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ERIKS sets the standards

ERIKS is a leading developer of high performance advanced elastomer and plastic components for the food, biochemical, pharma and life science industries.

Pharmaceutical and food equipment present some of the most demanding applications for elastomeric and plastic parts. Elastomers and plastic compounds used in valves, pumps, couplings, sterilisation equipment, containers, etc. must be able to cope with a wide range of process media, active ingredients, aggressive cleaning and sterilisation processes. In addition these elastomeric and plastic parts must be compliant with a growing range of legislative manufacturing regulations and hygiene standards.

ERIKS offers a full range of elastomers and plastics, compliant with the requirements of the Food and Drug Administration (FDA), United States Pharmacopeia (USP class VI), Food Contact Notification, Bfr regulation, 3A-Sanitary Standards, ADI (Animal derived ingredients) standards, as well as Good Manufacturing Practice (GMP). In addition to these standards ERIKS offers different compounds that prevent the development of bacteria and micro-biofilm.

ERIKS has over 50 years experience in designing and manufacturing components for the food and pharmaceutical processes. Therefore, ERIKS is very well placed to increase your plant productivity.

ERIKS sets the standard in materials:

- widest range of elastomer and plastics materials for use in food, pharma and bioscience applications,
- materials to suite operations from -60 °C to +300 °C,
- materials compatible with all process media, from EPDM over PEEK, to Kalrez® perfluorelastomers,
- certificates to all international norms.



Certification regulations and cleaning procedures

FDA compounds

- FDA sets the standard for ensuring that foods, human and veterinary drugs, biological products, medical devices are safe and effective.
- FDA also ensures that these products are honest, accurate and are informatively represented to the public.
- CFR § 21.177.2600 sets out the relevant regulations for 'rubber articles intended for repeated use'. This list contains the ingredients that may form part of a rubber compound. The list includes elastomers, accelerators, plasticisers, fillers, emulsifiers, etc.
- There are also certain quantitative limitations on different ingredients.
- Most ERIKS FDA compounds are produced to meet class 1 for fatty foods. This means that the 'high purity' carbon black does not exceed 10%. All our compounds have been tested by an independent certified lab in Germany following the class 1 rules in n-hexane at reflux temperature.
- Certificates on demand.

Migration tests FDA

Some compounds have been tested by independent laboratories (for example 'Rapra' in England).

Rubber articles intended for repeated use in contact with **aqueous food** shall meet the following specifications: 'The food-contact surface of the rubber article in the finished form in which it is to contact food, when extracted with distilled water at reflux temperature, shall yield total extractives not to exceed 20 milligrams per square inch during the first 7 hours of extraction, nor to exceed 1 milligram per square inch during the succeeding 2 hours of extraction'.

Rubber articles intended for repeated use in contact with **fatty foods** shall meet the following specifications: 'The food-contact surface of the rubber article in the finished form in which it is to contact food, when extracted with n-hexane at reflux temperature, shall yield total extractives not to exceed 175 milligrams per square inch during the first 78 hours of extraction, nor to exceed 4 milligrams per square inch during the succeeding 2 hours of extraction'.

FDA does not 'approve' products to CFR21.177.2600. It is the manufacturer's task and responsibility to demonstrate compliance of the finished rubber product.



Introduction to FDA-USP concept



USP class VI standards are controlled by United States Pharmacopeia (USP), a non-governmental organisation that promotes the public health by establishing state-of-the-art standards to ensure the quality of medicines and other health care technologies.

The standards are published in the USP-NF which is officially recognised in FDA act (21 usc § 321 et seq.).

USP class VI compounds have undergone tests to:

- cytotoxicity
- hemolysis
- pyrogenicity
- sensitisation

Some elastomers are also formulated following the European Pharmacopeia.

USP class VI was especially developed for the pharmaceutical industry.

This information has been carefully prepared to help in selecting the correct elastomer or perfluorocarbon utilized in high purity sanitary hygienic seals where critical pure water, process fluids (both ambient and hot), and SIP environment exist.

The intention is to consider the different uses, applications and conditions to determine the most favourable gasket material for each application. The following criteria are used in determining correct sanitary gasket materials.

- USP Pharmacopoeia Class VI-XXII Certification
- Cytotoxicity Criteria
- CFR Title 21 Section 177.1550 (PTFE)
- CFR Title 21 Section 177.2600 (rubber)
- Traceability: Lot and Batch
- Certification: Lot and Batch
- ASME-BPE Standards
- USD Standards
- 3-A Sanitary Standards
- Current Good Manufacturing Practices (CGMP)
- Manufacturer data and specifications
- Consultation with various pharmaceutical users

The gasket materials considered are Tef-Steel[®] (Teflon/Stainless Steel), Teflon[®] (PTFE), Silicone (platinum cured), Viton[®], EPDM and Kalrez[®].

The 3 main goals are:

- To protect products from contamination, spalling, particulates and TOCs resulting from the use of improper sanitary gasket material.
- To protect facilities from unnecessary downtime associated with sanitary gasket failure and replacement from use of improper gasket material.
- To provide a standard of consistency of sanitary gaskets selection between multiple facilities.

Most decisions driving gasket type selection are based on chemistry, temperature, exposure limits, USP, FDA qualifications, and curing methods.





FDA

Contact

Notification (FCN)

The Food and Drug Administration (FDA) has regulatory oversight for substances added to food, including monitoring their safe use.

Section 309 of the Food and Drug Administration Modernisation Act (FDAMA) of 1997 now also establishes a Food Contact Notification (FCN) process as the primary method by which the FDA regulates substances that are classed as 'food contact substances' (FCS).

A FCS is any substance that is intended for use as a component of materials used in manufacturing, packing, packaging, transporting or holding food, but is not an additive within the food.

DuPont Performance Elastomers



During the FCN process, the sealing material and its individual constituent ingredients undergo a significant amount of research, testing and analysis to evaluate the potential for food contamination.

Successful completion of the FCN process allows the following material grades to be used in a variety of food contact applications under the Food Contact number FCN000402.

The Food and Drug Administration Modernisation Act of 1997 provides a system whereby a manufacturer or supplier of food-contact material may submit a Food Contact Notification (FCN) to FDA regarding the identity and use of the new food contact substance, together with necessary data to demonstrate that the substance is safe for its intended use. FCN is a formal acceptance of a material by the FDA, so it is fundamentally different to self-certification to FDA CFR § 21.177.2600.

FCN application requires a detailed analysis of the compound, its constituents, toxicological effects and intended uses and is much more rigorous than the requirements of CFR § 21.177.2600. The complexity and high cost of the FCN process means that it is currently restricted to a limited range of very high performance perfluorelastomer materials that are used in very demanding applications.

Food Contact Notification Materials

Compound	Hardness °RHD	Material	Colour
FFKM Kalrez® 6221	70	perfluorelastomer	white
FFKM Kalrez® 6230	75	perfluorelastomer	black



3-A Sanitary Standards



ERIKS manufactures seals in accordance with 3-A Standard 18-03 which defines the requirements for food quality materials that must be suitable for cleaning and sanitising solutions.

All ERIKS 3-A Sanitary Standards compliant elastomers are FDA-compliant to FDA CFR § 21.177.2600 resistant to steam sterilisation, milk fat and water, acid and alkali cleaning solutions and chlorine sanitising solution.

The ERIKS elastomers meeting the 3-A Standard include fluorocarbon, silicone, EPDM and nitrile, allowing manufacturers to select the most appropriate elastomer to temperature, chemical and physical performance criteria.

Formed by the US Food and dairy industry, **3-A Sanitary Standards Inc.** defines specifications and best practice for the design, manufacture, installation and use of hygienic equipment. As with FDA, the 3-A Standards are adopted on a worldwide basis.

Standard N° 18-03, '3-A Sanitary Standard for multiple-use rubber and rubber-like materials used in product contact surfaces in dairy equipment' describes requirements for food quality materials that must also be suitable for cleaning and sanitising.

To comply with the requirements of the Standard, the elastomer materials must comply with FDA CFR § 21.177.2600 and also be resistant to steam sterilisation, milk fat, acid and alkali cleaning solutions and chlorine sanitising agents.



The European Hygienic Engineering & Design Group (EHEDG)

is a consortium of equipment manufacturers, food industries, research institutes and public health authorities. It was founded in 1989 with the aim to promote hygiene during the processes and packaging of food products. European legislation requires that handling, preparation, processing and packaging of food is done hygienically, with hygienic machinery in hygienic premises. EHEDG provides practical guidance on the hygienic engineering aspects of manufacturing safe and wholesome food, focusing particularly on equipment design and installation, cleanability and maintenance.

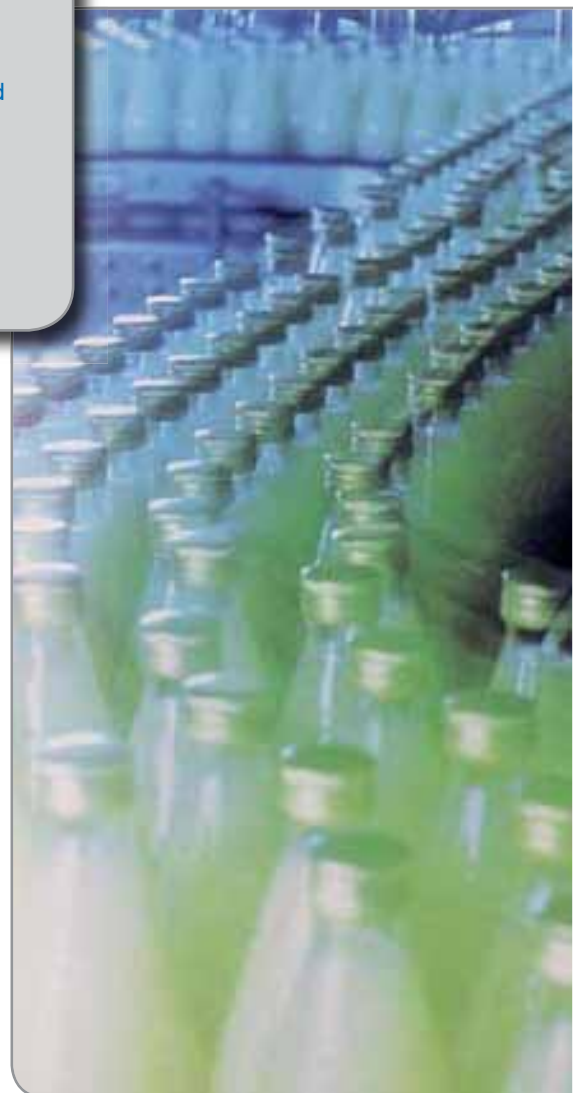
ADI free (Animal Derived

Ingredient free)

BSE (bovine spongiform encephalopathy) is a disease, which is caused by infectious proteins, so called prionics. These proteins are very resistant, it needs steam of 133°C, 3 bar and 20 minutes to destroy them. It is necessary to avoid to introduce any BSE prions into plants or food and beverage industry. Stearates, fatty acids or similar can be based on agricultural or animal production.

ERIKS has checked the standard qualities excluding the use of any animal derived ingredient in order to avoid the risk of contamination with BSE prions.

These qualities are certified with the logo 'ADI free' (Animal Derived Ingredients free).





Since sanitising programmes have been commonly established, cleaning and sanitising procedures have to be developed for all food processing equipment. The objective of cleaning and sanitising food contact surfaces is to remove food (nutrients) which bacteria requires so that it can grow, and to kill bacteria that already exists.

ERIKS has wide ranging experience in material and product design compatibility to overcome problems in the cleaning processes used in the food, beverage and pharmaceutical industries.

Cleaning procedures

Cleaning definitions

- Clean: Free from dirt, stain, or impurities and generally unsoiled
- Sanitised: Free from elements that endanger health, reduction of micro-organisms
- Desinfect: Refers to inanimate objects and the destruction of all vegetative cells (not spores)
- Sterilize: Refers to the statistical destruction and removal of all living organisms

Manual cleaning procedures

These procedures could be done by clean-up personnel, using:

- buckets, brushes and hoses or
- HPLV-Systems (High Pressure Low Volume) via spray wands or
- by foaming (cleaning primarily by chemical action)

Mechanical cleaning procedures

System uses an agitated tank to clean components (equipment parts and short section of piping) disassembled and placed in the tank.

CIP (Clean-in-Place)

This cleaning process is usually accomplished via chemical action based on spray or pressure recirculation of the flush, wash, and rinse solutions under controlled conditions of time, temperature and chemical concentration. It involves the washing of processing and storage tanks, the piping systems and integrated equipment.

SIP (Sterilization-in-place)

The objective is to sterilize all sterile product contact equipment at its point of use to eliminate or reduce the need for aseptic additions or connections.



Requirements to seals

The requirements to the seals and plastic parts are:

- chemical resistance against the product
- chemical resistance against the used CIP media
- good cleanable and sterilizable sealing surface
- good resistance against abrasion and wear
- nontoxic sealing material
- installation without any dead spots (spaces)

Compatibility

In addition to the above mentioned requirements, the following parameters strongly influence the quality of the cleaning process as well as the life time of the seals:

- immersion period
- temperature
- type of cleaning media
- concentration of the cleaning solution



Chemical	Example	Concentration	Temperature °C	Time	Cleaning procedure
Chlorinated alkalies	Mild solution of caustic soda	max. 0,5%	55-70	5-22	CIP
Acidified rinse	Post rinse, fresh water, acid solution	pH 5,5-6,0	RT	-	CIP
Strong alkalies	Caustic soda	0,5-5%	up to 90	45-90	CIP
Strong acids	Phosphoric acid, nitric acid	pH-2	75-90	20-30	CIP
Sanitiser	Sodium hypochlorite	200 ppm active chlorine	cold	a couple of	CIP
Hot water	-	-	80-90	-	CIP
Steam	-	-	+130	-	SIP

Material	Nitric acid 85°C,2%	caustic soda 85°C,3%	Aqua dest. 100°C	Steam 140°C	Sodium hypochlorite solution 70°C,5%	Solution sodium hydroxide sodium hypochlorite 70°C,3%	Solution sodium hydroxide sodium carbonate 70°C,3%	Solution hydrogen peroxide peracetic acid 50°C,3%	3-A Sanitary standards 18-03
PUR	+	+	+	-	+	+	+	+	Class 1,3**
NBR	(-)	+	+at 70°C	(-)	n.d.a.	n.d.a.	n.d.a.	n.d.a.	n.d.a.
H-NBR	(-)	+	+	-	n.d.a.	n.d.a.	n.d.a.	n.d.a.	n.d.a.
Silicone	-	(-)	+	(-)	n.d.a.	+	+	n.d.a.	n.d.a.
Viton®	(o)	o	o	-	o	+	+	+	Class 1

immersion period: 168 hours

n.d.a.: no data available

(+,o,-): n.d.a. supposed to be +, o or -

** class 1,3: passed all tests for class 1, except the temperature of exposure to product of sterilization (possible up to 100°C)

+ : resistant

o : limited resistance

- : not resistant

High Performance O-rings and custom moulded parts

Selecting the right elastomer is a balance of material and design.
All ERIKS compounds listed below are produced from listed ingredients.
We distinguished the following grades:



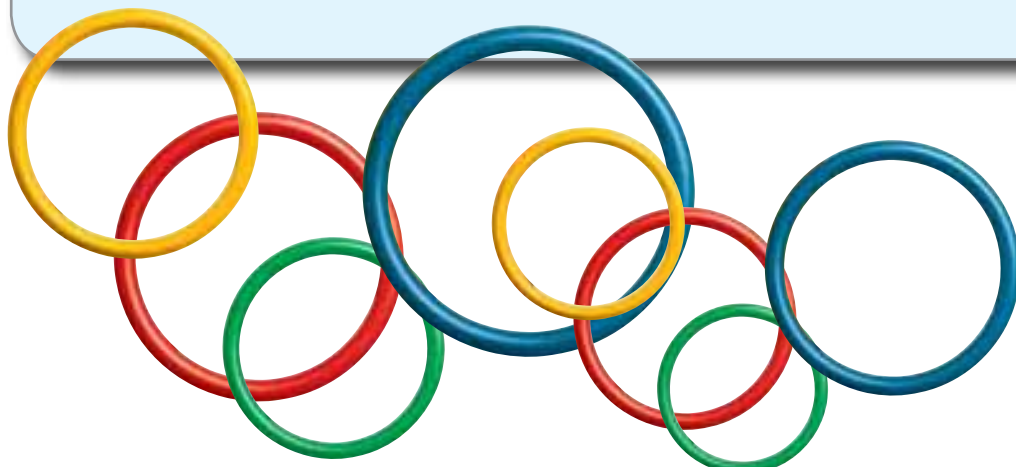
High Performance O-rings with Certificates

Compound Number	Material ASTM D1418	Colour	Hardness IRHD±5°	FDA 177.2600 aqueous & fatty foods	USP Class VI	FDA 177.1550	3A	BfR BGVV	ADI free	Temp. resistance °C
329303	Neoprene	black	75°	X					X	-35/+100
366470	Nitrile-NBR	black	70°	X					X	-30/+120
366010	Nitrile-NBR	grey	70°	X					X	-30/+120
366302	Nitrile-NBR	black	75°	X			X		X	-30/+120
366472	Nitrile-NBR	white	75°	X					X	-30/+120
366490	Nitrile-NBR	black	90°	X					X	-30/+120
886172	HNBR	black	70°	X					X	-30/+150
55641	EPDM	black	70°	X					X	-55/+150
559270	EPDM	black	70°	X					X	-55/+150
559272	EPDM	white	70°	X					X	-55/+150
559273	EPDM	black	70°	X	X				X	-40/+150
55111	EPDM	black	70°	X					X	-55/+150
559274	EPDM	white	70°	X	X				X	-40/+150
559302	EPDM	black	70°	X	X				X	-50/+150
559187	EPDM	black	75°	X					X	-40/+140
55920	EPDM	black	80°	X					X	-50/+150
514670	FKM	black	70°	X					X	-20/+200
514642	FKM	green	70°	X					X	-20/+200
514672	FKM	white	70°	X					X	-20/+200
514674	FKM	blue	70°	X					X	-20/+200
514270	FKM	white	70°	X					X	-20/+200
514002	FKM	green	75°	X					X	-20/+200
514010	FKM	white	75°	X	X				X	-20/+200
514304	FKM	white	75°	X			X		X	-20/+200
514172	FKM	black	75°	X					X	-20/+200
514641	FKM	black	75°	X					X	-40/+200
514676	FKM	black	75°	X	X				X	-20/+200
514312	FKM	black	75°	X	X				X	-20/+200



High Performance O-rings with Certificates

Compound Number	Material ASTM D1418	Colour	Hardness IRHD±5°	FDA 177.2600 aqueous & fatty foods	USP Class VI	FDA 177.1550	3A	BfR BGVV	ADI free	Temp. resistance °C
Genuine Viton® A 514305	FKM	black	75°	X			X		X	-20/+200
Genuine Viton® A 514680	FKM	black	80°	X					X	-20/+200
Tuf-Flex® Viton®	FKM FEP/PFA	black		X	X	X			X	-20/+200
Genuine Viton® A 514690	FKM	black	90°	X					X	-20/+200
Genuine Viton® A 514694	FKM	blue	90°	X					X	-20/+200
Silicone 714742	VMQ	white	40°	X					X	-60/+200
Silicone 714747	VMQ	transl.	40°	X					X	-60/+200
Silicone 714748	VMQ	red	40°	X					X	-60/+200
Silicone 714762	VMQ	white	60°	X					X	-60/+200
Silicone 714767	VMQ	transl.	60°	X					X	-60/+200
Silicone 714768	VMQ	red	60°	X					X	-60/+200
Silicone ST-EC-60-001	VMQ	white	60°	X	X			X	X	-60/+200
Silicone 714177	VMQ	red	70°	X					X	-60/+200
Silicone 714003	VMQ	blue	70°	X					X	-60/+200
Silicone 714001	VMQ	transp.	70°	X	X			X	X	-60/+200
Silicone 714625	VMQ	light red	70°	X					X	-60/+220
Silicone 714002	VMQ	Transp.	75°	X	X			X	X	-60/+200
Silicone 714206	VMQ	red	75°	X					X	-60/+200
Silicone 714006	VMQ	red	75°	X			X		X	-60/+200
Silicone 714782	VMQ	white	80°	X					X	-60/+200
Silicone 714787	VMQ	transl.	80°	X					X	-60/+200
Silicone 714788	VMQ	red	80°	X					X	-60/+200
Teflex® Silicone	VMQ FEP/PFA	red		X	X	X			X	60/+200
Kalrez® 6221	FFKM	white	70°	X	X				X	260
Kalrez® 6230	FFKM	black	75°	X	X				X	260



The High Purity Kalrez® concept

Kalrez® perfluoroelastomer parts improve sealing for today's processes

FDA and USP compliancy

The U.S. Food and Drug Administration (FDA) confirmed the compliance of Kalrez® 6221 and 6230 for repeated use in contact with food by Food Contact Notification (FCN) 000101. FCN 000101 was established through the FDA Premarket Notification Process for food contact substances as described in section 409(h) of the Federal Food, Drug, and Cosmetic Act 21U.S.C.348(h) and is the primary method by which the FDA authorizes the use of food additives that are food contact substances.

