

## FLANGE INSULATING KITS - TGCD



CPI Flange Insulation Kits are typically used on offshore installations, seawater environments, chemical installations; oil refinery pipelines where the flanges need to be properly plane to prevent leakage and also must be insulated.

CPI Flange Insulation Kits follow standards ANSI 16.5 & API 605; other standards need to provide more specifications according to our requirements.

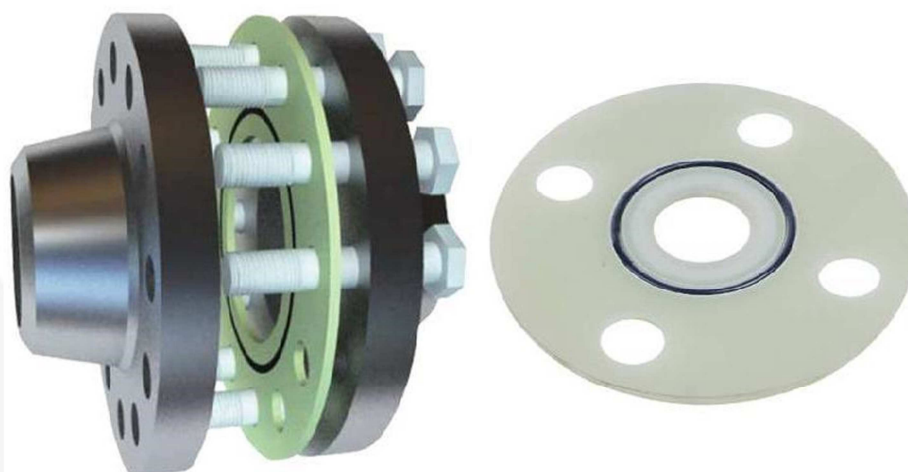
Flange Insulation Kits consist of an insulating gasket; some insulating sleeves and washers which are all correctly sized for the application and conveniently packaged to minimize the possibility of lost component parts during installation.

Insulating gaskets may be specified as "E" and "F" type while single, double or one-piece sleeve and washer sets are offered as options for varying degrees of electrical insulation between the flanges. In addition, a wide variety of material options exist for both insulating gaskets and sleeve and washer materials. The G10 retainer recommended when the conditions allowed.



## TYPE E GASKET

Type “E” is a full-face gasket with same outside with same outside diameter as the flange and precision cut bolt holes. This design facilitates proper alignment of the gasket during installation. This assembly minimizes the ingress of conductive foreign matter between the portions of the flanges outside the raise face and reduces the risk of bridging.

