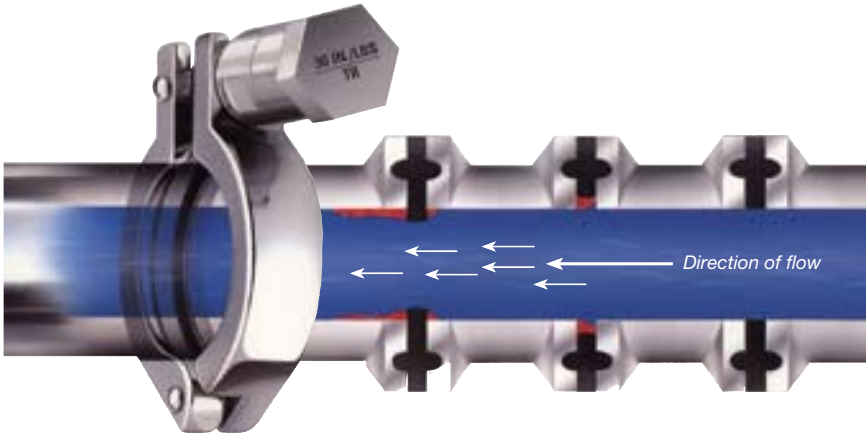
Clamp gaskets



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 inerruptions. Achieve higher performance under SIP/CIP conditions.
Tuf-flex® 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.

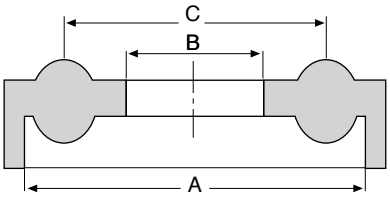
Triclover reference summary

Gasket Type	*Contin. Steam*	*Inter-mittent Steam*	*Pure Water Ambient*	*Pure Water Hot*	*Process Fluids Ambient*	*Process Fluids Hot*	*Process Fluids Variable < 0°C > 100°C*	*Colour*
Kalrez	1	1	1	1	1	1	1	Black or white
Bio-Pro	1	1	1	1	1	2	2	Light blue
Tuf-Flex®	1	2	1	1	1	2	1	Black
Tuf-Steel®	1	1	1	1	1	1	1	Bronze *
Teflon®	1	1	1	1	1	1	3	White *
Silicone (platinum)	2	2	2	2	2	2	1	Translu-cent *
Viton®	0	3	3	3	3	3	2	Black or white
EPDM	0	4	4	4	4	4	4	Black or white
Buna-N	0	0	5	5	5	5	5	Black or white

* = *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

Triclover gaskets dimensional list



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

DIN	ISO	Imperial ***		Diameter					
32676	2852	Standard	Sch 5	Flange(A)	Groove diam.(C)	Inside diam. (B)	Flange(A)	Groove diam.(C)	Inside diam. (B)
				(mm)			(inch)		
10 (x)				34,00	27,50	10,2	1,34	1,08	0,40
15 (x)				34,00	27,50	16,2	1,34	1,08	0,64
20 (x)				34,00	27,50	20,2	1,34	1,08	0,80
		1”		50,50	43,50	22,9	1,99	1,71	0,90
	1” (x)			50,50	43,50	23,10	1,99	1,71	0,91
25 (x)				50,50	43,50	26,2	1,99	1,71	1,03
32 (x)				50,50	43,50	32,2	1,99	1,71	1,27
	1 1/2” (x)			50,50	43,50	35,3	1,99	1,71	1,39
		1 1/2”		50,50	43,50	35,6	1,99	1,71	1,40
40 (x)				50,50	43,50	38,2	1,99	1,71	1,50
			1 1/2”	64,00	56,50	45,2	2,52	2,22	1,78
	2” (x)			64,00	56,50	48	2,52	2,22	1,89
		2”		64,00	56,50	48,0	2,52	2,22	1,89
50 (x)				64,00	56,50	50,2	2,52	2,22	1,98
			2”	77,70	70,50	57,3	3,06	2,78	2,26
		2 1/2”		77,70	70,50	60,2	3,06	2,78	2,37
	2 1/2” (x)			77,70	70,50	60,7	3,06	2,78	2,39
65 (x)				91,00	83,50	66,2	3,58	3,29	2,61
			2 1/2”	91,00	83,50	69	3,58	3,29	2,72
	3” (x)			91,00	83,50	73,2	3,58	3,29	2,88
		3”		91,30	83,50	73,3	3,59	3,29	2,89
			3”	104,80	97,00	84,9	4,13	3,82	3,34
80 (x)				106,00	97,00	81,2	4,17	3,82	3,20
	4” (x)			119,00	110,00	97,8	4,69	4,33	3,85
		4”		119,00	110,00	97,8	4,69	4,33	3,85
100 (x)				119,00	110,00	100,2	4,69	4,33	3,94
115				130,00	122,40	110,5	5,12	4,82	4,35
		4 1/2”		130,00	122,40	110,5	5,12	4,82	4,35
			4”	130,20	122,40	110,3	5,12	4,82	4,34
		5”		144,70	134,00	121,8	5,70	5,28	4,80
125 (x)				155,00	146,0	125,2	6,10	5,74	4,93
	5 1/2”			155,00	146,0	135,9	6,10	5,74	5,35
		6”		167,10	157,00	147,2	6,58	6,18	5,80
			6”	182,80	174,30	163,1	7,20	6,86	6,42
150 (x)				183,00	174,30	150,2	7,20	6,86	5,91
	6 5/8”			183,00	174,30	163,3	7,20	6,86	6,43
		8”		218,00	207,00	198	8,58	8,15	7,80
200 (x)				233,50	225,00	200,2	9,19	8,86	7,88
	8 5/8”			233,50	225,00	214,1	9,19	8,86	8,43
			8”	233,60	225,00	213,9	9,20	8,86	8,42
		10”		267,20	258,00	246,5	10,52	10,16	9,70
			10”	287,50	278,70	266,7	11,32	10,97	10,50
		12”		319,00	308,00	298	12,56	12,13	11,73
			12”	338,50	329,00	315,8	13,33	12,95	12,43

