Biopharm

venair

Flexible tubing & hoses and disposable solutions for pharma and bio processing industries



ABOUT US

At **Venair**, we design and create fluid transfer solutions that help top leading companies run all their operations with precision and reliability.

Today, we present more than 35 years of experience manufacturing custom high-quality product and delivering direct assistance to the most demanding industries across the world.

Together, we will achieve the maximum operability for your critical applications.







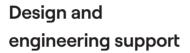
+35 years of meaningful innovation

We're involved in each part of the creation, design and engineering of the solution.

Material research and product development

Research of new materials

Development of new products or improvement of existing ones



Design advice Specialized in the design of customized parts

Quality assurance

Tailor-made testing for each application

Product certifications required for each
market or customer

Custom manufacturing

Custom pieces

Process automation for series production









Biopharm













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1. Biotechnology

Venair is a manufacturer of high purity tubing, sampling and storing bags as well as an integrator of high complexity and open architecture single use systems.

With ISO7 cleanrooms distributed in multiple locations, our products reach labs, institutions, CDMOs and big-pharma companies in more than 70 countries in every corner of the globe.

Services

ISO7 clean room manufacturing
Single Use User Requirement implementation
Change notification process
Active business continuity policies
Certificate of Analysis per batch
Certificate of compliance per product
Biocompatibility studies
Extractables and leachables studies
Gamma and X-Ray irradiation
Sterile claim
Integrity testing
Endotoxin and particulate batch release

Biotechnology

Introducing VENABIO®, the biotech range of products.

Products

Silicone Tubing

Thermoplastic tubing

Fluoropolymer tubing

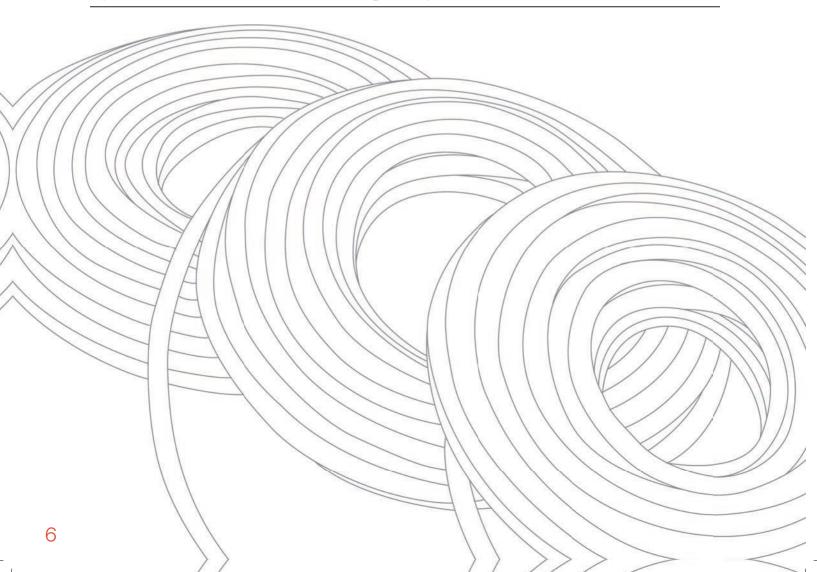
Silicone overmolding

50mL to 500mL sampling bags

1L to 50L bioprocessing bags

Pre-designed SU systems

Open architecture and customized design SU systems



1.1. Tubing guide

VENABIO® Tubing range comprises all key materials in a broad selection of sizes. To select the right product for your application, check the following guides:

- **01** Application Guide
- **02** Regulatory Guide
- 03 Size Guide

01 Application Guide

	Flow Pumpgrade	Flow Multipurpose	Braided Plus	Double Braided	Flex	Pump	PTFE	FEP
Material type	Silicone	Silicone	Silicone	Silicone	TPE	TPV	Fluoropolymer	Fluoropolymer
Hardness	50shA	60shA	60shA	60shA	58 ± 5shA	68 ± 5shA	56shD	56shD
Flexibility	+++	+++	+++	+++	+++	+++	+	+
Appearance	Transparent	Transparent	Transparent	Transparent	Transparent	Opaque	Translucid	Transparent
Aseptic Sealing and welding	NO	NO	NO	NO	YES	YES	NO	NO
Peristaltic pump life	++	+	NR	NR	++	+++	NR	NR
Extraction profile	YES	YES	YES	YES	YES	YES	NO	NO
Pressure resistant	NO	NO	YES	YES	NO	NO	YES	YES
Autoclave Sterilization	YES	YES	YES	YES	YES*	YES*	YES	YES
Gamma Sterilization	YES	YES	YES	YES	YES	YES	NO	YES
Molded assemblies	YES	YES	YES	YES	NO	NO	NO	NO
Max Temp [°C]	220	220	180	180	135	135	260	260
Min Temp [°C)	-60	-60	-60	-60	-45	-45	-200	-200
Chemical compatibility	See chart or consult to your sales representative.							

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02 Regulatory Guide

Compliance and biocompatibility							
Property Test Cool			After Ga	Before Gamma			
			BRAIDED	PUMP	FLEX	FEP	PTFE
Animal derived component Free	General Statement	X	X	Χ	X	X	X
Phthalates Free	General Statement	Х	X	Χ	Х	Х	Х
PFAS Free	General Statement	Х	Х	Х	Х		
Melamine Free	General Statement	Х	Х	Χ	Х	Х	Х
Bisphenol Free	General Statement	Х	Х	Χ	Х	Х	Х
BSE/ TSE free	General Statement	Х	X	Χ	Χ	X	Х
BfR recommendation XV	General Statement	Х	Х	Χ	Х		
Reach (EC 1907/2006)	General Statement	X	Х	Χ	Х	Х	X
Plastics in contact with food safety	EU 10/2011	Х	Х	Χ	Х		
Materials in contact with food safety	EU 1935/ 2004	X	X	Χ	X		
Silicone Elastomer for Closures and Tubing	EP 3.1.9.	Х	Х				
Rubber articles intended for repeated use in contact with food	FDA 21CFR177.2600	Х	Х	Χ	Х		
Perfluorocarbon resins in repeated contact with food	FDA 21CFR177.1550					Х	Х
Biological reactivity, in vivo, Class VI	USP 88	Х	Х	Χ	Х	Х	Х
Bacterial endotoxins	USP 85	Х	Х	X	Х		
Biological reactivity, in vitro	USP 87	Х	Х	Χ	Х		
Hemolysis	ISO 10993-4	Х	Х	Х	Х		
Cytotoxicity	ISO 10993-5	Х	X	Χ	Χ		
Local effects after implantation	ISO 10993-6	Х	Х	Χ	Х		
Irritation and delayed type hypersensitivity	ISO 10993-10	X	X	Χ	X		
Systemic toxicity	ISO 10993-11	Х	Х	Χ	Х		
Particulate matter in injections	USP 788	Х	X	Χ	Х		
Extractables study	USP 665	X	X	Χ	Χ		

03 Size Guide

Standard Size Guide, non reiforced tubing

METRIC (mm)			IMPERIAL (inches)						
ID	OD	WALL	ID	OD	WALL	PUMP SIZE	FLOW	FLEX	PUMP
0.8	2.4	0.8	1/32	3/32	1/32		Х		
1.6	3.2	0.8	1/16	1/8	1/32		Х		
1.6	4.8	1.6	1/16	3/16	1/16	14	Х	Х	Х
1.6	6.4	2.4	1/16	1/4	3/32		Х		
2.4	4.0	0.8	3/32	5/32	1/32		Х		
2.4	5.6	1.6	3/32	7/32	1/16		X		
3.2	4.8	0.8	1/8	3/16	1/32		х		
3.2	6.4	1.6	1/8	1/4	1/16	16	Х	х	х
3.2	7.9	2.4	1/8	5/16	3/32		Х		
3.2	9.5	3.2	1/8	1/8	1/8		Х		
4.0	5.6	0.8	5/32	7/32	1/32		Х		
4.0	7.1	1.6	5/32	9/32	1/16		Х		
4.0	8.7	2.4	5/32	11/32	3/32		X		
4.8	6.4	0.8	3/16	1/4	1/32		Х		
4.8	7.9	1.6	3/16	5/16	1/16	25	X	×	X
4.8	9.5	2.4	3/16	3/8	3/32	15	X		
4.8	11.1	3.2	3/16	7/16	1/8	123	Х		
6.4	7.9	0.8	1/4	5/16	1/32		Х		
6.4	9.5	1.6	1/4	3/8	1/16	17	Х	X	Х
6.4	11.1	2.4	1/4	7/16	3/32	24	Х	Х	Х
6.4	12.7	3.2	1/4	1/2	1/8	26	Х	Х	Х
7.9	11.1	1.6	5/16	7/16	1/16	18	Х	Х	Х
7.9	12.7	2.4	5/16	1/2	3/32	35	Х	Х	Х
7.9	14.3	3.2	5/16	9/16	1/8		X		
9.5	12.7	1.6	3/8	1/2	1/16		Х		
9.5	14.3	2.4	3/8	9/16	3/32	36	Х	Х	Х
9.5	15.9	3.2	3/8	5/8	1/8	70	X	X	Х
11.1	14.3	1.6	7/16	9/16	1/16		Χ		
12.7	15.9	1.6	1/2	5/8	1/16		X		
12.7	17.5	2.4	1/2	11/16	3/32		Х		
12.7	19.1	3.2	1/2	3/4	1/8	80	Х	Х	Х
12.7	22.2	4.8	1/2	7/8	3/16		X		
15.9	22.2	3.2	5/8	7/8	1/8	89	Х		
15.9	25.4	4.8	5/8	3/16	3/16				
19.1	25.4	3.2	3/4	1	1/8		X	X	X
19.1	28.6	4.8	3/4	1 1/8	3/16		X		
22.2	31.8	4.8	7/8	1 1/4	3/16				
25.4	31.8	3.2	1	1 1/4	1/8		X		
25.4	34.9	4.8	1	13/8	3/16		X		
25.4	38.1	6.4	1	1 1/2	1/4		Х		

03 Size Guide

Size Guide Braided Plus

	METRIC (mm)			IMPERIAL (inches)	
ID	OD	WALL	ID	OD	WALL
4.80	11.10	3.20	3/16	4/9	1/8
6.40	12.70	3.20	1/4	1/2	1/8
9.50	15.90	3.20	3/8	5/8	1/8
12.70	22.20	4.80	1/2	7/8	3/16
15.90	25.40	4.80	5/8	1	3/16
19.10	28.60	4.80	3/4	11/8	3/16
22.20	31.80	4.80	7/8	1 1/4	3/16
25.40	34.90	4.80	1	13/8	3/16

Size Guide Double Braided

	METRIC (mm)			IMPERIAL (inches)	
ID	OD	WALL	ID	OD	WALL
5.10	13.10	4.00	1/5	-	-
6.40	16.10	4.85	1/4	-	-
7.90	18.00	5.05	5/16	-	-
9.50	20.00	5.25	3/8	-	-
12.70	22.70	5.00	1/2	-	-
15.90	27.10	5.60	5/8	-	-
19.10	30.60	5.75	3/4	-	-
22.20	33.20	5.50	7/8	-	-
25.40	37.00	5.80	1	-	-
28.00	41.60	6.80	11/8	-	-
31.80	46.10	7.15	1 1/4	-	-

1.2. Tubing

Platinum cured silicone, braided and double braided hoses, thermoplastic elastomers and fluoropolymers make our tubing portfolio for the high value drug substance transfer applications.

Products

FLOW RANGE	12			
VENABIO® PUMPGRADE	13			
VENABIO® MULTIPURPOSE	13			
BRAIDED RANGE				
VENABIO® BRAIDED PLUS	15			
VENABIO®DOUBLE BRAIDED	15			
VENABIO® PUMP	16			
VENABIO® FLEX				
VENABIO® FEP				
VENABIO® PTFE				



FLOW RANGE



APPLICATIONS

Silicone tubing is the basic material upon any single use process is built. Its great overall performance and resistance to temperature, moist, ozone and steam and high biocompatibility makes it the product of choice for all stages of bioprocessing, from drug formulation, upstream processing and all downstream's critical steps from separation to final fill.



MATERIAL

Platinum cured silicone. Postcured to completely eliminate volatiles.



ROLL LENGTH

Available in 25ft and 50ft. Other lengths under demand



LASER ETCHED

Traceable with reference, lot number and ID/OD



CLEAN ROOM

Manufactured in ISO14644-1 Class 7



DOUBLE BAG

Double bagged ISO14644-1 Class 7



TEMPERATURE

-60°C/+220°C (-76°F/ +428°F)



ANIMAL FREE

Animal derived component free.



SMOOTHNESS

Reduces protein binding and biofilm formation



RADIOSTABLE

Gamma/eBeam sterilization available

VENABIO® Pumpgrade

CODE: 9200851* HARDNESS: 50ShA

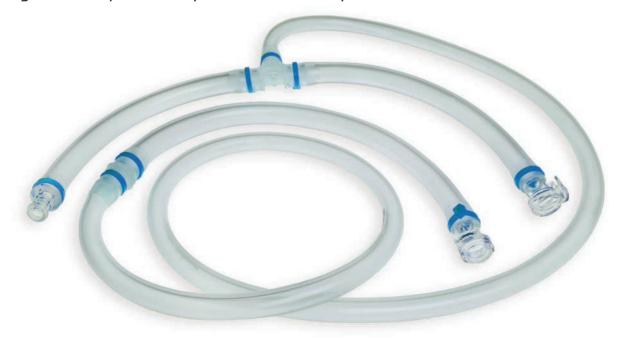
For the applications where low flow variations and long pumplife are of the utmost importance, lower hardness is recommended.



VENABIO® Multipurpose

CODE: 9200852* HARDNESS: 60ShA

This product is the workhorse for the majoritiy of fluid management applications happening in manufacturing and filling plants. It is used upstream from the media prep to the harvest stage and downstream all the way from the first filtration stages to the final filling. This hardness provides a compromise in pumping performance and the little pressures generated by filter incorporation to the fluid path.





BRAIDED RANGE

APPLICATIONS

Silicone tubing is the basic material upon any single use process is built. Its great overall performance and resistance to temperature, moist, ozone and steam and high biocompatibility makes it the product of choice for all stages of bioprocessing, from drug formulation, upstream processing and all downstream's critical steps from separation to final fill.



MATERIAL

Platinum cured silicone. Postcured to completely eliminate volatiles. Reinforced with a polyester.



ROLL LENGTH

Available in 25ft, 50ft. Other lengths under demand



LASER ETCHED

Traceable with reference, lot number and ID/OD



CLEAN ROOM

Manufactured in ISO14644-1 Class 7



TEMPERATURE

-60°C/+180°C (-76°F/+356°F)



DOUBLE BAG

Double bagged ISO14644-1 Class 7



HARDNESS

60ShA



ANIMAL FREE

Animal derived component free.



SMOOTHNESS

Reduces protein binding and biofilm formation.



RADIOSTABLE

Gamma/eBeam sterilization available.

VENABIO® Braided plus

CODE: 92008542*

BRAIDING: Single & High-performance polyester

This product is braided using a high-performance polyester yarn. This provides increased pressure resistance and a maximum temperature of 180°C. The ID/OD dimensions of this product have been harmonized to the standard imperial sizing.



VENABIO® Double braided

CODE: 9200855*

BRAIDING: Two separated polyester layers

This product is braided twice using a polyester yarn and a silicone layer between them. This provides the highest pressure resistance and a maximum temperature of 180°C.





VENABIO® PUMP



This product is specially designed to work in long lasting pump cycles, where silicone would need to be replaced mid-batch. The average pump life when proper maintenance is followed is in the thousand-hour range. It is important to mention that a thermoplastic is heat sensitive, so dry heat, SIP and autoclave sterilization cycles should be avoided.



