

## Insulation Set(Isolation Kit) Products

Item	Insulation Material		Insulation Gasket (JIC Code / Material)	Max. Temp. (°C)	Insulation Resistance (Ω)
	Sleeve	Washer		Pressure Class (lb)	
General	<input type="checkbox"/> PTFE <input type="checkbox"/> Epoxy <input type="checkbox"/> Phenolic	<input type="checkbox"/> Epoxy <input type="checkbox"/> Phenolic	<b>JIC 8305</b> PTFE Solid Gasket	-100 ~ 100	Over 2.0 × 10 <sup>13</sup>
			<b>JIC 8305G</b> Reinforced PTFE Gasket	150	
			<b>JIC 9020-CP</b> Neoprene Faced Phenolic Gasket	-200 ~ 200	1.3 × 10 <sup>11</sup>
			<b>JIC 9210-ER</b> <b>STARTEC™</b> Gasket (Glass Reinforced Epoxy Plate Gasket with Rubber O-Ring)	300	
			<b>JIC 9220-PR</b> <b>STARTEC™</b> Gasket (Reinforced Phenolic Plate Gasket with Rubber O-Ring)	-30 ~ 120	CR 1.6 × 10 <sup>7</sup>
			<b>JIC 9230-ES</b> <b>STARTEC™</b> Gasket (Glass Reinforced Epoxy Plate Gasket with Rubber O-Ring) EQ : PIKOTEK PGE TYPE	150	
High Pressure	<input type="checkbox"/> Mica <input type="checkbox"/> PTFE <input type="checkbox"/> Epoxy <input type="checkbox"/> Phenolic	<input type="checkbox"/> Mica <input type="checkbox"/> Epoxy <input type="checkbox"/> Phenolic	<b>JIC 9310-OS</b> <b>STARTEC™</b> Gasket (Epoxy Faced Metal Plate with Rubber O-Ring) EQ : PIKOTEK VCS TYPE	-40 ~150	EPDM 2.0 × 10 <sup>13</sup>
			<b>JIC 9320-OS</b> <b>STARTEC™</b> Gasket (Epoxy Faced Metal Plate with PTFE Seal) EQ : PIKOTEK VCS Type	600	
			<b>JIC 9310-OS</b> <b>STARTEC™</b> Gasket (Epoxy Faced Metal Plate with Rubber O-Ring) EQ : PIKOTEK VCS TYPE	-40 ~150	R U B B E R  VITON 9.7 × 10 <sup>9</sup>
			<b>JIC 9320-OS</b> <b>STARTEC™</b> Gasket (Epoxy Faced Metal Plate with PTFE Seal) EQ : PIKOTEK VCS Type	600	
High Temp &Pressure	<input type="checkbox"/> Mica	<input type="checkbox"/> Mica	<b>JIC 3850-SE(HT)</b> KAMMPROFILE Gasket with <b>STARPITE®</b>	-60 ~150	NBR 1.3 × 10 <sup>11</sup>
			<b>JIC 3850-SE(HT)</b> KAMMPROFILE Gasket with <b>STARPITE®</b>	600	

\* Without Flange application for line application purpose, please contact our Tech team first.  
\* PTFE material does not recommendable by creep to FR Type Gasket / Washer.



Technology for a better human life  
Seeking to Harmonize Industry and the Environment