Triclover gaskets materials

NEW

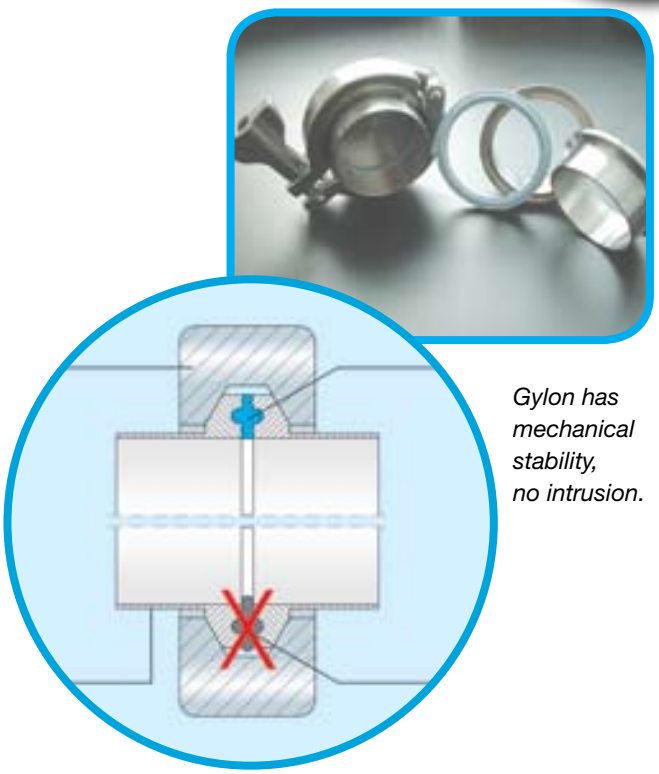
1	Bio-Pro®	FDA 177.1550 USP class VI	light blue
2	Tuf-Flex®	FDA 17.1550 USP class VI	black
3	Kalrez®	in FDA 177.2600 USP VI-XXII	black
4	Tuf-Steel®	in FDA 177.1550 USP VI-XXII 3A sanitary USDA standards	brown
5	PTFE	in FDA 177.1550 USP VI-XXII envelopes 3A sanitary USDA standards	white white EPDM or Viton®
6	PTFE	in FDA 177.1550 envelopes	white EPDM or Viton®
7	PTFE	in FDA 177.1550 USP VI-XXII 3A sanitary USDA standards	white-blue
8	Viton®	in FDA 177.2600 USP VI-XXII 3A sanitary USDA standards	black
9	Viton®	in FDA 177.2600	white-black-green
10	Silicone Platinium	in FDA 177.2600 USP VI-XXII 3A sanitary USDA standards	transparent-white
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

AUTHORIZED DISTRIBUTOR Kalrez® perfluoroelastomer parts DuPont Performance Elastomers

NEW

Bio-Pro®, the new modified PTFE-gasket for tri-clampcouplings

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.

Gylon has mechanical stability, no intrusion.

Bio-Pro®: the new modified PTFE-gasket for tri-clampcouplings

Size	
DIN 32676	*ISO 2852*
DN 10	-
DN 15	-
DN 20	-
DN 25	1"
DN 32	
DN 40	1 1/2"
DN 50	2"
DN65	2 1/2"
DN 80	3"
DN 100	4"

We can also quote for standards, others than the one we mentioned above.

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.

DuPont Performance Elastomers

Introducing a new standard of efficiency for pharmaceutical process lines...
Kalrez® Sanitary Seals: stainless steel and Kalrez® perfluoroelastomer parts combined in a controlled compression joint seal that provides premium performance.

Bioprocessing and pharmaceutical manufacturing processes must operate at the highest levels of cleanliness to assure product purity. Coupling joints in process lines can be a particularly troublesome source of contamination from various sources if the correct sealing material is not selected, as outlined in ASME's BPEa-2000 Bioprocessing Equipment Standards. Substandard seal performance can also result in excessive process downtime and maintenance costs. Selecting the joint design and sealing material to provide the optimum balance of cleanliness and seal life is an ongoing challenge to the pharmaceutical process engineer.