MATERIAL

Thermoplastic vulcanizated CODE: 92008810*



ROLL LENGTH

Available in 25ft, 50ft. Other lengths under demand



LASER ETCHED

Traceable with reference lot number and ID/OD



CLEAN ROOM

Manufactured in ISO14644-1 Class 7



WELDING

Heat sealable and weldable biopharmaceutical tubing



PUMPLIFE

Longest pumplife available



TEMPERATURE

-45°C/+135°C(-49°F/+275°F)



DOUBLE BAG

Double bagged ISO14644-1 Class 7



HARDNESS

68 ±5 ShA



ANIMAL FREE

Animal derived component free



RADIOSTABLE

Gamma/eBeam sterilization available



VENABIO® FLEX



This product satisfies the need for a heat sealable and weldable biopharmaceutical tubing. It provides disconnection and re-connection capabilities through a cuttable seal and aseptic welding.



Thermoplastic Vulcanizate

ROLL LENGTH

Available in 50ft. Other lengths under demand

T LASER ETCHED

Traceable with reference lot number and ID/OD

ISO 7

CLEAN ROOM

Manufactured in ISO14644-1 Class 7



WELDING

Heat sealable and weldable biopharmaceutical tubing



TEMPERATURE

45°C/+135°C (-49°F/+275°F)



DOUBLE BAG

Double bagged ISO14644-1 Class 7



A HARDNESS

70 ± 3ShA



ANIMAL FREE

Animal derived component free



RADIOSTABLE

Gamma sterilization available



APPLICATIONS

This is a fluoropolymer tubing especially recommended for the most aggressive chemicals, pressurized gas transfer and abrasive particles in the pharmaceutical and biopharm processes. It is highly transparent and semi-flexible. This product is gamma stable.

MATERIAL

Fluorinated ethylene propylene CODE: 92201100*

ROLL LENGTH

Available in 25ft

TEMPERATURE -200°C/+205°C(-328°F/+421°F)



UNIVERSAL

Universal chemical compatibility

SOLUTION LOW PERMEABILITY

Pressurized gas transfer

ANIMAL FREE

Animal derived component free

** RADIOSTABLE

Gamma/eBeam sterilization available.



VENABIO® PTFE

APPLICATIONS

This is a fluoropolymer tubing especially recommended for the most aggressive chemicals, pressurized gas transfer and abrasive particles in the pharmaceutical and biopharm processes. It is highly translucid and semi-flexible.

MATERIAL

Politetrafluoroethylene CODE: 92201200*

ROLL LENGTH
Available in 25ft

TEMPERATURE -200°C/+205°C (-328°F/ +421°F) THARDNESS 56 ShD

UNIVERSAL

Universal chemical compatibility.

LOW PERMEABILITY Pressurized gas transfer

ANIMAL FREE
Animal derived component free.

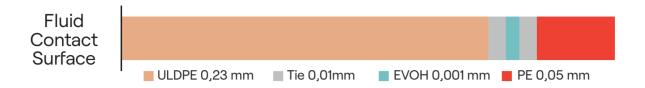
1.3. Bags

VENABIO®Bag is a single use bioprocessing container suitable for media and buffer formulation, storage, mixing and transportation. They help increase plant productivity by avoiding cleaning validation. The ethylene vinyl alcohol 0,01mm layer provides high oxygen and moisture impermeability equivalent to 1m thick of PE.

The current offering of bags consists of 2D constructions in small volume for sampling and bigger volumes for storage or preparation delivered without tubing in bulk or with a special design.

ABIO® NAKED BAGS	22
ABIO® BAG SYSTEMS	23
ECH	public para

Film Material



Film Specifications

PROPERTY	TEST PROTOCOL	VALUE						
Mechanical propeerties after 25	kGy gamma dose							
Film thickness	-	0,325 mm						
Haze	ASTM D-1003	7%						
Clarity	ASTM D-1003	97%						
Transmittance	ASTM D-1003	93%						
Tensile strength at break	ASTM D-882	13 Mpa						
Elongation at break	ASTM D-882	360%						
Elastic modulus	ASTM D-882	300 MPa						
Break at cold temperature	ISO 8570	below - 45°C						
Density	ASTM D-792	0,9 g/cm3						
Water vapour transmision rate at 23°C 100% RH	ASTM F-1249	0,32 g/(m2.day)						
Oxygen permeability at 23°C 0% RH	ASTM D-3985	0,05 cm3 /(m2.day.bar)						
Carbon dioxide permeability at 23°C 0% RH	ASTM F-2476	0,02 cm3 /(m2.day.bar)						
Compliance and biocompatibility after	Compliance and biocompatibility after 25kGy gamma dose							
Animal derived component free	ADCF	Pass						
Bacterial endotoxins	USP <85>	<0,005 EU/mL						
Biological reactivity tests, in vitro, Class VI	USP <87>	Pass						
Buffer capacity	USP <661>	0,10 mL						
Nonvolatile residue	USP <661>	0,0 mg						
Heavy metals	USP <661>	Pass						
Residue on ignition	USP <661>	Pass						
Hemolysis	ISO 10993-4	0,0%						
Cytotoxicity	ISO 10993-5	Pass						
Local effects after implantation	ISO 10993-6	Pass						
Irritation and delayed type hypersensitivity	ISO 10993-10	Pass						
Sensitization	ISO 10993-10	Pass						
Acute systemic toxicity	ISO 10993-11	Pass						
Appearance	EP <3.1.5>	Pass						
Acidity	EP <3.1.5>	<1,5 mL NaOH						
Alkalinity	EP <3.1.5>	<1,0 mL HCl						
Absorbance	EP <3.1.5>	<0,2 abs						
Reducing substances	EP <3.1.5>	< 3,0 mL KMnO ₄						



VENABIO® NAKED BAGS

We manufacture our line of Sampling (50mL, 150mL, 250mL and 500mL) and Bioprocessing (1L, 2L, 5L, 10L, 20L and 50L) in one of our ISO7 cleanrooms in Barcelona, Spain.

LINE	VOLUME	PORTS	QUANTITY	FILM	DESCRIPTION
	50mL				
Sampling	150mL	Injected PE boat weld with 2 ports of	1pc 10/pk 50/pk	Multilayer PE with oxygen barrier	Wide center hole with hard plastic
Garripiirig	250mL	3,2mm			support
	500mL				
	1L	Injected PE boat	1pc	Multilayer PE	Pair of
Bioprocessing	2L	weld with 3 ports of 1x 3,2mm 2x 6,4mm	·	with oxygen	self-supporting circular holes
	5L	1x 3,2mm 2x 6,4mm	50/pk	barrier	circular noies
	10L	Injected PE boat	1pc	Multilayer PE	Pair of
Bioprocessing	20L	weld with 3 ports of	10/pk	with oxygen	self-supporting
	50L	1x 3,2mm 2x 9,5mm	50/pk	barrier	circular holes

TUBING AVAILABLE IN:

- · VENABIO® FLOW
- · VENABIO® PUMP
- · VENABIO® WELD

CONNECTORS AVAILABLE IN:

- Polypropylene
- Polycarbonate
- PVDF

UNDER DEMAND:

- Different combination of inlet/outlet
- Other port lengths and diameters
- Sanitary fitting triclamp 25mm
- Stainless steel band clamps • Custom shapes and sizes
- · Optional gamma/ eBeam sterilization



VENABIO® BAG SYSTEM

VOLUME	PORT	SIZE	LENGTH	CONNECTIONS	DESCRIPTION
50mL 150mL 250mL 500mL	Sampling Inlet	ID 3,20mm x OD 6,40mm ID 3,20mm x OD 6,40mm	0,3m	LUER	Needlefree swabable valve female luer lock, Polycarbonate Male luer lock, Polycarbonate, cap included Female luer lock, Polycarbonate, cap included
50mL 150mL 250mL 500mL	Sampling Inlet	ID 3,20mm x OD 6,40mm ID 3,20mm x OD 6,40mm	0,3m	QUICK CONNECT	Needlefree swabable valve female luer lock, Polycarbonate RQC male quick connector, MPC compatible, Polypropylene, cap included RQC female quick connector, MPC compatible, Polypropylene, cap included
1L 2L 5L	Sampling Inlet Outlet	ID 3,20mm x OD 6,40mm ID 6,40mm x OD 9,50mm ID 6,40mm x OD 9,50mm	0,3m	QUICK CONNECT	Needlefree swabable valve female luer lock, Polycarbonate RQC male quick connector, MPC compatible, Polypropylene, cap included RQC female quick connector, MPC compatible, Polypropylene, cap included
1L 2L 5L	Sampling Inlet Outlet	ID 3,20mm x OD 6,40mm ID 6,40mm x OD 9,50mm ID 6,40mm x OD 9,50mm	0,3m	TRICLAMP	Needlefree swabable valve female luer lock, Polycarbonate Sanitary fitting triclamp 50mm, Polypropylene Sanitary fitting triclamp 50mm, Polypropylene
10L 20L 50L	Sampling Inlet Outlet	ID 3,20mm x OD 6,40mm ID 9,50mm x OD 15,90mm ID 9,50mm x OD 15,90mm	0,3m	QUICK CONNECT	Needlefree swabable valve female luer lock, Polycarbonate RQC male quick connector, MPC compatible, Polypropylene, cap included RQC female quick connector, MPC compatible, Polypropylene, cap included
10L 20L 50L	Sampling Inlet Outlet	ID 3,20mm x OD 6,40mm ID 9,50mm x OD 15,90mm ID 9,50mm x OD 15,90mm	0,3m	TRICLAMP	Needlefree swabable valve female luer lock, Polycarbonate Sanitary fitting triclamp 50mm, Polypropylene Sanitary fitting triclamp 50mm, Polypropylene

1.4 GMP-grade Single Use Systems

We understand the importance of optimizing your biomanufacturing processes to save time, space, and resources, while increasing flexibility, product quality, and scalability. That's why we offer both common and customized designs that are tailored to meet your unique facility needs and process parameters.

Our team of experts has years of experience designing and developing Single Use Systems that can be used in multiple unit operations with manual or automated filling. We provide flexible designs that enable you to choose the number and type of single-use bags/film technology, standard tubing, standard connectors, and equipment integration that best suits your needs.

- Tranfer lines
- Y pump kits
- Sampling bottle manifolds
- Sampling bag assemblies
- Bottle seed train
- Storing bags up to 50L
- Filter and TFF kits
- Sensorized PUPSIT architecture with drain bags
- Filling lines with SS316L or PEEK needles
- Whole "tank-to-vial" filling assembly with RTP Beta bags

We understand that each facility has unique challenges, and we're here to help you overcome them. Our customizable Single Use Systems are designed to help you achieve the highest level of process optimization, so you can focus on what you do best: biomanufacturing.



Customized open architecture

Our commitment to your success means that we offer direct access to experienced engineers who can help you with any questions or concerns you may have. We pride ourselves on providing quick prototyping and short lead times so that you can get your system up and running as soon as possible.



With our systems, you can transition seamlessly from bench to commercial scale, reducing time, space, and resources while increasing flexibility and scalability. For this reason we offer our integration services in a wide range of regulatory profiles for every stage of your development:

APPLICATION	LEVEL	GAMMA 25kGy	SHELF LIFE	STERILE CLAIM	USP 85	USP 788	INTEGRITY
Prototypes	0	-	-	-	-	-	_
Bioburden reduced	1	Yes	-	-	-	-	-
GMP grade	2	Yes	2 years*	Yes	_	_	_
GMP grade	3	Yes	2 years*	Yes	Lot release	Lot release	_
GMP grade	4	Yes	2 years*	Yes	Lot release	Lot release	Leak tested**
Customized	9	Any custom combination of services					

^{*}Although VENAIR strives to offer a 2 year shelf life, there are instances when certain components may not have 2 years shelf life prior to manufacture of an assembly and the expiration date of the whole assembly is adjusted based on the component with the shortest shelf life. Regarding shelf life for sterility, there is currently a risk assessment that supports a 2 year period. Data from accelerated and real time aged sterile barrier system properties is currently being generated to back this claim.

^{**} Pressure decay leak testing is performed partially or not performed at all when prohibited by the design.

Component library

Tubing

- VENABIO® Precision
- VENABIO® Flow 50
- VENABIO® Flow 60
- VENABIO® Braided Plus
- VENABIO® Flex
- VENABIO® Pump
- · Other brands available

PE/EVOH Bags

- 2 ports 3,2/3,2mm; 50mL to 500mL
- 3 ports 3,2/6,4/6,4mm; 1L to 5L
- 3 ports 3,2/9,5/9,5mm; 10L to 50L
- Customized ports and shapes
- Multiple brands available

Aseptic connectors and disconnectors

- Genderless and high temperature options
- TC and HB connections
- · Big range of dimemsions

Sensors

- · Pressure, Flow, Conductivity,
- PH, Turbidity and Air detection
- · Multiple brands available

Single Use Pump-Heads

- Pulsation-free fast transfer
- · No protein aggregation
- · Low particle release
- · Ultra-low shear technology



Filters

- Venting and Sterilizing grade
- TC and HB connections
- Hydrophobic and hydrophilic options
- Gamma stable
- Many materials, flow ranges and pores sizes
- Multiple brands available

Bottles

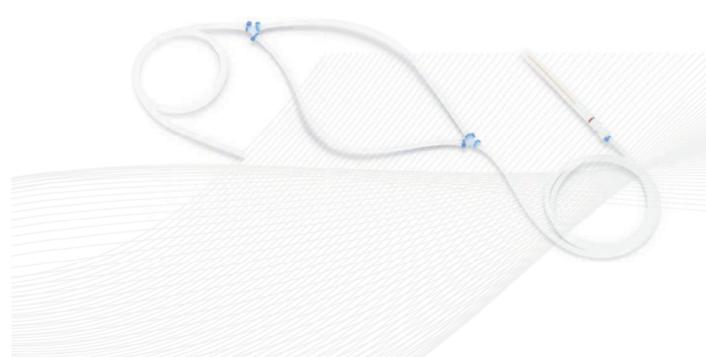
- PC and PET
- PP Caps with 48mm or 70mm
- 2, 3 and 4 ports
- 50mL to 20L
- · Multiple brands available

Needles

- Retro compatible with all filling machines
- SS316L or PEEK
- All flow ranges and sizes

Connections

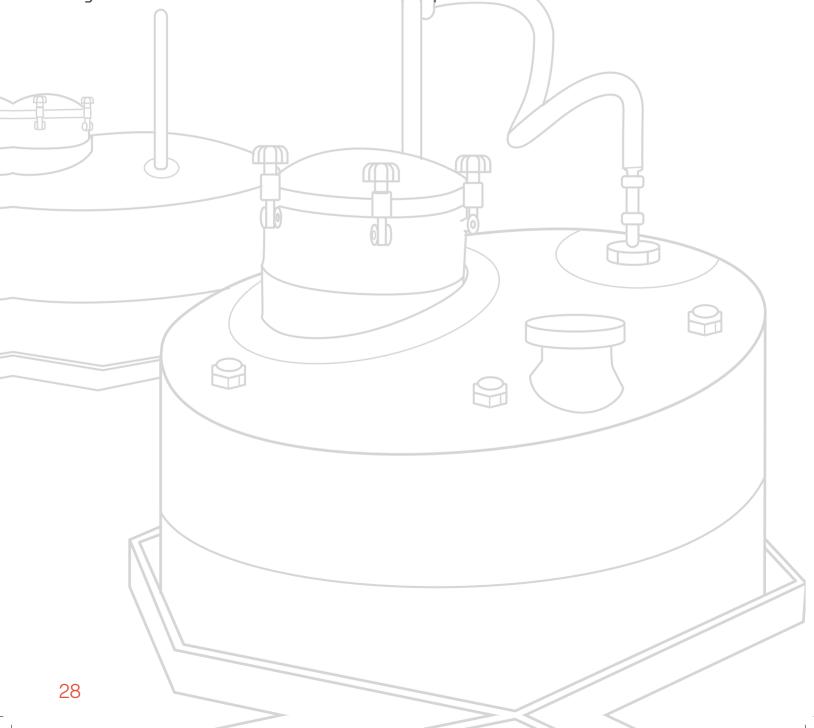
- Luer Lock and Quick Connects
- Straight adapters and reducers
- "Y", "T" and "+"
- TC and HB connections
- Many materials, flow ranges and sizes
- · Multiple brands available



2. Pharmaceuticals

We have years of experience in the manufacture of hoses for the pharmaceutical sector. We customize solutions based on high purity flexible hoses for the most critical applications in the pharmaceutical processing. Our hoses have a great mechanical properties, chemical stability and long durability within an extended range of temperatures and for critical applications with any chemical product. We help our partners to optimize the process by improving the preventive maintenance and reducing the machine shutdowns.

