

FLANGE INSULATION SETS



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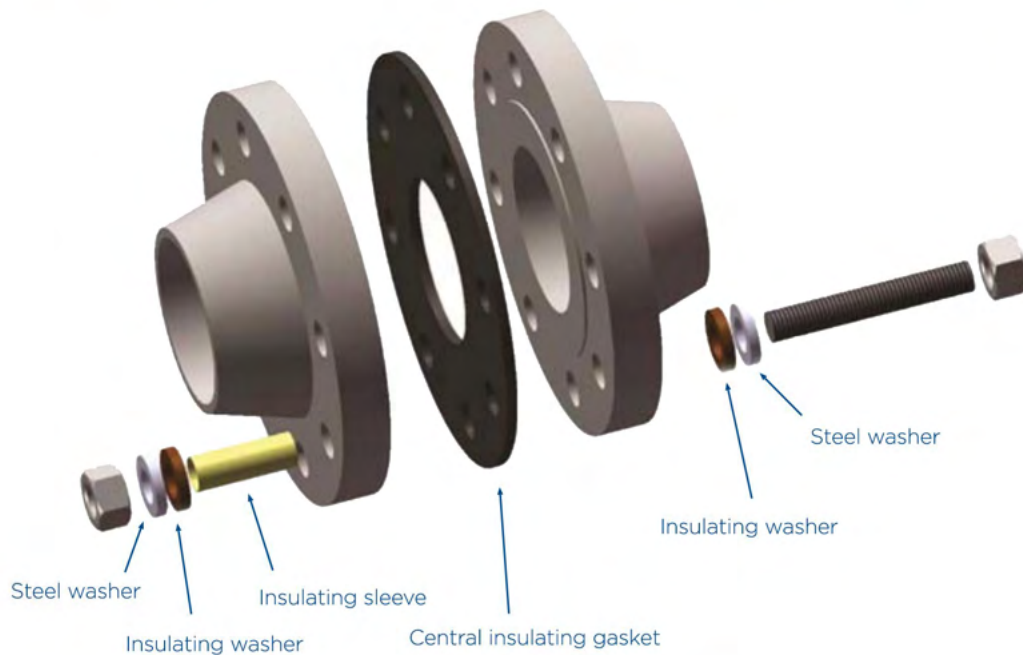
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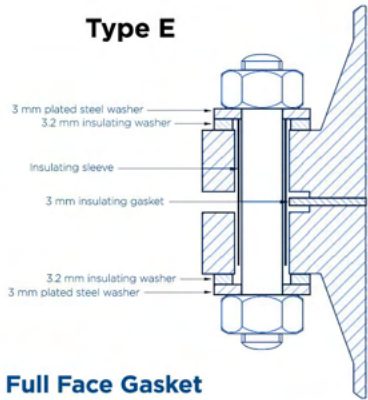


Standard Sleeve & Washer Materials in the Set are:

- Mylar Sleeves
- G10 Insulation Washers
- Steel Washers
- Others on request

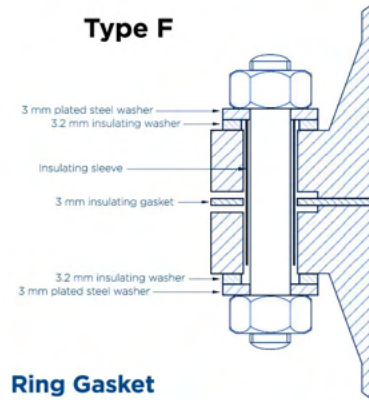
- Insulation sets are used to limit corrosion in pipeline systems.
- Where dissimilar metals are present, the sets remove the possibility of the system acting as a galvanic cell and reduce the risk of galvanic corrosion of the pipe work.
- Insulation sets are also used to isolate cathodically protected piping systems where they prevent the flow of electro-static charge.
- Each flange insulation set comprises one central flat or oval section gasket, one insulation, sleeve, two insulating and two plated steel washers per bolt.
- The sets are individually packed and clearly labelled with the flange rating, size, type and material combination.
- **Key function of Insulating gaskets:**
 - Used to electrically isolate sections of pipe work.
 - Designed to minimise electro-chemical erosion.
 - Comprising materials with high dielectric strength.
 - Manufactured to suit flanged joints to ASME, BS, DIN and customer designs.

