**Clamp gaskets**

Kalrez® is the ultimate choice. This material combines exceptional properties such as thermal and chemical resistance, with excellent sealing properties. More information about this material can be found further in this documentation.

Bio-Pro® is a re-enforced PTFE-gasket, maintaining the good chemical resistance with very low cold flow. This execution is a very competitive alternative to the widely spread envelope gaskets.

Tuf-Flex®: Tuf-flex® is the world’s only unitized gasket, setting new standards for purity, performance and flexibility. A Tuf-Flex® Gasket’s contact surface is a layer of PTFE unitezed to an EPDM rubber inner core. This totally bounded construction provides a PTFE gasket with the mechanical characteristics, including memory, of an elastomer gasket. Designed to meet critical requirements in biopharmaceutical, ultra-pure water, WFI (water for injection) and difficult food and beverage processing. Tuf-Flex outperforms other gaskets while eliminating costly process interruptions. Achieve higher performance under SIP/CIP conditions.

Tuf-Steel® is a rubber based gasket (EPDM) with a PTFE-liner on the inside of the gasket. Problems with misalignments can easily be solved by using this type of gasket.

Tuf-Steel® is the material of choice if the application involves wide temperature variations, exceptional chemical resistance (such as hydrocarbons, ethanol, ketones, etc.). Outstanding service life.

Tuf-Steel® is a 50-50 blend of PTFE and stainless steel, thus providing excellent mechanical properties beside the general chemical resistance. Due to the mechanical resistance, this material is recommended for hose couplings.

Teflon® (PTFE) is the material of choice except if the application requires wide temperature variations (leakage will develop).

Silicone (platinum cured) has a wide temperature compatibility range and good resistance to chemicals.

Viton® is a good choice, however, service life must be considered and monitored.

EPDM can be used in most applications due to temperature limitations.

Buna-N can be used in most applications due to low temperature thermal limits but does not pass U.S. Pharmacopeia class VI-XXII Certification and Cytotoxicity.
Summary materials for Triclover gaskets

This table indicates general preferences. Unique applications may require further considerations and analysis. When selecting gasket materials it is important to consider many factors: resistance to heat, resistance to SIP, resistance to chemicals like: hydrocarbons, ethanol, ketones, etc, tear strength and flexibility.

The service life of a material depends on the application. Many of the materials are acceptable if the expected service life is very short in duration, however, in extended exposure situations the material can degrade quickly rendering it ineffective or less desirable overall.

This analysis was intended for sanitary gasket applications specifically. Sanitary gasket applications are inherently static and can be dynamic. When different performance attributes are a consideration in dynamic applications, Tuf-Steel® may be the material of choice.

<table>
<thead>
<tr>
<th>Gasket Type</th>
<th>Contin. Steam</th>
<th>Inter-mittent Steam</th>
<th>Pure Water Ambient</th>
<th>Pure Water Hot</th>
<th>Process Fluids Ambient</th>
<th>Process Fluids Hot</th>
<th>Process Fluids Variable</th>
<th>Colour</th>
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<tbody>
<tr>
<td>Kalrez</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Black or white</td>
</tr>
<tr>
<td>Bio-Pro</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>Light blue</td>
</tr>
<tr>
<td>Tuf-Flex®</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>Black</td>
</tr>
<tr>
<td>Tuf-Steel®</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Bronze *</td>
</tr>
<tr>
<td>Teflon®</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>White *</td>
</tr>
<tr>
<td>Silicone (platinum)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>Translucent *</td>
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<tr>
<td>Viton®</td>
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<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
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<tr>
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<td>4</td>
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<td>4</td>
<td>4</td>
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<tr>
<td>Buna-N</td>
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<td>0</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>Black or white</td>
</tr>
</tbody>
</table>

* = No pigmentation

© Tef-Steel is a registered trademark of Rubber Fab Mold & Gasket
© Teflon is a registered trademark of E.I. Dupont
© Viton is a registered trademark of E.I. Dupont
### Tri-clover gaskets dimensional list