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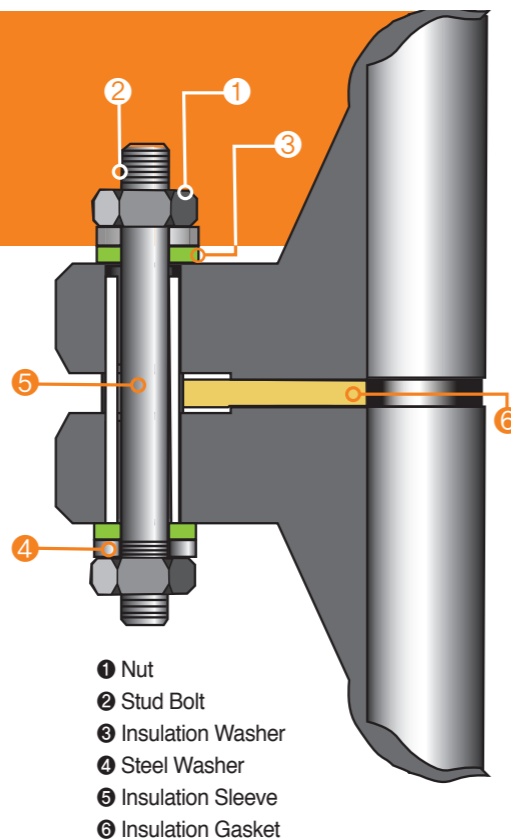
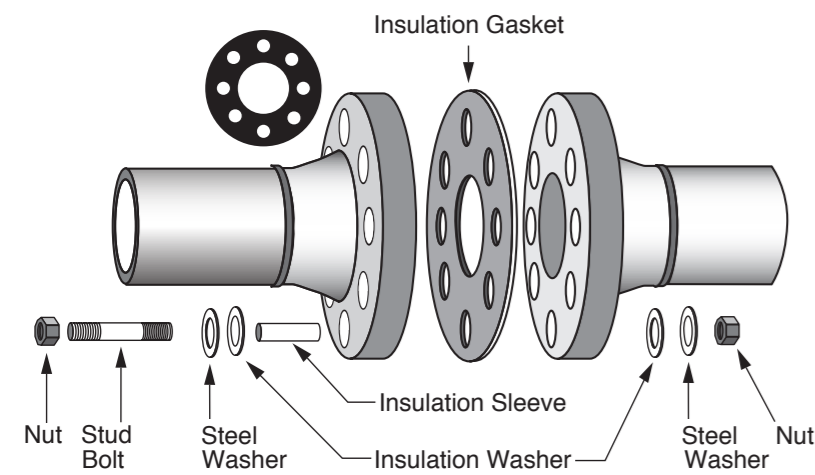
**JIC 7700-R** TYPE 'R' - Raised Face

**JIC 7700-F** TYPE 'F' - Full Face

**JIC 7700-RJ** TYPE 'RJ' - R.T.J

Insulation sets are used for pipeline flange corrosion protection and for complete electrical insulation protection where a seal is required between dissimilar flange materials. There are three standard styles available to suit raised face, full face and ring grooved flanges.

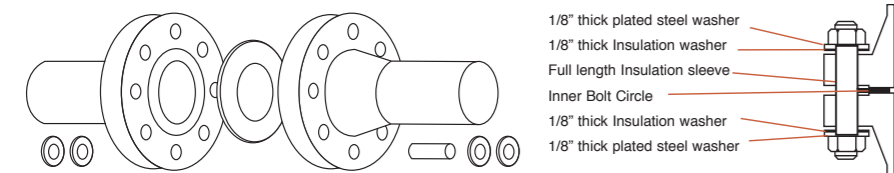
지하배관과 지상배관 사이의 전기적 보호를 위하여 사용하는 제품. 지하배관을 통하여 지상으로 유입되는 전류를 차단하여 쇼크로 인한 인명 피해를 방지하며, 전위차로 인한 지하매설물 및 이종재질로 연결된 배관의 전기적 이온부식을 방지함.



- 1 Nut
- 2 Stud Bolt
- 3 Insulation Washer
- 4 Steel Washer
- 5 Insulation Sleeve
- 6 Insulation Gasket

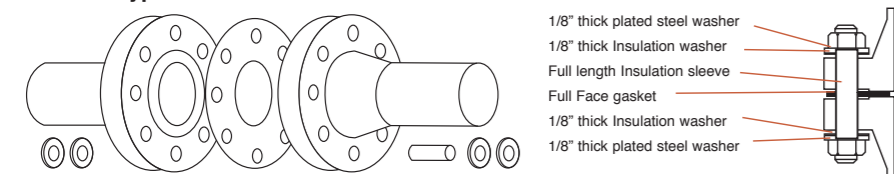
**[Standard Styles of Insulation Sets]**