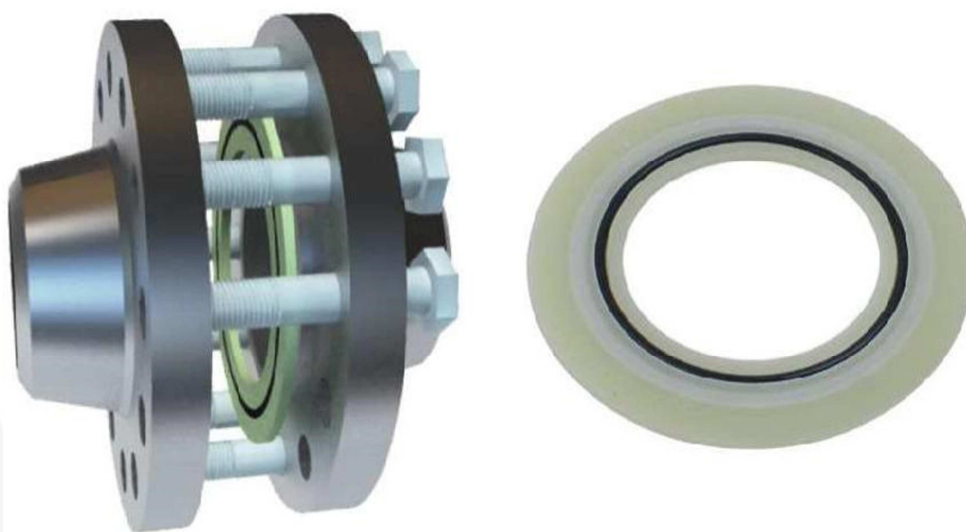


### TYPE “E” GASKETS ARE AVAILABLE IN ANY OF FOLLOWING CONFIGURATIONS:

- ✓ TGCDLB sealing gaskets
- ✓ TGCDPGE sealing gaskets
- ✓ TGCDVCS sealing gaskets
- ✓ TGCDVCS-OP sealing gasket
- ✓ Neoprene faced phenolic gaskets
- ✓ Plain phenolic gaskets
- ✓ PTFE gaskets
- ✓ Standard thickness is 1/8” (exclude TGCDVCS sealing gaskets)

## TYPE F GASKET

Type “F” gasket are made to fit the raise face portion of the flange only. As there are no bolt holes in the “F” gasket, the outside diameter of the gasket fit tightly into place assuring a well center position.

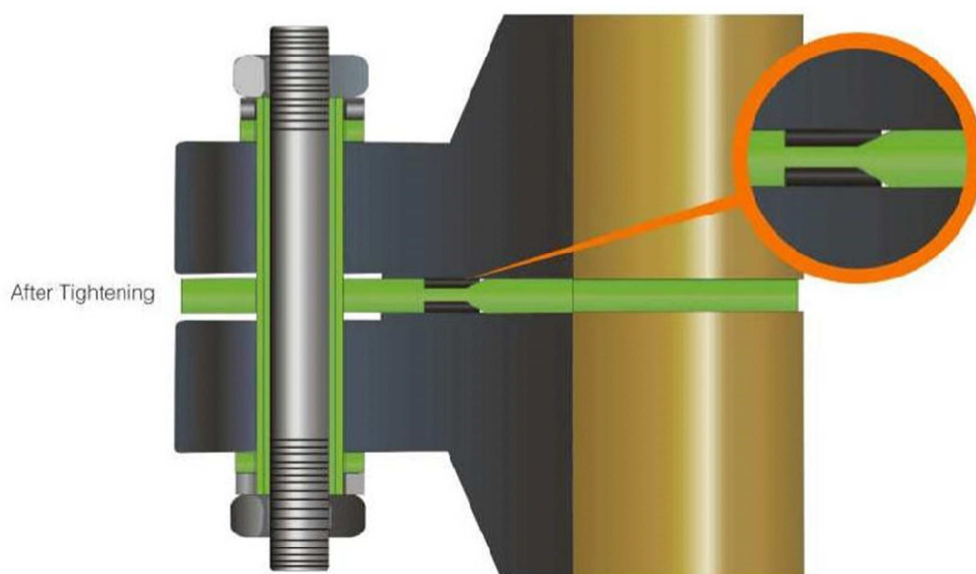
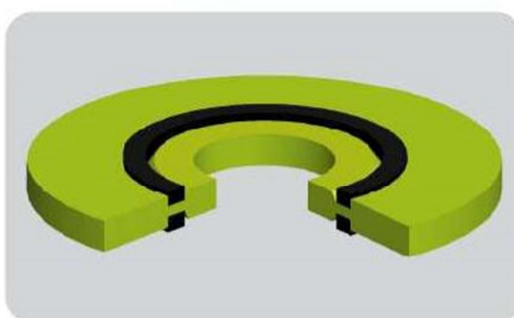


### TYPE “F” GASKETS ARE AVAILABLE IN ANY OF FOLLOWING CONFIGURATIONS:

- ✓ TGCDLB sealing gaskets
- ✓ TGCDPGE sealing gaskets
- ✓ TGCDVCS sealing gaskets
- ✓ Neoprene faced phenolic gaskets
- ✓ Plain phenolic gaskets
- ✓ PTFE gaskets
- ✓ Standard thickness is 1/8” (exclude TGCDVCS sealing gaskets)