Whatever the nature of the fluid you convey, its temperature, concentration, working pressure or even the type of cleaning cycles used in your process, Venair emerges as the specialist in the transfer of liquid, pasty products or even solids offering a wide range of flexible solutions and customized pieces in silicone and other materials.



21. Products

Liquid filling machines

Product	Custom	ization		
SIL630	PL			31
SIL640				32
SIL650V	PL	LASTIC	-X	33
SIL655	PL			34
TECHNOSIL	DB			35
BIO FLOW MULTIPURPOSE				36
ASEPTISIL				37
ADAPTSIL				38
VENA VIEW	·			39

Chemicals & Fats

Product	Custom	ization		
FLEXIP	-X			40
FLEXPURE	-X			41
VENAFLON HF	-X	HR	FULL X	42
VITOSIL				43

Solid products processing

Product	Customiza	ation	
PUR VAC FDA	-X		44
PUR S-100	S-200	-X	45
ABRASIL	-X	CLEAR	46
SILICONE SLEEVE			47
PHARMALOADER			48

Thermal management solutions

Product	Customization	
HEATED HOSE	49	
COOLING HOSE	50	
TELCRA	51	
STEAMFLOW	52	

Validation Package

All Venair's pharma silicone range of products is made with a fully validated silicone. From the simplest pharma application to the most technical bioprocess, Venair provides its products with the same and completely validated silicone, avoiding any cross contamination.

Under request, we can deliver our extensive leachables and extractables study.

Advantages:

- Animal derived component free (ADCF).
- Platinum cured and post cured to reduce extractables levels.
- Gamma stable and autoclavable.
- Low water absortion and low gas permeability rating.
- Minimal extractables help maintain fluid integrity.
- Documented biocompatibility for sensitive applications.

All our silicone products comply with the following regulations:

REFERENCE	TITLE
(EU) No 10/2011 (EU) No 1935/2004	Plastic materials and articles intended to come into contact with food. Simulant B (3% Acetic acid aqueous solution) and Simulant D1 (50% ethanol)
FDA 21 CFR 177.2600	Rubber articles intended for repeated use, FDA ITEM 177.2600 (e)
BfR recommendation XV	Recommendations on the health assessment of plastics and other high polymers
United States Pharmacopoeia <88>	Biological reactivity tests, IN VIVO Class VI - 121°C
ISO 10993-4	Biological evaluation of medical devices - Part 4: Selection of tests for interactions with blood
ISO 10993-5 & USP <87>	Biological evaluation of medical devices - Part 5: Tests for in vitro cytotoxicity
ISO 10993-6	Biological evaluation of medical devices - Part 6: Tests for local effects after implantation
ISO 10993-10	Biological evaluation of medical devices - Part 10: Tests for irritation and skin sensitization
3A 18-03	Sanitary standard procedure N° 18-03 Class I
European Pharmacopoeia 3.1.9.	Silicone elastomer for closures and tubing
	Extraction experiment in organic solvent
Extractables and Leachables study available for 70ShA silicone	Extraction experiment in polar organic-aqueous solvent system
	Extraction experiment in aqueous solvent, alkaline conditions
	Extraction experiment in aqueous solvent, acidic conditions



VENA® SIL 630

APPLICATIONS

For transport by suction or discharge of liquid, semi-liquid or solid products in the food, cosmetic, pharma, and biotech industries. Suitable for filling machines and any fluid transfer process where the vision of the liquid is required.



CERTIFICATIONS

- → Complete Validation Package.
- → 3A Sanitary Standard 62-02 (fitted hoses).
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3)



FABRIC REINFORCEMENT

No.



STAINLESS STEEL INSIDE

Stainless steel wire spring encased inside the hose wall.

-55°C/+200°C

(-67°F / +392°F)



INNER APPEARANCE

Transparent and completely smooth.



OUTER APPEARANCE

Transparent and completely smooth



STANDARD MANUFACTURING LENGTH

4m (13') / 6m (19' 8") under request



Technical Table See on page: 62

LIQUID FILLING MACHINES



Fabric reinforced silicone hose

VENA® SIL 640



No.

Temperature -55°C / +180°C (-67°F / +356°F)



APPLICATIONS

Suitable for the transport by the impulsion of liquid, semi-liquid or solid products in the food, cosmetic pharm, and biotech industries. Recommended for metal detector systems or applications where not any bending is required.



CERTIFICATIONS

- → Complete Validation Package.
- → 3A Sanitary Standard 62-02 (fitted hoses).
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3).



STAINLESS STEEL INSIDE

INNER APPEARANCE Translucent and smooth.



OUTER APPEARANCE

Translucent and smooth



X FABRIC REINFORCEMENT

Polyester fabric reinforcement.



STANDARD MANUFACTURING LENGTH

4m (13') / 6m (19' 8") under request



Technical Table See on page: 62

+ Polyester fabric

Temperature

-55°C / +180°C (-67°F / +356°F)

+ Stainless steel spring wire



Fabric and wire reinforced silicone hose

VENA® SIL 650V

APPLICATIONS



STAINLESS STEEL INSIDE

Stainless steel wire spring encased inside the hose wall.



INNER APPEARANCE

Translucent and smooth.

OUTER APPEARANCE



CERTIFICATIONS

- → Complete Validation Package.
- → 3A Sanitary Standard 62-02 (fitted hoses).
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3)

For the transport by suction or impulsion of

liquid, semi-liquid or solid products in the food,

cosmetic, pharm and biotech industries. High flexibility and tight bending radius make it suitable for repetitive movements in dosing and filling machines. Specially designed to absorb vibrations and to compensate level differences.



STANDARD MANUFACTURING LENGTH

Translucent, white or colored, and smooth.

4m (13') / 6m (19' 8") under request



FABRIC REINFORCEMENT

Polyester fabric reinforcements.



Technical Table See on page: 63



CONFIGURATIONS

X: With food grade black conductive silicone. PL: Plastic steel wire.

Lastic: with improved elastic properties silicone.

Vaccum Pressure 0,91 bar (13,23 psi)

Transparent platinum cured silicone + Polyester fabric + Double stainless steel

Material

spring wire

Temperature

-55°C / +180°C (-67°F / +356°F)



Fabric and wire reinforced silicone hose

For dosing and filling machines in food,

cosmetic and pharma industries, specially for

use at specific situations where there may be sudden high pressure surges (hammering).

VENA® SIL 655

APPLICATIONS



STAINLESS STEEL INSIDE

Double stainless steel wire spring encased inside the hose wall at different levels.



CERTIFICATIONS

- → Complete Validation Package.
- → 3A Sanitary Standard 62-02 (fitted hoses).
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3).



OUTER APPEARANCE

INNER APPEARANCE

Translucent and smooth.

Translucent, white or colored, and smooth.



STANDARD MANUFACTURING LENGTH

4m (13') / 6m (19' 8") under request



X FABRIC REINFORCEMENT

Polyester fabric reinforcement.



Technical Table See on page: 64





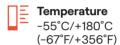
Polyester braided silicone tubing

VENA® TECHNOSIL



Material

Platinum cured silicone + Braided polyester fabric





APPLICATIONS

Recommended for repetitive movements in dosing and filling machines where no tight bending radius is needed. Available in long lengths applications. Is it resistant to UV, radiation, and ozone. It is gamma stable and autoclavable.



CERTIFICATIONS

- → Complete Validation Package.
- → 3A Sanitary Standard 62-02 (fitted hoses).
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3)



X FABRIC REINFORCEMENT

Polyester braiding.



STAINLESS STEEL INSIDE

No.



INNER APPEARANCE

Translucent and smooth.



OUTER APPEARANCE

Translucent and smooth.



STANDARD

MANUFACTURING LENGTH

10m and 20m (33ft and 66ft).



CONFIGURATIONS

VENA TECHNOSIL DB: For higher Pressure and vacuum resistance



Technical Table See on page: 65

LIQUID FILLING MACHINES



VENABIO® FLOW MULTIPURPOSE



APPLICATIONS

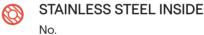
Recommended for transfer fluids at very low pressure in filling processes of liquidss and semi-liquids. Typical applications are media and buffer preparation, downstream processing, formulation, filling drug delivery and peristaltic pumps.



- → Complete Validation Package.
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3).









OUTER APPEARANCE

Translucent and smooth. Laser marking.



FEATURES

Manufactured and double bagged in clean room ISO7 according ISO 14644-1.





LIQUID FILLING MACHINES

Material

Antimicrobial silicone that avoids contamination from the growth of bacteria, mold and fungi.



Temperature

- -60°C (-76 F) to
- +200°C (392 F)

APPLICATIONS

Specially recommended for food contact applications in the transport of liquid or semiliquid fluids in the food and beverage industries. It offers an extremely broad field of applications, specially effective where there is intermittent use of water or other fluids in warm conditions without the possibility of drying between uses.



CERTIFICATIONS

- → US FDA Standard 21 CFR 177.2600.
- → ResAp 2004 (5), according to Reg 1935/2004/ EEC, and Reg 10/2011/EEC.
- → Tested in accordance with ISO 22196:2011 on E.coli and MRSA
- →Active substance in accordance with the Biocidal Product Regulation (EU) 528/2012
- → Material used is in accordance with EU Directive 2015/863 for restriction of the use of hazardous substances (RoHS 3).



X FABRIC REINFORCEMENT

No.



Technical Table See on page: 67



STAINLESS STEEL INSIDE

No.



INNER APPEARANCE

White and smooth.



OUTER APPEARANCE

White and smooth.



STANDARD

MANUFACTURING LENGTH

50ft (15,24m) and 100ft (30,48m).

LIQUID FILLING MACHINES



Special silicone shapes

ADAPTSIL



APPLICATIONS

Any configuration can be customized according to the costumer needs.

- → Recommended to compensate system vibrations as well as to optimize the overall life of the hose or tube connections.
- ightarrow Solve handling system miss-alignments as well as increased ease in hose or tube installation.
- ightarrow Offer sound dampening characteristics in your process systems due to its elastic and flexible construction.

CERTIFICATIONS

Completed Validation Package.

FABRIC REINFORCEMENT

Customized.

STAINLESS STEEL INSIDE

Customized.



INNER APPEARANCE

Customized.



OUTER APPEARANCE

Customized.



STANDARD

MANUFACTURING LENGTH

Customized.



CUSTOM MADE SHAPES

Venair offers technical advice and manufacturing of all types of silicone shapes including reducers, elbows upon demand.



Technical Table See on page: 67

LIQUID FILLING MACHINES



0

APPLICATIONS

Compatible with many chemical and aggresive products, which makes this product a very resistant and durable option. Where visual inspection of the conveyed material is required.



CERTIFICATIONS

- \rightarrow US FDA Standard 21 CFR 177.1550.
- → USP Class VI, <88> in vivo test.
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3)
- → ResAp 2004 (5), according to Reg 1935/2004/EEC, and Reg 10/2011/EEC.



STAINLESS STEEL INSIDE

No



INNER APPEARANCE

Translucent and completely smooth.



OUTER APPEARANCE

Translucent and smooth.



STANDARD MANUFACTURING LENGHT

Under demand (3m/10ft maximum).

ALTERNATIVES

This hose can be manufactured with metal grid protection.



Technical Table See on page: 68



CHEMICALS & FATS



Material

Fluoroelastomers with PTFE particles, polyester fabric, SS spring wire, and white FDA silicone cover.

Highly flexible hybrid hose VENA® FLEXIP





APPLICATIONS

It has good resistance specially in fatty products or oily foods and glycols, as well as alcoholic beverages. Specially recommended for vegetal and animal oils in food and cosmetic applications.



CERTIFICATIONS

- → US FDA Standard 21 CFR 177.2600.
- → USP Class VI <88> in vivo test, 121°C.
- \rightarrow ResAp 2004 (5), according to Reg 1935/2004/EEC, and Reg10/2011/ EEC with simulants A (10% of ethanol) and simulant D2 (olive oil).



STAINLESS STEEL INSIDE

Yes.



CONFIGURATIONS

X: Conductive material.



Technical Table See on page: 68



INNER APPEARANCE

White and smooth.



OUTER APPEARANCE

White and smooth FDA Silicone.



STANDARD MANUFACTURING LENGTH

4m (13') / 6m (19' 8").

CLEANING COMPATIBILITY

Media	Concentration	Temperature
Hot water	-	Up to 95°C
Steam	-	Up to 130°C, max 30 min.
Caustic Soda	1%	Up to 80°C
Caustic Soda	3%	Up to 25°C
NUMBER AND A	0,5%	Up to 80°C
Nitric Acid	2%	Up to 65°C
Peracetic Acid	3%	Up to 80°C

VENAIR BIOPHARM
 CHEMICALS & FATS



APPLICATIONS

Ideal for powder, liquid and semiliquid processing in applications with aggressive chemicals where a high hygienic design and is flexibility required.

CERTIFICATIONS

- → US FDA Standard 21 CFR 177.550
- → USP Class VI <88> in vivo test, 120°C
- → European Regulation (EU) 10/2011.

This hose is in accordance with the RoHS Directive 2002/95/EC and its subsequent amendments including the RoHS Directive 2011/65/EU and RoHS 3 Directive 2015/863.



White and smooth.

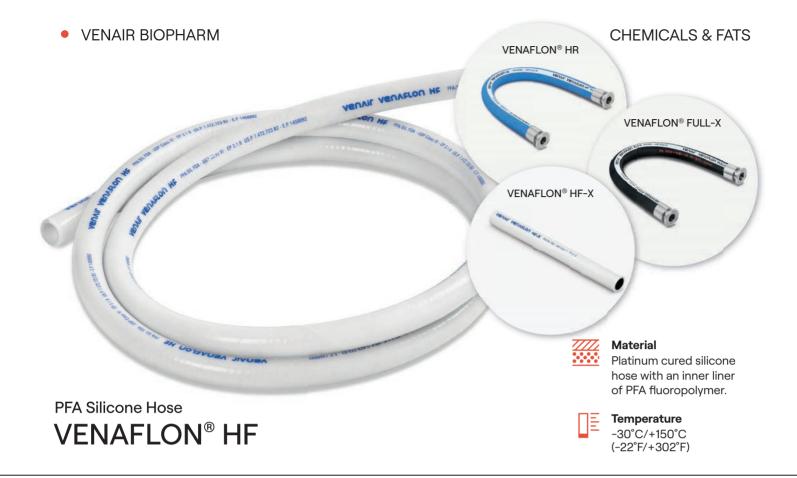
OUTER APPEARANCE

White and smooth.



4m (13') / 6m (19' 8").







APPLICATIONS

Very resistant to liquids and semi-liquids and aggressive chemical products. The construction of this hose allows the conveying of products at high temperatures by suction or discharge.



CERTIFICATIONS

- → US FDA Standard 21 CFR 177.1550
- → USP Class VI <88> in vivo tests.
- → USP Class VI <87> in vitro tests.
- → ISO 10993-5, 10 y 11
- \rightarrow Reg 1935/2004/EEC, and Reg 10/2011/EEC.
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3).



X FABRIC REINFORCEMENT

Yes.



Technical Table See on page: 69



STAINLESS STEEL INSIDE

Stainless steel wire spring encased inside the hose wall.



INNER APPEARANCE

White and smooth.



OUTER APPEARANCE

White and smooth.



STANDARD MANUFACTURING LENGTH

20m (65,62ft)



CONFIGURATIONS

X: Black conductive PFA (R<10⁶ Ω)

HR: EPDM cover for external abrasion resistance

Full-X: full conductive construction (R<10⁹ Ω)



Material

White FDA FKM inner layer and platinum cured silicone.



Temperature

-30°C/+180°C (-75°F/+356°F)



FKM Silicone hose



APPLICATIONS

Recommended to convey aggressive fluids that are not compatible with silicone. Able to transport liquid or semi-liquid foodstuffs at high temperatures by impulsion or suction, since their design can resist pressure or vacuum.