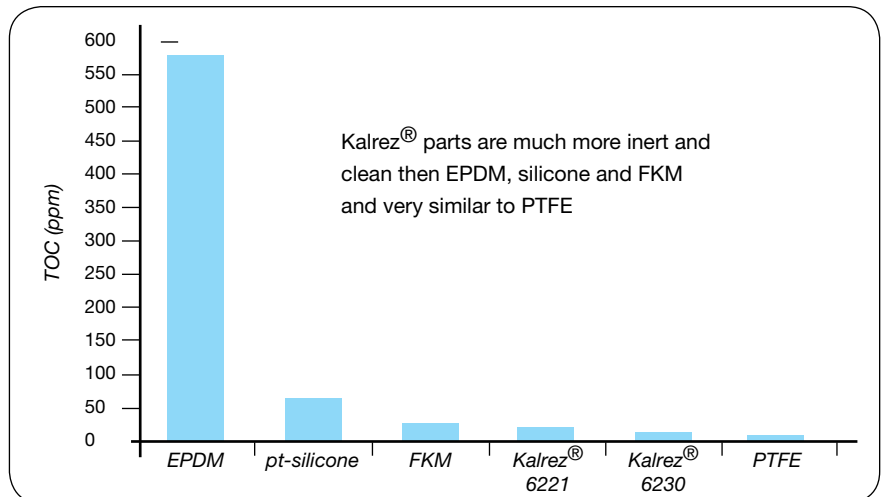
FCN 000101 requires materials to have extractable levels less than 0.2 mg/in². Kalrez® 6221 and 6230 have also been tested in accordance with United States Pharmacopeia Class VI (USP Class VI) and met those requirements.

To meet the demand for greater sealing integrity while maintaining process purity, DuPont Performance Elastomers has a family of high-performance perfluoroelastomer sealing materials uniquely suited for pharmaceutical medical manufacturing. Similar to PTFE in cleanliness, heat and chemical resistance, Kalrez® has the resilience and compressive strength that are characteristic for frequently used materials such as ethylene propylene polymers (EPDMs), fluoroelastomers (FKMs) and silicone rubber.

With its combination of thermal/chemical performance and rubber like sealing ability, Kalrez® offers the pharmaceutical industry a new level of protection against process contamination and seal failure. Multi-purpose Kalrez® seals increase process and equipment flexibility and may make it possible to standardize on a single seal material for all process environments.

Kalrez® compounds 6230 (black) and 6221 (white) have been developed to meet the unique sealing needs of today's high-speed, fully automated pharmaceutical and biopharmaceutical manufacturing processes. Kalrez® parts are manufactured by DuPont Performance Elastomers to ensure excellent quality, cleanliness and performance.

Kalrez® 6221 and 6230 have extractable levels compared to PTFE

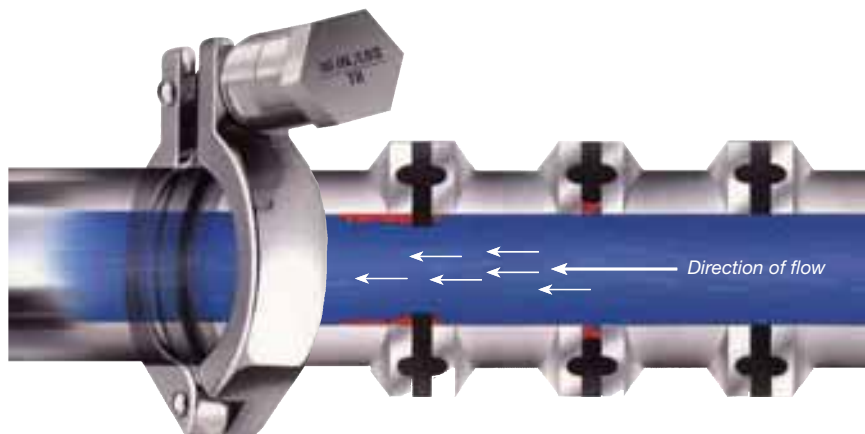


EPA method 415; TOC tests performed on 1" sanitary seals, immersed in 50 ml of sterile WFI at 100°C/24hrs. The solution was then diluted to 100 ml and analysis.



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 unitized 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-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.



STOP
MICROBES

THE BUILT IN ANTIMICROBIAL PROTECTION

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.



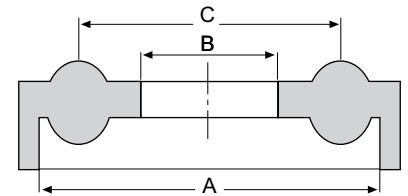
Triclover reference summary

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	Translucent *
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 32676	ISO 2852	Imperial ***		Diameter					
		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

AUTHORIZED DISTRIBUTOR
Kalrez®
performance parts
 DuPont Performance Elastomers

- | | | | |
|-----------|------------------------------|--|----------------------------------|
| 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
Platinum | 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 |



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

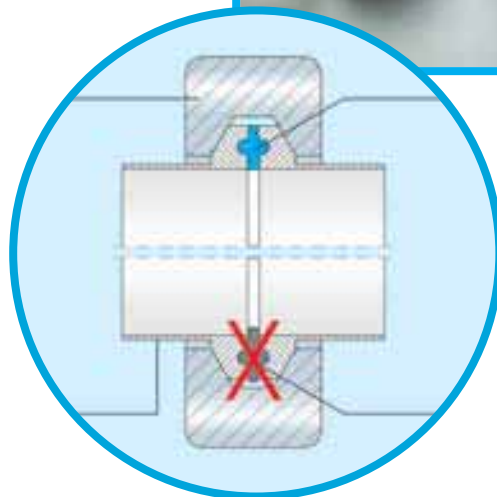
A unique alternative for the standard PTFE/envelope gaskets

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

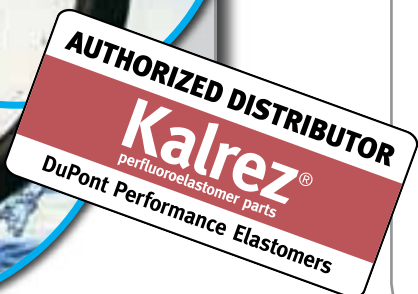
Dimensions and prices:

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

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 compliance.
- 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:

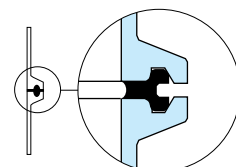
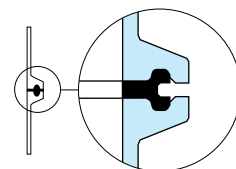
Incompatibility with fluids in the process line can cause some sealing materials to swell, crack and degrade, resulting in joint failure and process contamination. High process temperatures or repeated temperature cycling can also deteriorate seals made of many materials.

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.



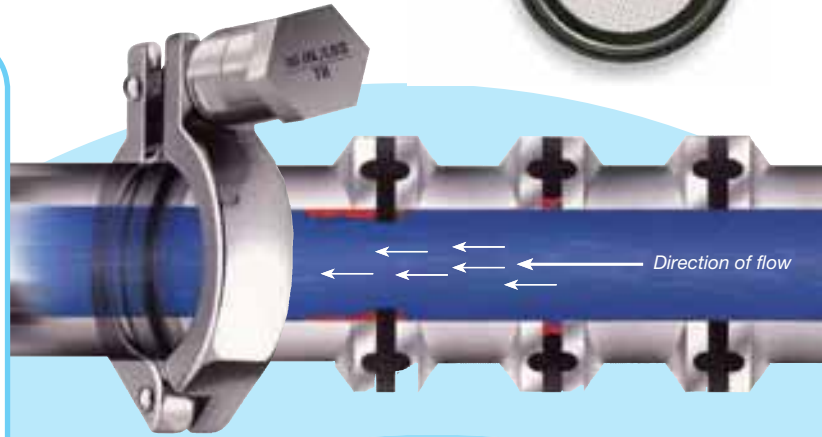
Special clamp products

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 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.

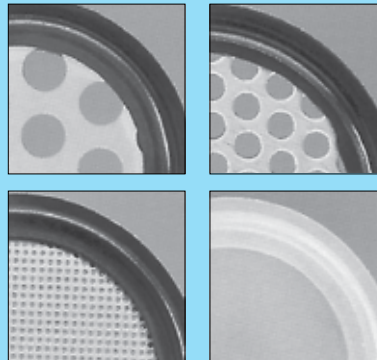
screen gaskets have an inbuilt filter in different sizes and materials.

- mesh 10 – 200
- sizes: 1/2" – 4"
- materials screens:
SS – PTFE – Polypropylene

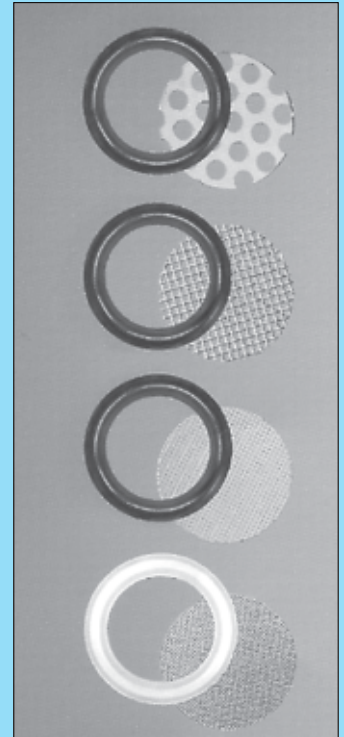
Applications:

- prefiltration
- protection
- gassing or degassing

...



Perforated fluid conditioning gaskets





Removable disc inserts and holders sold separately

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

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 gasket™ 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 gasket™ 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:

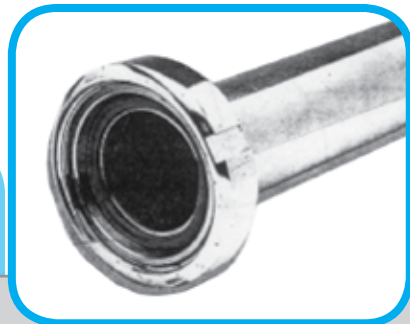
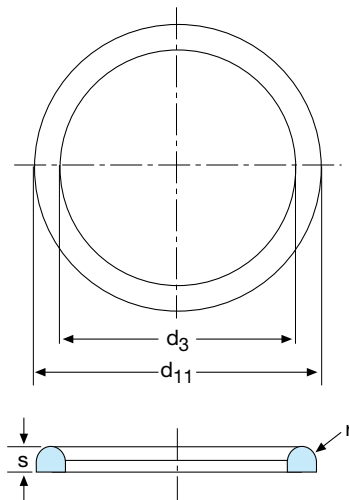
- Use temporarily or permanently without custom thermowells or expensive custom fittings
- Easy to expand to multiple system sites
- Sanitary without a dead leg



Milkcoupling gaskets

Rings to DIN 11851

NW	d_3	d_{11}	r	s
10	12	20	2,3	4,5
15	18	26	2,3	4,5
20	23	33	2,8	4,5
25	30	40	2,8	5
32	36	46	2,8	5
40	42	52	2,8	5
50	54	64	2,8	5
65	71	81	2,8	5
311	78	88	2,8	5
80	85	95	2,8	5
90	94	104	2,8	5
100	104	114	2,8	6
125	130	142	3,5	7
150	155	167	3,5	7



These gaskets are used in combination with the “milkcouplings” according to DIN11851, and mainly used in the milkindustry due to its aseptic concept. Over the years, the standard bleu gasket in NBR has changed into other qualities such as:

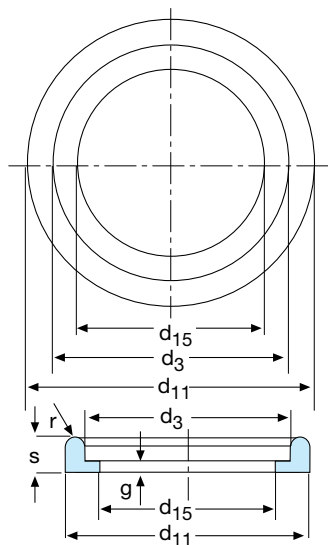
- EPDM (black)
- H-NBR (yellow) for temperature up to 150° C
- Viton® for chemical resistance
- Silicone (red or transparent)
- PTFE
- Teflex®, FEP encapsulated gasket with Viton, silicone or EPDM-core
- Bio-hygienic, rubber with antimicrobial properties (in H-NBR yellow)
- Kalrez® (white or black)
- Gylon® blue

Bio-hygienic also available in other rubber compounds.

All these components are FDA compliant.

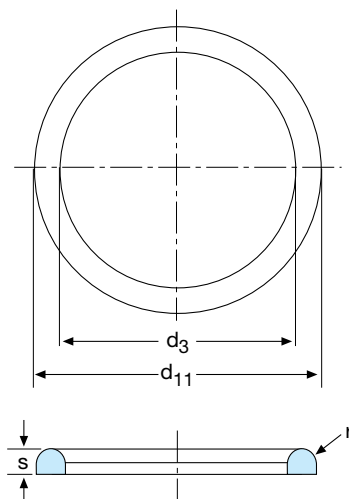
Rings with internal centering ring

NW	d_3	d_{11}	d_{15}	g	s	r
10	12	20	10.5	1,5	5	2,3
15	18	26	16.5	1,5	5	2,3
20	23	33	20.5	1,5	5	2,8
25	30	40	26.5	2	6	2,8
32	36	46	32.5	2	6	2,8
40	42	52	38.5	2	6	2,8
50	54	64	50.5	2	6	2,8
65	71	81	66.5	2	6	2,8
80	85	95	81.5	2	6	2,8
100	104	114	100.5	2	6	2,8
125	130	142	125	2	7	3,5
150	155	167	150	2	7	3,5



Rings

NW	d_3	d_{11}	r	s
25	30	40	2,8	8
32	36	46	2,8	8
40	42	52	2,8	8
50	54	64	2,8	8
65	71	81	2,8	6,5
65	71	81	2,8	8
80	85	95	2,8	6,5
80	85	95	2,8	8
100	104	114	2,8	8



Teflex® ERI-TITE gasket

ERIKS Teflex® ERI-TITE gasket is composed of a Silicone elastomer encapsulated in seamless FEP cover.

The elastomer works as a rubber material and helps the slow recovery of the FEP or PFA-cover. The chemical resistance of FEP is almost the same as PTFE. Permeability of FEP is much lower than PTFE. FEP complies with the FDA and USP class VI regulations for contact with food and pharmaceuticals.

The Encapsulated Teflex® ERI-TITE gasket is a critical component often used to prevent serious chemical/solvent spillage which can result in injury and environmental pollution. It is a component which we manufacture responsibly in a high quality manner, subject to stringent controls and only from the best leading name materials available.



Product Description

Chemical Composition	: FEP cover: Copolymer of Hexa-Fluorpropylene and Polytetrafluorethylene (PTFE)
Physical form	: CAMLOCK Seali Ring
Colour	: Red; cover: Translucent
Storage stability*	: 10 years

* : Following DIN 7716 conditions

Physical Properties

Test Method	Norm	Test Values
Specific Weight	ASTM 1817	1,26
Hardness	ASTM D 2240	60° ± 5° IRHD
Tensile Strength at break	ASTM D 412	8,6 MPa
Elongation at break	ASTM D 412	280%
Compression Set, 22h/175°C	ASTM D 395 B	9,2%
FEP cover		
Tensile Strength	ASTM D 2116	28 MPa
Fusion Point	ASTM D 3418	260°C

Temperature Resistance

with FEP: -60° to +204°C

Chemical Resistance

Concentrated acids	: very good
Acetone	: very good
Hydroxides	: very good
Benzol	: very good
Crude oil	: very good
Toluene	: very good
ASTM Fuel C	: very good
MEK	: very good
MTBE	: very good
Water	: very good
Steam	: very good

Advantages

- Excellent chemical resistance, comparable with that of PTFE
- Low compression set of silicone core

Other Information

- Other colours available on demand
- FEP in conformity with Foods and Drugs Administration (21 CFR 177.1550; 21 CFR 177.2600; 21 CFR 175.105, 21 CFR 176.180; 21 CFR 177.1520; 21 CFR 175.300; 21 CFR 176.170)
- Silicone inside compliant with FDA 21 CFR 177.2600
- FEP in conformity with U.S. Pharmacopeia (USP) class VI



Our Gasket profile is designed with large radiused corners. We have no reduction at weld point.



bio-hygienic

Antimicrobial growth problems and solutions

The most significant breakthrough ever in antimicrobial rubber technology

Imagine a situation where the rubber components you incorporate into your products; that form part of your production line; or you include in your plant specification; require much less costly labour-intensive, routine inspection and sterilisation treatment than they currently demand. Imagine rubber that inhibits the growth of any micro-organism; bacteria, fungi or algae and will deter it from contaminating or colonising its surface. Imagine the valuable, virtually unique marketing benefits and added value your products would enjoy.

Imagine the savings on downtime, lost production and maintenance costs. Just imagine how such a technically advanced antimicrobial rubber could improve your products, your productivity, your profitability.

bio-hygienic explained

The growth of microbes on rubber surfaces can lead to foul odours, discolouration, the formation of mildew and slime.

Another potential effect of microbial contamination on rubber components is serious surface degradation; a process that can significantly reduce the component's operational lifespan.

Traditional protection against microbial contamination involves thoroughly cleaning and washing with hot water and detergent. Such cleaning procedures, especially where the rubber components are sited in difficult to access locations, can be costly and time consuming. What's more, these procedures do not offer residual protection against further contamination.

Very often, to ensure compliance with health and hygiene regulations, rubber components are simply scrapped and replaced, frequently at significant expense.

bio-hygienic is a pro-active antimicrobial rubber that provides residual protection against microbial contamination, thereby dramatically reducing the necessity for a traditional routine decontamination service agenda.

Innovative patent pending technology

Bio-hygienic's innovative patent pending technology can be produced in a wide range of specialist compounds to meet a broad spread of needs. It incorporates a **zirconium phosphate-based ceramic, ion-exchange resin containing silver**, which is acknowledged to be safe for human contact, and is recognised for its antimicrobial effectiveness against a broad spectrum of micro-organisms. Unlike most organic biocides, bio-hygienic can be used in food contact situations and is designed for use in pharmaceutical and medical industries.

bio-hygienic
is not
imagination.
It is reality.
Available now.



Products:

- O-rings
- Oilseals
- Profiles
- Sheets
- Mouldings

Standard bio-hygienic RX Types:

- bio-hygienic® RX EPDM 70 black
- bio-hygienic® RX Viton® 70 black
- bio-hygienic® RX Silicon 70 red
- bio-hygienic® RX HNBR 70 yellow



bio-hygienic

Non-leaching

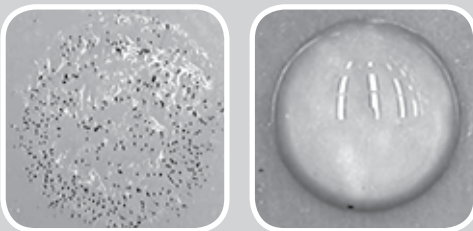
This antimicrobial agent forms an integral part of the rubber compound. It is not simply a skin or liner, and therefore the antimicrobial properties always remain active. Furthermore, any abrasion or wear to the surface of the rubber actually increases the exposure of the silver and with it the efficacy of its antimicrobial qualities.

- Designed for use in pharmaceutical and food processing technology, water treatment, medical equipment, beverage production and dispensing, and for close human contact.
- Provides effective microbial protection against a broad spectrum of micro-organisms.
- Available in a wide range of technical rubber compounds.
- Can be incorporated as part of a customised compounding facility.
- Forms an integral part of the rubber compound, is durable and non-leaching.
- Does not affect colour stability of the compound.
- Has no taste. Contains no smell.
- Non-toxic, non-flammable, non-corrosive.

Proven bio-hygienic efficiency is supported by substantial technical data

Pictures show contaminated water droplets. The sample on the left, which is on an untreated rubber surface, displays healthy growth of fungi.

The sample on the right, exposed to silver ions in bio-hygienic® rubber is virtually clear of any fungal contamination.



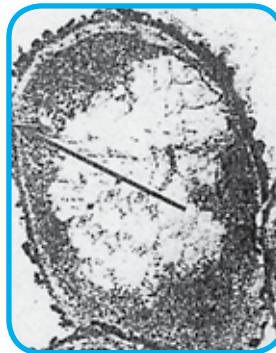
The effect of silver on healthy bacteria



Healthy bacteria



DNA condenses on itself

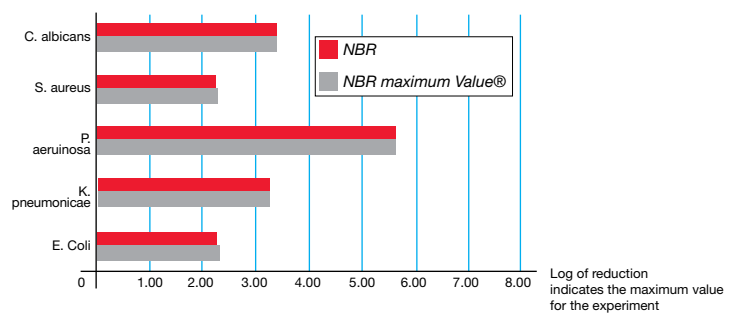


Formation of electron dense granulate

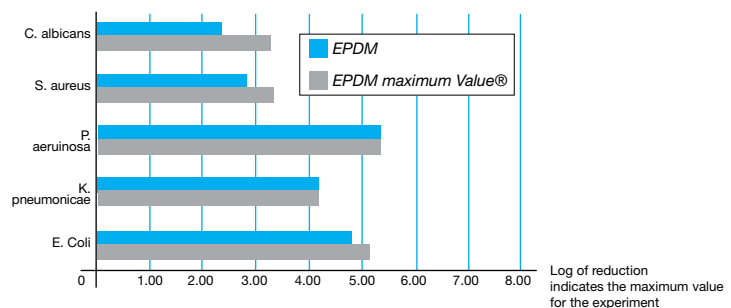


Cell wall decomposes

bio-hygienic NBR Rubber Exhibiting Safe and Durable Antimicrobial properties



bio-hygienic EPDM Rubber Exhibiting Safe and Durable Antimicrobial properties



Bio-Guardian® inflatable seals

The most effective technique for sealing between surfaces which move in relation to one another is the Bio-guardian® pneumatic seal. Bio-guardian® seals expand and retract to provide a secure, reliable seal that can hold, position, or handle objects in a wide range of applications.