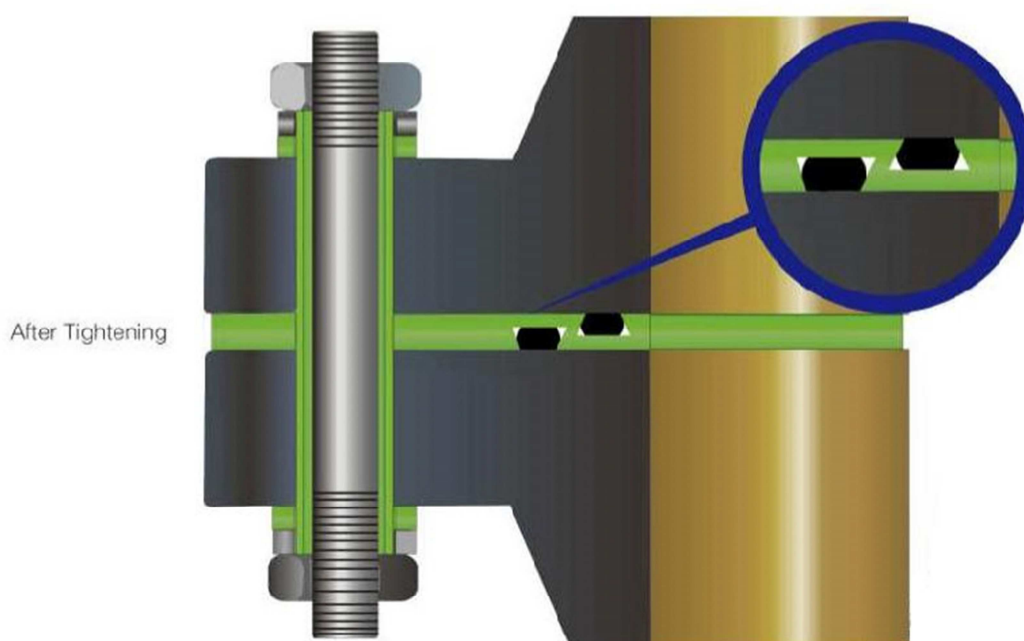
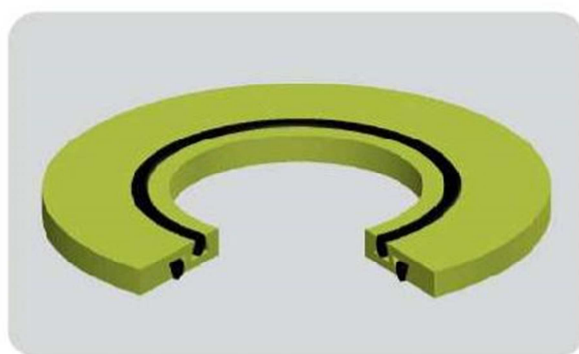
## TGCDLB SEALING GASKETS

TGCDLB sealing gaskets adopt one of the most effective methods for sealing and insulating all types' flanges. The quad ring, a rectangular sealing element, encapsulated in special designed groove, it provide near zero "m" and "y" factors to make the controlled-pressure seal can always be obtained without tremendous bolt loads. The material such Nitrile, EODM, VITON and PTFE can be used as sealing elements, this increase the options for different working conditions. Both retainer and sealing elements temperature limit should be considered together while choose the material. Refer to chart sealing gasket temperature range and material compatibilities.