**Raised Face Type**



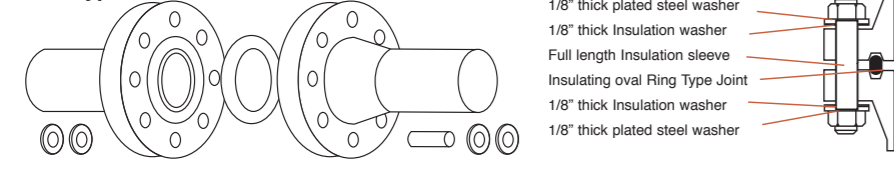
- 1/8" thick plated steel washer
- 1/8" thick Insulation washer
- Full length Insulation sleeve
- Inner Bolt Circle
- 1/8" thick Insulation washer
- 1/8" thick plated steel washer

**Full Face Type**



- 1/8" thick plated steel washer
- 1/8" thick Insulation washer
- Full length Insulation sleeve
- Full Face gasket
- 1/8" thick Insulation washer
- 1/8" thick plated steel washer

**R.T.J Type**



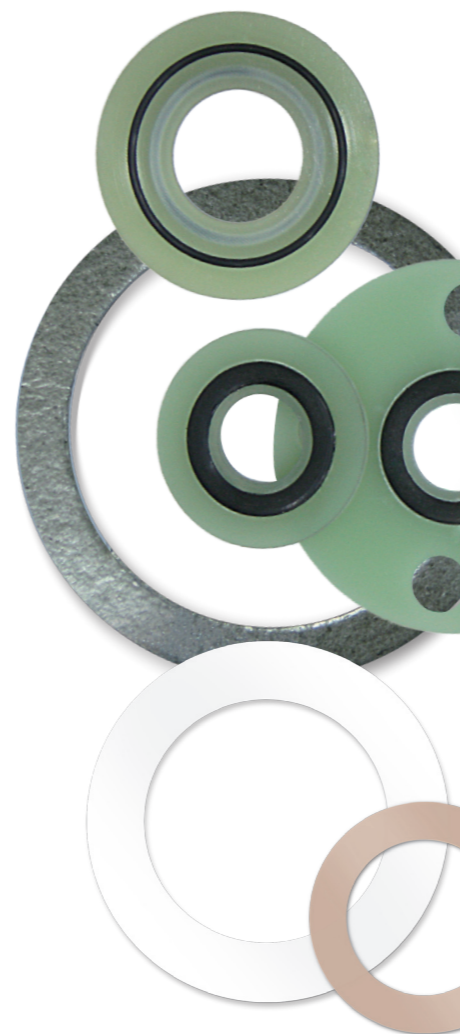
- 1/8" thick plated steel washer
- 1/8" thick Insulation washer
- Full length Insulation sleeve
- Insulating oval Ring Type Joint
- 1/8" thick Insulation washer
- 1/8" thick plated steel washer

Insulation Gasket (JIC Code/Material)	Max. Temp. (°C)		Insulation Resistance (Ω)
	Pressure Class (lb)		
PTFE Solid Gasket <b>JIC 8305</b>	-100 ~ 100		Over 2.0 × 10 <sup>13</sup>
	150		
Reinforced PTFE Gasket <b>JIC 8305G</b>	-200 ~ 200		1.3 × 10 <sup>11</sup>
	300		
Neoprene Faced Phenolic Gasket <b>JIC 9020-CP</b>	-30 ~ 120		CR 1.6 × 10 <sup>7</sup>
	150		
STARTEC™ Gasket (Glass Reinforced Epoxy Plate Gasket with Rubber O-Ring) <b>JIC 9210-ER</b>	-40 ~150		EPDM 2.0 × 10 <sup>13</sup>
	600		
STARTEC™ Gasket (Reinforced Phenolic Plate Gasket with Rubber O-Ring) <b>JIC 9220-PR</b>	-40 ~150		RUBBER VITON 9.7 × 10 <sup>9</sup>
	600		
STARTEC™ Gasket (Glass Reinforced Epoxy Plate Gasket with Rubber O-Ring) EQ : PIKOTEK PGE TYPE <b>JIC 9230-ES</b>	-60 ~150		NBR 1.3 × 10 <sup>11</sup>
	600		
STARTEC™ Gasket (Epoxy Faced Metal Plate with Rubber O-Ring) EQ : PIKOTEK VCS TYPE <b>JIC 9310-OS</b>	150		-
	1500		
STARTEC™ Gasket (Epoxy Faced Metal Plate with PTFE Seal) EQ : PIKOTEK VCS Type <b>JIC 9320-OS</b>	150		Over 2.0 × 10 <sup>13</sup>
	2500		
KAMMPROFILE Gasket with STARPITE® <b>JIC 3850-SE(HT)</b>	1000		9.9 × 10 <sup>10</sup>
	2500		

\* Without Flange application for line application purpose, please contact our Tech team first.  
\* PTFE material does not recommendable by creep to FR Type Gasket / Washer.