As a result of this patented design, modern manufacturing techniques, and the most advanced elastomers, Bio-guardian® seals can be used in a multitude of sealing, handling and holding applications.

Bio-guardian® seals withstand temperatures from -100°C (-148°F) to +250°C (+482°F) and pressures from 0.5 to 10.4 bar (7 to 150 psi) in a variety of liquid or gaseous media.

Manufacturing

Bio-guardian® pneumatic seals are either moulded or manufactured from extruded profiles that are joined together by a moulded joint. The moulded joint ensures uniform wall thickness while restricting stress at the joint, and provides substantial flexibility. The HP and LP are the standard profiles: however, other profiles and elastomers are available for special sealing, locking, gripping, and handling applications.

Operation

Bio-guardian® seals are homogeneous elastomeric seals with a high modulus of elasticity and considerable tensile strength. The seals are designed to be fitted into grooves and are restricted to low pressures to prevent bursting. They expand and retract with the pressurization and deflation of the seal within a groove. The exact groove and gap dimensions are **critical** in designing and producing the correct seal for your application.

Bio-Guardian®

Microbial protection is a must in the medical, pharmaceutical, food and beverage process industry. Avoiding bacteriological and microbial growth on equipment and materials by means of smooth and protected surfaces is a major step forward. To meet this high level of protection Garlock has developed a new elastomer Bio-Guardian® which formulation prevents the development of bacteria and micro-bio-film. Garlock offers the Bio-Guardian® elastomeric compound in extruded profiles, moulded parts and Cefil'air inflatable seals.

The Bio-Guardian® concept

is based on a silver anti-microbial technology. Bio-Guardian® prevents biofilm generation and eliminates micro organism of the surface of the rubber parts.

Conventional rubber elements

Micro-organism at untreated rubber parts promote undesired bacteria throughout the equipment. Undesired effects, eg. foul smell, discoloration and corrosion up to formation of mildew, slime mould occur, thus leading to early damage and destruction.

Bio-Guardian® elements

With a specific technology using silver ions throughout the entire rubber section, the Bio-Guardian® inhibits and blocks any growth of micro-organism.



World premiere

Extruded Silicone Profiles

Inflatable Cefil'air® Seals

Endless Tubular Seals

Moulded Parts

Microbes

Biofilm

Silver





Cellular qualities

Cellular rubber 329 H 096
Neoprene/EPDM FDA compliant.

- CR (Chloroprene)/ EPDM / Polyolefin
- Soft elastic cellular rubber with closed



Physical Properties

Test Method	Norm	Test Values
Density	DIN 53 420	96 kg/m ³ ±15
Oil resistance, Fluid immersion 7 days at 23°C		pass
Elongation at break	DIN 53571	305 %
FDA Approval		ingredients are approved
Compression Set Suffix B, 25 % max.	ASTM D 1056	20 %
Compression Deflection at 25 %	ASTM D 1056	37,9 kPa
Ozone Test	ASTM D 1171	no cracks, pass
UV-Resistance, 120h Ultra-violet light exposure		excellent
Water Absorption	DIN 54 428	5 % max.
Flame Retardant	UL 94 HF1 ASTM D 1056 99 SAW J 18 99 Mil R 6130, type II grade A, B & C. Mil C 3133, SCE42 & SCE 7	self-extinguishing, pass 2C2 2C2 pass pass

Temperature Resistance

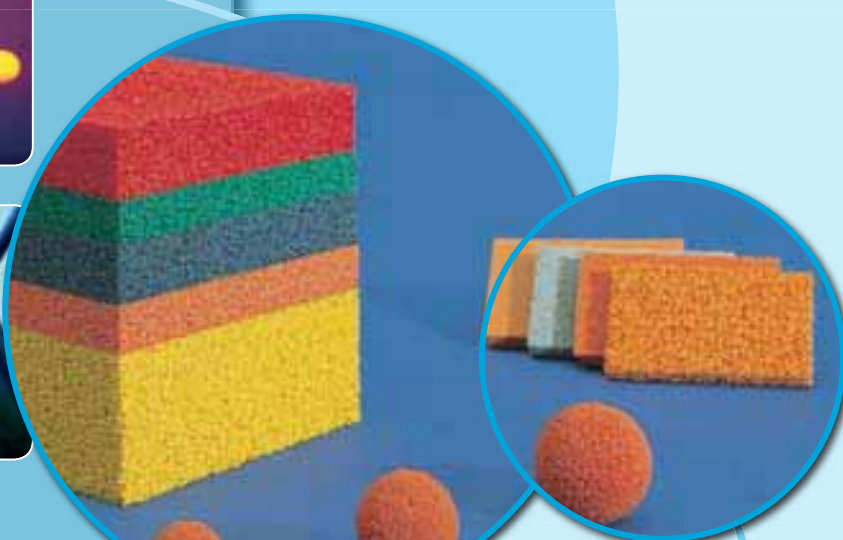
- -40° to +70°C
- Short duration up to +90°C

Application

- Ozone, air and UV resistant
- Weather resistant
- Food
- Seawater
- Petroleum
- Fuel and lubrication oil

Other Information

- Size tolerances according DIN 7715 P3.
- Material can be waterjetcut, cut, stamped, milled, grind, glued. very fine cells



Cellular qualities

Cellular silicone sheet material in FDA grade with numerous advantages for multi purposes.



Advantages such as:

- Excellent performances at high and low temperatures
- Superb compression set
- Durable long term resilience and long service life evening dynamic applications
- Low water absorption and excellent resistance against UV light and ozone
- Temperature tolerance from - 55°C to + 200°C
- Formulated to meet BgVV, XV and FDA 21.CFR 177.2600.

All products are supplied in maximum sheets of 914x914mm. Thickness available in inch dimensions. Material can be cut easily by die cutting in different gaskets. Material can be delivered with or without self adhesive layer.

SI 714 R 200 PR, SI 714 R 320 PR, SI 714 R 380 PR

Properties	Unit	SI 714 R 200 PR	SI 714 R 320 PR	SI 714 R 380 PR
Specific gravity	kg/cm ³	192	320	384
Compression force deflection	ASTM D1056 kpa 25% deflection	7-35	41-79	83-138
Compression set	ASTM D1056 100 °C	< 5%	< 5%	< 5%
Tensile strength	ASTM D412 kpa	241	310	414
Elongation	ASTM D412 %	90	80	65
Low temperature brittleness	ASTM D476 (B) °C	-55	-55	-55
Water absorption	ASTM D471	3,50%	1,40%	0,80%
Cell structure		Open cell	Closed cell	Closed cell
Colour		White-Gray	Gray	Gray
Thickness		1,6 upto 25,4mm	0,8 upto 12,7mm	0,8 upto 6,4mm

Silicone sponge profiles in FDA grade:

- This platinum-cured food grade silicone sponge is resistant to ultra-violet light, corona, arcing and ozone.
- Excellent for vibration damping and for protecting and cushioning components.
- Excellent chemical resistance (but not suitable for use with many solvents, oils or concentrated acids).
- Low degree of moisture absorption, therefore mechanical properties show little change, even after prolonged periods of immersion.
- Not recommended for long term service where steam pressure exceeds 50 psi

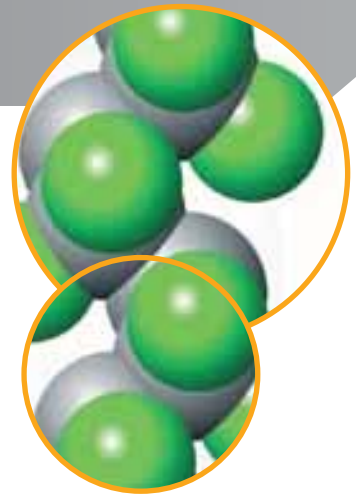
SI 714 S 400 PR, SI 714 S 600 PR

Properties	Unit	Test	SI 714 R 400 PR	SI 714 R 600 PR
Specific Gravity	g/cm ¹	D792	0.40	0.60
Compression Set (22 hrs at 100°C)	D395	%	<50	<50
Tensile Strength	Mpa	D412 DIE C	1.5	2.0
Elongation at Break	%	D412 DIE C	300	400
Tear Strength	kN/m	D624 DIE B	5	11
Plasticity Williams	mm/100	D926 67	240	240
Low Temperature Brittleness		ASTM D746-98 -55°C	No Cracks	No Cracks

Figures given above are for guidance only and should not be used in preparing specifications.

ZOTEK® High Performance PVDF Foams

Kynar exhibits exceptionally wide temperature tolerance (to 160°C), excellent UV, nuclear radiation and ageing resistance, high dielectric strength and outstanding resistance to a wide range of solvents and aggressive chemicals. It is biologically inert, thermally stable across a wide temperature range and is of a very low order of toxicity. In ZOTEK® F and ZOTEK® F HT, these properties are combined with light weight, flexural response, buoyancy and thermal and acoustic insulation. They are physically expanded using fabrication techniques such as sawing, properties derived from the foaming process. Like their parent resins, ZOTEK® F and ZOTEK® F HT foams are expected to exhibit outstanding durability and longevity.



PERFORMANCE INDICATIONS:

Fire Retardant Properties

ZOTEK® F and ZOTEK® F HT foams are inherently fire retardant, low smoke, low heat release materials. The materials have been tested to a variety of relevant fire standards including stringent aviation, aerospace and building materials standards.

Thermal Conductivity

The thermal conductivity of ZOTEK® F and ZOTEK® F HT grades has been tested in accordance with ISO, DIN and ASTM test methods at a range of temperatures.

Resistance to Fungal Growth

Selected ZOTEK® F and ZOTEK® F HT grades have been subjected to microbiological testing in accordance with RTCA DO1600, Category F, Section 13 and the results evaluated and laid out as per MIL-STD-81E method 508.4. Both products showed no fungal growth.

Biocompatibility

Selected ZOTEK® F and ZOTEK® F HT grades have been tested to the relevant sections of ISO 10993. The foams were shown to be suitable for use in medical surface devices in contact with the skin or surface devices in contact with mucosal membranes or breached or compromised surfaces for limited or prolonged exposure.

Chemical Resistance

General guidelines for chemical resistance of PVDF resins are that they exhibit excellent resistance to a wide range of chemicals. They are resistant to attack from most inorganic acids and alkalis, aliphatic and aromatic hydrocarbons, organic acids, alcohols and halogenated solvents. However, they are susceptible to attack from strong alkalis (i.e. pH > 12) and strongly polar solvents (e.g. acetone, methyl ethyl ketone, ethyl acetate, dimethylformamide and dimethylacetamide).

Solvent Resistance

Selected ZOTEK® F and ZOTEK® F HT grades have been independently tested for resistance to a wide range of solvents including fuels, lubricating oils, de-watering fluids, hydraulic fluids and alcohol solvents. No cracking, deterioration, punctures or other detrimental effects were observed.

UV Resistance

Selected ZOTEK® F and ZOTEK® F HT grades have been tested and found to have exceptional UV resistance.

ZOTEK® F is a registered trademark of Zotefoams pl





DETECTASEAL™

Metal detectable elastomer seals

The latest advance in contamination detection and containment

Do you use an in-line metal detector to detect contamination in process lines?
Does it identify contamination from elastomer seals?

Now it can!

The new DETECTASEAL™ range includes FDA compliant grades of EPDM, Nitrile, Fluorocarbon (FKM) compounds. Available in blue and black, DETECTASEAL™ O-rings have been tested and proven in use at leading pharmaceutical and food manufacturing plants. Fragments of DETECTASEAL™ as small as 2 mm can be identified by metal detector equipment.

A Maintenance Manager at a leading European Food manufacturer said:
"The seal and fragment detection trials were successful and represent a significant step forward from where we are now in contamination detection".

PPE provides fast and responsive lead-times and hygienic seal design services, supported by expert Material and Engineering Development teams.



Features of DETECTASEAL™ materials:

- Early detection and containment of contamination
 - reduced product loss
 - increased productivity
- FDA compliant elastomer materials
- Free from animal derived ingredients
- Blue seals to assist in easy identification



Flat Gaskets

Gylon® PTFE gaskets

Gylon® Standard Style 3500 and Style 3501E

These general purpose gasketing materials offer significant advantages over conventional PTFE in regard to functionality at higher temperature/pressure combinations. Style 3500 and 3501 E GYLON® gasketing conform to FDA specifications.

Gylon® Off-White Style 3510

Style 3510 GYLON® has a very wide chemical resistance (the optimum of all the GYLON® gasketing products). It is particularly suited for service against hydrofluoric acid and other strong chemicals such as potassium and sodium hydroxide, hydrogen fluoride, aluminium fluoride and chrome plating solutions. Conforms to FDA specifications.

Gylon® Blue 3504

Gylon® Blue is specially developed for Food and Pharmaceutical applications. Ideal for email flanges and for those applications where low bolt forces are available. Conforms to FDA-specification, and is approved according USP class VI.

GYLON® - technical data

	<i>GYLON® standard Style 3501 E</i>	<i>GYLON® Blue Style 3504</i>	<i>GYLON® Off-White Style 3510</i>
Temperature range	-210 to +260°C	-210 to +260°C	-210 to +260°C
Pressure load	83 bar	55 bar	83 bar
P x T, max. thickness : 1 and 1,5 mm 3,0 mm	12000 8600	12000 8600	12000 8600
Compressive creep strength (DIN 52913) 150°C - 30 N/mm ² 175°C - 50 N/mm ²	16 25	15 -	14 -
Modules at 100% Elongation (ASTM D1708)	11 N/mm ²	10 N/mm ²	9 N/mm ²
Compressibility (ASTM F 36)	7-12%	25-45%	4-10%
Recovery (ASTM F 36)	40%	30%	40%
Creep relaxation (ASTM F 38)	18%	40%	11%
Tensile strength (ASTM D 1708)	14 N/mm ²	14 N/mm ²	14 N/mm ²
Sealability (ASTM F 37 B) ASTM Fuel A: Internal pressure = 0,7 bar, Gasket load = 7 N/mm ²	0,1 ml/h	0,12 ml/h	0,04 ml/h
Gas sealability (DIN 3535/6)	0,10 cm ³ /min	0,15 cm ³ /min	0,10 cm ³ /min
Leak rate (DIN 28090-2), λ 2,0	<0,001 mg/(s x m)	<0,001 mg/(s x m)	<0,001 mg/(s x m)
Density (DIN 28090-2)	2,19 g/cm ³	1,70 g/cm ³	2,80 g/cm ³
Quality	FDA	FDA	FDA

Other materials conform to FDA:

- Eriks EPDM white
- Eriks Blanca (NR/SBR)
- Eriks silicone

Flat Gaskets

GORE® gaskets

GORE® sealants are among the world's tightest, chemically resistant gaskets. They have proven value to companies that handle aggressive or toxic materials that must be kept in compliance with environmental and safety regulations. Made from 100% expanded PTFE, GORE® gaskets are suitable for use throughout the entire pH range, except molten alkali metals and elemental fluorine. They withstand temperatures from -450°F to 600°F (-268°C to 315°C) which makes them ideal for high temperature as well as cryogenic applications.

Physiological Safety

GORE®, gasket tape, GORE-GR® Style R sheet gasketing and GORE-TEX® TriGuard may be safely used as articles or components of articles used in producing, manufacturing, packaging, processing, preparing, treating, transporting or holding foods. Physiologically harmless in prolonged installation at temperatures up to +260°C according to VDI/VDE guideline 2480, complies to FDA 21 CFR 177.1550 5PTFE) requirements for food.

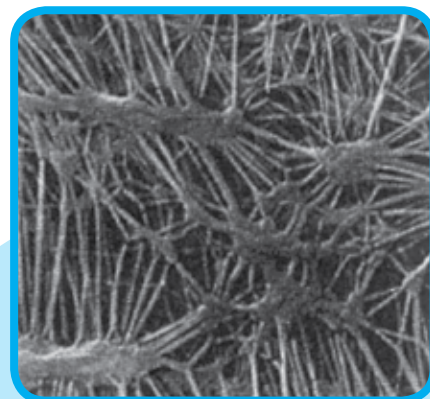
GORE-GR® Style R Sheet Gasketing

GORE-GR® Style R Sheet gasketing is manufactured using Gore's unique proprietary expanded ePTFE process. Its multidirectional strength inhibits creep and cold flow and also limits the possibility of blow out.

GORE-GR® Style R Sheet gasketing is a development based on GORE-GR® sheet gasketing. It provides a 6-fold increase in bend resistance making the gaskets easier to handle.

GORE® Gasket Tape

A form-in-place ePTFE gasketing material available in a variety of profiles to suit virtually any sealing configuration. Ideal for full-face gaskets where precise compressed thickness is essential.



GORE® - technical data

Availability	DF Tape	Series 300 and 600 Tape	GR/GR Style R Sheet and cut gasket
Installation	Apply overlap, cut, tighten up		Cut to shape, insert, tighten up
Temperature range	-240°C to +270°C for short periods up to +315°C	-240°C to +270°C for short periods up to +315°C	-240°C to +270°C for short periods up to +315°C
Pressure	210 bar	210 bar	210 bar
Chemical resistance	pH 0-14	pH 0-14	pH 0-14
Sealing factor			
$k_{1(PN40)} =$	$1,6 \times b_D$	$2,5 \times b_D$	$2,5 \times b_D$
$k_0 \times k_{D(PN40)} =$	$1,95 \times b_D$	$25,4 \times b_D$	$25,4 \times b_D$
Material characteristics	Expanded PTFE	Multi-directional orientated ePTFE	Multi-directional orientated ePTFE

2-Way Diaphragm Valves

The standard 2-way valve body is the basic building block of diaphragm valve technology. Its design and characteristics make it the ideal choice for all categories of clean processing systems. Optional materials, surface finish specifications (in compliance with ASME BPE) and international tube designations are all available to suit your application/specification criteria.

Saunders Valve Body Highlights

- Cavity free and self draining
- Isolating diaphragm, top entry design, and positive closure
- Controlled sulphur forged bodies (0.005% ñ 0.017%) meets ASME BPE DT-3 requirement for low sulphur content
- Low maintenance costs
- Readily incorporated into valve cluster and access valve/fitting fabrications
- Materials of construction compatible to entire system
- Bubble tight closure against both pressure and vacuum
- Bi-directional flowpath
- Diaphragm valves are recognised by the biopharm industry as the only truly aseptic valve

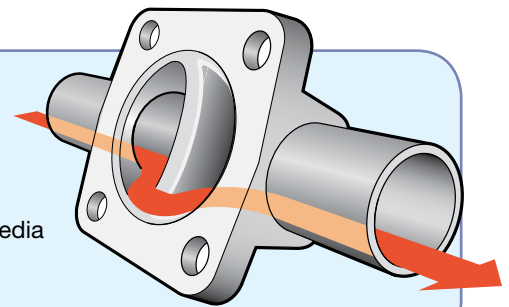
Standard 2-Way Bodies

Saunders invented the diaphragm valve concept and then pioneered the development of the first true high purity diaphragm valve with the introduction of the AFP forged 316L/1.4435 body range. The entrapment free design and self-draining characteristics of the diaphragm valve body make it the ideal choice for both aseptic processes and systems that must be cleaned in place. Top entry design allows maintenance while the valve is installed and permits the valve to be welded in place reducing the required number of mechanical joints and enhancing system security.



Drainability

- Valve size and end specification
- Internal surface finish
- Drain orientation (as shown)
- Surface tension and viscosity of media
- Pipe run angle - generally recommended at 2 to 3 degrees



Standard 2-Way Valves

Pure performance forged valves*	8 - 15 mm
Forged stainless steel valves*	15 - 80 mm
Solid block stainless steel valves	100 - 150 mm
Cast stainless steel valves	8 - 100 mm

* Compliant with ASME BPE Table DT-3 for low sulphur requirement

Chemical Composition - HC4 AFP Forgings

1.4435/316L	EN 10222-5	ASTM A-182	ASME BPE Table DT-3
Element	%		%
Carbon	0.03 max.		0.03 max.
Silicon	1.00 max.		1.00 max.
Manganese	2.00 max.		2.00 max.
Phosphorus	0.04 max.		0.04 max.
Sulphur	0.025 max.		0.005/.017
Chromium	17.0/18.0		17.0/18.0
Nickel	12.5/13.5		12.5/13.5
Molybdenum	2.5/3.0		2.5/3.0
Nitrogen	0.11		0.11

Pure Performance (Bio-Seal) Forged Bodies (DN8 - DN15)

Forged Stainless Steel Bodies (DN15 - DN80)

Investment Cast Stainless Steel Bodies (DN8 - DN100)

Machined from Block Standard Valve Bodies (DN100 - DN150)

Controlled Sulphur Forged Bodies (DN8-DN80)

Saunders

HC4 Standard Machined Block Valves



The Saunders range of HC4 Standard Machined Block valves uniquely provides the user with compact, minimum deadleg construction, full drainability, flexible high-integrity configuration and, ultimately, security of processing.