● Below are the most common gasket types:



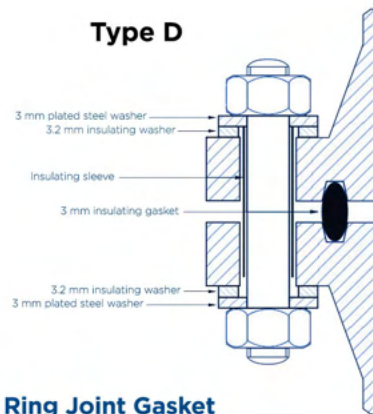
Full Face Gasket

Suitable for flat and raised face flanges. This style minimises the ingress of conductive foreign matter and reduces the risk of bridging. Typically used on oil and hydrocarbons where flange insulation is a requirement. Manufactured from materials with high dielectric strength to ensure minimum electrical contact between flanges.



Ring Gasket

Utilises a RF gasket which centrally locates within the bolts. Typically used on oil and hydrocarbons where flange insulation is a requirement. Manufactured from materials with high dielectric strength to ensure minimum electrical contact between flanges.



Ring Joint Gasket

Type D insulation gaskets use the same basic materials as the standard insulation sets but are designed for RTJ flanges. The gasket is manufactured from reinforced phenolic resin. Type D gaskets have an oval cross-section and are suitable for low pressure applications. Care must be taken during installation of this gasket so that it is not overstressed during bolt up.

● **Gasket recommendations for ANSI B16.5 Raised Face Flange Class**

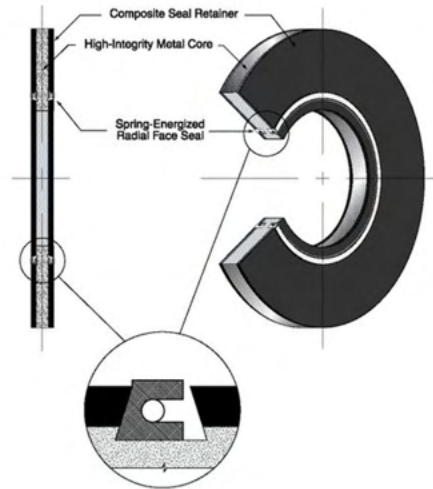
Gasket	Pressure Class Rating ANSI B16.5 Raised Face					
	150	300	600	900	1500	2500
Neoprene faced Phenolic	✓	✓	x	x	x	x
PTFE	✓	✓	x	x	x	x
AR-NA4420	✓	✓	✓	x	x	x
AR-9900-LP	✓	✓	✓	✓	✓	x
AR-9902-HP	✓	✓	✓	✓	✓	✓

✓ - Recommended x - Not Recommended

*** subject to a technical evaluation**

The above table is applicable to Raised Face Flanges. For ANSI B16.5 & API 6A Ring Joint Flanges(RTJ) ,insulating oval shape Type D gaskets are available but are not recommended due to their susceptibility to crack under load especially in high pressure applications. Aerolite would recommend to use other styles as per above table for high pressure (600# and above) RTJ flanges.

● AR-9902-HP Flange Insulation Set



● The AR-9902-HP is a high strength and high reliability flange gasket designed for electrical insulation and sealing in very critical service applications. The gasket is manufactured using a composite seal retainer material bonded to a high integrity metal core, 316 Stainless Steel is standard. The spring energized PTFE seal offers excellent sealability even at low loads.

● The AR-9902-HP gasket is a high reliability gasket used for both insulating and general sealing applications.

● The AR-9902-HP is suitable in all services up to and including ANSI 2500# and API 15,000# classes.

● Each AR-9902-HP insulation set comprises one central insulating gasket, one insulation sleeve per bolt and two insulating and two plated steel washers per bolt.

