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

* 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**

<table>
<thead>
<tr>
<th>Insulation Resistance (Ω)</th>
<th>Max. Temp. (℃)</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation Sleeve</td>
<td></td>
<td>0.8T ~ 1.0T</td>
</tr>
<tr>
<td>Glass Reinforced EPOXY</td>
<td>Over 2.0 × 10^{13}</td>
<td>150</td>
</tr>
<tr>
<td>Phenolic</td>
<td>2.2 × 10^{4}</td>
<td>180</td>
</tr>
<tr>
<td>PTFE</td>
<td>Over 2.0 × 10^{13}</td>
<td>100</td>
</tr>
<tr>
<td>Mica</td>
<td>9.9 × 10^{10}</td>
<td>1000</td>
</tr>
<tr>
<td>Insulation Washer</td>
<td></td>
<td>3.0T</td>
</tr>
<tr>
<td>Glass Reinforced EPOXY</td>
<td>Over 2.0 × 10^{13}</td>
<td>150</td>
</tr>
<tr>
<td>Phenolic</td>
<td>2.2 × 10^{4}</td>
<td>180</td>
</tr>
<tr>
<td>Mica</td>
<td>9.9 × 10^{10}</td>
<td>1000</td>
</tr>
<tr>
<td>Steel Washer</td>
<td></td>
<td>3.0T ~ 5.0T</td>
</tr>
<tr>
<td>Carbon Steel</td>
<td>N / A</td>
<td>N / A</td>
</tr>
<tr>
<td>Stainless Steel</td>
<td>N / A</td>
<td>N / A</td>
</tr>
<tr>
<td>Nut (Heavy Hex Nut)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A194 Gr.2H (ASTM)</td>
<td>N / A</td>
<td>-</td>
</tr>
<tr>
<td>A194 Gr.8 (ASTM)</td>
<td>N / A</td>
<td>-</td>
</tr>
<tr>
<td>A194 Gr.8M (ASTM)</td>
<td>N / A</td>
<td>-</td>
</tr>
<tr>
<td>Bolt (Stud Bolt)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A193 Gr.7B (ASTM)</td>
<td>N / A</td>
<td>-</td>
</tr>
<tr>
<td>A193 Gr.B8 (ASTM)</td>
<td>N / A</td>
<td>-</td>
</tr>
<tr>
<td>A193 Gr.B8M (ASTM)</td>
<td>N / A</td>
<td>-</td>
</tr>
</tbody>
</table>

* Insulation Resistance(Ω) ASTM D257-07: Usage Voltage : 1000V, Capacity of Tester : 2.0 × 10^{13} Ω.
* Gasket type confirmed by customer.
* For Specific size & application recommendations consult JEIL.
* PTFE Gasket : Not suitable for FR type.
## Insulation Set (Isolation Kit) Products

<table>
<thead>
<tr>
<th>Item</th>
<th>Insulation Material</th>
<th>Insulation Gasket (JIC Code / Material)</th>
<th>Max. Temp. (℃)</th>
<th>Insulation Resistance (Ω)</th>
<th>Pressure Class (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>□ PTFE □ Epoxy □ Phenolic</td>
<td>□ PTFE Solid Gasket</td>
<td>-100 ~ 100</td>
<td></td>
<td>Over 2.0 × 10^13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JIC 8305G Reinforced PTFE Gasket</td>
<td>-200 ~ 200</td>
<td>1.3 × 10^11</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JIC 9020-CP Neoprene Faced Phenolic Gasket</td>
<td>-30 ~ 120</td>
<td></td>
<td>CR 1.6 × 10^7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JIC 9210-ER STARTEC™ Gasket (Glass Reinforced Epoxy Plate Gasket with Rubber O-Ring)</td>
<td>-40 ~ 150</td>
<td></td>
<td>EPDM 2.0 × 10^13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JIC 9220-PR STARTEC™ Gasket (Reinforced Phenolic Plate Gasket with Rubber O-Ring)</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>JIC 9230-ES STARTEC™ Gasket (Glass Reinforced Epoxy Plate Gasket with Rubber O-Ring)</td>
<td>-60 ~ 150</td>
<td></td>
<td>NBR 1.3 × 10^7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EQ : PIKOTEK PGE TYPE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Pressure</td>
<td>□ Mica □ PTFE □ Epoxy □ Phenolic</td>
<td>□ Mica □ PTFE Solid Gasket</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>JIC 9310-OS STARTEC™ Gasket (Epoxy Faced Metal Plate with Rubber O-Ring) EQ : PIKOTEK VCS TYPE</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>JIC 9320-OS STARTEC™ Gasket (Epoxy Faced Metal Plate with PTFE Seal) EQ : PIKOTEK VCS Type</td>
<td>150</td>
<td>Over 2.0 × 10^13</td>
<td></td>
</tr>
<tr>
<td>High Temp &amp; Pressure</td>
<td>□ Mica □ Mica</td>
<td>□ Mica □ Mica □ PTFE Solid Gasket with STARPITE®</td>
<td>1000</td>
<td></td>
<td>9.9 × 10^10</td>
</tr>
</tbody>
</table>

* 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.
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

2. Cleaning
Remove all foreign material and debris from

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.
c. Replace components if found to be defective. If in doubt, seek advice.

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 gaskets are isolation gaskets.
e. Replace components if found to be defective. If in doubt, seek advice.

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.

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)

7. Re-Tightening

A. Caution
   Consult yours gasket manufacture for guidance and recommendations re-tightening.
B-1. Do Not
   Re-torque elastomer-based, non-asbestos gaskets after they have been exposed to elevated temperature unless otherwise specified.
B-2. Re-torque fasteners exposed to aggressive thermal cycling.
B-3. All re-torquing should be performed at ambient temperature and atmospheric pressure.

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.
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Seeking to Harmonize Industry and the Environment

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