Zero Deadleg 'T' Pattern

Essential for the elimination of dead legs and designed to ease installation and validation, Saunders Zero Deadleg T pattern range (ZDT) enhances the integrity of critical systems.

Machined integrally from a forging, the ZDT normally features three common ports with the same bore dimensions and incorporates a valve body and tee fitting into a single solution. ZDT valves form the ideal solution for feeding laterals off recirculating loops, sample points or use point applications. The bodies can be supplied with weld or hygienic clamp end connections or included in a U-bend configuration for point-of-use service.

Major benefits of the range include:

- Virtual elimination of deadleg to enhance process integrity
- Highly compact, space saving design providing ideal solution where space is a concern
- Excellent drainage characteristics to facilitate quick and effective sterilisation
- Patented design to aid validation for FDA and cGMP compliance
- Machined integrally from Stainless Steel 316L/1.4435 forging (no welds)
- Available in size range DN15 to DN50 with full range of FDA conforming diaphragm/bonnet/actuation options

Close-Coupled Branch Valves

The Saunders Close Coupled Branch Valve (CCBV) compliments the patented ZDT design by facilitating larger main line size options. They provide the ideal solution when the main process line is at least one size larger

than the valve/branch size. The unique tee construction is engineered from a machined billet to enhance structural integrity and ease installation and validation.

Major benefits of the range include:

- Compact flexible design providing excellent drainage characteristics and absence of deadleg
- Machined block construction provides security of installation, rapid sterilisation and easier regulatory compliance
- Ideal solution when main process line is larger than valve/branch size (i.e. main line DN50 valve/branch DN25) utilises DN25 diaphragm/bonnet/ actuator
- Sampling/injection points on high purity water systems

Point-of-Use Options (Close-Coupled Branch Valve 'U' Bend)

One of the most sensitive applications in a WFI loop is the use point valve. These valves represent the barrier between the safety of the recirculating loop and the potential hazards of the environment and function as the take off point for consumption of WFI. Valves for this application need the highest level of design security, integrity and cleanliness. Saunders point-of-use valves are engineered to minimise dead areas and fully drain all associated tubing.

Multi-port Diverter Valves

Modern machining technology is employed in the design and manufacture of Saunders range of Bio-Block diverter valves.

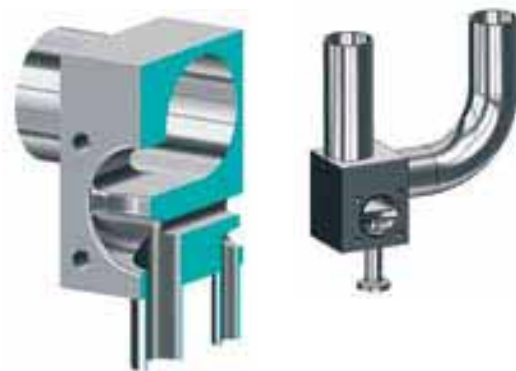


Significant advantages:

- Machined Block construction, free from fabrication welds to enhance structural integrity
- Minimal deadleg design to reduce risk of process contamination
- Inlet machined integrally eliminates a potential source of contamination (many other designs employ bolted inlet)
- Excellent drainage characteristics for quick and effective sterilisation
- Reduced space requirement provides greater flexibility in system design and simplified installation
- Complete solution including FDA compliant diaphragms, manual bonnets and actuators
- Fully certified range, with comprehensive validation support documentation on request

Integral Sampling Ports

Saunders Close Coupled Branch Valves (both T and U bend) can be supplied with optional integral sample ports to permit real-time sampling of WFI without breaking a sterile use point connection.



This provides a number of key process advantages:

- Minimum product envelope
- Minimum deadleg
- Less system welds

Tank Bottom Valves

The Saunders tank bottom valve incorporates the performance and features of a diaphragm valve into a one piece fully forged tank outlet design.

HC4 Customised Fabrication Options

For applications where a standard machined block valve is not sufficient, but a full custom solution is not required, there is a wide variety of fabricated options that will provide the optimum valve configuration.

Tandem Valves (Sterile Access Valves)

Welded Valve Fabrications

The first and still most common customised valve concept is the tandem valve or valve and fitting combination.

The following rules help define the possible orientation of tandem valves:

- The main valve and access valve may be installed to drain in either the horizontal or vertical position. When installed in a horizontal run the valve must be rotated into the self-drain position to drain
- Allowance must be made to permit access to bonnet or actuator fasteners and for diaphragm maintenance
- The access valve can be any size including the same size as the main valve
- The amount of dead leg between main and access valves will vary depending on respective valve sizes and orientation. Virtually all combinations fall within cGMP requirements
- 'Handwheel opposite' designs generally have shorter tangents than configurations with the handwheel of the main and access valves in the same quadrant
- All Saunders welded valve fabrications are 100% hydro-tested before and after all welding and polishing processes to ensure mechanical integrity. Full material certification of all tube and fittings utilised is standard
- Saunders bonnets, actuators and diaphragms fit fabricated valve assemblies without adaptors or distance pieces

Saunders

A main valve is ported and a section of tube is welded to the port to create an access point into the valve. This tube can in turn be welded to a second valve forming a two-valve cluster, or the tube can be turned into a weld end, hygienic clamp or other type of fitting. The fabrication weld is polished to match the required surface finish specification. The resulting assembly is designed to optimise drainability and meet standard process considerations including cGMPs for dead legs.

Applications include flow diversion, sampling, steam injection or condensate drain and block and bleed applications.

E Tools

Electronic tools exist to assist customers in the selection and orientation of these fabrications. Saunders Tandem Valve Selection Programme enables engineers and design detailers to select the optimum orientation to suit system requirements and produce a fully coded 3D graphic for immediate translation to valve manufacture.



ZDL Zero Deadleg Valve 'L' Pattern

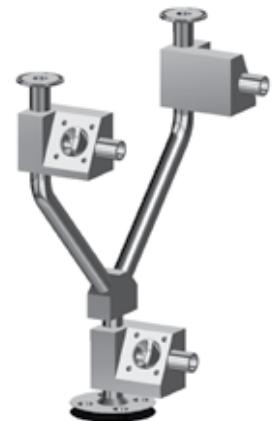
The Saunders ZDL 'L' pattern diaphragm valve is typically installed in a vertical line. The functions of a 90 degree fitting and a take-off valve are combined within the valve body. The bore of the third port is situated in line with the point of seal where the diaphragm meets the weir. This ensures low point drainability and elimination of deadlegs.



Valve Manifolds/Clusters

Configuration of optimum process fabrication presents system process designers with an ongoing challenge. Minimum space envelope, reduced hold up areas, reduced cost and facilitating ease of installation are all key considerations.

- Manufactured under stringent ISO 9001:2000 quality control
- Tailor-made solutions to customer requirements
- Fully tested assembled units manufactured under controlled conditions
- Full traceability of all components



Saunders



HC4 Bio-Block Customised Design Solutions

Almost every process system includes a unique piping challenge that does not lend itself to conventional solutions. Saunders custom designed HC4 Bio-Block valves replace welded clusters, manifolds and valve/fitting combinations and offer the most compact, minimum deadleg design for optimum process integrity.

Computer Aided Design Capability (CAE) Bio-Block Standard & Compound Valves

Our design teams work closely with customers to create unique machined valve designs that we call Bio-Blocks.

These 'outside of the box' solutions may be driven by process, space constraints, regulatory issues or other specific requirements.

The key element in producing Bio-Block valve solutions has been the development

of advanced CAE (Computer Aided Engineering) design and manufacturing tools that enable our engineers to convert concept into reality. This approach to manufacturing provides custom machined valve products with the shortest possible lead times in design and production. We work closely with customers to co-ordinate solutions to unique application challenges.

All custom Bio-Block valve bodies accept Saunders standard diaphragms, bonnets and actuators without modification or adaptors. The compact design of the EC actuator range enables us to produce the most space-efficient solutions in the industry.

Machined Bio-Blocks have the advantages of reduced wetted area and dead-legs, no internal fabrication welds and reduced documentation for installation and validation. Faster and easier installation of process manifolds can be achieved using advanced imachined from solidi valves.

HC4 Diaphragms

The critical component of any diaphragm valve is the diaphragm itself, due to its function as a dynamic seal and its continuous contact with highly valuable process media. Through continuous in-house development of our core expertise in this area, the Saunders brand provides customers with class-leading, traceable solutions to meet the most stringent process needs.

The Diaphragm - Key to Successful Valve Performance

The diaphragm is the key performance component within a diaphragm valve. The diaphragm forms both the differential and atmospheric seal and isolates the topworks from the process media.

Saunders continues to lead the diaphragm valve industry in the development and manufacture of elastomer components based on our in-house core competence in rubber and plastic technologies. We remain the only manufacturer to have front to back ownership of all aspects of



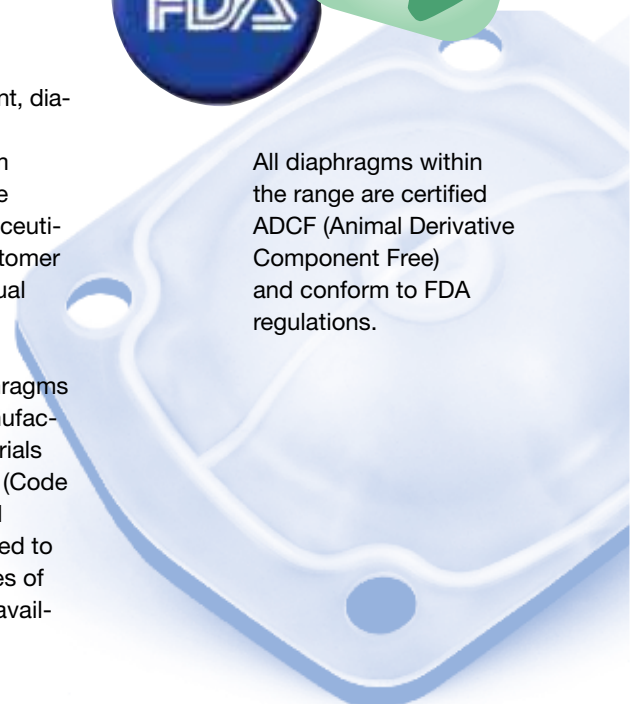
polymer research and development, diaphragm design and production.

We offer a full range of diaphragm selections engineered to meet the exacting demands of the pharmaceutical industry. PTFE, TFM and elastomer types are available to suit individual system requirements.

All Saunders brand aseptic diaphragms are formulated in-house and manufactured from FDA conforming materials to meet the requirements of CFR (Code of Federal Regulations) Chapter 1 Title 21 and are tested and certified to USP Classes V and VI. Certificates of Conformity to FDA and USP are available upon request.



All diaphragms within the range are certified ADCF (Animal Derivative Component Free) and conform to FDA regulations.



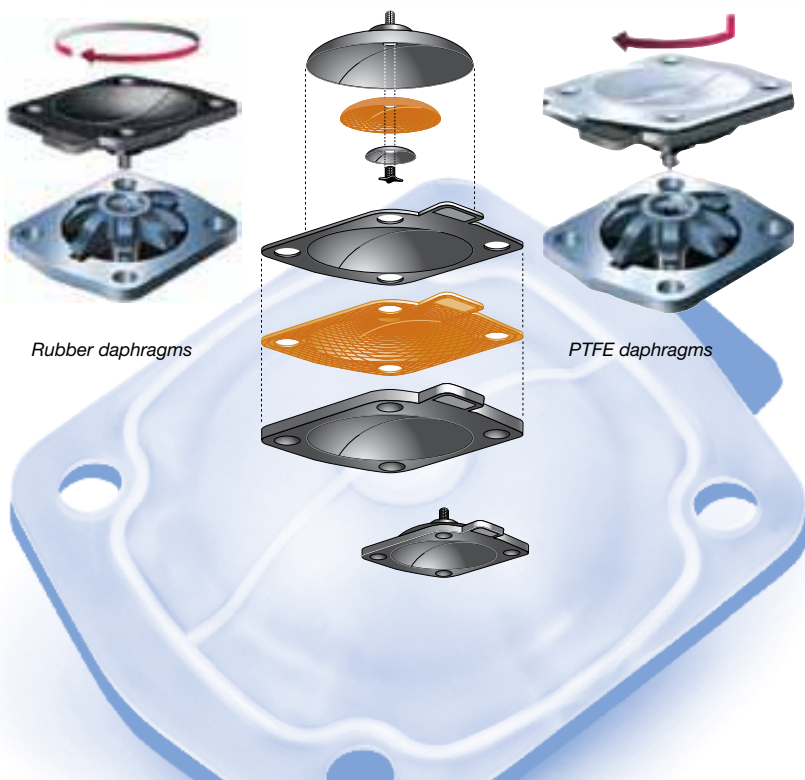


HC4 Diaphragms

Diaphragm specifications

Grade	Material	Colour	Size Range Lower-upper	Continuous temperature	Hardness IRHD	Tensile Strength	Approvals		
							FDA	3A	USP
300	Resin cured butyl rubber (isobutylene/isoprene)	Black	DN8-DN200	-30 to 130	62-68°	12.9	v	v	v
425	Ethylene Propylene, co-polymer, peroxide cured	Black	DN8-DN100	-40 to 140	61-67°	12	v	v	v
325	(*)								
E5	(*)								
E3	Ethylene Propylene, co-polymer peroxide cured, post cured	Black	DN8-DN100	-40 to 140	61-67°	12	v	v	v
E4	Ethylene propylene (EPDM) diene-modified, peroxide cured	White	DN8-DN100	-40 to 110	60-66°	11	v	-	-
214/300	PTFE/Butyl backed	White facing, black backing	DN8-DN200	-20 to 150	-	32	v	v	v
214/425	PTFE/EPM backed	White facing, black backing	DN8-DN200	-20 to 160	-	-	v	v	v
214S/425*	PTFE/EPM backed for steam	White facing, black backing	DN8-DN200	-20 to 160	-	-	v	v	v
214/325									
500	Silicone DBPH cured	White	DN8ñDN200	-40 to 150	67-73°	7.1	v	v	-
214S/300	PTFE/Butyl backed for steam	White facing, black backing	DN8ñDN200	-20 to 150	-	30	v	v	v
214S/325	(*)								

* DN8-50 conforms to new Hi-Steam design / ** superceded by new enhanced EPDM



The main categories of aseptic diaphragms are:

Synthetic elastomer - black internally reinforced grades

- Grade 300 - Butyl
- Grade 425 - EPM, peroxide cured
- Grade E3 - EPM, peroxide cured, post cured

Synthetic elastomer - white internally reinforced grades

- Grade 500 - Silicone
- Grade E4 - EPDM peroxide cured

PTFE

- PTFE virgin grade white, grade 214 with either 300, 325 or 425 backing support
- TFM white, grade 214S with 325 or 425 backing

HC4 Diaphragms



Saunders

Type 425 Grade EPM diaphragms

Delivers highest levels of performance and security for the most demanding biopharmaceutical applications

- Manufactured from inherently stable EPM (A copolymer of Ethylene and Propylene monomers)
- Uses the latest vulcanisation technology
- Enhanced temperature performance and chemical resistance due to the elimination of any double bond active sites as displayed with EPDM molecular structure
- Improved steam life cycle and flex life
- Longer lasting diaphragm provides better reliability with less disruption to pharmaceutical processes
- Fully complies with all international standards for toxicity and purity as defined by regulatory bodies such as FDA, USP and ISO is confirmed by independent laboratory studies
- Full traceability documentation available to confirm specific batch number and critical data. This aids validation, assists in trouble shooting and is a guarantee of product quality
- Certified as ADCF (Animal Derivative Component Free) to ensure maximum product purity and integrity



Full Traceability

To assist in the validation process and to provide the highest level of reliability, security and regulatory compliance, we provide full batch traceability for all grades of aseptic diaphragms.

Key elements in diaphragm design and selection include:

- Media compatibility
- Levels of extractables
- Flex and closure performance
- Resistance to compression set
- Longevity
- Regulatory conformance

Our elastomer technology and application engineering specialists are available to consult on specifics of material selection.

The Saunders range of FDA conforming diaphragms has been designed to meet the highest standards of performance and reliability based on current elastomer and plastics technology. Equally important is the associated documentation support to assist regulatory compliance and aid plant and system validation.

Only the Saunders brand matches diaphragm quality and performance with the highest standard of documentation and validation support.

Saunders

HC4 Top Works Manual Bonnets, Actuators & Accessories

The Saunders HC4 range of manual and actuated Top Works provides industry-leading features with ergonomic, compact design. Ease of operation and high temperature resistant materials (polymer and stainless steel) compliment a wide choice of modular options.

Black PES (Polyethersulphone) Performance Bonnet

Designed for the most demanding applications and featuring PES, a high performance thermoplastic material with excellent chemical resistance, to ensure long life and high reliability.

Fully autoclavable, the PES bonnet is available across the size range DN15-DN80.

Key Features:

- High integrity, ergonomic handwheel. Design ensures comfortable operation and precise control
- Fully autoclavable to 140°C
- 'O' Ring seal prevents both the escape of product and the potential ingress of contaminants
- Shrouded bonnet construction provides maximum containment and diaphragm support for critical applications

- Modular options available including padlocking facility, proximity sensors, 'V' notch vent plugs and limit open stop version
- Fully FDA conforming materials of construction
- Limit closing stop to provide process/flow control option

Padlock Option

The padlocking facility can be supplied to order or is available in kit form for retro-fitting to the bonnet sub-assembly or whole valve.

Limit open stop option

Limit open stop bonnet to facilitate effective running of system under normal capacity.

Limit closing stop option

A fully adjustable limit closing stop is fitted as standard to all Performance bonnets. The limit closure stop is located under the handwheel and is adjusted by first removing the handwheel fixing screw and the handwheel assembly.



Compact Actuators that provide reliable remote control

Saunders EC and SSC Pneumatic Actuators facilitate remote operation of the valve, either as a simple alternative to manual bonnet assemblies or as an integral part of the control system. Both are compact piston style actuators with excellent chemical and temperature resistance.

The versatile and robust design derived from the use of high technology materials of construction, results in an actuator suitable for a wide range of process industry applications.

EC Actuator

SSC Actuator

ECX Actuator Bodies (DN8-DN80)

Pneumatic Actuators for Larger Valves; EV & ES Modular

Actuation Accessories: Overview

Model	Size Range	Style	Material	Accessories
EC	DN8-50	A, AFP	PES	Solenoid, switch box, positioner, handwheel available / air filter not available
SSC	DN8-50	A, AFP	316 C12	Solenoid, switch box, positioner, handwheel available / air filter not available
ECX	DN65-150	A, AFP	SiAl Coated	Solenoid, switch box, air filter, handwheel available / positioner not available
EV	DN15-150	A, AFP, KB	SiAl Coated	Solenoid, switch box, positioner, air filter available / handwheel not available
ES	DN15-200	A, AFP, KB	SiAl Coated	Solenoid, switch box, positioner, air filter, handwheel available

Mini Positioner

ESPositioner

Solenoid Valves

EC & SSC Limit Open Stop

Module Switchbox

007 Switchbox

SSC Manual Over-Ride



Saunders

HC4 Quality Standards, Traceability & Validation



Through continuous focus on quality, the Saunders brand offers the clean processing industries complete peace of mind. All international standards and conformance are rigidly adhered to throughout the HC4 product portfolio to assist the user in achieving secure, repeatable and reliable processing when using Saunders brand valves.

The Complete Approach to Quality

- Quality Management system registered to ISO 9001:2000 standard in which our R & D and manufacturing process are optimised to maintain our product quality and service
- TUV AD2000 Merkblatt HPO and A4 Qualifications for Saunders product manufacturing and certification
- CE marked products for compliance to European Directive ATEX 94/9/EC for Group II, Categories 2 and 3 applications
- Certified compliance to the European Pressure Equipment Directive 97/23/EC authorising Saunders to CE mark relevant valve products
- International product approval from authorities such as Bureau Veritas, American Bureau of Shipping
- Polymer/Rubber materials certified as meeting the requirements of FDA, 3A, WRAS and USP

HC4 Diaphragm Traceability & Validation

- Validation support - from raw materials to your system
- All ingredients - base polymer, filler, accelerators, etc - are manufactured from FDA conforming materials
- All diaphragms are fully batch traceable and carry a unique moulded batch identification number
- All diaphragms can be issued with a certificate of FDA conformity to assist in FDA validation and internal quality controls
- All diaphragm grades certified ADCF (Animal Derivative Component Free)
- Physical property data is also available upon request

Full traceability and product validation

- The Saunders valve range is acknowledged right across industry as being a leader in quality assurance techniques and design criteria for clean processes. The Saunders product, through its range of fully traceable diaphragms provides its users with valuable support in the validation process.
- A unique moulded reference number gives precise batch traceability
- Access is available to all relevant physical data
- Diaphragms that meet the most stringent validation requirements
- A certificate of the physical properties of each batch is issued to ensure consistency and support validation on request
- A profile of the complete physical data of each batch is available to help trouble shooting
- Complete documentation package is available for all valve components in contact with the process fluids (EN 10204 3.1 certification)

Validation Documentation:

Saunders can supply the following validation documentation on request:

- Certification of chemical composition to EN 10204 for body material
- Traceability certification for diaphragm grade
- Full validation manual (polymers)
- Surface trace certification
- USP Class V and VI diaphragm certification
- FDA conformance certification for all biopharm diaphragm grades
- Certificate of conformity to order specification
- ISO 9001:2000 certification
- Certification of testing to BS 6755-1
- EN 12266-1/2



The pneumatic Pinch Valve type VMP-Compact

Reliable and cost-effective!