**Bolt / Nut / Sleeve / Washer**

	Insulation Resistance (Ω)	Max. Temp. (°C)	Thickness
Insulation Sleeve	Glass Reinforced EPOXY	Over 2.0 × 10 <sup>13</sup>	150
	Phenolic	2.2 × 10 <sup>8</sup>	180
	PTFE	Over 2.0 × 10 <sup>13</sup>	100
	Mica	9.9 × 10 <sup>10</sup>	1000
Insulation Washer	Glass Reinforced EPOXY	Over 2.0 × 10 <sup>13</sup>	150
	Phenolic	2.2 × 10 <sup>8</sup>	180
Steel Washer	Mica	9.9 × 10 <sup>10</sup>	1000
	Carbon Steel	N / A	N / A
Nut (Heavy Hex Nut)	Stainless Steel	N / A	N / A
	A194 Gr.2H (ASTM)	N / A	N / A
Bolt (Stud Bolt)	A194 Gr.8 (ASTM)	N / A	N / A
	A194 Gr.8M (ASTM)	N / A	N / A
	A193 Gr.B7 (ASTM)	N / A	N / A
	A193 Gr.B8 (ASTM)	N / A	N / A
	A193 Gr.B8M (ASTM)	N / A	N / A



\* Insulation Resistance(Ω) ASTM D257-07 : Usage Voltage : 1000V, Capacity of Tester : 2.0 × 1013 Ω  
\* Gasket type confirmed by customer.  
\* For Specific size & application recommendations consult JEIL.  
\* PTFE Gasket : Not suitable for FR type.

\* Insulation Resistance(Ω) ASTM D257-07: Usage Voltage: 1000V, Capacity of Tester : 2.0 × 10<sup>13</sup> Ω  
\* Steel Washer, Nut, Bolt : Special Material can be available as customer's requirements.

**Insulation Set (Isolation Kit) 장착 절차 및 주의 사항**

**1. Tools required**

Specific tools are required for cleaning and tensioning the fasteners. Additionally, always use standard safety equipment and follow good safety practices.

- a. Calibrated torque wrench, hydraulic or other tensioner
- b. Wire brush (brass if possible)
- c. Helmet, Safety goggles, Lubricant
- d. Other plant-specified equipment

**1. 장착도구**

Fastener 의 Cleaning 및 조임, 풀림을 위하여 특별한 도구가 필요하다. 항상 규격 안전 장비를 사용하고 안전 규칙을 준수하여야 한다.

- a. 검교정된 토크렌치 및 유압 혹은 기타 Tensioner
- b. 와이어 브러시 (가능하면 동/구리제품)
- c. 헬멧, 보안경, 윤활제
- d. 기타 공장에서 지정한 장비

**2. Cleaning**

Remove all foreign material and debris from

**2. 청소**

이물질 및 잔해물을 제거 한다.

**3. Examine**

- a. Examine fasteners (bolts or studs), Nuts and washers for defects such as burrs or cracks. Check insulating washers and insulating sleeves are torn or cracked.
- b. Examine flange surfaces for warping, radial scores, heavy tool marks, or anything prohibiting proper gasket seating. Make sure the gaskets are isolation gaskets.
- c. Replace components if found to be defective. If in doubt, seek advice.

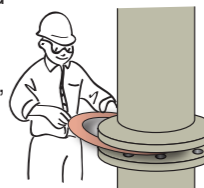
**3. 검사**

- a. Fastener (볼트 혹은 스톨드), 너트 및 와셔 등의 거친 부분 및 금이 간 부분 같은 결함여부를 검사한다. 절연기능이 필요할 시 절연와셔와 절연슬리브가 찢어진 부분, 갈라진 부분이 있는지 결함여부를 검사한다.
- b. 플랜지 표면에 적절한 가스킷 정착을 방해하는 뒤틀림, radial 혹은 중기 자국이 있는지 검사한다. 가스킷이 절연기능이 있는 가스킷인지 확인한다.
- c. 결함부분이 발견되면 부품을 바꾼다. 의심 나는 점이 있으면 상의토록 한다.