● **General Characteristics**

- Flange insulation as well as cathodic protection
- Reduces galvanic corrosion in dissimilar metal materials used in flange joints
- Allows mismatched ring-joint to raised-face flanges to be effectively sealed. AR-9902-HP will seal in ring joint, raised-face and flat face/slip-on flange applications
- Will withstand corrosive environments including high CO₂, H₂S and processed water
- The bore construction protects flange faces from media-induced corrosion and flow-induced erosion.
- The pressure energised seal allows for reduced flange assembly stress
- Easy to install and remove
- Reusable seal retainer and seals
- Suitable for all ANSI and API rated flanges
- High strength laminate material reduces failure due to over compression

Materials

- Metallic Core: 316 Stainless Steel
- (Duplex & Inconel available)
- Gasket Insulating Material: G-10 Glass Reinforced Epoxy (GRE) as standard (G-11 available)
- Seal Material: Spring-energized PTFE as standard
- (Viton available)
- Insulating Sleeve Material: GRE as standard
- (Mylar available)
- Insulating Washers Material GRE (standard)
- Steel Washer Material Zinc Plated Steel as standard (stainless steel available).

AR-9902-HP Design

The design of the AR-9902-HP gaskets incorporates a high-strength reinforced epoxy laminate bonded to a 316 stainless steel core as standard (other core materials available). This design results in the gasket having the strength of a traditional metallic gasket while at the same time allowing complete electrical insulation between the flange faces. PTFE Spring-energised seals are installed into machined grooves to provide a pressure-activated sealing system that allows the AR-9902-HP to be used as a high pressure insulating gasket. (Viton o-rings also available if specified)

Electrical Insulation

- The AR-9902-HP distinguishes itself by providing electrical flange insulation in a high-strength gasket
- The AR-9902-HP significantly reduces the potential for electrical conductivity between two flange faces by providing a non-conducting, non-metallic interface.
- This eliminates potential corrosion resulting from dissimilar metals making contact or from ground induced current corrosion of metal components in pipeline systems.
- The AR-9902-HP is an effective sealing system used in breaking electrical conductivity in piping systems with cathodic protection.
- The AR-9902-HP's steel core and construction enables the gasket to withstand higher system pressure, pressure cycling, over torquing than conventional insulating gaskets.

- The gasket set comprises the following as listed below:

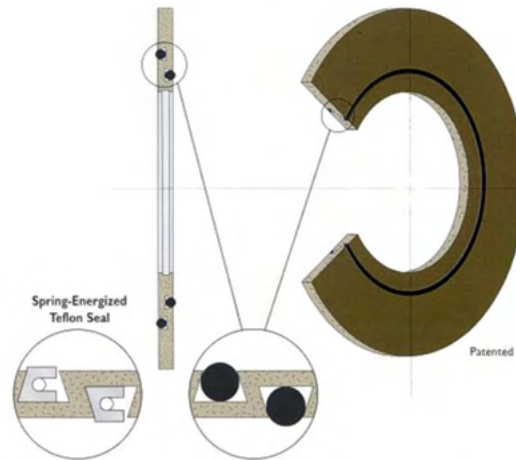
Insulation Kit Contents:

Insulating facing	G-10 glass reinforced epoxy resin standard. G11 also available on request.
Seal	Spring energised PTFE (Viton also available)
Core	Stainless steel 316
Standard Thickness	7.0 mm.
Insulating Washers	G-10 glass reinforced epoxy resin (other materials are available) 3.2mm thickness 2 washers per bolt
Steel Washers	Zinc-plated steel, 3.2mm thickness (stainless steel washers also available) 2 washers per bolt
Insulating Sleeves	G-10 glass reinforced epoxy resin. (Mylar and Nomex also available) 1 insulating sleeve per bolt

Insulation Kit Properties:

Material type	G-10 Glass-reinforced epoxy resin	G-11 High temperature resin
Compressive strength	50,000psi - minimum	50,000psi - minimum
Dielectric strength	24.1-31.5 kV/mm	24.0 kV/mm
Maximum temp	150°C	200°C
Water absorption	0.1% - maximum	0.1% - maximum
Flexural strength	65,000psi	57,700psi
Tensile strength	50,000psi	41,000psi
Temperature range	- 130°C to 150°C (limited by gasket material)	- 46°C to 200°C (limited by gasket material)
Seal	Spring-energised PTFE (Viton rubber also available)	