The compact valve solution for the automatic shut off. For example dust, granule, powder, suspension, sewage, air venting etc.



Advantages:

- Extremely compact – face to face length reduced up to 30%
- Weight reduced by 25%
- Suitable for food applications
- ATEX conformity
- Excellent weather resistance
- Complete free passage
- No plugging
- 100% tight shut off
- Easy maintenance and re-sleeving
- Free passage
- Optimum tightness
- Low resistance
- No plugging
- Low air consumption
- Low weight
- Easy maintenance

Hygiene-Right angle control valve



With Integrated Digital Positioner for applications in food processing

Pneumatic control valve with right angle body design and integrated microprocessor-positioner for applications in food processing and chemical.



Hygiene-Right angle control valve

DN 15 up to DN40

- Space saving, low weight design
- Body made from stainless steel barstock
- Stainless steel actuator and positioner housing options
- Metallic or soft seat options
- Zero steady-state air consumption
- Contactless stroke feedback (inductive sensor)
- Operation independent of mounting position and supply pressure variations
- Not sensitive to vibration
- Instrument grade air not essential
- Software configurable flow characteristics
- Protection class IP65

Ball and speciality valves

ERIKS has solutions for your valve application!

ERIKS works with manufacturers of ball valves, specialty valves and accessories, ERIKS recognizes that many applications are unique and may have special problems. The ideal solution combines specific application requirements with creative engineering and quality manufacturing practices.

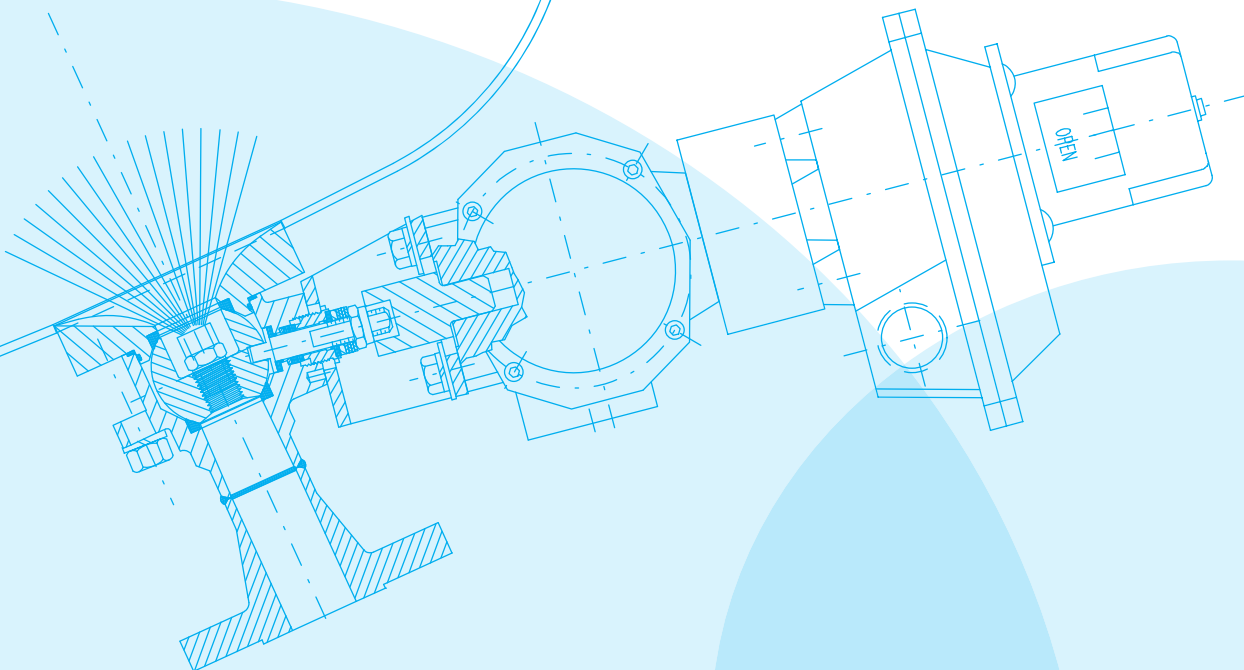
Our valves offer the convenience of standard features with the option of customizing for a specific process. Most of our manufacturers' valves incorporate the Adjust-O-Seal® design and many include the True-Bore® port design. Only these valves have the ability to provide Clean-in-place/Steam-in-place capability without process interruption. These are just a few of the innovations that help reduce processing costs and improve efficiency for our customers.



Sanitary Valves

Our Igenix® line of sanitary valves is ideally suited for pure process applications where cracks and crevices within the valve need to be minimized. These valves consistently exhibit high performance in pharmaceutical, biotechnological, food, beverage, cosmetic, and other sanitary or clean steam applications and validation systems. Our sanitary valves include:

- Two-Way ball valves
- Flush Tank ball valves
- Diverter Port ball valves
- Multi-Port ball valves
- Steam Trap valves
- Rising Stem Sampling valves





Clean Steam Traps Solutions which are brilliant in their simplicity

TLV's headquarters were founded over half a century ago. TLV is represented by ERIKS for more than 20 years. TLV's goal has been to produce dependable, long-lasting steam traps and products for steam equipments.

TLV is true to the philosophy of complete customer satisfaction through strict adherence to its two fundamental policies: 'Quality first' and 'Incomparable Originality'.

Only through providing superior products and service that are of great benefit to the customer can complete satisfaction be guaranteed. This is the credo that has supported TLV's growth since its inception, and will continue to be the guide into the future.

TLV's quality system is certified to ISO9001, with products and services exceeding the strictest standards and requirements for a wide range of applications.

TLV approaches product developments with continuous dedication to customer needs. Development means the creation of totally new ideas and concepts. The many patents derived through this development process attest to TLV's dedication to innovation.

TLV products meet the needs of the industrial world:

- Longer service life
- Greater energy savings
- Improved quality
- Increased productivity
- Enhanced environmental conservation

Each product is developed with TLV's highest quality and incomparable originality to offer the customer excellent value and service.

TLV is internationally established, with companies in 10 countries. A network of over 100 distributors in more than 50 countries enables the provision of engineering support in any part of the world at any time. TLV plays a leading role in the promotion of efficient energy systems and increased environmental conservation on a worldwide scale through its original products and services.

Clean Steam Traps

Designed for Bio and Clean Steam Applications:

- All Stainless (316L)
- Self-draining
- Crevice-free interior
- Easy Disassembly and Cleaning

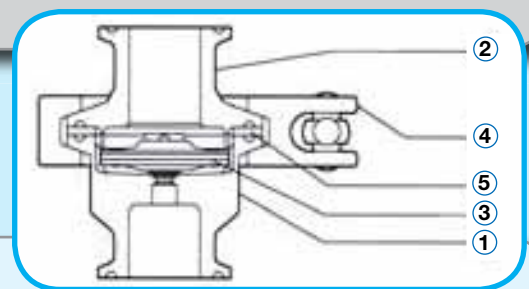


Model LV6 Clean Steam Trap

Features

Balanced pressure thermostatic steam trap recommended for use in reactors sterilizers and distribution lines in clean and pure steam systems.

- Free-draining, virtually crevice-free design minimizes the possibility of bacteria buildup.
- Patented 'fall open' feature minimizes interruption of critical operation.
- Large orifice provides high air venting capacity for rapid start-up and resists plugging to ensure continuous operation.
- Compact for easy installation
- Maintainable design lowers cleaning costs.
- LV6P polished to 0.8µm Ra inside and 1.2µm Ra outside with an electro-polish option to further resist bacterial growth.



N°	Description	Material*	DIN	ASTM/AISI
①	Lower body	Stainless Steel SUS316L	1.4404	AISI316L
②	Upper body	Stainless Steel SUS316L	1.4404	AISI316L
③	X-element	Stainless Steel SUS316L	1.4404	AISI316L
④	Body Clamp	Cast Stainless Steel S13A	1.4308	A351 Gr. CF-8
⑤	Body Gasket	Fluorine / Ethylene Rubber PTFE/EPDM**	-	-

* Equivalent materials

** Wetted part is PTFE only; PTFE approved to FDA CFR Title 21 Paragraph 177 Section 1550

High Quality Pressure Gauges



Armaturenbau is a company established in 1903 with the concept of manufacturing pressure gauges of the most durable, rugged and reliable type, working with the latest machinery and laboratory grade equipment available on the market today.

ERIKS supply program, from pressure gauges to chemical seals, pressure transmitters, limit-switch contact assemblies, pressure gauge test equipment, accessories such as pressure gauge valves or cocks and last but not least our comprehensive offer of gas-actuated and bimetal

thermo meters. Besides for our DIN/EN standard gauges, we are well known for finding solutions for our customers also in difficult pressure issues. Innumerable special versions have been developed for our customer's individual requirements. We meet all pressure gauge and thermometer applications. We take pride in having the highest standards of accuracy, performance and quality, and to be known as an organization that you can depend and rely on to be there when you need us.

Hygienic Design Bourdon Tube Pressure Gauges Weld connection piece for Diaphragm Seal

Case and Bayonet Ring Stainless Steel
Standard (RCh 100-3v) or Liquid Filled (RChG 100-3v)

Application

Hygienic design pressure gauges with Bourdon tube were developed for direct welding to a diaphragm seal for hygienic/aseptic applications, where high process and/or cleaning temperatures require an outstanding high-grade sealing of the measuring system (CIP/SIP procedures in food industry, biotechnics, and pharmacy). In data sheet 7303 you will find the selection of diaphragm seals in hygienic design that are to be welded to these Bourdon tube pressure gauges.

Nominal Case Size (NCS): 100 (4")

Accuracy Class (EN 837-1): 10

Pressure Ranges:

0-0.6 up to 0-40 bar and 0-10 psi up to 0- 600 psi
Also corresponding vacuum and vacuum/pressure compound ranges.

Endurance Limitations:

Steady pressure: full scale value
Cyclic pressure: 90% of full scale value
Overpressure: 130 % of full scale value

Protection Type (EN 60 529 / IEC 529):

Model RCh 100-3v = IP 54 / Model RChG 100 3v = IP 65

STANDARD CONFIGURATION

Process Connection:

Bottom weld connection piece stainless steel 316 Ti (1 4571) welded to the case; for welding to diaphragm seal according to tri-clamp, varivent or DIN 11851

Bourdon Tube: 316 Ti (1 4571), C-form, argon arc welded

Movement: Stainless steel



Dial: Aluminum alloy, black figures, white background

Pointer: Aluminum, black

Case and Ring: 304 stainless steel (1.4301)

Window: Laminated safety glass

Case Filling: Model RChG 100-3v only: Glycerine

Safety Features:

RCh 100-3v: Blow-out plug

RChG 100-3v: Blow-out plug with tum fastener at the top of the case.

Flow-Through-Pressure Gauge PsP 50-3 FT Pressure Gauges for Ultra High Purity applications

Application:

For fluid and gaseous media with highest purity requirements

Case Diameter: 50 mm

Accuracy: Class 1,6 (EN 837-3)

Ranges: -1/3 bar and -1/9 bar,
Other ranges on request.

Temperature Limitation: Ambient temperature: - 20°C up to +50°C ;
Medium temperature: max. +50°C

Wetted Parts:

Bourdon Tube: Inconel 718

Case: 1.4435 (316L), electropolished

Surface: Ra < 0,25 µm

Lens: Plexiglass

Connection: Inlet: 1/4" VCR-female / Outlet: 1/4" VCR- male,



High Quality Pressure and temperature gauges

75 Years Schmierer:
Measurable Precision !
 High quality pressure and temperature gauges with state-of-the-art production and testing equipment.

Flexible ways of production in combination with modern CNC-controlled machinery, assembling and calibration equipment gain are very high valued within our customers. ERIKS supply the Schmierer instruments to industries like: chemical, pharmaceutical, foodstuff, paper, machinery and many others.

Our range of products covers all kinds of Bourdon tube-, Diaphragm-, Test- and Differential Pressure Gauges. These gauges are available in all regular sizes and can be combined with numerous accessoires. We deliver according to DIN/EN- Standard or many other standards. The various types of connections of pressure gauges can be realised fast and cost efficient with our flexible supplier. Futhermore, we can deliver our gauges with nearly all kinds of contact switches; slow-action, snap-action or inductive system. We do make repairs of all kinds of pressure gauges from all manufacturer, if requested.

ERIKS deliver, assemble, fill and calibrate a wide range of diaphragm/ chemical seals according to actual norms or even custom-made. All these seals can be combined with pressure gauges or pressure switches/transmitters (supplied from customer). The seals can be mounted with or without capillary line or cooling element for high temperature

applications – everything is possible. We have more than 10 different filling fluids in our standard selection, some of these with FDA-approval for foodstuff or pharmaceutical applications. The standard material of our seals is 1.4571/ St.Steel 316 Ti; we may also supply 1.4435, 1.4539, Tantalum, Hastelloy C, PTFE, Titanium, Gold, Nickel, Silver or others. Filling and Calibration will be made with modern and very effective filling stations with high range vaccum pumps and first-class calibration instruments.

ERIKS deliver also a wide range of Bimetallic- and Gas-Filled Pointer Thermometers, these can be partly equipped with contact switches or in case of gas-filled thermometers with remote indication and capillary line. Parallel to the gauges, we deliver the suitable thermowells to be welded or screwed and flanged connection; also available in special materials.



Technical Descriptions

PKU 100, Flange DN25 PN40, PTFE PKU 100 Diaphragm Pressure Gauge

- Case diameter: 100 mm
- Case: st. steel 304
- Bayonet lock ring: st. steel 304
- Scale white with black lettering
- Micrometer Pointer
- Safety glass
- Accuracy: 1,6% f.s.d.
- Diaphragm made of Duratherm 600, alternative with PTFE-coating
- Flange made of st. steel 316Ti, DN25 PN40 acc. EN 1092
- Outer diameter of flange: 115 mm
- Alternative flange with PTFE-lining

V 158





Technical Descriptions (cont'd)

RU 160 Bourdon tube Pressure Gauge



Case diameter: 160 mm
 Case: st. steel 304
 Bayonet lock ring: st. steel 304
 Scale white with black lettering
 Micrometer Pointer
 Safety glass
 Accuracy: 1,0% f.s.d.
 Bourdon tube st. steel 1.4571/316 Ti

V 119 Junction box, right side
 V 126 Bayonet lock ring for contacts
 V 136 Contact device acc. to customer specs.
 V 120 Diaphragm Seal made of st. steel 1.4571 / 316 Ti
 Diameter 100 mm,
 Membrane made of st. steel 1.4571/ 316 Ti

V 200-2 System filling: Silicone Oil M 20
 V 158 Flange made of st. steel 316Ti,
 DN25 PN40 acc. EN 1092
 Outer diameter of flange: 115 mm



PKU 160 Diaphragm Pressure Gauge

Case diameter: 160 mm
 Case: st. steel 304
 Bayonet lock ring: st. steel 304
 Scale white with black lettering
 Micrometer Pointer
 Safety glass
 Accuracy: 1,6% f.s.d.
 Diaphragm made of Duratherm 600
 Junction box, right side
 V 119 Bayonet lock ring for contacts
 V 126 Contact device acc. to customer specs.
 V 136 Flange made of st. steel 316Ti,
 DN50 PN40 acc. EN 1092
 V 150 – V158 Outer diam. of flange: 115 mm or 165 mm

flow-captor: for Sanitary Applications



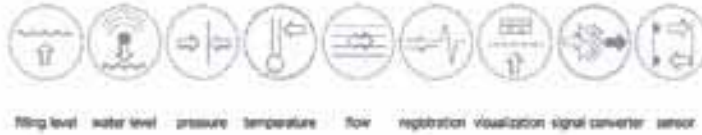
Metering Flow Switch with Analog Display

The flow-captor is a compact, rugged and reliable flow sensor with proven reliability and long-term stability. Operating according to a calorimetric principle the flow-captor offers a level of performance, especially at low flow rates, not comparable with instruments employing different operating principles. The flow-captor is available in a range of many different models.

Advantages:

- For liquid media
- Insertion and inline version
- Separate adjustment of range and set point
- Analog display of flow rate and set point
- High accuracy even under low flow conditions
- Usable for high temperatures
- High pressure resistance
- Inline version for small diameters





ACS Measuring Techniques and Automation

ACS-Control-System is a company with nearly two decades of experience in measurement technique. This experience is the reliable basis for the development and production of filling level, pressure, temperature and flow sensors. The products meet the various requirements and are used under extreme conditions.

Besides the extensive know how in the fields development and construction we have a long-standing experience in the realizing of special customer requests and the creation of solution concepts in industrial automation. We optimize continuously our products that are used in the fields measuring technique and control engineering. ACS-Control-System guarantees the customers fast supplying and highest quality. Due to our experience we are convinced also to fulfill your individual requirements.



◀ Hydrostatic filling level transmitter
Hydrocont D50, humidity resistant

Filling level

The filling level measuring technique in liquids and solids are one of the core competences. Due to the variety of devices and the thought-out module system of the devices it is possible to fulfill nearly all measuring tasks in all branches

- Hydrostatic filling level measuring
- Ultrasonic filling level measuring
- Radar measuring

Water level

In times of climatic changes autarchic operating water level measuring systems with high water and low water alarm functions gets more and more importance.

- Water level sensor with battery operation
- Data remote transmission
- Alarming with GSM module

Pressure

No matter if relative, absolute or difference pressure, in the fields hydraulics, mechanical engineering, food industry, pharmacy or only for compressed air, ERIKS offers due to its variety of devices and the extensive Know-how in this field always the right system.

- Standard pressure sensors
Pressure sensors with analogue and switching output, in 2-wire or 3-wire-technology, from strain gauge measuring element up to the capacitive ceramic measuring sensor, with or without display, from synthetic housing with plug up to a housing in high-grade steel with terminal box and with all common process connections.



◀ **Conductive rod probe SLK**,
with food process
connection and
weld-in-sleeve



Measuring Techniques and Automation

Temperature

Well equipped for all measuring tasks with the temperature sensors and signal converters.

- Standard screw-in resistance thermometer
- Digital temperature sensors
- Ex resistance thermometer
- Hygienic and pharmaceutical applications
Screw-in sensors with hygienic process connections, touching type sensors with front flush weld-in sleeves and highly precise tube touching type sensors. Validateability, material check, self-supervision, highest precision
- Chemical resistant sensor
- Stab-in and dive-in resistance thermometer
- Pt100 sensors in various styles with fix connected cable.
- Temperature signal converter



Flow meter
Flowcont L

Flow

Measure flow – uncomplicated and easy

- Flange versions, Flowcont F
- Hygienic versions, Flowcont L
Magnetic-inductive flow meter especially for the food industry, with hygienic process connections and high-grade steel housing.
- Flow measurement for partially filled pipes, Flowcont TGF
- Mass flow meter
- Floating object flow meter

Visualization

The interface man to machine is of especial importance for ERIKS. Due to this we offer a variety of display, evaluation and registration devices, where the attention is focused to good readability, easy operation and highest reliability.

- Display devices
From the simple 3 1/2 - digit panel device to devices with bar graph display and up to multifunctional display and evaluation devices with multiple channels and limit values.
- Multifunctional, calculation and differentiating devices
- Signal converter
A good isolation amplifier is perceptible by this that it is not perceptible. By using isolation amplifier and signal converter expensive control systems can be galvanically safe isolated to the field layer and by this protected against ground loops, over voltages etc. or various measuring signals can be also converted into standardized signals.

Flow meter
Flowcont M



PVDF (Polyvinylidene fluoride) HP (High Purity) Piping Systems Products for each Application

Semiconductor industry:

Hi-tech semiconductor micro electronic factories run 24/7. It is therefore absolutely essential that the piping systems deliver critical process fluids safely and reliably. Avoiding unnecessary shutdowns is a goal we share with the operators. PVDF piping system components in combination with high quality fusion technology, like Bead and Crevice Free (BCF) jointing methods, the natural smooth surface of the pipe, fittings and valves, have kept the ultrapure water (UPW) systems in semiconductor fabs running round the clock for more than two decades.

The PVDF resins are handled in a clean room environment to prevent contamination and following, while in the clean-room, the PVDF fittings and valves are cleaned and double backed (CDB). The resistance of PVDF to permeation and water adsorption as compared to other thermoplastics such as PFA, FEP, PTFE, PP and PE is superior, and is equivalent in resistance to PVC-U and PVC-C. The above make the PVDF (BFC) piping systems suitable for the transport of USP Water for Injection (WFI) or USP (Ultra) Purified Water (PW).