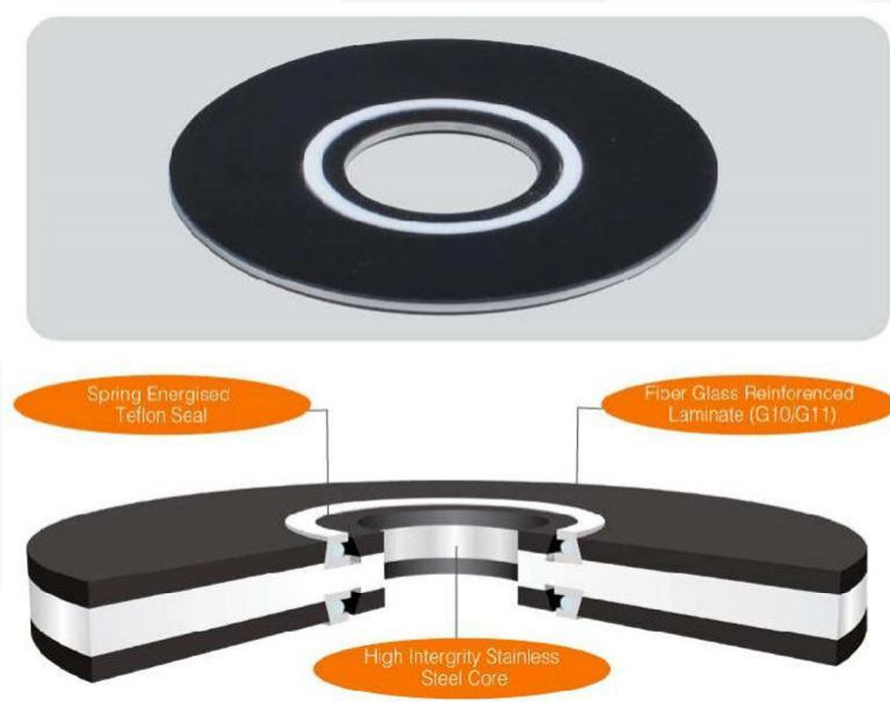
## TGCDPGE SEALING GASKETS

TGCDPGE Sealing Gaskets have the excellent sealing and insulating design for all types' flanges. The sealing elements encapsulated in the special designed groove, avoid the sealing element broken when the bolts torque are not equal. The material such Nitrile, EPDM, VITON and PTFE can be used as sealing elements, this increase the options for different working conditions. Both retainer and sealing elements temperature limit should be considered together while choose the material. Refer to chart sealing gasket temperature range and material compatibilities.



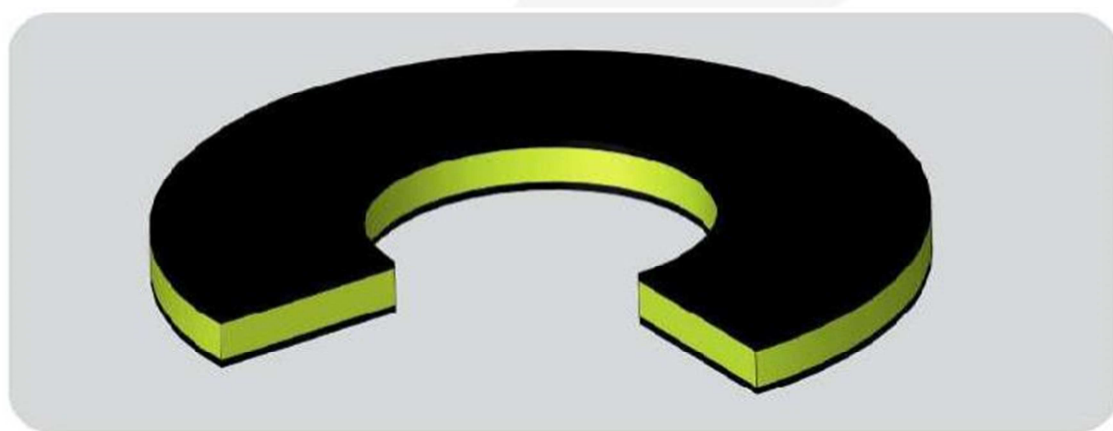
## TGCDVCS SEALING GASKETS

TGCDVCS Sealing gasket is special designed for flange sealing and insulating in all critical services. It is suitable for raise-face, flat-face and RTJ flanges in all pressure classes even API 15.000 psi service. The TGCDVCS Sealing gasket has been use in all over the world because of the superior sealing characteristics and excellent dielectric properties.