CERTIFICATIONS

- → US FDA Standard 21 CFR 177.2600.
- → Regulation 10/2011/EC and Reg 1935/2004/EC.
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3).



X FABRIC REINFORCEMENT

Yes.



STAINLESS STEEL INSIDE

Stainless steel wire spring encased inside the hose wall.



INNER APPEARANCE

White and smooth.



OUTER APPEARANCE

White and smooth.



STANDARD

MANUFACTURING LENGTH

4m (13') / 6m (19' 8").



Technical Table See on page: 73



High flexible polyurethane hose

VENA® TECHNIPUR VAC



APPLICATIONS

Recommended for the transport of bulk or powder materials in food and pharma industries.



- → US FDA (Foods and Drugs Administration) Standard 21 CFR 177.1680 and CFR 177.2600.
- \rightarrow 1935/2004/EC Regulation and and 10/2011/EC (Migration Test).
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3).

FABRIC REINFORCEMENT

No.

STEEL WIRE INSIDE

Yes.



INNER APPEARANCE

Translucent and corrugated.

OUTER APPEARANCE

Translucent and corrugated.

STANDARD
MANUFACTURING LENGTH

10 m (33 ft).

CONFIGURATIONS

X: Conductive polyurethane (R<10⁹ Ω)





Smooth mandrel-made polyurethane hose

VENA® TECHNIPUR® S100





APPLICATIONS

Pneumatic transport of bulk materials in food and pharma industries.



CERTIFICATIONS

- → US FDA (Foods and Drugs Administration) Standard 21 CFR 177.1680 and CFR 177.2600.
- → 1935/2004/EC Regulation and European Council Resolution AP 2004 (5) – silicones and 10/2011/ EC (Migration Test).
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3) hazardous substances (RoHS 3).



INNER APPEARANCE

Translucent and smooth.



OUTER APPEARANCE

Translucent and corrugated.



STANDARD MANUFACTURING LENGTH

4m (13') / 6m (19' 8").



CONFIGURATIONS

S-200: Translucent and smooth outside. X: Conductive material (R<10^9 $\,\Omega$)



Technical Table See on page: 71

SOLID PRODUCTS PROCESSING



VENA® ABRASIL



APPLICATIONS

Recommended for suction and transport in food and pharmaceutical industries. Generally acceptable for pneumatic transport of nonflammable bulk materials and suction of all types of abrasive particles.



CERTIFICATIONS

- → FDA 21 CFR 177.2600. Rubber articles intended for repeated use, FDA ITEM 177.2600(e)
- ightarrow USP (88) Biological reactivity tests, IN VIVO class V.
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3) hazardous substances (RoHS 3).



X FABRIC REINFORCEMENT

Yes.



Technical Table See on page: 72



STAINLESS STEEL INSIDE

it may reach up to 120°C (248°F) during short period of time

Yes.



INNER APPEARANCE

White and smooth.



OUTER APPEARANCE

White and smooth.



MAXIMUM LENGTH OF MANUFACTURE

4m (13') / 6m (19' 8").



CONFIGURATIONS

X: Conductive material

Clear: Translucent material.



SOLID PRODUCTS PROCESSING



Sleeve with or without textil reinforcement

SILICONE SLEEVES





APPLICATIONS

Silicone sleeves are suitable to convey liquids, semi liquids and powder at low pressure (gravity discharge) or protecting against contamination outer-inner or inner-outer in areas of product handling.



CERTIFICATIONS

- → Complete Validation Package.
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3).



X FABRIC REINFORCEMENT

Under request.



STAINLESS STEEL INSIDE

No.



INNER APPEARANCE

Translucent and completely smooth.



OUTER APPEARANCE

Translucent and smooth.



MAXIMUM LENGTH OF MANUFACTURE

4m (13') / 6m (19' 8").



CONFIGURATIONS

Customized construction under request.



Silicone compensator

VENA® PHARMALOADER





APPLICATIONS

An elastic and smooth compensator for the pharmaceutical and food industries. It is the ideal solution for all tank, hopper, pump and weighing tank outlets to compensate vibrations and level differences. Autoclayable and sterilizable.



- → Complete Validation Package.
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3)

★ FABRIC REINFORCEMENT

Yes.





OUTER APPEARANCE
Customized.

 MAXIMUM LENGTH
 OF MANUFACTURE Customized.



Pharmaloader HP: Special construction for high pressure resistance.

FKM: for transport of chemicals.



Technical Table See on page: 66



APPLICATIONS

Specially recommended for convey viscous products that needs to maintain a regular temperature during the production process, such as caramel, glycerin or chocolate.



CERTIFICATIONS

- → Complete Validation Package.
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3).



FABRIC REINFORCEMENT

Yes.



STAINLESS STEEL INSIDE

Yes.



INNER APPEARANCE

Translucent and completely smooth.



OUTER APPEARANCE

White and smooth.



STANDARD MANUFACTURING LENGTH

4m (13') / 6m (19' 8").



CONFIGURATIONS

Specific construction according to application.

Fluoropolymer inner layer for better chemical resistance

Voltage depending on user needs 220V/110V/24V

STANDARD CONSTRUCTIONS

Silicone hose equipped with an electrical resistance encased inside the wall in order to provide a regular temperature to the hose for an optimum flow of the conveyed product. Inner cable is connected to an electronic regulator and is also equipped with a PT 100 Ohm gauge connected to the regulator through a cooled end.

THERMAL MANAGEMENT SOLUTIONS





Material

Platinum cured silicone hose with an integrated secondary tubing.



COOLING HOSE



APPLICATIONS

For conveying products that require a stable temperature.

This system provides a regular temperature of the conveyed product by cold water or nitrogen for cooling and by hot water or steam for heating.



CERTIFICATIONS

- → Complete Validation Package.
- → Material used is in accordance with EU Directive 2015/863 for Restriction of the use hazardous substances (RoHS 3)



X FABRIC REINFORCEMENT

Yes.



STAINLESS STEEL INSIDE

Stainless steel wire spring encased inside the hose wall.



INNER APPEARANCE

White and completely smooth.



OUTER APPEARANCE

Customized.



STANDARD MANUFACTUIRNG LENGTH

4m (13') / 6m (19' 8").

ADDITIONAL INFORMATION

Custom made.

THERMAL MANAGEMENT SOLUTIONS



Insulation & anticondensation material for silicone hoses

TELCRA®



APPLICATIONS

It is suitable for very cold or frozen liquids and semi liquids in the food, pharmaceutical and biotech industries for insulation and anticondensation.

- CERTIFICATIONS
 - Complete Validation Package.
- INNER APPEARANCE
- Translucent and completely smooth.
- OUTER APPEARANCE Customized.

STANDARD MANUFACTURING LENGTH

4m (13') / 6m (19' 8").

CONFIGURATIONS

- → LT: for anticondensation and insulation.
- → HT: for insulation.

ADVANTAGES

- → ULTRALIGHT: Lightweight material with a density of 500 kg/m3.
- → EASY INSTALLATION: Super flexible material. Contours easily to complex forms.
- → ADHESION TO SILICONE: Telcra® presents an adhesive ree chemical adhesion with silicone materials.
- → ENVIRONMENTALLY SAFE: Odorless, tasteless and completely non-toxic.



Material Hybrid polymer



Highly resistant to satured steam in continuous flow **VENA® STEAMFLOW**

APPLICATIONS

The perfect product for saturated steam in continuous flow in the food and pharma industries.

Its robust but flexible design makes this hose perfect for those applications where flexibility and good mechanical performance are needed. Abrasion resistant outer layer in Vena® Steamflow guarantees good performance in most demanding applications.

CERTIFICATIONS

- US FDA Standard 21 CFR 177.2600

This hose is in accordance with the RoHS Directive 2002/95/EC and its subsequent amendments including the RoHS2 Directive 2011/65/EU and RoHS3 Directive 2015/863



X FABRIC REINFORCEMENT

Two plies of synthetic fabric reinforcements.



STAINLESS STEEL INSIDE

Yes. Metal spiral.



INNER APPEARANCE

Cream-color food quality rubber.



OUTER APPEARANCE

Black colored and smooth.



STANDARD MANUFACTURING LENGTH

4m (13') / 6m (19' 8").



CONFIGURATIONS

Customized shape under request.



Technical Table See on page: 73

2.2. Sterilization & Cleaning

ALL FLEXIBLE HOSES MUST BE STERILIZED BEFORE USE AND MUST ONLY BE USED FOR THE INTENDED PURPOSE FOR WHICH THEY WERE DESIGNED.

During hose selection, it is vitally important to consider the cleaning and sterilization process since this will affect to a greater or lesser extent, the mechanical properties and the behaviour of the materials used. It can also determine the useful life of the hose due to the aging effect.

Sterilization and cleaning are important and necessary processes that must be applied in order to eliminate contamination due to transport, storage, handling, or usage of the product. So, it is highly recommended to do it prior to each use to prevent microorganisms growth or harmful contamination that can affect the inner layer of the hose which is in contact with the flow.

Sterilization

The hoses exposed to steam or hot-air sterilization have different and unpredicted behaviour depending on the connections, on the frequency of the cleaning and sterilization processes, and on the specific product application.

Non aggressive liquid transfer (Silicone):

Our entire range of silicone hoses can be sterilized by steam cycles of 30 minutes at a maximum temperature of 135°C.

• Chemicals & Fats:

The products Vena® Flexip and Vena® Flexpure can be sterilized by steam cycles of 30 minutes at a maximum temperature of 130°C.

The product range Vena® Vitosil and Venaflon can be sterilized by steam cycles of 30 minutes at a maximum temperature of 121°C.

Solid products transfer:

The product range Vena® Abrasil can be sterilized by steam cycles of 30 minutes at a maximum temperature of 121°C.

The product range Vena Technipur cannot be sterilized by steam.

Thermal management solutions:

Sterilization conditions depends on the product material (see previous information)

53

For all hoses, a minimum time of 1 hour must be left between steam cycles for material stabilization.

It is recommended an accurate inspection of the hose after 150 hours of sterilization.

Hose replacement criteria based on visual inspection includes among others, displacement of layers, displacement of wire helix from their normal pitch, signs of displacement of fittings or leakage in the ends, reinforcement fabric exposed, wire corrosion, dents, kinks, or abrasion marks in both internally and externally.

CIP (Cleaning in place)

As per the sterilization process, the cleaning process can determine the useful life or the behavior of the hose material due to mechanical and chemical stress that occurs during the cleaning procedure. Therefore, there are some aspects that need to be considered when choosing one process over another (such as temperature, concentration, time...). Also is important to regularly monitor the physical conditions of the hoses in order to detect any possible alteration which could be a sign of a material degradation.

In the CIP process the following media are used in different concentrations:

Basic solutions (such as caustic soda) used to remove fat and protein part

- Acid solutions (for example phosphoric acid) to eliminate mineral deposits
- Oxidizing acids or other oxidizing products (nitric acid, peracetic acid, hydrogen peroxide) to
- remove bacterial load

Except the Polyurethane product families (Vena Technipur), all Venair products can be cleaned by the typical CIP processes (see table).

Sterilization & CIP Compatibility

	SILICONE	FLEXIP	FLEXPURE	VENAFLON	ABRASIL
HOT	Up to 95°C	Up to 95°C	Up to 95°C	Up to 95°C	Up to 95°C
WATER	Up to 200°F	Up to 200°F	Up to 200°F	Up to 200°F	Up to 200°F
STEAM	135°C -	130°C -	130°C -	121°C -	130°C -
	30min	30min	30min	30min	30min
	275°F -	265°F -	265°F -	250°F -	265°F -
	30min	30min	30min	30min	30min
CAUSTIC	3% - 80°C	3% - 80°C	3% - 80°C	3% - 80°C	1% - 80°C
SODA	3% - 175°F	3% - 175°F	3% - 175°F	3% - 175°F	1% - 175°F
NITRIC ACID /	0,5% - 80°C 1% - 25°C 0,5% - 175°F 1% - 75°F	1% - 25°C 1% - 75°F	3% - 80°C 3% - 175°F	3% - 80°C 3% - 175°F	1% - 25°C 1% - 75°F

^{*}This information is based on tests and generally available sources, and it should be used only as a guide since it does not take into consideration other variables that may affect the hose.

2.3. Traceability solutions

Hose marking

Venair offers several traceability solutions in order to improve the data reading. Various solutions make it possible to obtain all information related to the hose during the manufacturing process, e.g. raw materials, product codes and components, batch number, appropriate certificates, production and sale date and related orders.

Our hoses can be marked by laser. Apart of the product batch number, any customized marking like customer name and reference can be added to any specific silicone hose.

Connection marking

All crimped hoses count with the batch number marked by laser in the connections which makes it as the simplest and fully reliable system to ensure the traceability of the assembly.

QR marking

The QR code can be marked by laser on the metal connection, assuring the full traceability of the hose while allowing the access to any information related to the product at any time along the life of the hose. QR code is an alternative to the chip that is commonly used in the market to assure hoses traceability. Data content in the code are completely customizable. It does not need any additional software. QR code can be read with all kind of mobile device which has downloaded an app to read codes. Applications to read QR codes are completely free for any device.



Identification by labels

Color silicone labels can be placed over any Venair hose in order to mark specific information required by the client. The label offers clear identification, cleanliness and permanence in the silicone hose. Venair silicone labels can be customized to meet your specific needs such as part number, manufacturing date, replacement date, or any specific product or process information required by the customer.

Features:

- It is not in contact with the inner liquid
- It is made of permanent vulcanized silicone
- Handles clean-in-place (CIP) and steam-in-place (SIP) processes
- Autoclavable
- Several colors available



SZR crimping system

Venair offers its range of sanitary tubes with any type of 316L stainless steel connections crimped at the ends.

The connection by means of a pressing system (SZR system) is the most recommended for any flexible hose, as it guarantees the correct pressure resistance of the final assembly, avoiding the retention area that usually appears in any sanitary connection. Most of our flexible hoses with connections can be certified according to Sanitary Regulation 3A 62-02 for assemblies.



Finishing quality

The maximum standard roughness of the inner surface of our SZR* fittings is 0.8µm and can be improved to 0.375µm electropolished under demand.

The manufacturing batch number is indicated on each assembly, ensuring the total traceability of the product. It is also possible to mark a laser QR code on the ferrule, which allows immediate access to any information related to the product (technical data sheet, certificates, instructions for use, etc.).

All the straight fittings are manufactured in a single block, without welds, and the connections at 45° or 90° are made by orbital welding.

Molded Clamps

VENAIR® molded silicone clamps are well-suited for critical applications in high purity industries. These assemblies are manufactured with the same raw material than this is used to manufacture hoses and tubing. They reduce installation time (no gaskets), improve cleanliness (no retention zone) and maintain the benefits of the silicone.

VENAIR® molded silicone clamps are available in mini and standard Tri-Clamp fitting styles and are supplied with integrated gaskets molded directly to the face of the clamps. Protective backup cups (thermoplastic or stainless steel) provide a stable clamping surface and safeguard the clamps during installation and use.



Features:

- Platinum-cured silicone
- Completely smooth transition from the tubing or the hose through the clamp
- Constant diameter. No internal reductions.
- Autoclavable and sterilizable (CIP and SIP)
- Meets USP Class VI, FDA and BfR standards*
- Easy installation. Reduces assembly time
- Temperature resistance: -55°C to 180°C (-67°F to +356°F)
- No product contact with metallic materials
- Molded clamps can be supplied on any Venair silicone

^{*}Under request, molded assemblies can meet all the certifications set out in the Validation Package.

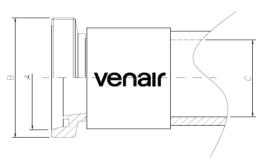
Available fittings

Any connection, however special it may be, can be crimped to our product: DIN-11851, SMS, Tri-Clamp, DIN-11864, Gas, RJT, Camlock, Flanges ...

We have the most standard connections and dimensions in stock for immediate assembly.