+GF+

FIP

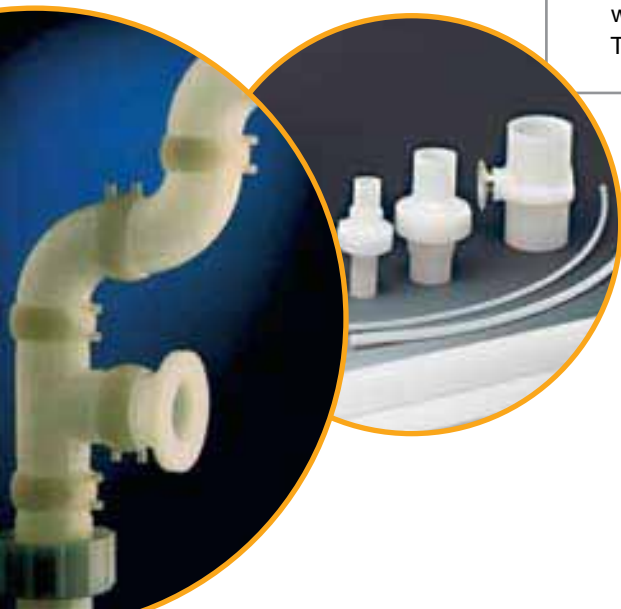


Biotechnology, pharmaceutical, Food and Beverage industry:

Biotechnology is changing the pharmaceutical marketplace. Ground-breaking technology provides new methods for producing pharmaceutical products. These innovations require the need for cleaner, better, faster-built, and longer running operations without the need of system shutdowns. The use of PVDF in production systems is the latest advance in reducing costs, with the added benefits of improving operational efficiencies and system purity, for the industry to take advantage of the benefits of this material.

PVDF is non-toxic. It satisfies the requirements of the Food and Drugs Administration (FDA) for use as food packaging and in articles which come into contact with food. PVDF is just as poor a nutrient for micro-organisms as glass. This makes it also suitable for analytic demi-water systems, with the highest quality requirements. These PVDF systems can be cleaned with hot water, chemicals, ozone and steam (sterilization).

For water systems in the pharmaceutical and biotechnology (AP, USP and WFI) PVDF may readily be substituted for 316L stainless steel. Since it may be steam sterilized, PVDF is also a good choice for solution preparations and transfers. This piping system has undergone extensive testing for extractable levels, and the FDA has approved the raw materials for food and pharmaceutical applications. PVDF HP manufacturers can give a certificate which they can valid the applications according to FDA and USP. This makes it also suitable for Food and Beverage applications.





Chemical Process Industry (CPI):

Due to the unique properties of PVDF, such as its high chemical resistance to most corrosive acids, aromatic hydrocarbons, alcohols and halogens (chlorine, bromine, iodine except fluorine), usable over a wide range of temperatures (-20°C to above +140°C), high strength, good impact resistance, high abrasion resistance, flame retardant and its resistance to ambient uv, and rays, makes PVDF the piping system of choice for the applications in the chemical process (CPI) and nuclear industry. The excellent properties of the material and especially its chemical resistance are fully retained by avoiding the use of colour pigmentation.

One of the original and prevalent uses of PVDF was actually as a liner for carbon steel where the system combined the strength of metal and the corrosion resistance of PVDF. As an evolution to lighter weight systems and outside corrosion barrier, systems made from either butt-welded PVDF pipes and fittings or from PVDF piping liners wrapped with fibreglass (polyester, vinylester and epoxy resin systems) have won the approval of engineers for harsh chemical handling, high pressures and temperatures.

Planned Quality Control and packaging

Manufactures use a regulatory approach in both the manufacturing and technical support of its High Purity products. All components are produced under clean room (Class 10.000 according U.S. Fed.Std.209E; Class 7 ISO 14644-1) conditions. Products are cleaned and double bagged (CDB) after production. Pipes are capped and each component is double bagged in a specified inner bag and an outer bag under clean room ISO 14644-1 Class 6 (U.S. Fed.Std.209E; Class 1000) conditions.

A rigorous quality control program ensures that the customer shall receive products as specified and packaged so that they are 100% contamination free. PVDF HP systems are designed around the stringent requirements defined by FDA guidelines and listed in all current codes.

Manufactures produce a quality assurance certificate for each batch of components, which they will furnish to you upon request.

The documentation is in a format that readily translates to protocols for Installation Qualification (IQ) and Operational Qualification (OQ).

Even if the client uses a different protocol format, the information is easily inserted. For greater convenience, an electronic version will be available.

All products come with installation, engineering and validation support. The key to validation is documentation: all the information required by the regulatory agencies for pharmaceutical and biopharmaceutical applications.



PVDF (Polyvinylidene fluoride) HP (High Purity) Piping Systems Products for each Application

**Bead and Crevice Free (BCF)
Fusion Equipment, Fusion
Training and Certification**

For each type of installation an appropriate type of joining equipment is provided. Joining technology is available in bead free joining (BCF/WNF), automated IR, butt fusion, and socket fusion. For pharmaceutical and biotechnology market, the manufacturers improved special welding technology without beads. The Welding system is the only method on the market that provides practical fusion with a smooth inner surface. Welds can be done quickly in almost any location by the use of remote weld units. The welding system equipment is completely portable making installations, tie-ins, and additions easier to conduct than ever before.





Elimination of Historic System Worries; Total Cost of Ownership

Here are just a few of the notable advantages of employing PVDF piping systems: material and installation costs are lower than with conventional metal systems, such as stainless steel (304-L and 316-L Sch.40) and Hastelloy (C-276 Sch.40); chemical resistance is extremely high; rouging and associated metal contamination problems are nonexistent; and borescoping and passivation are not required. In addition, all materials have smooth surfaces to meet or exceed the standard for Mechanical and Electro polished Stainless Steel. These smooth surfaces and the lower TOC contamination (than stainless steel) are unfavourable for the proliferation of micro organisms.

Safety benefits and reliable fusion methods: fully controlled and monitored fusion process, read-out software, traceability of materials and welds, entirely reproducible fusion, highest fusion factors, low-stress fusion, no bead or crevice (BCF), on site failures of welds in %.

Customer benefits: shorter weld and installation times with IR and BCF (shorter in comparison with traditional butt-weld), quick introduction to machine handling, high, warranted traceability, excellent fusion weld quality, low in maintenance, no corrosion, light in weight and proven and tested technology worldwide.

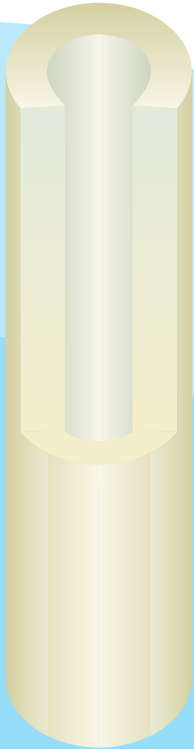
Comprehensive Product Offering

PVDF – High Purity is available in a complete offering of Ø20 up to Ø315 and valves are also available in zero dead leg (zero static) configurations. In addition to piping, fittings and valves a Vortex Flow Meter is ideal for pharmaceutical operations. The instrument has no moving parts and is crevice free. It may be steam-sterilized and can be installed in Purified Water, Water For Injection, and Solution Preparation Systems. We offer the PP-R piping system for pharmaceutical black utilities (compressed air, potable water, chilled and hot water). If you require sanitary piping and distribution of air, nitrogen, carbon dioxide and other gases (not medical gasses), ERIKS offers a more cost-effective system in comparison to Stainless Steel piping systems. For all systems please contact our technical team for engineering assistance and technical specifications.



Hoses

RX®-LABO SILICONE MEDICAL 60° Shore transparent



Application :

- Specially designed for the food and pharmaceutical industry
- "Medical Grade" : ST-EC-60-01
- For foodstuff contact approved by:
 - FDA CFR 21 177.2600
 - USP XXI Class VI
 - BGA
- No toxic ingredients

Temperature range :

-70 °C tot +200 °C continuous

Tube :

- Silicone rubber, semi-transparent
- Hardness : 60° shore

Reinforcement :

None

Cover :

- Natural silicone rubber, smooth, semi-transparent
- Hardness : 60° shore

Marking :

None

Extra :

Also available in colour depending on the quantities

RX®-LABO SILICONE MEDICAL

ERIKS art.nr.	Int. diameter mm	Wall thickness mm	Weight mm	Length coil kg/m
10015203	2	1.5	0.02	25
10015204	2	2	0.03	25
10015205	3	1	0.03	25
10015206	3	2	0.04	25
10015207	4	1	0.03	25
10015208	4	1.5	0.04	25
10015209	4	2	0.05	25
10015210	5	1	0.04	25
10015211	5	2	0.05	25
10015212	5	3	0.09	25
10015213	6	1	0.03	25
10015214	6	1.5	0.04	25
10015215	6	2	0.06	25
10015216	6	3	0.10	25
10015217	7	1	0.04	25
10015218	8	2	0.07	25
10015219	8	3	0.13	25
10015220	8	4	0.18	25
10015221	9	1	0.07	25
10015222	10	2	0.10	25
10015223	10	2.5	0.12	25
10015224	10	3	0.15	25
10015225	12	2	0.12	25
10015226	15	3	0.20	25
10015227	18	3	0.22	25
10015202	19	3	0.25	25

Hoses

RX®-SILIPRESS MEDICAL 70° Shore transparent



Application :

- Specially designed for the food and pharmaceutical industry
- An ideal solution for filling equipment, load cell connections and food processing
- "Medical Grade"
- Lightweight hose for ease of handling
- For foodstuff contact approved by:
 - FDA CFR 21 177.2600
 - USP XXI Class VI
 - German BgVV
- No toxic ingredients

Temperature range :

-60 °C tot +180 °C continuous

Tube :

- Natural, smooth bore, silicone rubber, semi-transparent
- Liner will not affect taste, colour or odour of product
- Detergent or caustic (CIP) cleanable

Reinforcement :

Plies of glass fibre

Cover :

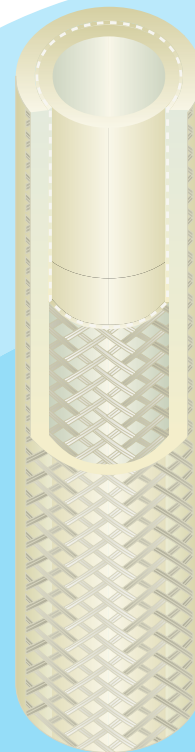
- Natural, silicone rubber, smooth
- Food quality according BGA and FDA
- Hardness: 60° shore

Marking :

None

Extra :

Also available in colour depending on the quantities



RX®-SILIPRESS MEDICAL

ERIKS art.nr.	Internal diameter	Wall thickness	Working pressure	Bend radius	Weight	Length coil
	mm	mm	bar	mm	kg/m	m
	3	3	20	10	0.08	25
10015230	4	3	20	10	0.09	25
	5	3	15	15	0.09	25
10015231	6	3	12.5	15	0.09	25
	7	3	11	18	0.10	25
10015232	8	3.5	10	28	0.12	25
10015233	10	3.5	9	38	0.12	25
10015234	12.5	3.5	9	50	0.15	25
10015235	16	5	7.5	60	0.20	25
10015236	19	5	7.5	60	0.20	25
10015237	25	6	5	100	0.25	25

Technical data at 20 °C.



Hoses RX®-SILIPRESS SPIRAL

Application :

- Very flexible inert suction and delivery hose with mirror-like liner, specially designed for the food and pharmaceutical industry
- For foodstuff contact approved by:
 - FDA CFR 21 177.2600
 - USP XX1 Class VI and 3A
- Autoclavable
- Detergent or caustic (CIP) cleanable
- Steam cleanable (SIP)
- Suitable for the use in food, beverages and pharmaceutical applications, where the highest levels of purity are critical

Temperature range :

-100°C - +300°C

Tube :

- Natural, smooth bore, silicone rubber platinum cured, semi-transparent
- Liner will not affect taste, colour or odour of product

Reinforcement :

- 4 Plies of polyester fibre
- Fully embedded stainless steel wire helix

Cover :

- Natural, silicone rubber, smooth, platinum cured
- UV- and aging resistant

Marking :

None

Extra :

Also available in colour depending on the quantities

SILIPRESS SPIRAL

ERIKS art.nr.	Int. diameter	Wall thickness	Working pressure	Burst pressure	Maximum Vacuum	Minimum Bend radius
	mm	mm	bar	bar	%	mm
-	12,7	4,6	17	55	95	50
-	19	4,6	17	55	95	50
-	25	4,6	17	55	95	75
-	38	4,6	17	55	95	100
-	50	4,6	16	48	95	150
-	63	6,2	14	41	95	210
-	76	6,2	12	27	95	250
-	102	6,2	11	24	95	300

Hoses RX®-CLEANFIXX FDA

Application :

- Food quality steam hose for heavy duty steam cleaning and hot water wash down service in dairies, creameries and food processing plants.
- The hose does not leave stripes on the floor.

Temperature range :

- For Water:
At 95°C working pressure 20 bar, burst pressure ≥ 3 times working pressure.
- For steam:
At 164°C working pressure 6 bar, burst pressure ≥ 10 times working pressure

Tube :

- EPDM-based rubber, light colour, mirror-like, smooth.
- Rubber compound complying with FDA food standards
- This hose is free from Animal Derived Ingredients (ADI)

Reinforcement :

- Plies of synthetic cord

Cover :

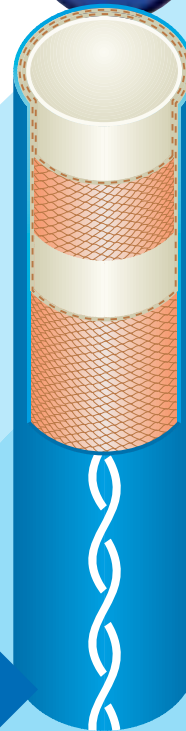
- EPDM-based rubber, blue,
- Smooth with cloth finish
- abrasion and weather resistant
- Resistant to traces of animal and vegetable fats

Marking :

“RX CLEANFIXX FDA STEAM OPEN SYSTEM 6 BAR 164°C ”

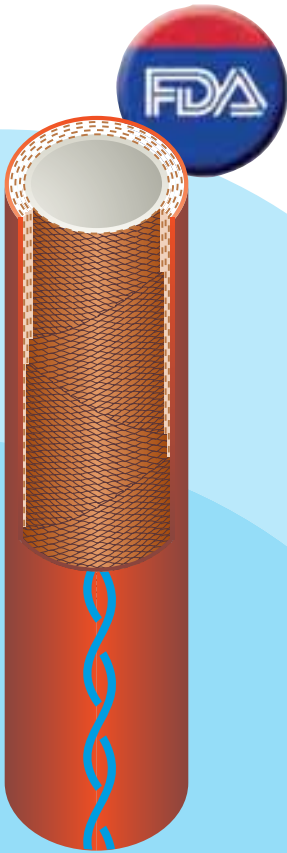
Other information :

This hose is free from Animal Derived Ingredients (ADI-free)



RX®-CLEANFIXX FDA							
ERIKS art.nr.	Int. diameter	Wall thickness	Working pressure Steam 164°C	Working pressure Water 95°C	Bend radius	Weight	Length coil
	mm	mm	bar	bar	mm	kg/m	m
10069593	10	5	6	20	75	0.27	40
11089003	13	5	6	20	100	0.34	40
11241415	16	6	6	20	120	0.51	40
11089004	19	6	6	20	160	0.60	40
11089005	25	7	6	20	200	0.89	40
11089006	32	7	6	20	260	1.10	40
11089007	38	8	6	20	300	1.65	40
11089008	50	10	6	20	380	2.35	40





Hoses RX®-DELIFIXX

- A flexible suction and discharge hose for use in wine cellars and breweries, in the food and beverage industry.
- White EPDM-Tube, food quality, high temperature-resistance to aggressive cleaning.
- Suitable for conveying alcohol (up to 40%), soft drinks and non-fatty foods.
- For the application of cleaning liquids please see our separate information sheet.
- The hose complies with the 'Recommendation XXI, Category 2' of BGVV, KTW and FDA.

Temperature:

Tube shortly up to +95 °C for water, lowest temp. at which the hose remains flexible: -35°C, brief steam; sterilisation up to max. 130°C/30 min.

Safety factor : 3,15 : 1

Tube : EPDM, white, smooth, food quality

Reinforcement : textile, wrapped

Cover : NR/SBR, red, smooth, abrasion resistant, cloth impression

Identification :

- Blue marking stripe with text: "RX DELIFIXX BEER/WINE 12 BAR D"
- Embossed text: "RX DELIFIXX EPDM D diam. 12 bar "

RX®-DELIFIXX

ERIKS art.nr.	Internal diameter	Wall thickness	Working pressure	Vacuum	Bend radius	Weight	Length coil
	mm	mm	bar	%	mm	kg/m	m
11088581	13	5	12	50	50	0.40	40
11088582	19	5	12	50	100	0.55	40
11088583	25	6	12	50	150	0.85	40
11088584	32	8	12	50	170	1.45	40
11088585	38	9	12	50	200	1.85	40
11088586	40	10	12	50	250	2.25	40
11088596	50	11	12	50	350	2.95	40
11088597	65	12	12	40	450	4.05	40
11088598	75	15	12	40	600	6.10	40
11088599	80	15	12	30	650	6.40	40
11088600	100	15	12	20	750	7.75	40

Hoses

RX®-PHARMAFLON MFA

Application :

- Universal suction and delivery hose designed to convey manifold chemical, pharmaceutical, cosmetic and alimentary products within the pharmaceutical, biotech and food industry.
- It exceeds the quality standards of the most impermeable and ultra-smooth fluorinated inner line available on the market superior to any other similar material.
- The non-toxic outer surface prevents contamination of the working environment.
- It offers excellent resistance to extreme temperatures and good resistance to mechanical stress.

Temperature range :

- From -50°C up to +170°C depending on conveyed product.
- Sterilisation up to 150°C / 30 minutes

Tube :

- MFA (Perfluoroalkoxy polymer), fully fluorinated, white, mirror-like, smooth.
- Very high thermal endurance, stress-cracking resistance, bending and oxidation resistance.

- For foodstuff contact approved by:
- US Pharmacopeia (USP 23 Class VI), USA Federal Drug and Cosmetic Act
- FDA Title 21 P.177.1550);
- Conform EU Directives 82/711 EEC; 85/572 EEC; 90/128 EEC; 92/39 EEC; 93/9 EEC; 95/3 EEC; 96/11 EEC
- This hose is free from Animal Derived Ingredients (ADI-free)

Reinforcement :

- High strength plies of synthetic cord, embedded steel wire helix and two crossed copper wires to ensure the dissipation of static electricity

Cover :

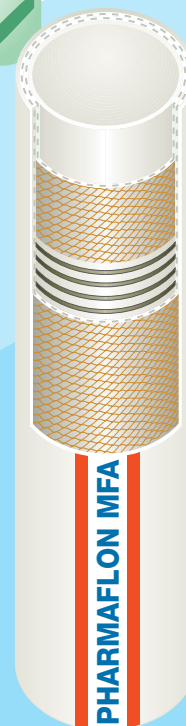
- EPDM-based rubber, white, smooth, non-toxic, abrasion, ozone and weather resistant, cloth finish.
- Approved by USA Federal Drug and Cosmetic Act (FDA).

Marking :

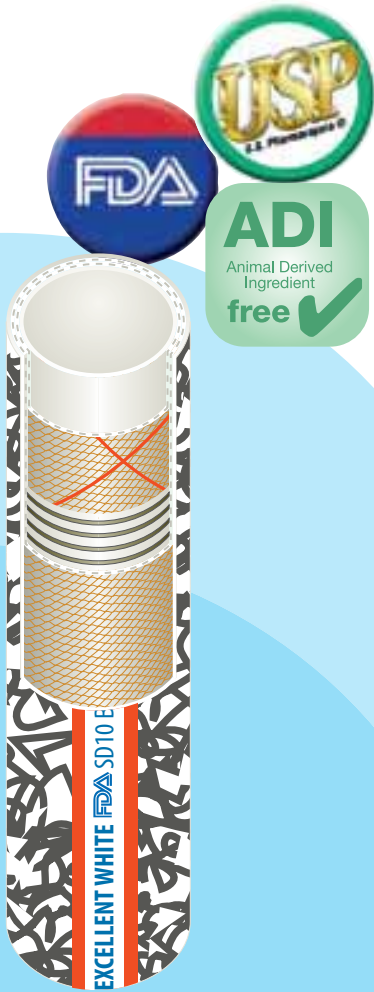
"PHARMAFLON MFA"

Safety factor :

≥ 4 times working pressure.