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.

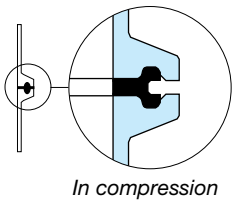
• *Joint leakage:*
Cold flow ('creep') of PTFE and some elastomers can cause loss of sealing pressure over time, requiring frequent inspections and retightening.

• *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 tempertures or repeated temperature cycling can also deteriorate seals made of many materials.

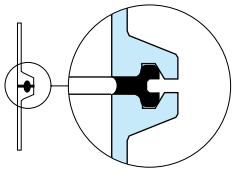
Sizes, Packaging and Availability
Kalrez® Sanitary Seals will be made available in sizes to fit most standard process lines, supplied in individual bags and bar coded for full traceability. Seals for 1,5-in diameter piping are presently available for sampling. Other sizes will be made available soon.

Kalrez® perfluoroelastomer parts, a product of DuPont Performance Elastomers

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



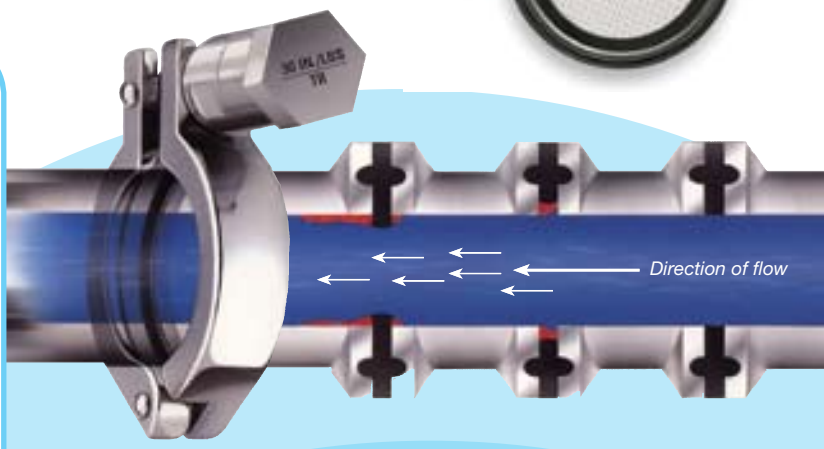
In compression



Not in compression

Special clamp products

Torque-Rite for Perfect Surface Gasket System



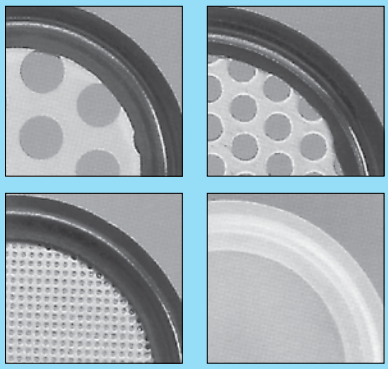
Torque-Rite
Presenting Rubber Fab's Perfect Surface Gasket System
The perfect union of Torque-Rite and the Perfect Surface Gasket:
Torque-Rite allows you to control compression and expansion while maintaining constant inch/pounds force assuring a Perfect Surface ID when used with a Perfect Surface Gasket.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

Tri-clamp couplings 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 overiew of the most important executions.

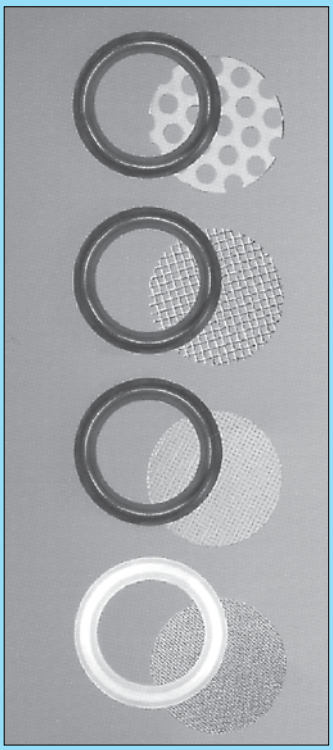
screen gaskets have an inbuilt filter in different sizes and materials.
- mesh 10 – 200
- sizes: 1⁄2" – 4"
- materials screens:
  SS – PTFE – Polypropylene

Applications:
- prefiltration
- protection
- gassing or degassing

...



Perforated fluid conditioning gaskets



Removable disc inserts and holders sold separately

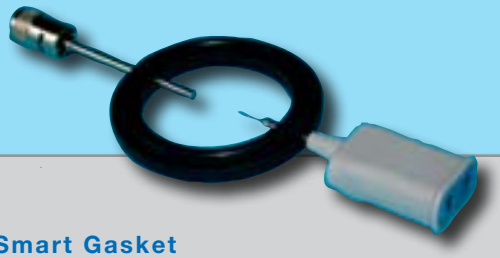
Special clamp products

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