		1	
DIN 1	1851		
DN	Α	B (DIN 405)	С
	mm	thread	mm
10	10	28 x 1/8"	10
15	16	34 x 1/8"	15
20	20	44 x 1/6''	20
25	26	52 x 1/6"	25
32	32	58 x 1/6''	32
40	38	65 x 1/6''	38
50	50	78 x 1/6''	51
65	66	95 x 1/6''	63
80	81	110 x 1/4"	75
100	100	130 x 1/4''	102
125	125	160 x 1/4''	127
150	150	190 x 1/4''	152

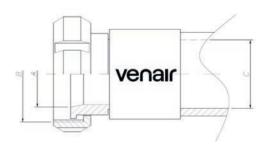
DIN Female venair DIN Male



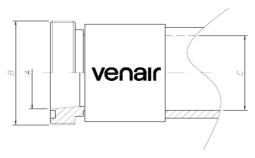
SMS

DN	А	B (DIN 405)	С
	mm	thread	mm
25	22,5	39,7x 1/6''	25
38	35,5	59,8 x 1/6''	38
51	48,5	69,8 x 1/6''	51
63	60,5	84,8 x 1/6''	63
76	72,8	97,5 x 1/6''	75
101,6	97,6	132 x 1/6"	102
104	100	124,4 x 1/6''	102

SMS Female



SMS Male



TRI-CLAMP SMS 3008

TRI-CLAMP ASME BPE (DIN 32676-C) / Imperial

Head	Cone	Hose
А	В	С
(mm)	(mm)	(mm)

9,7

16,0

16,0

22,5

22,5

35,5

35,5

35,5

48.5

60,3

72,9

97,6

13

19

19

19

25

19

25

38

50

63

76

102

25

25

50,5

50,5

50,5

50,5

50,5

50,5

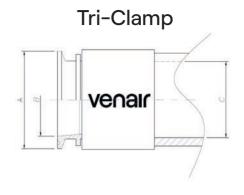
64

77

91

119

DN	Head	Cone	Hose		
	А	В	С	С	
(inch)	(mm)	(mm)	(mm)	(inch)	
1/2	25	9,4	6,35	1/4	
3/4	25	15,8	6,35	1/4	
1/2	25	9,4	9,52	3/8	
3/4	25	15,8	9,52	3/8	
1/2	25	9,4	12,7	1/2	
3/4	25	15,8	12,7	1/2	
1/2	25	9,4	19,05	3/4	
3/4	25	15,8	19,05	3/4	
1	50,5	22,1	6,35	1/4	
11/2	50,5	34,8	6,35	1/4	
1	50,5	22,1	9,52	3/8	
11/2	50,5	34,8 9,52		3/8	
1	50,5	22,1	12,7	1/2	
11/2	50,5	34,8	12,7	1/2	
1	50,5	22,1	19,05	3/4	
11/2	50,5	34,8	19,05	3/4	
1	50,5	22,1	25,4	1	
11/2	50,5	34,8	25,4	1	
2	64	47,5	25,4	1	
11/2	50,5	34,8	38,1	11/2	
2	64	47,5	38,1	11/2	
2	64	47,5	50,8	2	
2 1/2	77	60,2	50,8	2	
2 1/2	77	60,2	63,5	2 1/2	
3	91	72,9	63,5	2	
3	91	72,9	76,2	3	
4	119	97,4	101,6	4	

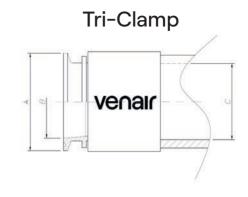


TRI-CLAMP DIN (DIN 32676-A)

DN	Head	Cone	Hose
	А	В	С
(mm)	(mm)	(mm)	(mm)
10	34	10	10
15	34	16	16
20	34	20	19
25	50,5	26	25
32	50,5	32	32
40	50,5	38	38
50	64	50	51
65	91	66	63
80	106	81	76
100	119	100	102

TRI-CLAMP (Others)

Head	Cone	Hose		
Α	В	С		
(mm)	(mm)	(mm)		
25	6,0	6		
34	8,0	8		
50	8,0	8		
25	10,0	10		
50	10,0	10		
25	13,0	13		
34	10,0	13		
34	13,0	13		
50	13,0	13		
25	16,0	16		
34	16,0	16		
50	16,0	16		
50	20,0	19		
64	22,5	25		
50	29,7	32		
64	32,0	32		
64	35,5	38		
64	38,0	38		



2.5. Specification Charts

VENA® SIL 630

01	NT	WALL THICKNESS			KING SURE*	BURSTING	PRESSURE	BENDING	RADIUS	
				ISO 140	ISO 1402/2009		ISO 1402/2009		ISO 10619-1	
mm	inch	+1/-0.5mm	+0.04/-0.02''	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°F	mm	ft	
10	25/64	5,7	0,22	9,86	143,00	29,58	429,02	16,03	0,053	
13	1/2	5,7	0,22	8,40	121,83	25,20	365,49	25,04	0,083	
19	3/4	5,7	0,22	6,66	95,75	19,99	289,33	43,07	0,15	
25	1	5,7	0,22	5,63	81,65	16,90	245,11	61,10	0,21	
32	1 1/4	5,7	0,22	4,84	70,19	14,53	210,73	82,13	0,27	
38	11/2	5,7	0,22	4,36	63,23	13,08	189,70	112,00	0,54	
51	2	5,7	0,22	3,64	52,79	10,92	158,38	139,22	0,37	

^{*} At the indicated working pressure, the hose may experience an elongation up to 20%. Other diameters can also be manufactured. Please consult.

VENA® SIL 640

Ø INT		WALL THICKNESS		WORKING PRESSURE*		BURSTING PRESSURE	
	IIN I	VVALL IT	ICKNESS	ISO 1402/2009		ISO 140	2/2009
mm	inch	+1/-0.5mm	+0.04/-0.02''	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°F
6	1/4	4,5	0,18	11,7	169	35	508
10	3/8	4,5	0,18	9,7	140	29	421
13	1/2	4,5	0,18	8,7	126	26	377
19	3/4	4,5	0,18	7,7	111	23	334
25	1	4,5	0,18	6,7	97	20	290
32	11/4	4,5	0,18	5,7	82	17	247
38	11/2	4,5	0,18	5	73	15	218
51	2	4,5	0,18	4	58	12	174
63	2 1/2	4,5	0,18	3,3	48	10	145
76	3	4,5	0,18	2,7	39	8	116
102	4	4,5	0,18	1,7	24	5	73

^{*} Pressure data hold at room temperature. Please reduce pressure values by 20% for each increase of 100°C / 212°F. Other diameters can also be manufactured. Please consult.

VENA® SIL 650V

01	NT	WALL 1	THICKNESS	WORKING PRESSURE*		BURSTING PRESSURE		BENDING	RADIUS	VACUUM
				ISO 1402/2009		ISO 1402/2009		ISO 10619-1		RESISTANCE
mm	inch	+1/-0.5mm	+0.04/-0.02''	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°F	mm	inch	
6	1/4	5,5	0,22	26	377	77,9	1130	29	1,14	
10	3/8	5,5	0,22	22	318	65,9	955	34	1,34	
13	1/2	5,5	0,22	19,9	289	59,7	866	39	1,54	
19	3/4	5,5	0,22	16,5	240	49,6	719	54	2,13	684 Torr (mmHg)
25	1	5,5	0,22	14,8	214	44,3	643	68	2,68	0,91 bar 13,23 psi
32	1 1/4	5,5	0,22	12,8	186	38,5	558	94	3,7	26,93 inHg 9,29 m H ₂ O
38	11/2	5,5	0,22	11,5	167	34,5	500	112	4,41	2
51	2	5,5	0,22	9,2	133	27,5	399	144	5,67	
63	2 1/2	5,5	0,22	7,5	109	22,6	327	181	7,13	
76	3	6	0,24	6,1	88	18,2	263	232	9,13	
102	4	6	0,24	3,7	54	11,2	163	367	14,45	

^{*} Pressure data hold at room temperature. Please reduce pressure values by 20% for each increase of 100°C / 212°F. Other diameters can also be manufactured. Please consult.

VENA® SIL 650V LASTIC

Ø INT		WALL .	WALL THICKNESS		WORKING PRESSURE*		BURSTING PRESSURE		BENDING RADIUS	
				ISO 140	2/2009	ISO 140	2/2009	ISO 10	0619-1	
mm	inch	+1/-0.5 mm	+0.04/ -0.02 inch	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°F	mm	inch	
6	1/4	5.5	0.22	23.5	340.7	70.5	1022.1	15	0.6	
8	5/16	5.5	0.22	21.4	310.3	64.2	931.0	15	0.6	
10	3/8	5.5	0.22	19.8	286.8	59.3	860.3	15	0.6	
13	1/2	5.5	0.22	17.9	259.1	53.6	777.2	15	0.6	
16	5/8	5.5	0.22	16.3	237.1	49.0	711.4	15	0.6	
19	3/4	5.5	0.22	15.1	219.0	45.3	657.0	15	0.6	
22	7/8	5.5	0.22	14.0	203.5	42.1	610.5	15	0.6	
25	1	5.5	0.22	13.1	190.0	39.3	570.0	25	1.0	
32	1 1/4	5.5	0.22	11.3	163.9	33.9	491.8	49	1.9	
38	1 1/2	5.5	0.22	10.1	145.8	30.2	437.4	69	2.7	
51	2	5.5	0.22	7.9	114.7	23.7	344.1	114	4.5	
63	2 1/2	5.5	0.22	6.4	92.4	19.1	277.2	155	6.1	
76	3	6.0	0.24	5.0	72.6	15.0	217.8	200	7.9	
102	4	6.0	0.24	2.9	41.5	8.6	124.6	290	11.4	

^{*} Pressure data hold at room temperature. Please reduce pressure values by 20% for each increase of 100°C / 212°F. Other diameters can also be manufactured. Please consult.

VENA® SIL 650V PLASTIC

01	NT	WALL T	HICKNESS	WOR PRESS		BURSTING	PRESSURE	BENDING RADIUS	
				ISO 140	ISO 1402/2009		ISO 1402/2009		0619-1
mm	inch	+1/-0.5 mm	+0.04/-0.02 inch	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°F	mm	inch
6	1/4	6	0.24	26.0	376.5	77.9	1129.5	29	1.14
8	5/16	6	0.24	24.0	348.1	72.0	1044.3	31	1.22
10	3/8	6	0.24	22.0	318.4	65.9	955.3	34	1.34
13	1/2	6	0.24	19.9	288.6	59.7	865.8	45	1.77
16	5/8	6	0.24	18.3	265.0	54.8	794.9	55	2.15
19	3/4	6	0.24	16.5	239.6	49.6	718.8	68	2.69
22	7/8	6	0.24	15.8	228.8	47.3	686.3	82	3.24
25	1	6	0.24	14.8	214.2	44.3	642.7	105	4.13
32	1 1/4	6	0.24	12.8	186.2	38.5	558.5	131	5.15
38	1 1/2	6	0.24	11.5	166.6	34.5	499.9	166	6.52
51	2	6	0.24	9.2	133.2	27.5	399.5	231	9.08
63	2 1/2	6	0.24	7.5	109.1	22.6	327.4	299	11.77
76	3	6.5	0.26	6.1	87.8	18.2	263.4	378	14.88
102	4	6.5	0.26	3.7	54.3	11.2	163.0	550	21.67

^{*} Pressure data hold at room temperature. Please reduce pressure values by 20% for each increase of 100°C / 212°F. Other diameters can also be manufactured. Please consult.

VENA® SIL 655

01	INT	WALL TH	HICKNESS	WOR PRESS		BURSTING	PRESSURE	BENDING	RADIUS	VACUUM
				ISO 1402/2009		ISO 1402/2009		ISO 10619-1		RESISTANCE
mm	inch	+1/-0.5mm	+0.04/-0.02''	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°F	mm	inch	
6	1/4	5,5	0,26	31,5	456	94,5	1370	43	1,69	
10	3/8	5,5	0,26	27	392	81.0	1174	49	1,93	
13	1/2	5,5	0,26	24,5	355	73,5	1066	54	2,13	
19	3/4	5,5	0,26	20,5	297	61,5	892	68	2,68	684 Torr (mmHg)
25	1	5,5	0,26	18,5	268	55,5	805	80	3,15	0,91 bar 13,23 psi
32	11/4	5,5	0,26	16,5	239	49,5	718	100	3,94	26,93 inHg 9,29 m H ₂ O
38	11/2	6,5	0,28	15.0	218	45.0	653	121	4,76	2
51	2	6,5	0,28	12.0	174	36.0	522	185	7,28	
63	21/2	6,5	0,28	10.0	145	30.0	435	273	10,75	
76	3	6,5	0,28	7.1	103	21.3	308	318	12,52	
102	4	6,5	0,28	5.0	73	15.0	218	423	16,65	

 $^{^{*}}$ Pressure data hold at room temperature. Please reduce pressure values by 20% for each increase of 100°C / 212°F. Other diameters can also be manufactured. Please consult.

VENA® TECHNOSIL

01	NT	OUTER DIAMETER			WORKING PRESSURE*		PRESSURE	BENDING RADIUS	
				ISO 1402/2009		ISO 1402/2009		ISO 10619-1	
mm	inch	mm	inch	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°F	mm	inch
6,35	1/4	13.2	0.52	9.3	135	28	406	40	1.57
7,93	5/16	15.0	0.59	7.7	111	23	334	45	1.77
9,52	3/8	16.6	0.65	7.0	102	21	305	55	2.21
12,7	1/2	20.3	0.80	5.7	82	17	247	70	2.76
15,88	5/8	24.5	0.96	4.3	63	13	189	85	3.35
19,05	3/4	27.9	1.10	3.7	53	11	160	95	3.74
22,22	7/8	31.3	1.23	3.3	48	10	145	110	4.33
25,4	1	34.5	1.36	3.0	44	9	131	135	5.32
31,75	1 1/4	40.8	1.61	2.3	34	7	102	160	6.30

^{*} Pressure data hold at room temperature. Please reduce pressure values by 20% for each increase of 100°C / 212°F. Other sizes available under demand.

VENA® TECHNOSIL DB

01	NT		TER		KING SURE*	BURSTING	PRESSURE	BENE RAD		VACUMM PRESSURE	
		DIAM	IETER	ISO 1402/2009		ISO 140	ISO 10619-1				
mm	inch	mm	inch	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°F	mm	inch	Bar	Psi
6,35	1/4	16	0,63	23,7	344	71,2	1033	34	1,36	1	14,5
7,93	5/16	18	0,71	22,8	331	68,5	994	37	1,48	1	14,5
9,52	3/8	20	0,79	22,3	324	66,9	971	46	1,84	0,95	13,78
12,7	1/2	23	0,91	19,4	282	58,3	846	51	2,04	0,95	13,78
15,88	5/8	27	1,06	17	246	50,9	739	65	2,6	0,9	13,05
19,05	3/4	30,5	1,2	15,6	226	46,8	678	76	3,04	0,8	11,6
22,22	7/8	33	1,3	14	202	41,9	607	99	3,96	0,5	7,25
25,4	1	37	1,46	12,5	181	37,5	544	118	4,72	0,4	5,8
28,00	17/64	38	1,50	11,67	169	35,00	507	160,00	6,40	0,15	2,18
31,75	1 1/4	46	1,81	10,07	146	30,20	438	181,00	7,24	0,15	2,18

^{*} Pressure data hold at room temperature. Please reduce pressure values by 20% for each increase of 100°C / 212°F. Other sizes available under demand.