● AR-9900-LP Flange Insulation Set



- The AR-9900-LP gasket is an economical seal for electrical flange isolation and general applications requiring higher performance capabilities than those offered by neoprene-faced phenolic gaskets.
- The gasket comprises grooves that are machined into high strength G10 laminate and in to which are inserted either spring energized PTFE or Viton o-ring seals which offer excellent sealability at low loads.
- The AR-9900-LP gasket is highly suited for use in classes up to and including class 600 lb gasket.
- The AR-9900-LP gasket is available in full face (Type E) and ring style (Type F) configuration.
- **General Properties**
 - Gives a high sealing reliability in low pressure system.
 - Excellent electrical insulation when used on cathodic protection systems.
 - Is suitable for most hydrocarbons services subject to seal ring material selection.
 - Reduces galvanic corrosion in dissimilar metal flanges.
 - Design eliminates media-induced corrosion and flow-induced erosion from flange faces.
 - Design requires reduced flange/bolt assembly stress.
 - Easy installation and removal.
 - Suitable for all ANSI rated flanges up to class 600 lb.

● **Materials**

- Gasket Insulating Material & Washers: G-10 Glass Reinforced Epoxy (GRE) as standard (G-11 high temperature grade also available).
- Spring energized PTFE or O-Ring pressure activated seal: PTFE (spring energized) as standard (Viton and Nitrile also available).
- Insulation sleeves: GRE (standard) or Nomex for high temperature service.

● **AR-9900-LP Flange Gasket Advantages & Benefits**

- Low pressure sealing (ANSI class 150, 300 and 600) service.
- Seals are pressure activated.
- High strength laminate material reduces failure due to excess compression.
- Excellent electrical insulation when used on cathodic protection systems
- Design eliminates media-induced corrosion and flow-induced erosion from flange faces
- Reduces galvanic corrosion in dissimilar metal flanges.
- Also available with a variety of elastomeric seals.
- Easy installation, assembly and removal as design requires reduced flange/bolt assembly stress.
- Flanges do not have to be spread as would be the case with RTJ gaskets. The AR-9900-LP easily slips in place.
- Gasket is self-aligning and centering, quick to install, no special tools are required.
- Maintenance-free, corrosion resistant design.

- The gasket set comprises the following as listed below:

Insulation Kit Contents:

Insulating facing	G-10 glass reinforced epoxy resin
Seal	Spring energised Viton (PTFE also available)
Thickness	3.2mm.
Insulating Washers	G-10 glass reinforced epoxy resin (other materials are available) 3.2mm thickness 2 washers per bolt
Steel Washers	Zinc-plated steel, 3.2mm thickness (stainless steel washers also available) 2 washers per bolt
Insulating Sleeves	G-10 glass reinforced epoxy resin. (Mylar and Nomex also available) 1 insulating sleeve per bolt

Core Materials:

Material type	G-10 Glass-reinforced epoxy resin	G-11 High temperature resin
Compressive strength	50,000psi - minimum	50,000psi - minimum
Dielectric strength	24.1-31.5 kV/mm	24.0 kV/mm
Maximum temp	150°C	200°C
Water absorption	0.1% - maximum	0.1% - maximum
Flexural strength	65,000psi	57,700psi
Tensile strength	50,000psi	41,000psi
Temperature range	- 130°C to 150°C (limited by gasket material)	- 46°C to 200°C (limited by gasket material)
Seal	Spring-energised PTFE (Viton rubber also available)	

● Properties:

	Component	Dielectric Strength (Kv/mm)	Water Absorption (%)	Maximum Temperature (°C)
Neoprene faced Phenolic	Gasket	19.8	1.6	107
Aerolite NA4420	Gasket	21.3	10.6	400
PTFE	Gasket	16.7	0.5	260
G10	Gasket, Sleeve, Washer	24.1-31.5	0.1-max.	150
G11	Gasket, Sleeve, Washer	24.0	0.1-max.	200
Mylar	Sleeve	157.5	0.8	145
Phenolic	Sleeve	5.5	1.0	107
Reinforced Phenolic	Washer	7.8	1.0	107

Note: The above values are based upon limited test data. Whilst every effort is made to ensure the information in this data sheet is accurate, it must be stressed that it is the users responsibility to ensure suitability for the intended end use. The values quoted above may be subject to modification at a later date.

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