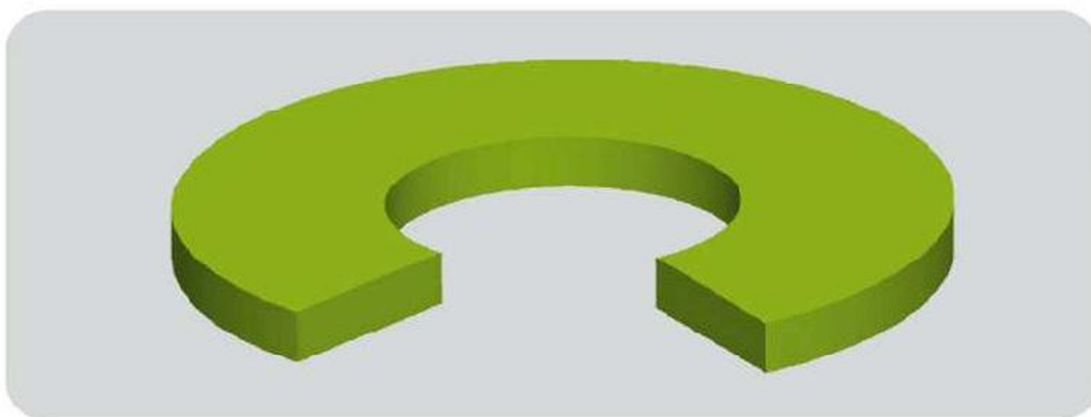


The Gasket material incorporates high-strength, glass-reinforced epoxy laminated bonded to a stainless steel core. This provides the strength of a traditional metallic gasket while maintaining complete electrical insulation between the flange faces. Seal grooves are machined through the laminate insulating material and into the stainless steel core which provides a strong base for the seal to seat into and breaks the potential leak path that is inherent in glass laminate materials. Spring-energized PTFE internal face seals are installed in the dovetail shape seal grooves to provide the reliable sealing.

**Neoprene Faced Phenolic Gaskets** Neoprene faced phenolic gaskets have long been used as a standard insulating gasket in the gas and oil industries because the soft neoprene rubber provides good sealing qualities. In these gaskets, neoprene sheets are factory bonded to both sides of a laminate phenolic sheet to give a good sealing qualities and high electrical resistance. The temperature imitation of these gaskets is approximately + 90° C (194° F)



**Solid Plain Gaskets** Solid plain gaskets are used in special applications, materials such as plain phenolic, PTFE, reinforced PTFE are available for your options.



## TGCDVCS – OP SEALING GASKET

TGCDVCS – OP is a one-piece isolating and sealing orifice plate design for pipeline flow restriction. TGCDVCS-OP incorporates spring-energized PTFE radial face seals or elastomeric O-ring seals which are completely encapsulated in a composite seal retainer which makes the orifice plate one-piece and simple to install. This eliminates the need for conventional orifice plates, plate holders and separate gaskets. This orifice plate design substantially reduces residual flange/bolt stress in orifice flanges and improves overall sealing performance under even the most extreme operating conditions in all hydrocarbon production, injection and process applications.



### Advantages:

- One-piece, self-contained plate and seal design (replaces and retrofits conventional plate and ring-joint plate holder designs)
- Available for orifice fitting and orifice flanges
- Flow restriction orifice plates available with any beta orifice size
- Integrated spring-energized radial face seals insure high integrity, maintenance free, pressure-energized sealing
- Integrates composite seal retainer mitigates galvanic corrosion in dissimilar metal fittings and flanges
- Protects flanges from media induced corrosion and flow-induced erosion in orifice flanges
- Decreases flange, bolt makeup stress on orifice flanges
- Increases flange pressure sealing capabilities in Orifice flanges
- Increases flange, bolt external (bending and tension) load bearing capabilities in orifice flanges
- Easy installation and removal
- Reusable orifice plate/seal retainer and seals

### Application:

- Hydrocarbon production
- Hydrocarbon injection
- Hydrocarbon processing

### Supply specification:

TGCDVCS-OP comprised of all alloy steel plate bonded to a G-10 fiber glass reinforced laminate. The orifice plate will be either .260" thick or .308" thick. The sealing surface will contain a precision tapered groove to accommodate the controlled compression of a PTFE spring energized seal. Sealing element placement shall accommodate either flat, raised or RTJ face flanges. The PTFE seal shall be spring and pressure energized. The G-10 retainer shall have 800 volts/mil dielectric strength and a minimum 65.000 psi compressive strength.

