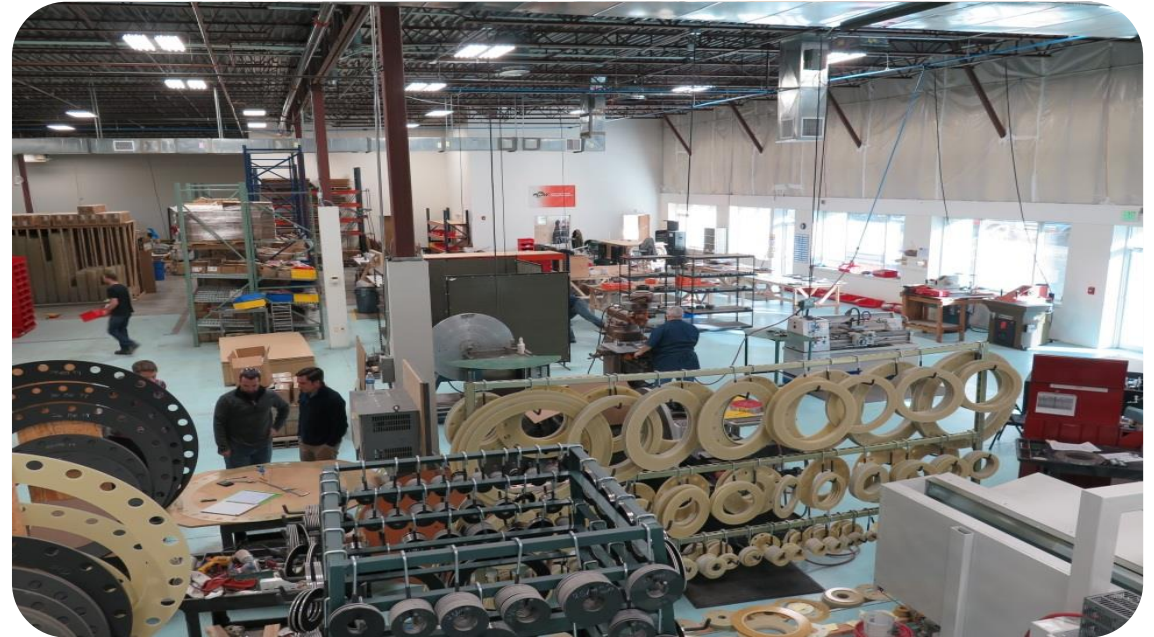
Retainer Washers – Steel Washers
Same Manufactured OD and ID



Lamons ISOTEK Manufacturing



CNC Machine



Building Inventory
IsoGuard Gasket blanks