**4. Install Gasket**

- a. Ensure gasket is the specified size and material.
- b. Examine the gasket to ensure it is free of defects.
- c. Carefully insert the gasket between the flanges.
- d. Make sure the gasket is centered between the flanges.
- e. Bring flanges together, ensuring the insulation materials (insulation sleeves, washers & gaskets) aren't pinched or damaged.

- f. Put insulation sleeves on the bolts and insert insulation washers and steel washers.



**1. 가스킷 장착**

- a. 가스킷이 지정된 사이즈와 재료로 제작되었는지 확인한다.
- b. 가스킷의 결함 여부를 확인한다.
- c. 플랜지 사이에 가스킷을 조심스럽게 끼운다.
- d. 가스킷이 플랜지 센터 부분에 위치했는지 확인한다.
- e. 절연체(절연 슬리브, 와셔와 가스킷)가 잘못 끼워지거나 손상되지 않도록 확인하면서 장착한다.
- f. 볼트에 절연 슬리브를 장착하고 반드시 절연 와셔를 스틸 와셔 안쪽에 장착한다.

**5. Install and tighten fasteners**

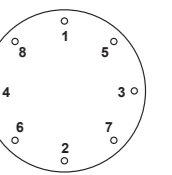
**a. Always use proper tools**

Calibrated torque wrench or other controlled tensioning device

**b. Consult your gasket manufacturer**

for guidance on torque specifications

**c. Always torque in a cross bolt tightening pattern.**



**5. 결속용구 장착과 조임**

a. 항상 적절한 기구를 사용한다.

b. 토크 지침 안내에 관해서는 가스킷 제조업체와 상의한다.

c. 볼트 조임시 항상 대각선 방향 순서로 한다.

**6. Tighten the nuts in multiple steps**

**Step 1.** Tighten all nuts initially by hand (Larger bolts may require a small hand wrench)

**Step 2.** Torque each nut to ~30% of full torque

**Step 3.** Torque each nut to ~60% of full torque

**Step 4.** Torque each nut full torque, again still using the cross bolt tightening pattern (larger diameter flanges may require additional tightening passes)

**Step 5.** Apply at least one final torque to all nuts in a clockwise direction until all torque is uniform (Larger diameter flanges may require additional passes)

**3. 다단계 너트 조임**

1단계. 모든 너트를 처음에는 손으로 조인다. (큰 볼트는 작은 핸드렌치를 사용할 수 있다.)

2단계. 30%까지 각 너트를 조인다.

3단계. 60%까지 각 너트를 조인다.

4단계. 대각선 순서로 완전히 너트를 조인다. (대구경 플랜지는 추가로 조임을 준다.)

5단계. 모든 토크가 균일하게 될 때까지 시계방향으로 볼트를 최종적으로 조인다.



**7. Re-Tightening**

**A. Caution**

Consult yours gasket manufacture for guidance and recommendations re-tightening.

**B-1. Do Not**

Re-torque elatomer-based, non-asbestos gaskets after they have been exposed to elevated temperature unless otherwise specified.

**B-2. Re-torque fasteners exposed to agressive thermal cycling.**

**B-3. All re-torquing should be performed at ambient temperature and atmospheic pressure.**

**4. 재조임**

A. 주의 - 재조임에 관한 안내 및 주의사항에 관해서는 가스킷 제조업체와 상의한다.

B-1. 달리 규정되어 있지 않으면 상승된 온도에 노출된 후에는 고무가 함유된 비석면 가스킷은 재조임을 하지 않는다.

B-2. 심각한 열변화에 노출된 조임부분은 재조임을 한다.

B-3. 모든 재조임은 대기온도 및 대기압에서 이루어져야 한다.

**8. Notes on use**

Install a protective cover on insulation sets to prevent exposure on rainy days.

Note : Pay attention Insulation set of Mica material in particular.

**8. 사용시 주의 사항**

절연세트의 장착후 보호커버를 설치하여 우천에 노출되지 않도록 한다. Mica Sleeve, Washer, Gasket의 경우는 특히 주의를 요한다.