### GASKET MATERIAL

	Plain phenolic	Neoprene faced phenolic	Reinforced PTFE	G7 Silicone glass	G10 Epoxy/Glass	G11 Epoxy/Glass
Dielectric strength Volts/Mil	500	500	350	350	550	550
Compressive strength psi	25000	25000	2300	40000	50000	50000
Water absorption %	1.6	1.6	0.01	0.07	0.1	0.1
Tensile strength psi	20000	20000	1450	25000	45000	43000
Operating t° F	-65 to +220	-65 to +175	-320 to 450	-320 to +450	-320 to +280	-320 to +349
Operating t° C	-54 to +104	-54 to +79	-196 to +260	-196 to +232	-196 to +232	-196 to 176

### SEALING ELEMENT MATERIAL

	Nitrile	Viton	PTFE	Neoprene	EPDM
Operating t° F	-40 to +250	-20 to +350	-320 (-20) to +450 (+350)	-40 to +250	-40 to +250
Operating t° C	-40 to +121	-29 to +177	-196 (-29) to +232 (+177)	-40 to +121	-40 to +121

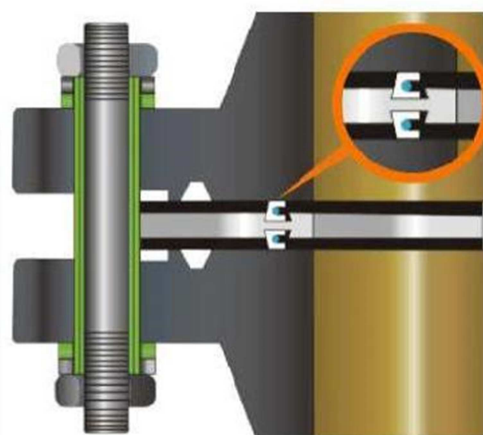
## STAINLESS STEEL CORE:

The standard stainless steel core is 316. Special materials such as duplex stainless steel, Inconel stainless steel can be made according the requirements.

Glass-reinforced epoxy:

The standard glass-reinforced epoxy material is G10. G10 is available when the temperature requirement is higher.

	G10 Bonded	G11 Bonded
Dielectric strength Volts/Mil	550	550
Compressive strength psi	50000	50000
Water absorption %	0.05	0.085
Flexural strength psi	65000	60000
Tensile strength psi	50000	45000
Operating t° F	-65 to +280	-50 to +349
Operating t° C	-54 to +138	-45 to -176



After Tightening

## SEALING MATERIAL

The standard sealing material is Spring-energized PTFE which suitable for most of working conditions. Meanwhile, the other material like Viton is also available.

	Nitrile	Viton	PTFE
Operating t° F	-40 to +250	-20 to +350	-320 to 450
Operating t° C	-40 to +121	-29 to +177	-196 to +232

## ADVANTAGES AND BENEFITS

- ✓ Extreme high-reliability sealing and insulating solutions for all critical services
- ✓ Seals and insulates at all pressures classed including API 15000 psi services
- ✓ Withstands severe service conditions including large bending moments, vibration, temperature and pressure cycling.
- ✓ Designed to withstand corrosive environments including high concentration of CO<sub>2</sub>, H<sub>2</sub>S, produced water, etc.
- ✓ Outstanding insulation properties for cathodic protection.
- ✓ Pressure – activated seals provide high confidence sealing and eliminate costly leaks
- ✓ Gasket is sized to the bore to protect flange faces from media-induced corrosion and flow-induced erosion
- ✓ Prevents turbulent flow at flanged conditions
- ✓ Mitigates galvanic corrosion in dissimilar metal flanges
- ✓ Available to match any flanges specification (ANSI, API, MSSP, BS, DIN, AS, others)
- ✓ Can mate mismatched RTJ with raised-face flanges
- ✓ Easy installation and removal