- **Tri-clover gaskets; flanged execution; qualities approved according FDA 177.2600 / 177.1550 / USP class VI**

<table>
<thead>
<tr>
<th>DIN</th>
<th>ISO</th>
<th>Imperial ***</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>65 (x)</td>
<td>2852</td>
<td>Standard</td>
<td>(mm) Flange(A) Groove diam.(C) Inside diam. (B) Flange(A) Groove diam.(C) Inside diam. (B)</td>
</tr>
<tr>
<td>10 (x)</td>
<td>32676</td>
<td>Sch 5</td>
<td>34,00 27,50 10,2 1,34 1,08 0,40</td>
</tr>
<tr>
<td>15 (x)</td>
<td>34,00 27,50 16,2 1,34 1,08 0,64</td>
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<td></td>
</tr>
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<td>20 (x)</td>
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<td></td>
</tr>
<tr>
<td>1&quot; (x)</td>
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<td></td>
</tr>
<tr>
<td>25 (x)</td>
<td>50,50 43,50 23,10 1,99 1,71 0,91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32 (x)</td>
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<td></td>
</tr>
<tr>
<td>1 1/2&quot; (x)</td>
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</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>1 1/2&quot; (x)</td>
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<tr>
<td>2&quot; (x)</td>
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</tr>
<tr>
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</tr>
<tr>
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</tr>
<tr>
<td>3&quot; (x)</td>
<td>91,00 83,50 73,2 3,58 3,29 2,88</td>
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</tr>
<tr>
<td>3&quot; (x)</td>
<td>91,30 83,50 73,3 3,59 3,29 2,89</td>
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</tr>
<tr>
<td>3&quot; (x)</td>
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</tr>
<tr>
<td>80 (x)</td>
<td>106,00 97,00 81,2 4,17 3,82 3,20</td>
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</tr>
<tr>
<td>4&quot; (x)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; (x)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>100 (x)</td>
<td>130,00 122,40 110,5 5,12 4,82 4,35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>115</td>
<td>130,00 122,40 110,5 5,12 4,82 4,35</td>
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<td></td>
</tr>
<tr>
<td>5&quot; (x)</td>
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<tr>
<td>125 (x)</td>
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</tr>
<tr>
<td>6&quot; (x)</td>
<td>155,00 146,0 135,9 6,10 5,74 5,35</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>150 (x)</td>
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<td></td>
</tr>
<tr>
<td>8&quot; (x)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>6 5/8&quot; (x)</td>
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</tr>
<tr>
<td>8&quot; (x)</td>
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<td></td>
</tr>
<tr>
<td>200 (x)</td>
<td>233,50 225,00 200,2 9,19 8,86 7,88</td>
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<td></td>
</tr>
<tr>
<td>8 5/8&quot; (x)</td>
<td>233,50 225,00 214,1 9,19 8,86 8,43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10&quot; (x)</td>
<td>233,60 225,00 213,9 9,20 8,86 8,42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10&quot; (x)</td>
<td>267,20 258,00 246,5 10,52 10,16 9,70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12&quot; (x)</td>
<td>287,50 278,70 266,7 11,32 10,97 10,50</td>
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<td></td>
</tr>
<tr>
<td>12&quot; (x)</td>
<td>319,00 308,00 298 12,56 12,13 11,73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>338,50 329,00 315,8 13,33 12,95 12,43</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Triclover gaskets materials

1. **Bio-Pro®**
   - FDA 177.1550
   - USP class VI
   - Light blue

2. **Tuf-Flex®**
   - FDA 17.1550
   - USP class VI
   - Black

3. **Kalrez®**
   - in FDA 177.2600
   - USP VI-XXII
   - Black

4. **Tuf-Steel®**
   - in FDA 177.1550
   - USP VI-XXII
   - Brown

5. **PTFE**
   - in FDA 177.1550
   - USP VI-XXII
   - White
   - Envelopes
   - EPDM or Viton®