VENABIO® FLOW MULTIPURPOSE PHARMALOADER®

INN DIAM		OUTER DIAMETER				
mm	inch	mm	inch			
1,6	1/16	4,8	3/16			
2,4	3/32	5,6	7/32			
3,2	1/8	6,4	1/4			
3,2	1/8	7,9	5/16			
3,2	1/8	9,5	3/8			
4,8	3/16	7,9	5/16			
4,8	3/16	9,5	3/8			
4,8	3/16	11,1	7/16			
6,4	1/4	9,5	3/8			
6,4	1/4	12,7	1/2			
7,9	5/16	12,7	1/2			
9,6	3/8	14,3	9/16			
9,5	3/8	15,9	3/8			
11,1	7/16	14,3	9/16			
12,7	1/2	19.1	3/4			
15,9	5/8	22,2	7/8			
19.1	3/4	25,4	1			

NOMINAL CLAMP Ø	CLAMP HEAD Ø	INNER Ø	OVERALL LENGHT		WORK PRESS	
inch	mm	mm	inch	mm	Bar	Psi
1	50,5	22,1	4	102	1,00	14
1 1/2	50,5	34,7	4	102	0,90	13
2	64	47,5	4	102	0,80	11
2 1/2	77,5	60	4	102	0,70	10
3	91	73	6	152	0,60	8
4	119	97,6	6	152	0,50	7
5	155	125	7	178	0,40	5
6	183	150	7	178	0,35	5
6	167	147	7	178	0,35	5
8	233,5	200	7	178	0,20	3
8	218	198	7	178	0,20	3
10	270	250	8	204	0,10	1

Other sizes available under demand.

PHARMALOADER HP®

NOMINAL CLAMP	CLAMP HEAD Ø	INNER Ø	OVERALL LENGHT	WORKING PRESSURE	BURSTING PRESSURE
inch	mm	mm	mm(inches)	Bar	Bar
1 1/2"	50.5	34.7	4" (102)	5.7	17
2"	64.0	47.5	4" (102)	4.0	12
3"	91.0	73.0	6"(152)	2.6	7.9

VENA® ASEPTISIL

INNE	R DIAMI	ETER	TOLER	ANCE	OUTE	R DIAM	ETER	TOLE	RANCE	THIC	KNESS	TOLE	RANCE
mm	in	ch	mm	inch	mm	in	ch	mm	inch	mm	inch	mm	inch
1,59	0,06	1/16	0,25	0,0098	4,76	0,19	3/16	0,75	0,0295	1,585	0,062	0,25	0,0098
2,38	0,09	3/32	0,25	0,0098	5,56	0,22	7/32	0,75	0,0295	1,59	0,063	0,25	0,0098
3,18	0,13	1/8	0,25	0,0098	6,35	0,25	1/4	0,75	0,0295	1,585	0,062	0,25	0,0098
3,18	0,13	1/8	0,25	0,0098	7,94	0,31	5/16	0,85	0,0335	2,38	0,094	0,30	0,0118
3,18	0,13	1/8	0,25	0,0098	9,52	0,37	3/8	0,85	0,0335	3,17	0,125	0,30	0,0118
4,76	0,19	3/16	0,30	0,0118	7,94	0,31	5/16	0,80	0,0315	1,59	0,063	0,25	0,0098
4,76	0,19	3/16	0,30	0,0118	9,52	0,37	3/8	0,90	0,0354	2,38	0,094	0,30	0,0118
4,76	0,19	3/16	0,30	0,0118	11,11	0,44	7/16	0,90	0,0354	3,17	0,125	0,30	0,0118
6,35	0,25	1/4	0,30	0,0118	9,52	0,37	3/8	0,80	0,0315	1,585	0,062	0,25	0,0098
6,35	0,25	1/4	0,30	0,0118	12,70	0,50	1/2	0,90	0,0354	3,17	0,125	0,30	0,0118
7,94	0,31	5/16	0,30	0,0118	12,70	0,50	1/2	0,90	0,0354	2,38	0,094	0,30	0,0118
9,52	0,37	3/8	0,35	0,0138	14,29	0,56	9/16	0,95	0,0374	2,38	0,094	0,30	0,0118
9,52	0,37	3/8	0,35	0,0138	15,88	0,63	5/8	0,95	0,0374	3,18	0,125	0,30	0,0118
11,11	0,44	7/16	0,35	0,0138	14,29	0,56	9/16	0,85	0,0335	1,59	0,063	0,25	0,0098
12,70	0,50	1/2	0,35	0,0138	19,05	0,75	3/4	0,95	0,0374	3,17	0,125	0,30	0,0118
15,88	0,62	5/8	0,35	0,0138	22,22	0,87	7/8	0,95	0,0374	3,17	0,125	0,30	0,0118
19,05	0,75	3/4	0,40	0,0157	25,40	1,00	1	1	0,0394	3,17	0,125	0,30	0,0118

ADAPTSIL®

0	Ø INT	\A/A TL	IICKNESS	WORKING	PRESSURE	BURSTING PRESSURE		
	IIN I	WALL IT	IICKNESS	ISO 140	2/2009	ISO 1402/2009		
mm	inch	+1/-0.5mm	+0.04/-0.02''	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°F	
13	1/2	5,8	0,23	16,1	234	48,3	701	
19	3/4	5,8	0,23	14	204	42,1	611	
25	1	5,8	0,23	13,4	194	40,1	582	
38	1 1/2	5,8	0,23	10,4	151	31,2	453	
51	2	5,8	0,23	8,3	120	24,8	360	
63	2 1/2	5,8	0,23	6,1	89	18,4	267	
76	3	5,8	0,23	4,9	72	14,8	215	

VENA® VIEW

INNER DIAMETER		WORKING PRESSURE ISO 1402/2009		BURSTING PRESSURE ISO 1402/2009			G PRESSURE HOUSING	BURSTING PRESSURE WITH HOUSING	
mm	inch	Bar	Psi	Bar	Psi	Bar	Psi	Bar	Psi
25	0,98	8	116	32	464	12	174	48	696
51	2	5	72	22	319	10	145	47	681
63	2,48	5	72	22	319	10	145	40	580
76	2,99	5	72	20	290	9	130	36	522
102	4,02	4	58	16	232	7	101	14	203

VENA® FLEXIP

INNER D	IAMETER	WALL TI	HICKNESS	WORKING I ISO 1402		BURSTING P ISO 1402		BENDING ISO	
mm	inch	+1/ -0.5 mm	+0.04/-0.02 inch	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°F	mm	inch
6	1/4	5,50	0,22	32,70	474,40	98,10	1423,20	29	1,14
8	5/16	5,50	0,22	31,20	452,00	93,50	1356,00	31	1,22
10	3/8	5,50	0,22	29,70	430,30	89,00	1290,80	34	1,34
13	1/2	5,50	0,22	27,50	398,90	28,50	1196,70	39	1,54
16	5/8	5,50	0,22	25,40	369,00	76,30	1107,10	45	1,77
19	3/4	5,50	0,22	23,50	340,60	70,50	1021,80	54	2,13
22	7/8	5,50	0,22	21,60	313,70	64,90	941,00	60	2,36
25	1	5,50	0,22	19,90	288,20	59,60	864,50	68	2,68
32	1 1/4	5,50	0,22	16,20	234,50	48,50	703,40	94	3,70
38	1 1/2	5,50	0,22	13,40	194,80	40,30	584,40	112	4,41
51	2	5,50	0,22	8,90	129,10	26,70	387,20	144	5,67
63	2 1/2	5,50	0,22	6,40	92,90	19,20	278,80	181	7,13
76	3	6,00	0,24	5,50	80,40	16,60	241,10	232	9,13

VENA® FLEXPURE

INNER D	INNER DIAMETER		WALL THICKNESS		WORKING PRESSURE		BURSTING PRESSURE		RADIUS
mm	inch	+1/ -0.5 mm	+0.04/-0.02 inch	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°F	mm	inch
19,10	3/4	3,80	0,150	10	145	30	435	65	2,56
21,00	7/8	4,10	0,161	10	145	30	435	80	3,15
25,50	1	4,20	0,165	10	145	30	435	90	3,54
31,80	1 1/4	4,65	0,183	10	145	30	435	125	4,92
38,10	1 1/2	5,00	0,197	10	145	30	435	155	6.10

VENAFLON® HF

INNER D	IAMETER		ICKNESS 1307		PRESSURE 1402	BENDING ISO 10	RADIUS 0619-1
mm	inch	+- 0.8 mm	+- 0.03 inch	Bar at 20°C	Psi at 68°F	mm	inch
10	3/8	6,0	0,24	10	145,04	40	1,58
13	1/2	6,0	0,24	10	145,04	45	1,77
16	5/8	6,0	0,24	10	145,04	55	2,17
19	3/4	6,0	0,24	10	145,04	65	2,56
25	1	6,0	0,24	10	145,04	85	3,35
32	1 1/4	6,0	0,24	10	145,04	120	4,72
38	1 1/2	6,5	0,26	10	145,04	140	5,51
51	2	8,0	0,31	10	145,04	180	7,09
63,5	2 1/2	8,0	0,31	5	72,52	320	12,60
76	3	8,0	0,31	5	72,52	380	14,96
100	4	9,0	0,35	3	43,51	500	19,69

VENAFLON® HF-X

INNER D	IAMETER	WALL THICKNESS ISO 1307		WORKING ISO	PRESSURE 1402	BENDING RADIUS ISO 10619-1	
mm	inch	+0,8/ -0,8 mm	+-0,03 inch	Bar a 20°C	Psi at 68°F	mm	inch
13	1/2	6.0	0,24	10	145,04	120	4,72
19	3/4	6.0	0,24	10	145,04	120	4,72
25	1	6.0	0,24	10	145,04	150	5,91
32	1 1/4	6.0	0,24	10	145,05	200	7,87
38	1 1/2	6.5	0,26	10	145,05	250	9,84
51	2	8.0	0,31	10	145,05	300	11,81
63,5	2 1/2	8.0	0,31	5	72,52	380	14,96
76	3	8.0	0,31	5	72,52	460	18,11

VENAFLON® HR

INNER D	IAMETER	WALL TH	ICKNESS		PRESSURE 1402	BENDING RADIUS		
mm	inch	+1/ -0.5 mm	+0.04/-0.02 inch	ISO 1402/2009 Bar at 20°C	ISO 1402/2009 Psi at 68°F	ISO 1746/1998 mm	ISO 1746/1998 inch	
13	1/2	6	0,24	10	145	45	1.77	
19	3/4	6	0,24	10	145	65	2.55	
25	1	6	0,24	10	145	85	3.34	
32	1 1/4	6.5	0,26	10	145	120	4.72	
38	1 1/2	6.5	0,26	10	145	140	5.51	
51	2	7.25	0,28	10	145	180	7.08	
63.5	2.5	8	0,31	10	145	250	9.84	
76	3.00	8	0,31	10	145	350	13.77	

VENAFLON® FULL-X

INNER D	IAMETER	WALL TH	ICKNESS	WORKING ISO 140	PRESSURE 2/2009	BENDING RADIUS ISO 10619-1	
mm	inch	+1/-0.5 mm	+0.04/-0.02 inch	Bar at 20°C	Psi at 68°F	mm	inch
13	1/2	6.0	0,24	10	145,04	135	5,31
19	3/4	6.0	0,24	10	145,04	188	7,40
25	1	6.0	0,24	10	145,04	225	8,85
32	1 1/4	6.5	0,26	10	145,04	262	10,31
38	1 1/2	6.5	0,26	10	145,04	338	13,30
51	2	7.25	0,28	10	145,04	412	16,22
63,5	2 1/2	8.0	0,31	10	145,04	450	17,71
76	3	8.0	0,31	10	145,04	525	20,66
100	4	8.50	0,33	10	145,04	700	27,56

VENA® TECHNIPUR® VAC FDA

	NER		ALL		KING SURE		STING SURE		UUM TANCE	BENDING	RADIUS
DIAN	IETER	THICK	(NESS	ISO 140	ISO 1402/2009 ISO		2/2009	ISO 723	3/2006	ISO 10	0619-1
mm	inch	+0.04/ -0.02 mm	+1.57x10 ⁻³ / -7.87x10 ⁻⁴ inch	Bar a 20°C	Psi a 68F	Bar a 20°C	Psi a 68F	Bar a 20°C	Psi a 68F	mm	inch
50	1.97	1,20	0,05	2,07	30,02	6,21	90,05	0,61	8,85	85	0,28
55	2.17	1,20	0,05	1,87	27,12	5,61	81,35	0,55	7,98	93	0,31
60	2.36	1,20	0,05	1,71	24,80	5,13	74,39	0,51	7,40	100	0,33
65	2.56	1,20	0,05	1,58	22,91	4,74	68,73	0,47	6,82	108	0,35
70	2.76	1,20	0,05	1,46	21,17	4,38	63,51	0,43	6,24	115	0,38
75	2.95	1,20	0,05	1,36	19,72	4,08	59,16	0,4	5,80	123	0,40
80	3.15	1,20	0,05	1,28	18,56	3,84	55,68	0,38	5,51	130	0,43
85	3.35	1,20	0,05	1,2	17,40	3,60	52,20	0,36	5,22	138	0,45
90	3.54	1,20	0,05	1,13	16,39	3,39	49,16	0,34	4,93	145	0,48
95	3.74	1,20	0,05	1,07	15,52	3,21	46,55	0,32	4,64	153	0,50
100	3.94	1,20	0,05	1,01	14,65	3,03	43,94	0,3	4,35	160	0,52
105	4.13	1,20	0,05	0,96	13,92	2,88	41,76	0,29	4,21	168	0,55
110	4.33	1,20	0,05	0,92	13,34	2,76	40,02	0,27	3,92	175	0,57
115	4.53	1,20	0,05	0,88	12,76	2,64	38,28	0,26	3,77	183	0,60
120	4.72	1,20	0,05	0,84	12,18	2,52	36,54	0,25	3,63	190	0,62
125	4.92	1,20	0,05	0,81	11,75	2,43	35,24	0,24	3,48	198	0,65
130	5.12	1,20	0,05	0,77	11,17	2,31	33,50	0,23	3,34	205	0,67
135	5.31	1,20	0,05	0,75	10,88	2,25	32,63	0,22	3,19	213	0,70
140	5.51	1,20	0,05	0,72	10,44	2,16	31,32	0,22	3,19	220	0,72
145	5.71	1,20	0,05	0,69	10,01	2,07	30,02	0,21	3,05	228	0,75
150	5.91	1,20	0,05	0,67	9,72	2,01	29,15	0,2	2,90	235	0,77
155	6.10	1,20	0,05	0,65	9,43	1,95	28,28	0,19	2,76	243	0,80
160	6.30	1,20	0,05	0,63	9,14	1,89	27,41	0,19	2,76	250	0,82
165	6.50	1,20	0,05	0,61	8,85	1,83	26,54	0,18	2,61	258	0,85

VENA® TECHNIPUR® S100

ININIED E	DIAMETER	WALL TH	IOKNIEGO	WORKING	PRESSURE	BURSTING PRESSURE		
IINNEK L	JIAMIETEK	WALL IH	ICKNESS	ISO 140	2/2009	ISO 140	2/2009	
mm	inch	+1/-0.5 mm	+0.04/-0.02 inch	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°I	
20	0.79	3.6	0.14	10.44	151.35	31.31	454.06	
25	0.98	3.6	0.14	9.40	136.27	28.19	408.80	
30	1.18	3.6	0.14	8.46	122.68	25.38	368.05	
32	1.26	3.6	0.14	8.11	117.64	24.34	352.92	
35	1.38	3.6	0.14	7.62	110.46	22.85	331.37	
38	105	3.6	0.14	7.15	103.71	21.46	311.14	
40	1.57	3.6	0.14	6.86	99.45	20.58	298.34	
45	1.77	3.6	0.14	6.17	89.53	18.52	268.60	
51	2.01	3.6	0.14	5.44	78.93	16.33	236.80	
60	2.36	3.6	0.14	4.51	65.34	13.52	196.02	
63,5	2.5	3.6	0.14	4.19	60.71	12.56	182.13	
70	2.76	3.6	0.14	3.65	52.96	10.96	158.89	
76	2.99	3.6	0.14	3.22	46.69	9.66	140.08	
82	3.23	3.6	0.14	2.84	41.17	8.52	123.50	
90	3.54	3.6	0.14	2.40	34.80	7.20	104.40	
102	4.02	3.6	0.14	1.87	27.05	5.60	81.14	
114	4.49	3.6	0.14	1.45	21.02	4.35	63.07	
127	5.00	3.6	0.14	1.10	16.00	3.31	48.00	
203	7.99	3.6	0.14	0.65	9.47	1.96	28.40	