RX®-PHARMAFLON							
ERIKS art.nr.	Internal diameter	Wall thickness	Working pressure	Vacuum	Bend radius	Weight	Length coil
	mm	mm	bar	%	mm	kg/m	m
11294914	13	6	10	90	60	0,550	20
11294915	19	6	10	90	90	0,720	20
11294916	25	6	10	90	140	0,890	20
11294917	32	6,5	10	90	200	1,160	20
11294918	38	6,5	10	90	250	1,470	20
11294919	51	7,25	10	90	300	2,080	20
11294920	63,5	8	10	90	380	2,800	20
11294921	75	8	10	90	500	3,480	20
	100	8	10	90	550	4,380	20



Hoses RX®-EXCELLENT WHITE

Application :

- Universal sanitary hose with PFA liner designed to handle alimentary, cosmetic and pharma-chemical products.
- Specifically suitable for use on filling machines.
- Fluorinated, ultra smooth, inert liner of the newest generation ensuring utmost degree of impermeability and absolute hygienic and contamination-free delivery of the medium

Temperature range :

- From -40°C up to +130°C (depending on product and combinations).
- Sterilisations up to +150°C for a maximum time of 30 minutes.
- In case of dynamic applications: from +10°C up to +40°C.

Tube :

- PFA (Alkoxy polymer), fully fluorinated, white colour, smooth, mirror-like.
- No pick-up of taste and odour.
- Excellent flex-performance (resistance to repeated cycles of bending in accordance with ASTM D 2176).
- For foodstuff contact approved by:
- US Pharmacopeia (USP 23 Class VI), USA Federal Drug and Cosmetic Act
- FDA Title 21 P.177.1550);
- This hose is free from Animal Derived Ingredients (ADI-free)

Reinforcement :

- High strength plies of synthetic cord
- Embedded steel wire helix
- Built-in copper wires to ensure the dissipation of static electricity

Cover :

- Patented marble-like, white-black colour surface with a very compact and smooth texture.
- Suitable for applications in the pharmaceutical industry and in general in processes requiring the use of inert, non-polluting materials.
- Odourless and tasteless according FDA 21P.177 2600
- Slides easily over the working floor and does not create friction.
- It does not taint contact surfaces at all and is totally inert.
- Highly resistance to chemicals and can easily be washed.
- Superb resistance to abrasion, ozone and the aggression of weather.
- Antistatic according to EN 12115 parameters. (R<10⁶ Ohm)

Marking :

"RX®-Excellent White USP VI FDA SD 10 Bar"

Safety factor :

≥ 4 times working pressure

RX®-EXCELLENT WHITE

ERIKS art.nr.	Internal diameter	Wall thickness	Working pressure	Vacuum	Bend radius	Weight	Length coil
	mm	mm	bar	%	mm	kg/m	m
11384124	13	6,0	10	90	60	0,55	20
11384125	19	6,0	10	90	90	0,72	20
11384126	25	6,0	10	90	140	0,89	20
11384127	32	6,5	10	90	200	1,16	20
11384128	38	6,5	10	90	250	1,47	20
11384129	51	7,25	10	90	300	2,08	20
11384130	63,5	8,0	10	90	380	2,80	20
11384131	76	8,0	10	90	500	3,48	20

Technical data at 20° C.

Hoses

RX®-PREMIUM according to EN 12115

HOSE



Application :

- Versatile suction and delivery hose with UPE liner to convey a broad range of pharmaceutical, chemical and alimentary products.
- Meets the standard EN 12115
- Conform FDA, BgVV and M.D. 21.03.73.

Temperature range :

- From -35° C up to +100°C.
- Resistant to steam up to +130°C for a maximum time of 30 minutes.

Tube :

- UPE (ultra High Molecular Weight Polyethylene)
- Clear colour, smooth
- Conductive (R<106 Ohm) through a black UPE helix stripe.
- Inner liner approved by BgVV and conforming to FDA standards as well as to the M.D. 21.03.
- This hose is free from Animal Derived Ingredients (ADI-free)

Reinforcement :

- Plies of high strength synthetic cord.
- Embedded steel helix wire.
- Copper wires

Cover :

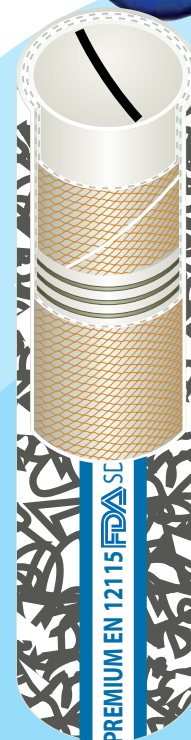
- Patented marble-like, white-black colour surface with a very compact and smooth texture.
- Suitable for applications in the pharmaceutical industry and in general in processes requiring the use of inert, non-polluting materials.
- Odourless and tasteless according FDA 21P:177 2600
- Slides easily over the working floor and does not create friction.
- It does not taint contact surfaces at all and is totally inert.
- Highly resistance to chemicals and can easily be washed.
- Superb resistance to abrasion, ozone and the aggression of weather.
- Antistatic according to EN 12115 parameters. (R<10⁶ Ohm)

Marking :

"RX®-Premium EN 12115 FDA SD 16 Bar "

Safety factor :

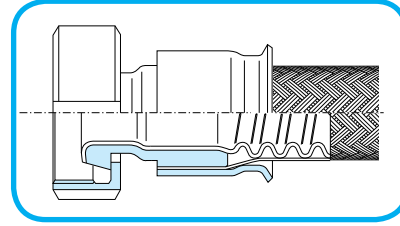
- ≥ 4 times working pressure up to ID 75 mm
- ≥ 3 times working pressure over ID 75 mm



RX®-PREMIUM							
ERIKS art.nr.	Internal diameter	Wall thickness	Working pressure	Vacuum	Bend radius	Weight	Length coil
	mm	mm	bar	%	mm	kg/m	m
	19	6,0	16	90	125	0,65	40
	25	6,0	16	90	140	0,89	40
	32	6,0	16	90	200	1,16	40
	38	6,5	16	90	250	1,47	40
	50	8,0	16	90	275	2,10	40
	63,5	8,0	16	90	300	2,60	40
	75	8,0	16	80	350	3,10	40
	100	9,0	12	80	450	4,90	40

Technical data at 20° C.

The convoluted PTFE hoses



The helically convoluted PTFE (polytetrafluorethylene) inner tube with an outer cover of AISI304 high tensile stainless steel braid are assembled in our ware hose.

The PTFE hoses are virtually resistant to all chemicals with a temperature range from -70°C to +260°C.

Special range: Antistatic PTFE hoses

Properties :

- Non-sticking, easy to clean.
- Excellent mechanical resistance for vibrations and flexing.
- FDA approved resin that guarantees food, cosmetic and pharmaceutical applications.
- Non-flammable.
- Non-aging and very good U.V. resistance.
- Chemically inert.
- Good dielectric properties.
- Low coefficient of friction ensuring low pressure drop.

Fittings :

PTFE- hoses are mainly offered with PTFE flared couplings or hose fittings with PTFE tails. An extended range of assemblies can be offered to all customer specific demands.

The smooth bore PTFE hoses: Smoothflex



Construction:

- Ultra hygienic non-convoluted PTFE (polytetrafluorethylene) liner with stainless steel helix and a AISI 304 high tensile, stainless steel braid.
- The hose has exceptionally good vacuum- and kink resistance properties for extreme performance.
- Smoothflex should be specified for applications where Ultra hygienic non-convoluted hose and high flexibility are imperative, e.g. Food, Bio, Pharmaceutical and Cosmetic industry.
- Only available in complete hose assembly form.

Temperature:

-70°C +260°C

Other types available:

- Type TWF - TAWF
Type TWF SMOOTHFLEX Smooth bore flexible Teflon® hose with a stainless steel helix.
- Type TWFB6 - TAWFB6
Type TWFB6 SMOOTHFLEX Smooth bore flexible Teflon® hose with a stainless steel helix and a polypropylene braid.
- Type TWFB9 - TAWFB9
Type TWFB9 SMOOTHFLEX Smooth bore flexible Teflon® hose with a stainless steel helix and a PVDF (Kynar) braid.
- Type SIW1
Type SIW1 Smooth bore Silicon hose with stainless steel helix

Smoothflex type TWFB1-TAWFB1

Size	D1	D2	D3	R	WP	BP	Weight gr/m	REF	REF
	min.	min.	min.	mm	Bar 20°C			VIRGIN	Antistatic
1/2"	11,50	1,25	17,80	38	50	250	290	TWFB1012	TAWFB1012
5/8"	15,50	1,25	21,80	42	50	250	361	TWFB1016	TAWFB1016
3/4"	20,00	1,5	26,70	50	60	290	430	TWFB1020	TAWFB1020
1"	22,80	1,5	29,80	70	40	210	653	TWFB1025	TAWFB1025
1 1/4"	30,50	1,5	37,50	85	45	210	750	TWFB1032	TAWFB1032
1 1/2"	36,50	2	46,50	100	40	175	800	TWFB1040	TAWFB1040
2"	48,50	2	58,30	140	25	135	950	TWFB1050	TAWFB1050

SMS Couplings

Female threaded SMS coupling with smooth hose shank to DIN 2817

ID	Inch	ND	Thread	Material
25.0	1"	25	40 x 1/6"	Stainless
32.0	1 1/4"	32	48 x 1/6"	Stainless
38.0	1 1/2"	40	60 x 1/6"	Stainless
51.0	2"	50	70 x 1/6"	Stainless
63.5	2 1/2"	65	85 x 1/6"	Stainless
76.0	3"	80	98 x 1/6"	Stainless
101.6	4"	100	132 x 1/6"	Stainless



Female threaded SMS coupling with hose shank for crimping

ID	Inch	ND	Thread	Material
25.0	1"	25	40 x 1/6"	Stainless
32.0	1 1/4"	32	48 x 1/6"	Stainless
38.0	1 1/2"	40	60 x 1/6"	Stainless
51.0	2"	50	70 x 1/6"	Stainless
63.5	2 1/2"	65	85 x 1/6"	Stainless
76.0	3"	80	98 x 1/6"	Stainless
101.6	4"	100	132 x 1/6"	Stainless



Male threaded SMS coupling with smooth hose shank to DIN 2817

ID	Inch	ND	Thread	Material
25.0	1"	25	40 x 1/6"	Stainless
32.0	1 1/4"	32	48 x 1/6"	Stainless
38.0	1 1/2"	40	60 x 1/6"	Stainless
51.0	2"	50	70 x 1/6"	Stainless
63.5	2 1/2"	65	85 x 1/6"	Stainless
76.0	3"	80	98 x 1/6"	Stainless
101.6	4"	100	132 x 1/6"	Stainless



Male threaded SMS coupling with hose shank for crimping

ID	Inch	ND	Thread	Material
25.0	1"	25	40 x 1/6"	Stainless
32.0	1 1/4"	32	48 x 1/6"	Stainless
38.0	1 1/2"	40	60 x 1/6"	Stainless
51.0	2"	50	70 x 1/6"	Stainless
63.5	2 1/2"	65	85 x 1/6"	Stainless
76.0	3"	80	98 x 1/6"	Stainless
101.6	4"	100	132 x 1/6"	Stainless



SMS Couplings

Nut SMS

<i>ID</i>	<i>Inch</i>	<i>N</i>	<i>Thread</i>	<i>Material</i>
25.0	1"	25	40 x 1/6"	Stainless
32.0	1 1/4"	32	48 x 1/6"	Stainless
38.0	1 1/2"	40	60 x 1/6"	Stainless
51.0	2"	50	70 x 1/6"	Stainless
63.5	2 1/2"	65	85 x 1/6"	Stainless
76.0	3"	80	98 x 1/6"	Stainless
101.6	4"	100	132 x 1/6"	Stainless



Gasket SMS

<i>ID</i>	<i>Inch</i>	<i>N</i>	<i>Material</i>
25.0	1"	25	EPDM
32.0	1 1/4"	32	EPDM
38.0	1 1/2"	40	EPDM
51.0	2"	50	EPDM
63.5	2 1/2"	65	EPDM
76.0	3"	80	EPDM
101.6	4"	100	EPDM



Couplings according to DIN 11851 for food industry

Female coupling with hose shank to DIN 2817 (AISI 316 = DIN 1.4401 - nut AISI 304)

ID	Inch	ND	Thread	Material
13	1/2"	15	34 x 1/8"	Stainless
19	3/4"	20	44 x 1/6"	Stainless
25	1"	25	52 x 1/6"	Stainless
32	1 1/4"	32	58 x 1/6"	Stainless
38	1"	40	65 x 1/6"	Stainless
50	1"	50	78 x 1/6"	Stainless
63	1"	65	95 x 1/6"	Stainless
75	1"	80	110 x 1/4"	Stainless
100	1"	100	130 x 1/4"	Stainless



Male coupling with hose shank to DIN 2817 (AISI 316 = DIN 1.4401)

ID	Inch	ND	Thread	Material
13	1/2"	15	34 x 1/8"	Stainless
19	3/4"	20	44 x 1/6"	Stainless
25	1"	25	52 x 1/6"	Stainless
32	1 1/4"	32	58 x 1/6"	Stainless
38	1 1/2"	40	65 x 1/6"	Stainless
50	2"	50	78 x 1/6"	Stainless
63	2 1/2"	65	95 x 1/6"	Stainless
75	3"	80	110 x 1/4"	Stainless
100	4"	100	130 x 1/4"	Stainless



Female coupling with hose shank for crimping

ID	Inch	ND	Thread	Material
13	1/2"	15	34 x 1/8"	Stainless
19	3/4"	20	44 x 1/6"	Stainless
25	1"	25	52 x 1/6"	Stainless
32	1 1/4"	32	58 x 1/6"	Stainless
38	1 1/2"	40	65 x 1/6"	Stainless
50	2"	50	78 x 1/6"	Stainless
63	2 1/2"	65	95 x 1/6"	Stainless
75	3"	80	110 x 1/4"	Stainless
100	4"	100	130 x 1/4"	Stainless



Male coupling with hose shank for crimping

ID	Inch	ND	Thread	Material
13	1/2"	15	34 x 1/8"	Stainless
19	3/4"	20	44 x 1/6"	Stainless
25	1"	25	52 x 1/6"	Stainless
32	1 1/4"	32	58 x 1/6"	Stainless
38	1 1/2"	40	65 x 1/6"	Stainless
50	2"	50	78 x 1/6"	Stainless
63	2 1/2"	65	95 x 1/6"	Stainless
75	3"	80	110 x 1/4"	Stainless
100	4"	100	130 x 1/4"	Stainless



Couplings according to DIN 11851 for food industry

Nut to DIN 11851 (AISI 304 - 1.4301)

ID	Inch	ND	Thread	Material
13	1/2"	15	34 x 1/8"	Stainless
19	3/4"	20	44 x 1/6"	Stainless
25	1"	25	52 x 1/6"	Stainless
32	1 1/4"	32	58 x 1/6"	Stainless
38	1 1/2"	40	65 x 1/6"	Stainless
50	2"	50	78 x 1/6"	Stainless
63	2 1/2"	65	95 x 1/6"	Stainless
75	3"	80	110 x 1/4"	Stainless
100	4"	100	130 x 1/4"	Stainless



Gasket

ID	Inch	N	Material
13	1/2"	15	EPDM
19	3/4"	20	EPDM
25	1"	25	EPDM
32	1 1/4"	32	EPDM
38	1 1/2"	40	EPDM
50	2"	50	EPDM
63	2 1/2"	65	EPDM
75	3"	80	EPDM
100	4"	100	EPDM



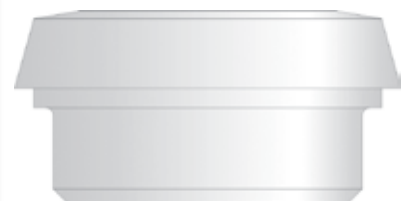
Male threaded welding coupling to DIN 11851 (AISI 304 - 1.4301)

ID	Inch	ND	Thread	Material
13	1/2"	15	34 x 1/8"	Stainless
19	3/4"	20	44 x 1/6"	Stainless
25	1"	25	52 x 1/6"	Stainless
32	1 1/4"	32	58 x 1/6"	Stainless
38	1 1/2"	40	65 x 1/6"	Stainless
50	2"	50	78 x 1/6"	Stainless
63	2 1/2"	65	95 x 1/6"	Stainless
75	3"	80	110 x 1/4"	Stainless
100	4"	100	130 x 1/4"	Stainless



Cone welding coupling to DIN 11851 (AISI 304 - 1.4301)

ID	Inch	ND	Material
13	1/2"	15	Stainless
19	3/4"	20	Stainless
25	1"	25	Stainless
32	1 1/4"	32	Stainless
38	1 1/2"	40	Stainless
50	2"	50	Stainless
63	2 1/2"	65	Stainless
75	3"	80	Stainless
100	4"	100	Stainless



Couplings according to DIN 11851 for food industry

Male plug to DIN 11851 (AISI 304 - 1.4301)

ID	Inch	ND	Thread	Material
13	1/2"	15	34 x 1/8"	Stainless
19	3/4"	20	44 x 1/6"	Stainless
25	1"	25	52 x 1/6"	Stainless
32	1 1/4"	32	58 x 1/6"	Stainless
38	1 1/2"	40	65 x 1/6"	Stainless
50	2"	50	78 x 1/6"	Stainless
63	2 1/2"	65	95 x 1/6"	Stainless
75	3"	80	110 x 1/4"	Stainless
100	4"	100	130 x 1/4"	Stainless



Female cap to DIN 11851 (AISI 304 - 1.4301)

ID	Inch	ND	Thread	Material
13	1/2"	15	34 x 1/8"	Stainless
19	3/4"	20	44 x 1/6"	Stainless
25	1"	25	52 x 1/6"	Stainless
32	1 1/4"	32	58 x 1/6"	Stainless
38	1 1/2"	40	65 x 1/6"	Stainless
50	2"	50	78 x 1/6"	Stainless
63	2 1/2"	65	95 x 1/6"	Stainless
75	3"	80	110 x 1/4"	Stainless
100	4"	100	130 x 1/4"	Stainless



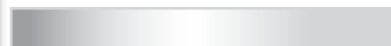
Cone welding coupling to DIN 11851 (AISI 304 - 1.4301)

ID	Inch	ND	Material
13	1/2"	15	Stainless
19	3/4"	20	Stainless
25	1"	25	Stainless
32	1 1/4"	32	Stainless
38	1 1/2"	40	Stainless
50	2"	50	Stainless
63	2 1/2"	65	Stainless
75	3"	80	Stainless
100	4"	100	Stainless



Gasket

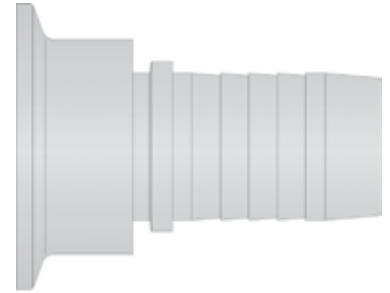
ID	Inch	ND	Material
13	1/2"	15	EPDM
19	3/4"	20	EPDM
25	1"	25	EPDM
32	1 1/4"	32	EPDM
38	1 1/2"	40	EPDM
50	2"	50	EPDM
63	2 1/2"	65	EPDM
75	3"	80	EPDM
100	4"	100	EPDM



Triclover Couplings

Hose shank

ID	Inch	Flange	Material
06	1/4'	25	Stainless
06	1/4'	34	Stainless
06	1/4'	50	Stainless
10	3/8'	25	Stainless
10	3/8'	34	Stainless
10	3/8'	50	Stainless
12	1/2'	25	Stainless
12	1/2'	34	Stainless
12	1/2'	50	Stainless
20	3/4'	25	Stainless
20	3/4'	34	Stainless
20	3/4'	50	Stainless
20	3/4'	64	Stainless
25	1'	33,5	Stainless
25	1'	50,5	Stainless
25	1'	64	Stainless
32	1 1/4'	50,5	Stainless
32	1 1/4'	64	Stainless
38	1 1/2'	50,5	Stainless
38	1 1/2'	64	Stainless
50	2'	64	Stainless
50	2'	77,5	Stainless
50	2'	91	Stainless
65	2 1/2'	77,5	Stainless
65	2 1/2'	91	Stainless
75	3'	106	Stainless



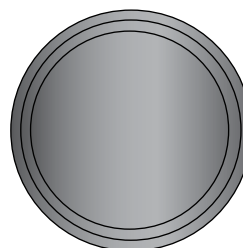
Heavy duty clamp

Flange	Material
25	Stainless
33,5	Stainless
50,5	Stainless
64	Stainless
77,5	Stainless
91	Stainless

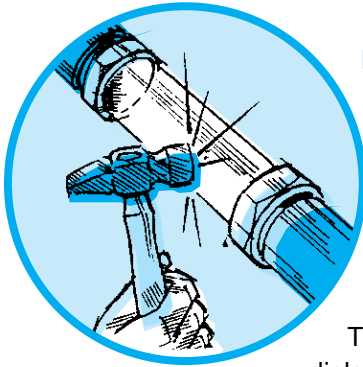


Solid end cap

Flange	Material
50	Stainless
77	Stainless

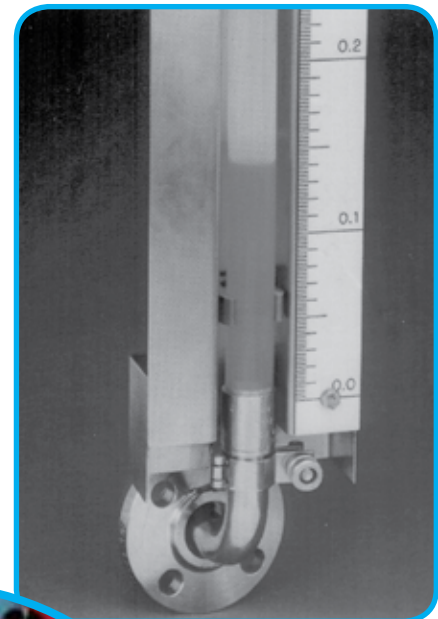
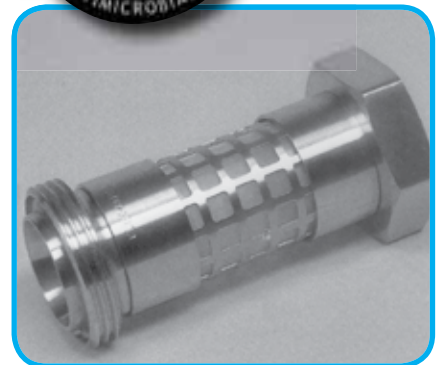


FLEX-RITE: sight glasses and vessel level indicators



ERIKS provides a complete range of In-Line and stand alone non-glass sight glasses and vessel level indicators that are partially or fully lined in FEP - a melt processable fluoropolymer with similar characteristics to PTFE.