6. **PTFE**
   - in FDA 177.1550
   - USP VI-XXII
   - White
   - EPDM or Viton®

7. **PTFE**
   - in FDA 177.1550
   - USP VI-XXII
   - White-blue

8. **Viton®**
   - in FDA 177.2600
   - USP VI-XXII
   - Black
   - 3A sanitary
   - USDA standards

9. **Viton®**
   - in FDA 177.2600
   - White-black-green

10. **Silicone Platinium**
    - in FDA 177.2600
    - USP VI-XXII
    - Transparent-white
    - 3A sanitary
    - USDA standards

11. **Silicone Peroxide**
    - in FDA 177.2600
    - Transparent-white

12. **EPDM**
    - in FDA 177.2600
    - USP VI-XXII
    - 3A sanitary
    - USDA standards

13. **EPDM**
    - in FDA 177.2600
    - Black-white

14. **NBR**
    - in FDA 177.2600
    - Black-white
Bio-Pro®, the new modified PTFE-gasket for tri-clamp couplings

A unique alternative for the standard PTFE/envelope gaskets

As the process conditions in pharmaceutical installations are getting more and more severe (temperature - CIP - SIP - aseptic), the need of a universal applicable product is relevant.

Gylon® Blue (the basic material for the Bio-Pro® gaskets) is a perfect combination between virgin PTFE and glass based microspheres. Due to its inorganic microspheres, Gylon® Blue is highly compressible and can be used in a wide range of applications.

The mix of PTFE with microspheres permits Gylon® Blue to resist to a universal range of liquids, and combines a high temperature resistance with an exceptional good mechanical stability. Indeed, cold-flow, usually recognised as one of the major problems with virgin PTFE-gaskets, is completely eliminated when using a modified PTFE-gasket such as Gylon® Blue.

Gylon® Blue can be used in Low-Stress-applications, which means that this material can be used in plastic, glass as well as in stainless steel couplings.

Main properties:
- Temperature: -210 up to +260 °C
- Pressure: up to 55 bar
- Compressibility: 22 to 45%
- Recovery: 30%

Approvals:
- Gylon® Blue conforms to FDA specifications
- Gylon® Blue has recently been tested and proven to be according USP class IV regulations

Dimensions and prices:
Bio-Pro gaskets can be supplied in a different range of sizes and standards, such as DIN 32676 and ISO 2852.

<table>
<thead>
<tr>
<th>Size</th>
<th>DIN 32676</th>
<th>ISO 2852</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DN 15</td>
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<tr>
<td>DN 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DN 25</td>
<td>1&quot;</td>
<td></td>
</tr>
<tr>
<td>DN 32</td>
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</tr>
<tr>
<td>DN 40</td>
<td>1 1/2&quot;</td>
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</tr>
<tr>
<td>DN 50</td>
<td>2&quot;</td>
<td></td>
</tr>
<tr>
<td>DN 65</td>
<td>2 1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>DN 80</td>
<td>3&quot;</td>
<td></td>
</tr>
<tr>
<td>DN 100</td>
<td>4&quot;</td>
<td></td>
</tr>
</tbody>
</table>

We can also quote for standards, others than the one we mentioned above.
DuPont Dow Elastomers is answering that challenge with the development of new Kalrez® Sanitary Seal design, a combination of two optimum performance engineering materials - stainless steel and Kalrez®. Developed using Finite Element Analysis to simulate the range of temperatures a seal can see, this seal is designed with a metal retainer that controls compression of the seal and prevents its intrusion into process stream. The result is a prefabricated seal that provides the cleanliness of PTFE and the elastic memory of an elastomer while meeting stringent ASTM requirements for joints intended for clean-in-place (CIP) and steam-in-place (SIP) applications. The Kalrez® sealing element minimizes absorption, desorption and extractables to assure minimal contamination and a long sealing life.

**Kalrez® Seal**
- Perfluoroelastomer parts provide the ultimate sealing performance for maximum efficiency with FDA compliancy.
- Extractable levels comparable to PTFE.
- Resistant to high operating temperatures (up to 260°C).
- Compatible with most pharmaceutical process media, including CIP and SIP.
- Concave inside diameter forms flush face seal when compressed; prevents intrusion into process stream.