VENA® TECHNIPUR® \$200

INNER D	IAMETER	WALL TH	ICKNESS	WORKING	PRESSURE	BURSTING PRESSURE		
mm	inch	+1/-0.5 mm	+0.04/-0.02 inch	ISO 1402/2009 Bar at 20°C	ISO 1402/2009 Psi at 68°F	ISO 1402/2009 Bar at 20°C	ISO 1402/2009 Psi at 68°F	
13	0,51	4,50	0,18	12,17	176,47	36,50	529,25	
16	0,63	4,50	0,18	11,54	167,33	34,61	501,84	
20	0,79	4,50	0,18	10,73	155,51	32,18	466,54	
25	0,98	4,50	0,18	9,75	141,43	29,26	424,29	
30	1,18	4,50	0,18	8,83	128,02	26,49	384,06	
32	1,26	4,50	0,18	8,47	122,85	25,42	368,54	
35	1,38	4,50	0,18	7,95	115,29	23,85	345,87	
38	1,5	4,50	0,18	7,45	107,98	22,34	323,93	

VENA® ABRASIL

ININED DI	ANAETED	\A/A TIUG	NA IFOO	WORK PRESS		BURSTING PF	RESSURE	BENDING	RADIUS
INNER DIA	AMETER	WALL THIC	KNESS	ISO 1402	/2009	ISO 1402/	2009	ISO 106	619-1
mm	inch	+1/ -0.5 mm	+0.04/ -0.02 inch	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°F	mm	inch
6	1/4	5.0	0.20	14.5	210.3	43.5	630.9	28.6	1.13
10	3/8	5.0	0.20	13.7	199.3	41.2	598.0	34.4	1.35
13	1/2	5.0	0.20	13.2	191.3	39.6	574.0	39.1	1.54
16	5/8	5.0	0.20	12.7	183.5	38.0	550.6	44.3	1.74
19	3/4	5.0	0.20	12.1	175.9	36.4	527.7	49.7	1.96
22	7/8	5.0	0.20	11.6	168.5	34.8	505.4	55.6	2.19
25	1	5.0	0.20	11.1	161.2	33.3	483.7	61.8	2.43
32	1 1/4	5.0	0.20	10.0	145.1	30.0	435.2	77.7	3.06
38	11/2	5.0	0.20	9.1	132.0	27.3	396.0	92.9	3.66
51	2	5.0	0.20	7.3	106.3	22.0	318.9	130.8	5.15
63	2 1/2	5.0	0.20	5.9	85.7	17.7	257.2	171.8	6.76
76	3	5.5	0.22	4.6	66.8	13.8	200.4	222.8	8.77
102	4	5.5	0.22	2.7	39.6	8.2	118.7	345.2	13.59

VENA® ABRASIL PL

INNED DI	ANACTED	\A/A T	OKNESS	WORKING	PRESSURE	BURSTING	PRESSURE	BENDING RADIUS	
INNER DIA	AMETEK	WALL TH	ICKINESS	ISO 140	2/2009	ISO 140	2/2009	ISO 10	
mm	inch	+1/-0.5mm	+0.04/-0.02 inch	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°F	mm	inch
6	1/4	5.0	0.20	10.5	152.5	31.6	457.6	24.6	0.97
8	5/16	5.0	0.20	9.5	138.0	28.5	413.9	25.2	0.99
10	3/8	5.0	0.20	8.7	126.6	26.2	379.9	25.9	1.02
13	1/2	5.0	0.20	7.8	113.3	23.4	340.0	27.1	1.07
16	5/8	5.0	0.20	7.1	102.8	21.3	308.4	28.4	1.12
19	3/4	5.0	0.20	6.5	94.1	19.5	282.3	29.9	1.18
22	7/8	5.0	0.20	6.0	86.7	17.9	260.0	31.5	1.24
25	1	5.0	0.20	5.5	80.2	16.6	240.6	33.3	1.31
32	1 1/4	5.0	0.20	4.7	67.7	14.0	203.0	38.1	1.50
38	1 1/2	5.0	0.20	4.1	59.0	12.2	176.9	42.9	1.69
51	2	5.5	0.20	3.0	44.1	9.1	132.2	55.5	2.18
63	2 1/2	5.0	0.20	2.3	33.3	6.9	100.0	115.4	4.54
76	3	5.5	0.22	1.6	23.8	4.9	71.5	194.8	7.67
102	4	5.5	0.22	0.6	8.9	1.8	26.7	425.9	16.77

VITOSIL®

INNER D	IAMETER	METER WALL THICKNESS		WORKING PRESSURE ISO 1402/2009		BURSTING PRESSURE ISO 1402/2009		BENDING RADIUS ISO 10619-1	
mm	inch	+1/ -0.5 mm	+0.04/ -0.02 inch	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°F	mm	inch
25	1	6,5	0,26	13,3	192,9	40,0	580,2	111	4,37
38	1 ½	6,5	0,26	10,3	149,4	31,0	449,6	159	6,26
51	2	6,5	0,26	8,3	120,4	25,0	362,6	209	8,23
63	2 ½	6,5	0,26	6,7	97,2	20,0	290,1	237	9,33
76	3	6,5	0,26	5,3	76,9	16,0	232,1	346	16,62
102	4	7,2	0,28	3,7	53,7	11,0	159,5	412	16,22

VENA® STEAMFLOW

INNER D	INNER DIAMETER WALL T		IICKNESS		WORKING PRESSURE ISO 1402/2009		BURSTING PRESSURE ISO 1402/2009		RADIUS 1619-1
mm	inch	+1/ -0.5 mm	+0.04/-0.02 inch	Bar at 20°C	Psi at 68°F	Bar at 20°C	Psi at 68°F	mm	inch
10	3/8	6,5	0,26	21,3	308,9	63,9	926,8	123,8	4,9
13	1/2	6,5	0,26	19,4	281,4	58,2	844,1	135,3	5,3
16	5/8	6,5	0,26	17,1	247,5	51,2	742,6	148,2	5,8
19	3/4	6,5	0,26	15,3	221,4	45,8	664,3	162,4	6,4
25	1	6,5	0,26	11,4	165,3	34,2	496,0	194,7	7,7
32	1 1/4	6,5	0,26	9,9	143,1	29,6	429,3	239,1	9,4
38	1 1/2	6,5	0,26	9,6	139,7	28,9	419,2	283	11,1
50	2	6,5	0,26	8,6	124,7	25,8	374,2	396	15,6

3. Chemical Compatibility

A	SILICONE	TPV	TPE	ULDPE	KM VITOSIL	:EP/PFA/PTFE	
acetaldehyde	Α	А	Α	С	Ē D	Ē A	
acetamide	В	A	В	A	В	A	
acetic acid 5%	Α	Α	Α	-	Α	A	
acetic acid 30%	Α	С	А	-	В	Α	
acetic acid, hot high press	С	-	-	-	D	A	
acetic acid, glacial	В	Α	С	D	D	Α	
acetic anhydride	С	Α	В	D	D	Α	
acetone	В	Α	С	В	D	Α	
acetophenone	D	В	-	D	D	Α	•
acetyl acetone	D	Α	-	-	D	Α	
acetyl chloride	С	D	Α	D	Α	Α	
acetylene	В	Α	Α	D	Α	Α	
acetylene tetrabromide	-	D	-	-	Α	Α	
acrylonitrile	D	D	D	Α	D	Α	
adipic acid	-	В	С	Α	-	Α	
aero lubriplate	В	С	-	-	Α	Α	
aero safe 2300	С	В	-	-	D	Α	
aero safe 2300 w	С	В	-	-	D	Α	
aero shell IAC	В	D	-	-	Α	Α	
aero shell 7 A grease	В	D	-	-	Α	Α	
aero shell 17 grease	В	D	-	-	Α	Α	
aero shell 750	D	D	-	-	Α	Α	
air-below 300° F	Α	D	Α	-	Α	Α	
air-above 300° F	Α	D	Α	-	Α	Α	
alkazene	D	D	-	-	В	Α	
alum NH3 CR-K	Α	Α	-	-	D	Α	
aluminum acetate	D	Α	-	-	D	Α	
aluminum bromide	Α	В	-	-	Α	Α	
aluminum chloride	В	Α	Α	В	Α	Α	
aluminum fluoride	В	Α	-	Α	Α	Α	
aluminum nitrate	В	Α	-	Α	Α	Α	
aluminum phosphate	Α	Α	-	-	Α	Α	
aluminum salts	Α	Α	A	A	Α	Α	
aluminum sulfate	A	Α	Α	Α	Α .	Α .	
ambrex 33 mobile	D	-			Α	A	
amines, mixed	В	A	A	С	D	A	
ammonia anhydrous(liquid)	C	A	A	В	D	A	
ammonia gas, cold	A	A -	A		D D	A A	
ammonia gas, hot ammonia & lichium metali	D	_	-	_	D	A	
solution							
ammonium carbonate	-	Α	Α	В	-	Α	
ammonium chloride	-	Α	Α	Α	Α	Α	
ammonium hydroxide (concentrated)	Α	Α	Α	Α	В	Α	
ammonium nitrate	-	А	Α	Α	-	А	•
ammonium nitrite	В	Α	-	-	-	Α	
ammonium persulfate solution	-	Α	-	Α	-	Α	***************************************
ammonium persultate 10%	-	-	-	-	-	Α	
ammonium phosphate	Α	Α	Α	-	-	Α	- dummaria
ammonium phosphate, mono-basic	А	А	-	А	-	А	
ammonium phosphate, dibasic	Α	Α	-	Α	-	А	
ammonium phosphate, tribasic	Α	А	-	С	-	А	
ammonium salts	Α	Α	Α	Α	С	Α	
ammonium sulfate	А	Α	Α	Α	Α	Α	
ammonium sulfide	-	Α	-	-	D	Α	
amyl acetate	D	D	D	С	D	Α	
amyl alcohol	D	Λ	D	B	B	Λ	

oility	SILICONE	TPV	TPE	ULDPE	FKM VITOSIL	FEP/PFA/PTFE
amyl chloride	D	D	D	D	Α	Α
amyl chloronaphthalene	D	С	-	-	Α	Α
amyl naphthalene	D	D	-	-	Α	Α
anderol L 774 (di-ester)	D	_	-	-	А	Α
anderol L 826 (di-ester)	D	D	_	-	Α	Α
anderol L 829 (di-ester)	D	D	-	-	Α	Α
ang-25 (glycerol ester)	В	-	-	-	Α	Α
ang-25 (di-ester base)	В	D	-	-	Α	Α
anhydrous ammonia	В	Α	-	-	D	Α
anhydrous hydrazine	-	-	-	-	D	Α
anhydrous hydrogen fluo	-	С	-	-	D	Α
aniline	D	Α	D	С	С	Α
aniline dyes	С	Α	-	-	В	Α
aniline hydrochloride	D	А	D	D	В	Α
aniline oils	D	С	-	-	С	Α
animal fats	В	В	-	-	А	А
animal oil (lard oil)	В	В	-	-	А	Α
AN-03 grade M	В	В	-	-	Α	Α
AN-0-6	D	-	-	-	Α	Α
AN-0-366	D	-	-	-	Α	Α
AN-V V-0-366 b hydrofluid	D	D	-	-	Α	Α
ansul ether	D	D	-	-	D	Α
aqua regia	D	С	В	В	В	Α
argon	В	Α	-	-	Α	Α
aroclor 1248	В	D	-	-	Α	Α
aroclor 1254	С	D	-	-	Α	Α
aroclor 1260	Α	D	-	-	Α	Α
aromatic fuel 50%	D	С	-	С	Α	Α
arsenic acid	Α	Α	С	В	А	Α
arsenic trichloride	-	В	-	-	-	Α
askatel	D	D	-	-	Α	Α
asphalt	D	С	-	Α	Α	Α
ASTM oit #1	Α	С	D	-	Α	Α
ASTM oil #2	D	D	D	-	Α	Α
ASTM oil #3	С	D	D	-	Α	Α
ASTM oil #4	D	D	-	-	А	Α
ASTM reference fuel A	D	С	-	-	А	Α
ASTM reference fuel B	D	С	-	-	А	Α
ASTM reference fuel C	D D	С	-	-	<u> </u>	A
ATL-857	D	-	-	-	A	A
atlantic dominion F	D	С	-	-	A	A
aurex 903R mobil	D	-	-	-		A
		D		_	Α	Α
	D C		ļ			A

В						
bardol B	D	D	-	-	Α	Α
barium chloride	Α	Α	-	Α	Α	Α
barium hydroxide	Α	Α	Α	В	Α	Α
barium salts	Α	-	Α	-	Α	Α
barium sulfate	Α	Α	-	В	Α	Α
barium sulfide	Α	Α	-	В	Α	Α
bayol D	D	D	-	-	Α	Α
beer	Α	Α	Α	А	Α	Α
beet sugar liquors	Α	Α	-	Α	Α	Α
benzaldehyde	D	В	D	А	D	Α
benzene	D	D	D	С	Α	Α
benzene sulfonic acid	D	Α	Α	А	Α	Α
benzine	D	D	-	-	Α	Α
benzochloride	-	-	-	-	Α	Α
benzoic acid	В	Α	D	Α	Α	Α
benzophenone	-	-	-	-	Α	Α

	SILICONE	TPV	TPE	ULDPE	FKM VITOSIL	FEP/PFA/PTFE
benzyl alcohol	-	С	В	D	Α	Α
benzyl benzoate	-	С	-	-	Α	Α
benzyl chloride	D	С	-	-	Α	Α
black point 77	С	-	-	-	Α	Α
black sulphate liquors	В	-	-	-	Α	Α
blast furnace gas	Α	Α	-	-	Α	Α
bleach solution	В	В	-	-	Α	Α
borax	В	Α	Α	Α	Α	Α
bordeaux mixture	В	Α	-	-	Α	Α
boric acid	Α	Α	Α	Α	Α	Α
boron fluids (HEF)	D	D	_	-	Α	Α
brake fluid (non petroleum)	С	Α	_	-	D	Α
bray GG-130	D	-	_	-	Α	Α
brayco 719-R (VV-H-910)	В	-	_	-	D	Α
brayco 885 MILL-L-6085 A	D	-	_	-	Α	Α
brayco 910	D	-	_	-	D	Α
bret 710	D	-	_	-	D	Α
brine	-	Α	_	-	-	Α
brom-113	D	-	_	-	-	Α
brom-114	D	-	_	-	В	Α
bromine	D	С	Α	D	Α	Α
bromine anhydrous	С	С	_	-	Α	Α
bromine pentafluoride	D	D	_	-	D	Α
bromine trifluoride	D	С	_	-	D	Α
bromine water	D	В	_	-	Α	Α
bromobenzene	D	D	_	-	Α	Α
bromochloro trifluoroethane	D	D	-	-	Α	Α
bunker oil	В	В	-	-	Α	Α
butadiene	D	D	-	D	В	Α
butane	D	D	D	С	Α	Α
butane 2.2-dimethyl	D	-	-	-	Α	Α
butane 2.3-dimethyl	D	-	-	-	Α	Α
butanol (butyl alcohol)	В	Α	В	В	Α	Α
1-butane.2-ethyl	D	-		-	Α	Α
butter	В	В	-	-	Α	Α
butyl acetate	D	D	D	С	D	Α
butyl acetyl ricinoleate	-	В	-	-	Α	Α
butyl acrylate	-	D	-	-	D	Α
butyl alcohol	В	A	-	-	A	Α
butyl amine	В	Α	-	С	D	Α
butyl benzoate	-	С	-	-	A	Α
butyl butyrate	-	С	<u> </u>	-	A	A
butyl carbitol	D	С	-	-	С	A
butyl cellosolve	-	Α	-	-	D	A
butyl cellosolve adipate	В	-	-	-	В	A
butyl ether	D	В	-	-	D	A
butyl oleate	-	В	-	-	A	A
butyl stearate	-	В	-	-	A	A
butylene	D	С	-	В	A	A
butyraldehyde	D	A	-	-	D	A
butyric acid	-	Α	Α	D	В	Α
C						