## INSULATING SLEEVES

Insulating sleeves are available in the following material:

- ✓ Phenolic
- ✓ Mylar
- ✓ G7 Silicon Glass
- ✓ G10 Epoxy Glass
- ✓ G11 Epoxy Glass

Sleeves easily fit over standard size flange bolts within standard size bolt holes. They are available for standard American bolts size, custom size can be made. Also available are one piece integral sleeves and washers with providing superior compression strength. Integral sleeves available sizes through 1-1/2".



	Mylar	Nomex	G7 Silicone glass	G10 Silicone glass	G11 Epoxy glass
Dielectric strength Volts/Mil	4000	400	350	400	400
Water absorption %	0.8	N/A	0.1	0.1	0.1
Operating t° F	-79 to +300	-65 to +450	-320 to +450	-320 to +280	-320 to +349
Operating t° C	-59 to +149	-54 to +232	-196 to +232	-196 to +138	-196 to +176

## INSULATING & STEEL WASHERS

Insulating washers are available in the following materials:

- ✓ Phenolic
- ✓ G7 silicon glass
- ✓ G10 Epoxy glass
- ✓ G11 Epoxy glass

Standard thickness is 1/8". Insulating washers are fit insulating sleeves in full range of bolts sizes.

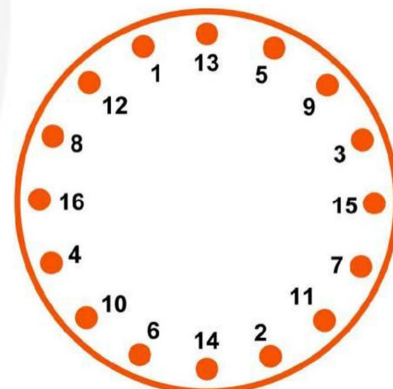


	Plain phenolic	G7 Silicone glass	G10 Epoxy glass	G11 Epoxy glass
Dielectric strength Volts/Mil	500	350	550	550
Compressive strength psi	25000	40000	50000	50000
Water absorption %	1.6	0.07	0.1	0.1
Tensile strength psi	20000	25000	45000	43000
Operating tº F	-65 to +220	-320 to +450	-320 to +280	-320 to +349
Operating tº C	-54 to +232	-196 to 232	-196 to +138	-196 to +176

## HOW TO ORDER

When ordering a complete insulation kit, the following must be specified:

- ✓ Flange specification (ANSI/ASME, API, MSS, BSI or DIN standard)
- ✓ Nominal pipe size, pressure rating and bore size
- ✓ Operating pressure, temperature and media
- ✓ Gasket type and design
- ✓ Required gasket material
- ✓ Required seal material
- ✓ Insulation sleeve material and length is a custom size
- ✓ Insulation washer material



## INSTALLATION

1. Open box and check all the parts available.
2. Check the joint faces are clean and free from indentations and scoring, the joint surface finish should be between 3.2  $\mu\text{m}$  to 6.3  $\mu\text{m}$ .
3. Align the flanges, ensure that the flanges are coaxial. Insert the gasket parallel and carefully. Do not use jointing compounds, grease or lubricants with our gasket materials. These compounds can affect the friction between the gasket and the flange and can lead to premature joint failure.
4. Bolting. Apply bolt lubricant to the bolt and nut threads and to the face of the nut to be tightened, assemble the steel washer, insulation washer and insulation sleeve to the bolts by hand (make sure the steel washer is always close to the nut) and insert into the bolt holes, put insulation washer, steel washer and nut on the other side of bolts.
5. Tighten all the bolts until the flange meets the gasket.
6. Check the distance between flanges to make sure they are parallel.
7. Tighten to 30% of the suggested load.
8. Tighten to 60% of the suggested load.
9. Tighten to full suggested load. (Too much load will damage the gasket)