**Avoid These Common Coupling Problems by Specifying Kalrez® Sanitary Seals:**
- **Intrusion from overcompression:** Too much sealing pressure can cause some elastomer seals to intrude into the process stream, resulting in product contamination. Overcompression can also result in seal splitting and loss of joint integrity.
- **Joint leakage:** Cold flow (‘creep’) of PTFE and some elastomers can cause loss of sealing pressure over time, requiring frequent inspections and retightening.
- **Seal degradation:** Incompatibility with fluids in the process line can cause some sealing materials to swell, crack and degrade, resulting in joint failure and process contamination. High process temperatures or repeated temperature cycling can also deteriorate seals made of many materials.

**Sizes, Packaging and Availability**
Kalrez® Sanitary Seals will be made available in sizes to fit most standard process lines, supplied in individual bags and bar coded for full traceability. Seals for 1.5-in diameter piping are presently available for sampling. Other sizes will be made available soon.

**Stainless Steel Retaining Ring**
- Provided for controlled compression resulting in maximum seal life and reduced maintenance (eliminates the need to retorque).
- Rigid stainless steel ring helps maintain alignment during assembly.
**Special clamp products**

**Torque-Rite for Perfect Surface Gasket System**

**Torque-Rite**  
Presenting Rubber Fab’s Perfect Surface Gasket System  
The perfect union of Torque-Rite and the Perfect Surface Gasket:  
Torque-Rite allows you to control compression and expansion while maintaining constant inch/pounds force assuring a Perfect Surface ID when used with a Perfect Surface Gasket. Torque-Rite eliminates the problems associated with over- or under-tightening a gasket which can lead to an unsanitary system.

**Tri-clamp couplings**  
Tri-clamp couplings have a big advantage versus other type of couplings such as DIN 11864 and DIN 11851. Due to the design of the gasket, it is possible to develop very particular gaskets, applicable in different situations, without the necessity to change the couplings. Hereby you can find an overview of the most important executions.

**Screen gaskets**  
Screen gaskets have an inbuilt filter in different sizes and materials.  
- mesh 10 – 200  
- sizes: 1/2” – 4”  
- materials screens:  
  - SS – PTFE – Polypropylene

**Applications:**  
- prefiltration  
- protection  
- gassing or degassing 

**Perforated fluid conditioning gaskets**

**ERIKS**  
**high purity pharmaceutical gaskets**  
passes USP class VI  
passes cytotoxicity testing  
meets FDA 21 CFR 177.2600  
meets 3A-standards  
meets U.S.D.A-standards  

**www.eriks.com**

Removable disc inserts and holders sold separately
Self draining orifice plates

There’s a new standard in orifice plate design. Offered in an eccentrically self draining configuration, the Rubber Fab Orifice Plate prevents dead legs, maintains flow while assuring self drainage thereby eliminating the potential for soil retention.

Orifice plates are standard gaskets with pre-drilled central plate in order to reduce the flow rate in a pipeline.

• Drilled holes from 1/64” up to 1.1/2”
• Eccentrically positioned for self-draining purposes
• Available with or without tabs for verification.

Smart Gasket

Its value is proven when validating for sterility in a high-purity pharmaceutical system. Your standard sanitary flange utilizing the smart gasket TM is used to obtain the critical thermal mapping information you need during the validation process. Smart gasketTM easily install between 2 standard flanges, using an adapted clamp to secure the flanges. The clamp and gasket provide up to four internal ports for accepting the smart gasketTM thermocouple sampler or accessories.

Features:
• Safe to use
• Ease of installation
• 1, 2, 3 and 4 internal ports available
• Sensors seal with gasket compression
• User friendly
• Reusable

Benefits:
• Use temporarily or permanently without custom thermowells or expensive custom fittings
• Easy to expand to multiple system sites
• Sanitary without a dead leg