The robust range offers outstanding dielectric properties, chemical inertness, low coefficient of friction, anti-stick properties and weather ability. It is transparent, ideal for sight gauges and can be steam or chemically sterilised by normal industrial methods. It meets FDA requirements for repeated contact with food and its non-stock properties can transport viscous and sticky materials without line clogging. The In-Line Sight Glass provides product viewing for process or safety reasons, whilst the hose assembly is connected.



PTFE lipseals and energised seals



Eriflon's PTFE Lip Seal was introduced in the early 1970's. The seals were designed to bridge the gap between conventional elastomer lip seals and mechanical face seals. Hostile environments such as extreme temperatures, aggressive media, high surface speeds, high pressures, and lack of lubrication forced the designer to specify the expensive and complicated mechanical face type seals. Eriflon's PTFE Lip Seal provides the designer a significant improvement in performance over elastomer lip seals at a much lower cost than the mechanical face seal.

Due to our unique manufacturing capabilities we are able to quickly supply the geometry and material which best meets your requirements. This is accomplished by utilising modern computer-controlled equipment and the stocking of semi-finished components. Eriflon PTFE Lip Seals solve difficult applications which are not addressed by conventional elastomer seals.

We exceed the performance of elastomer lip seals in the following areas:

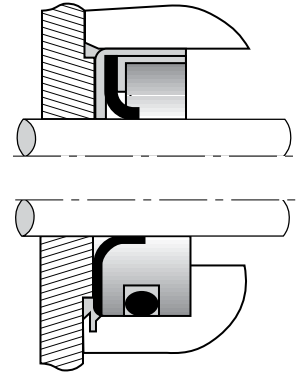
- Greater chemical resistance
- Lower friction
- Capable of surface speeds to +30 meters/second
- Works to temperature extremes (-70°C to +250°C)
- Has extended seal life in dry or abrasive media
- Handles pressures to 35 bar
- Shaftspeeds up to 36 m/s

Successful Applications:

- Hydraulic motors and pumps
- chemical pumps
- Rotary unions
- Vacuum pumps
- Blowers
- Drilling and tapping spindles
- High-speed gearboxes
- Crankshafts of engines and compressors
- Robotics
- Pharmaceutical and food processing equipment
- Mixers
- Chemical processing equipment
- Actuators
- Alternators and generators
- Encoders
- Radar/targeting devices

Note:

- We stock the unique Garlock® PS-Seal in ca. 100 different dimensions
- PS-Seals are seen as the best PTFE-seals worldwide
- PS-Seals give the best results in lifetime-tests under the most difficult circumstances
- Some types also have BGA-approval



Element materials

Material Code	Name and description	Application details
SEALING LIP MATERIALS :		
72	Rulon® 641 Proprietary filled PTFE White colour	Meets FDA requirements. Moderate wear and heat resistance. Suitable for use on soft shafts such as 316 Stainless Steel.
F8	Gylon 3510 Special filled PTFE White colour	Extreme wear resistant material for use in high-speed applications in dry or non-lubricating environments. Excellent material for use in water. Requires a shaft hardness of 55 HRC minimum. <ul style="list-style-type: none"> • Gylon white complies with FDA 21CFR1550. • It meets ingredient and extract requirements. • The fillers are acceptable under 21CFR 177.2600 • Branding ink complies with FDA 21 CFR.175.300
METAL COMPONENTS :		
M1	Low-carbon steel	Used for outer case, inner case and washers. Low cost. Limited corrosion resistance.
M2	Aluminium	Lightweight material used for outer case, inner case and washers. Low cost. Limited corrosion resistance.
M3	Stainless Steel 304	Used for outer case, inner case, washers and support rings. Good corrosion resistance.
M4	Stainless Steel 316	Used for outer case, inner case, washers and support rings. Good corrosion resistance.
M5	Stainless Steel 316 Ti	Used for outer case, inner case, washers and support rings. 316 Stainless Steel with titanium for superior corrosion resistance.

Rulon® is a registered trademark of Furon Company. Ekonol® is a registered trademark of SOHIO Company. Ask for our technical documentation.

Eriseals

We have different executions. Please ask:

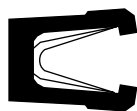
- Our technical 'omniseal documentation'
- FDA execution filled with silicone



Temp.: -70/+260°C
Velocity: 15 m/s
Helicoidal spring
200 bar
Type: 230-239



Temp.: -70/+260°C
Velocity: 15 m/s
V-spring
450 bar
Type: 220-225



Temp.: -70/+260°C
Static
V-spring
Type: 320-323



Temp.: -70/+260°C
Static
V-spring
Type: 348-349



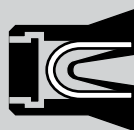
FDA, filled with silicone

Omniseal 400A can be supplied with an FDA-silicone-filling.



Type RS

In this unique design the inserted stainless steel spring is totally protected by the PTFE-coating on the media side. Applications with high temperatures, defined friction forces and very elastic behaviour are characteristics for this sealing element. Even extra-pure media can be conveyed or sealed off with this seal, where the medium may not get into contact with the metal. This type is FDA approved and admitted for food and pharmaceutical drugs.

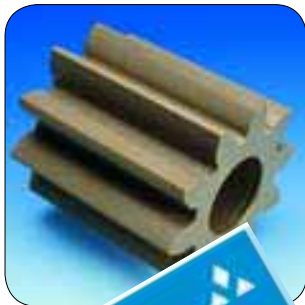


Type JS

The series JS is a variant of the RS type, but with a machined synthetic material jacket. Available in all sizes without additional costs. Mostly for small quantities. The jacket is available in PTFE or also in FDA approved UHMW-Polyethylene.



High Purity Plastics



°C
260

KETRON PEEK 1000

Properties:

- unfilled, high crystalline plastic
- high mechanical properties
- resistant up to 260 °C in air, short term up to 300 °C
- very stable
- excellent chemical and hydrolysis resistance up to +200°C
- extremely good radiation resistance (gamma-Röntgen)
- FDA conformity

KETRON PEEK-TX

Properties:

- PTFE filled
- lower coefficient of friction
- good electrical isolating properties
- FDA conformity

KETRON PEEK 1000 LSG black

Properties:

- black
- FDA conformity
- biocompatibility acc. to ISO 10993
- other colours possible, not acc. to ISO 10993
- resistant to sterilisation, up to 134 °C
- resistant to detergents and disinfection solvents

KETRON PEEK-CLASSIX LSG

Properties:

- biocompatibility acc. to USP class VI
- FDA 21 CFR 177.2415 conformity
- delivered with certificate
- extremely resistant to hydrolysis
- can be sterilised with steam, gamma radiation and ethyleneoxyde
- standard colour is white
- very high mechanical values
- suitable for many medical-technical applications:
Examples are catheters, medication dosing systems, devices in contact with blood (dialysis), endoscopes, surgical instruments, analytical instruments, measurement probes in the pharmaceutical area and short-term implants.
Further examples of use are for functional parts in production, filling and packaging plants for pharmaceuticals.

Applications

KETRON PEEK 1000:

- back-up rings in seals
- scrapers in the food industry
- medical devices
- bearings in pumps for high pressure
- FDA conformity
- low smoke emission (V-0)

This page gives an overview of standard available high purity semi-finished products. Our machine shop realises your finished product.



Biocompatibility for Life Science Products:

The biocompatibility describes the compatibility of a material to the tissue or the physiological system of the patient. The assessment is performed using various tests acc. to USP (US Pharmacopoeia) Class VI or acc. to ISO 10993.

Resistance to different sterilisation procedures and chemicals: multiple-use equipment in medical technology has to have good resistance towards preparatory procedures such as sterilisation and disinfection. The requirements are best met with high-performance plastics.

The table below gives a summary of the FDA CFR 21, ISO10993 and USP Class VI materials.

Applications in food/pharma technologies

Material	DIN description	FDA conformity	USP class VI conform	ISO 10993	Sterilisation	
					Steam 134 °C	Gamma radiation
KETRON PEEK-1000 LSG BLACK	PEEK	X		X	+	+
ERIFLON PTFE	PTFE	X			+	-
RX® PES-1000	PES-1000	X			0	+
RADEL PPSU-1000	PPSU-1000	X	X		+	+
PSU-1000	PSU	X	X		0	+
PVDF	PVDF	X			+	+
PC-1000	PC-1000	X			-	+
ERTALON 66SA	PA 66	X			-	0
ERTALYTE	PETP	X			-	+
ACETRON LSG	POM-C	X			0	-
MULTILENE	HMPE	X			-	0
RX® MULTILENE PP-FG (food grade)	PP (stab)	X			0	-
KETRON PEEK-1000	PEEK	X	-	X	-	-
KETRON PEEK-CLASSIX LSG	PEEK	X	X	X	+	+

X FDA conformity and biocompatibility / + resistant / 0 medium resistant / - not resistant

We produce your product in our modern production plant.



KETRON PEEK-CLASSIX LSG

for medical-technical applications

KETRON PEEK-CLASSIX LSG is an ultra-high performance biocompatible thermoplastic, the mechanical properties of which are comparable with those of KETRON PEEK-1000 and KETRON PEEK-1000 LSG BLACK.

Polyaryletherketone belongs to the group of polymers which have the best chemical resistance and biocompatibility. It shows a particularly good combination of strength, rigidity, toughness and hardness, which proves ideal for medical-technical applications.

The polymer can be processed and shaped using customary processes, such as injection moulding, extrusion, machining and compression moulding. This gives manufacturers of medical products and applications wide-ranging flexibility in design and manufacture.

Main characteristics

- extremely good chemical resistance
- mechanical strength
- dimensional stability
- excellent abrasion and impact strength
- can be frequently and repeatedly sterilised with conventional methods (hot steam, gamma radiation, plasma and ethylene oxide) without interfering with the mechanical properties
- extreme resistance to hydrolysis, even at high temperatures
- can be produced as thin as wall tubes
- standard colour is currently creamy-white, further colours and modifications upon request

Applications

KETRON PEEK-CLASSIX LSG is suitable for many medical-technical applications. Examples are catheters, medication dosing systems, devices in contact with blood (dialysis), endoscopes, surgical instruments, analytical instruments, measurement probes in the pharmaceutical area and short-term implants. Further examples of use are for functional parts in production, filling and packaging plants for pharmaceuticals.

Specifications

The basic prerequisites for the medical-technical area have been demonstrated and are, of course, satisfied by KETRON PEEK-CLASSIX LSG with regard to FDA conformity and biocompatibility testing according to USP. In addition, each raw material batch undergoes cytotoxicity testing. Semi-finished goods are also tested for cytotoxicity according to ISO 10993 after the raw material stressing processes of extrusion and tempering for each production batch. In this way, the medical device industry has a highly qualified product at its disposal, which includes development safety and reliability.

KETRON PEEK-CLASSIX LSG is suitable for medical-technical applications with less than 30 days blood contact. It is unsuitable, however, for applications in permanent implants, which are in contact with blood or tissue for longer than 30 days.



RX® MULTILENE PP-FG

dimensionally stable and light weight.

Resistant to chemicals with stable colour.

Sterilisation containers, eg. for surgical instruments have to provide high dimensional stability, especially throughout repeated sterilisation cycles.

Due to a special stabilisation process, RX® MULTILENE PP-FG shows a better resistance to higher temperatures than standard polypropylene. Compared to other materials, eg. stainless steel and PTFE, RX® MULTILENE PP-FG possesses a much lower density which results in a reduced weight of the component parts. Standard colour is white, however, other colours can be produced according to customer preferences.

Preferred fields

Medical technology and food processing

Applications

Surgical trays, surgical related equipment, implant trials

Properties

- good resistance to cleaning agents and disinfectants
- can be repeatedly sterilised with hot steam
- high dimensional stability
- good machinability
- laser marking possible
- FDA conformity of raw material and colour pigments

Very stable after exposure to chemicals

Exposure in two different chemical systems for cleaning and hot steam autoclaving:

- Ecolab chemistry
- Boxer chemistry
- 300 cycles of exposure

The comparison between RX® MULTILENE PP-FG and RX® MULTILENE PP shows good resistance to chemical agents. Minimal property variation of RX® MULTILENE PP-FG in the Ecolab and Borer tests.

- no optical changes
- no serious changes in mechanical properties



RX® PP layerpads

innovation for your sterilisation process!



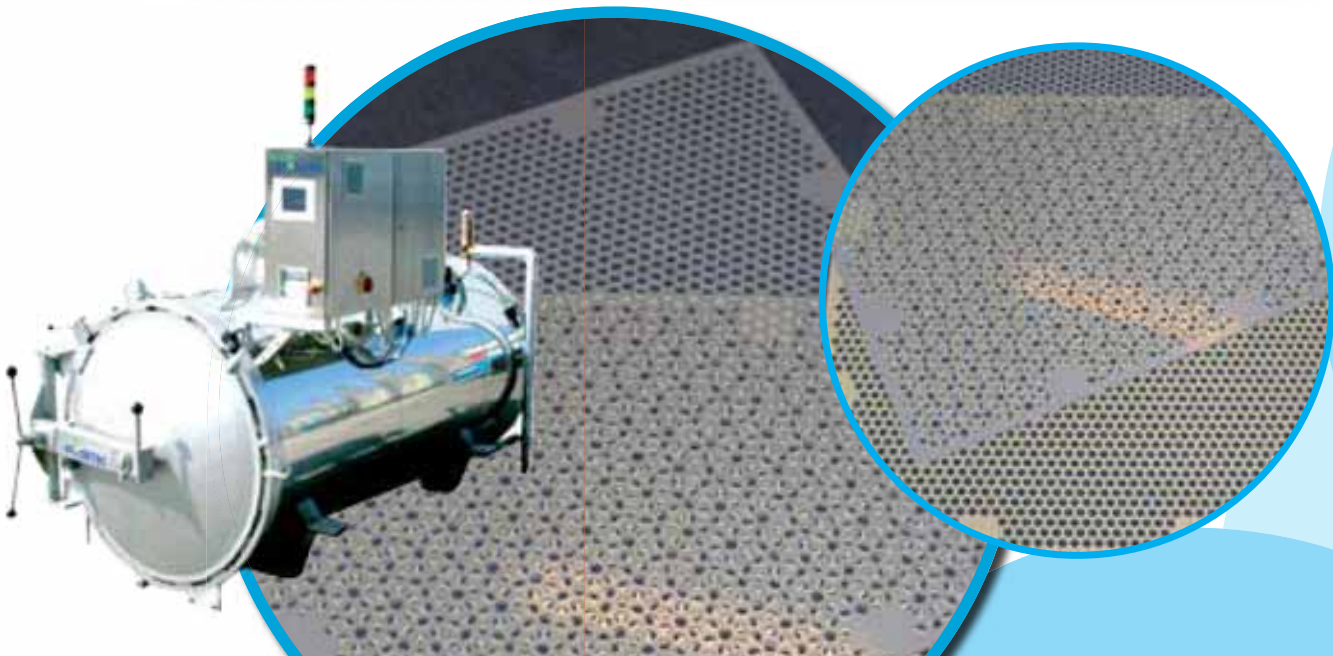
Advantages:

- Longer lifetime thanks to higher HDT
- Increased rigidity with higher temperatures
- CNC-made holes: no burrs or permanent distortion with die-cutting
- Possibility to obtain with 1 structured side, preventing sticking together of the sheets when loaded automatically
- FDA-compliant: suitable for direct contact with foodstuffs
- Thickness: 1 - 5 mm
- Max. width: 1500 mm

In order to offer our customers a solution for the restricted resistance to sterilisation cycles, ERIKS has developed 2 special types of materials:

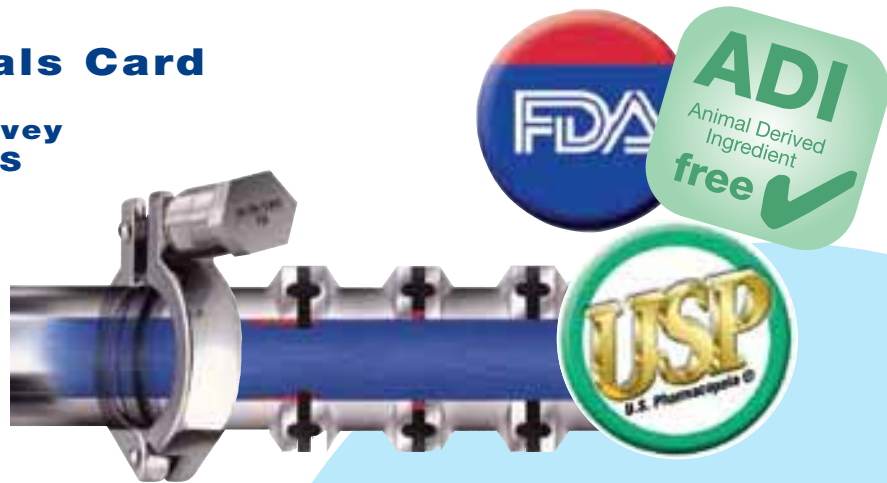
- RX® PPH-0: special granulated polypropylene with improved mechanical properties
- RX® PPH-2: polypropylene with 30% talcum for 130°C

Properties	Test Methode	RX® PPH-2	RX® PPH-0	RX® PPH	Unit
Density	ISO 1183	1,09	0,91	0,91	g/cm ³
Flexural Modulus (23°C)	ISO 178	2800	2200	1150	MPa
Tensile Strength	ISO 527	40	40	32	MPa
Impact Strength	ISO 179-1	1,85	2,6	7	KJ/m ²
Hardness	ISO 868	80	80	70	Shore D
Vicat Softening Temp.	ISO 306/A	160	160	90	°C
HDT at 0,45 MPa	ISO 75/B	140	130	86	°C
HDT at 1,8 MPa	ISO 75/A	110	81	53	°C
FDA		Yes	Yes	Yes	compliance



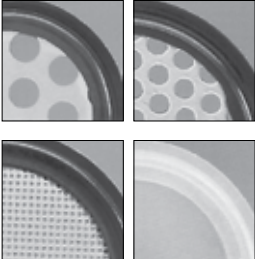




High Purity Seals Card

Below you find a survey of the services ERIKS can provide:



HIGH PURITY SEALS CARD

<i>PRODUCT SERVICES</i>	<i>TECHNICAL SUPPORT</i>	<i>PACKAGING</i>	<i>CERTIFICATES</i>	<i>INVENTORY SYSTEMS</i>
O-rings	Application Engineering	One by one	FDA 177.2600	Kanban
Oil seals	R & D	Clean Room	FDA 177.1550	Local branch
PTFE seals	Product Search	Barcode	USP class VI	In plant shop
Rubber parts	Technical Data	Your ID number	USDA	Express production
Clamp seals	Independant labs	FDA or USP labels on packaging	NSF	Kitting
Hydraulic seals			KTW-BGV	e-business
Rubber profiles			KIWA	Just-in-time
			WRC-ACS	EDI
			Cytotoxicity testing	
			3A standards	
			Namsa	
			Full Traceability	
				

Clean Room

A clear vision on clean products

Due to a growing awareness in the field of purity, industry focuses more and more on effectively controlling manufacturing processes. Goal is to prevent technical components from being the cause of pollution in processes and systems. Pollution can originate from airborne solid particles, which can be visible or invisible. These particles are called aerosols. To avoid this type of pollution is an important factor in the pharmaceutical-, semiconductor and food industry.

ISO class 7

The size of a human hair is 100 µm on average. Nowadays it is possible to filter up to 0.5 µm with very good results and relatively little effort. This filtering takes place in the cleanroom. This sealed space is filled with air in which only a limited number of particles, with a size of 0.5 µm or more, float about. The current norm for the industry is ISO 14644-1. Within this norm Eriks uses ISO class 7 (also known as class 10,000) for her cleanroom. The cleaning and packing takes place in an, even tighter, class 100 environment which is accepted by 90% of the industry.

Cleanroom cleaning and packing

ERIKS is fully equipped to take over your cleaning and packing activities in one's own cleanroom. Out-gassing of rubber products by means of vacuum ovens is also an added ERIKS-value to the market.



Flexible
Reliable
Fast
Efficient
Certified



Clean Room

Seals

O-rings

Coupling rings

Triclover seals

Hoses

Couplings

Plastic piping

Valves

Instrumentation