С						
calcine liquors	-	-	-	-	Α	А
calcium acetate	D	Α	-	-	D	Α
calcium bisulfite	Α	D	D	А	Α	Α
calcium carbonate	Α	Α	-	В	Α	Α
calcium chloride	Α	Α	-	В	Α	Α
calcium cyanide	Α	-	-	-	-	Α
calcium hydroxide	Α	Α	-	Α	Α	Α
calcium hypochloride	-	Α	-	-	Α	Α
calcium hypochlorite	В	В	-	А	Α	А

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Resistance to different products:
A - excellent B - good C - insufficient

	SILICONE	TPV	TPE	ULDPE	FKM VITOSIL	FEP/PFA/PTFE		SILICONE	VdT	TPE	ULDPE	FKM VITOSIL	FEP/PFA/PTFE		SILICONE	ML	TPE
calcium nitrate	В	А	-	Α	Α	А	city service pacemaker #2	D	-	-	-	А	Α	diethyl sebacate	В	В	
calcium phosphate	Α	-	-	-	Α	Α	city service #65,#120,#250	D	-	-	-	Α	Α	diethylene glycol	В	Α	A
calcium salts	В	Α	Α	-	Α	Α	cobalt chloride	В	Α	-	-	А	Α	difluorodibromomethane	D	В	1 -
calcium silicate	-	-	-	-	Α	Α	cobalt chloride, 2N	Α	-	-	-	Α	Α	diisobutylene	D	С	Ť.
calcium sulfide	В	А	-	<u> </u>	А	А	cocoanut oil	Α	В	С	-	А	Α	diisooctyl sebacate	С	В	<u>-</u>
calcium sulfite	Α	А	<u> </u>	-	А	А	cod liver oil	В	С	-	-	А	Α	diisopropyl benzene	-	С	
calcium thiosulfate	А	А	<u> </u>	-	А	Α	coffe	А	А	-	-	А	Α	diisopropyl ketone	D	С	
caliche liquors	В		<u> </u>	_	A	A	coke oven gas	В	С	_	-	Α	Α	dimethyl aniline	-	В	
cane sugar liquors	A	А	<u> </u>	_	1	A	coliche liquors	-	В		-	-	A	dimethyl formamide	В	A	
	<u> </u>	^	1		A	- -							ł		-	İ	
caproic aldehyde	B -		1 -	<u> </u>	D	A	convelex 10	D D	D D		-		A	dimethyl phthalate	D	B B	
carbanate		A	1 -	-	A	A	coolanol (monsanto)	D			_	A	A	dinitro toluene	С	В	
carbitol	В	Α .		-	В .	Α .	coolanol 45 (monsanto) +A269	U	D		_	А	Α	dioctyl phthalate	·		
carbolic acid	D	A		-	Α .	Α	copper acetate	D	Α	-	-	D	Α	dioctyl sebacate	С	С	
carbon bisulfide	-	D	D	-	А	Α	copper chloride	Α	С	-	-	Α	Α	dioxane	D	В	
carbon dioxide, dry	В	-	Α	Α	В	Α	copper cyanide	Α	С	-	В	Α	Α	dioxolane	D	С	
carbon dioxide, wet	В	-	Α	Α	В	Α	copper salts	Α	-	Α	-	Α	Α	dipentene	Α	С	
carbon disulfide	-	D	D	С	Α	Α	copper sulfate	Α	С	-	Α	Α	Α	diphenyl	D	С	ļ
carbon monoxide	Α	Α	Α	Α	А	Α	copper sulfate 10%	Α	-	-	-	А	Α	diphenyl oxides	С	С	
carbon tetrachloride	D	D	В	D	Α	Α	copper sulfate 50%	Α	_	_	_	A	A	dow chemical 50-4	-	-	
carbonic acid	А	А	А	В	Α	Α	corn oil	A	- В			A	A	dow chemical ET378	D	-	
castor oil	Α	В	С	-	Α	Α				_			ł	dow chemical ET588	-	-	
cellosolve	D	С	D	В	D	Α	cottonseed oil	A	В	С	-	Α .	Α .	dow corning-3	С	-	-
cellosolve acetate	D	Α	D	-	D	Α	creosol	D	С	D	D	Α	Α	dow corning-4	С	-	-
cellosolve butyl	D	С	i -	-	D	Α	creosote	D	В	-	-	Α	Α	dow corning-5	С	-	Ť.
celluguard	Α	В	-	-	Α	А	creosote, coal tard	D	D	-	-	Α	Α	dow corning-11	С	-	<u> </u>
cellulube A60 (now fyrquel)	-	-	<u>. </u>	<u> </u>	В	А	creosote, wood	D	D	-	-	Α	Α	dow corning-33	С	_	<u> </u>
cellulube 90,100,150,220,300	А	_	<u>.</u>		A	А	creosvlic acid	D	В	-	-	Α	Α	dow corning-44	С	_	<u> </u>
and 500						1	crude oil	D	С	-	-	Α	Α	dow corning-55	С		
cellutherm 2505A	-	D	-	-	Α	Α	cumene	D	С	-	-	Α	Α		С		
cetate (hexadecane)	D	D	-	-	А	А	cutting oil	D	С	-	-	Α	Α	dow corning-200	1	_	
china wood oil (tunf oil)	D	В	-	-	Α	Α	cyclohexane	D	D	D	В	Α	Α	dow corning-220	С		-
chloroacetic acid	-	D	В	D	D	Α	cyclohexanol	D	В	-	-	Α	Α	dow corning-510	С	-	_
chlorodane	D	В	-	-	А	А	cyclohexanone	D	В	D	D	D	А	dow corning-550	С		
chlorextol	D	-	-	-	А	А	P-cymene	D	D	-	-	Α	Α	dow corning-704	-	-	ļ -
chlorinated salt brine	D	-	-	-	А	Α				<u>i</u> i			1	dow corning-705	-	-	ļ -
chlorinated solvents, dry	D	-	-	-	А	А	D							dow corning-710	С	-	ļ -
chlorinated solvents, wet	D	_	<u> </u>	_	А	Α	decalin	D	D	-	С	А	Α	dow corning-1208	С	-	
chlorine, dry	D	С	Α	D	А	Α	decane	В	В	_	-	A	A	dow corning-4050	С	-	ļ.
chlorine, wet		С	Α		Α	Α	delco brake fluid	С			-	D	Α	dow corning-6620	С	-	ļ -
chlorine dioxide	_	D											ł	dow corning-F60	С	-	ļ -
			<u> </u>	<u> </u>	Α .	A	denatured alcohol	Α .	В		-	Α .	Α .	dow corning-F61	В	-	-
chlorine dioxide (8%Cl as NAC102 in solution)	-	-	-	-	Α	Α	detergent solutions	Α	В	-	D	А	Α	dow corning-XF60	С	-	-
chlorine trifluoride	D	D	-	-	D	Α	developing fluids (photo)	Α	A	-	Α	Α	Α	dow guard	Α	-	-
chloroacetone	D	В	-	-	D	Α	dextrin	D	Α	-	-	Α	Α	dowtherm oil	В	D	i -
chloroacetic acid	-	D	A	D	-	Α	diacetone	D	С	-	-	D	Α	dowtherm A or E	D	D	İ .
chlorobenzene	D	D	D	D	А	A	diacetone alcohol	D	Α	Α	-	D	Α	dowtherm 209.50% solution	С	-	-
chlorobenzene (mono)	D	С	D	С	Α	А	diazinon	D	D	-	-	В	Α	driking water	Α	_	<u>.</u>
chlorobromo methane	D	D	D	Α	В	Α	dibenzyl ether	-	С	-	-	D	Α	dry cleaning fluids	D	D	
	D	С		_	· -		dibenzyl sebacate	С	С	-	-	В	Α		D	D	<u> </u>
chlorobutadiene			<u>.</u>	<u>.</u>	A	A	dibromoethyl benzene	D	С	-	-	Α	Α	DTE light oil	U	U	
			-	-	A	Α	dibutylamine	С	В	-	-	D	Α				
chrorododecane	D	D	•		Α	Α	dibutyl ether	D	В	-	-	С	Α	E			
chrorododecane chloroform		D D	D	С									ļ	elco 28-EP lubricant	В	-	<u> </u>
	D	ļ	D -	-	A	Α				С	-	В	Α			В	
chloroform	D D	D	D - -	<u> </u>	+	A A	dibutyl phthalate	В	В	C -	-	В	A	epichlorohydrin	D		· i
chloroform O-chloroaphtanene	D D	D D	D - - A	-	Α		dibutyl phthalate dibutyl sebacate	B B	B B	C -	-	В	Α	epichlorohydrin epoxy resins	D -	-	
chloroform 0-chloroaphtanene I-chloro-I-nitro ethane	D D D	D D C	-	-	A C	А	dibutyl phthalate dibutyl sebacate 0-dichlorobenzene	B B D	B B D	- -	-	B A	А			- В	
chloroform 0-chloroaphtanene I-chloro-I-nitro ethane chlorosulfonic acid	D D D D	D D C	-	- - D	A C C	A	dibutyl phthalate dibutyl sebacate 0-dichlorobenzene P-dichlorobenzene	B B D	B B D	C - -	-	В А -	A A A	epoxy resins	-	-	. i
chloroform 0-chloroaphtanene I-chloro-I-nitro ethane chlorosulfonic acid chlorotoluene	D D D D D	D D C B	-	- D	A C C	A A	dibutyl phthalate dibutyl sebacate 0-dichlorobenzene P-dichlorobenzene dichloro-butane	B B D D	B B D D	C	- - -	B A - A	A A A	epoxy resins esam-6 fluid	-	-	. i
chloroform 0-chloroaphtanene I-chloro-I-nitro ethane chlorosulfonic acid chlorotoluene chlorox	D D D D -	D C B C	-	- D	A C C A A	A A A	dibutyl phthalate dibutyl sebacate 0-dichlorobenzene P-dichlorobenzene	B B D	B B D	- - - -	-	В А -	A A A	epoxy resins esam-6 fluid esso fuel 208	- - B	-	. i
chloroform 0-chloroaphtanene I-chloro-I-nitro ethane chlorosulfonic acid chlorotoluene chlorox 0-chlorphenol	D D D D -	D C B C	-	- D	A C C A A A	A A A A	dibutyl phthalate dibutyl sebacate 0-dichlorobenzene P-dichlorobenzene dichloro-butane	B B D D	B B D D	- - - -	- - -	B A - A	A A A	epoxy resins esam-6 fluid esso fuel 208 esso golden gasoline	- - B D	-	. i
chloroform 0-chloroaphtanene I-chloro-I-nitro ethane chlorosulfonic acid chlorotoluene chlorox 0-chlorphenol chrome alum	D D D D D D A	D D C B C C A	A A		A C C A A A A A	A A A A A	dibutyl phthalate dibutyl sebacate 0-dichlorobenzene P-dichlorobenzene dichloro-butane dichloro-isopropyl ether	B B D D	B B D D D	D	- - - -	B A - A C	A A A A	epoxy resins esam-6 fluid esso fuel 208 esso golden gasoline esso motor oil	- - B D	-	. i
chloroform 0-chloroaphtanene I-chloro-I-nitro ethane chlorosulfonic acid chlorotoluene chlorox 0-chlorphenol chrome alum chrome plating solution chromic acid	D D D D D A B C	D C B C C C	-	- D	A C C A A A A A A	A A A A A A	dibutyl phthalate dibutyl sebacate 0-dichlorobenzene P-dichlorobenzene dichloro-butane dichloro-isopropyl ether dicyclohexylamine diesel oil di-ester lubricant	B B D D D -	B B D D D B	- - - -	- - - -	B A - A C D	A A A A	epoxy resins esam-6 fluid esso fuel 208 esso golden gasoline esso motor oil esso transmission fluid	- - B D	-	. i
chloroform 0-chloroaphtanene I-chloro-I-nitro ethane chlorosulfonic acid chlorotoluene chlorox 0-chlorphenol chrome alum chrome plating solution	D D D D D A B	D D C B C C A	A A	- D	A C C A A A A A	A A A A A	dibutyl phthalate dibutyl sebacate 0-dichlorobenzene P-dichlorobenzene dichloro-butane dichloro-isopropyl ether dicyclohexylamine diesel oil di-ester lubricant MIL-L-7808	B B D D D D D D D D D D D D D D D D D D	B B D D C D	- - - -	- - - - - C	B A - A C D A A	A A A A A A	epoxy resins esam-6 fluid esso fuel 208 esso golden gasoline esso motor oil esso transmission fluid (typeA)	- - B D D	- B - -	<u> </u>
chloroform 0-chloroaphtanene I-chloro-I-nitro ethane chlorosulfonic acid chlorotoluene chlorox 0-chlorphenol chrome alum chrome plating solution chromic acid chromic acid chromic oxide 88 Wt, %	D D D D D A B C	D D C B C C A	A A	- D	A C C A A A A A A	A A A A A A	dibutyl phthalate dibutyl sebacate 0-dichlorobenzene P-dichlorobenzene dichloro-butane dichloro-isopropyl ether dicyclohexylamine diesel oil di-ester lubricant MIL-L-7808 di-ester synthetic lubricants	B B D D D D D D D D D D D D D D D D D D	B B D D C D D D	- - - - D	- - - - - C	B A - A C D A A A	A A A A A A	epoxy resins esam-6 fluid esso fuel 208 esso golden gasoline esso motor oil esso transmission fluid (typeA) esso WS3812 (MIL-L-7808 A)	- B D D	- B - -	<u> </u>
chloroform 0-chloroaphtanene I-chloro-I-nitro ethane chlorosulfonic acid chlorotoluene chlorox 0-chlorphenol chrome alum chrome plating solution chromic acid chromic oxide 88 Wt, % aqueous solution	D D D D D A B C B	D D C B C C A	A A	- D	A C C A A A A A	A A A A A	dibutyl phthalate dibutyl sebacate 0-dichlorobenzene P-dichlorobenzene dichloro-butane dichloro-isopropyl ether dicyclohexylamine diesel oil di-ester lubricant MIL-L-7808	B B D D D D D D D D D D D D D D D D D D	B B D D C D	- - - -	- - - - - C	B A - A C D A A	A A A A A A	epoxy resins esam-6 fluid esso fuel 208 esso golden gasoline esso motor oil esso transmission fluid (typeA) esso WS3812 (MIL-L-7808 A) esso SP90-EP lubricant	B D D D D D	- B - -	

	SILICONE	VAL	TPE	ULDPE	FKM VITOSIL	FEP/PFA/PTFE
diethyl sebacate	В	В	-	-	В	Α
diethylene glycol	В	Α	Α	В	Α	Α
difluorodibromomethane	D	В	-	-	-	Α
diisobutylene	D	С	-	-	Α	А
diisooctyl sebacate	С	В	-	-	В	А
diisopropyl benzene	-	С	-	-	Α	Α
diisopropyl ketone	D	С	-	-	D	А
dimethyl aniline	-	В	_	-	D	Α
dimethyl formamide	В	Α	Α	Α	D	Α
dimethyl phthalate	-	В	_	-	В	Α
dinitro toluene	D	В	_	-	D	А
dioctyl phthalate	С	В	_	-	В	Α
dioctyl sebacate	С	С	-	-	В	А
dioxane	D	В	D	С	D	А
dioxolane	D	С	_	-	D	А
dipentene	Α	С	_	-	Α	Α
diphenyl	D	С	_	-	Α	А
diphenyl oxides	С	С	_	-	Α	Α
dow chemical 50-4	-	-	-	-	D	Α
dow chemical ET378	D	-	-	-	-	Α
dow chemical ET588	-	-	-	-	D	Α
dow corning-3	С	-	-	-	Α	Α
dow corning-4	С	-	-	-	Α	Α
dow corning-5	С	-	-	-	Α	Α
dow corning-11	С	-	-	-	Α	Α
dow corning-33	С	-	-	-	Α	Α
dow corning-44	С	-	-	-	Α	Α
dow corning-55	С	-	-	-	Α	Α
dow corning-200	С	-	-	-	Α	Α
dow corning-220	С	-	-	-	Α	А
dow corning-510	С	-	-	-	А	Α
dow corning-550	С	-	-	-	Α	Α
dow corning-704	-	-	<u> </u>	-	Α	А
dow corning-705	-	-	_	-	Α	Α
dow corning-710	С	-	-	-	Α	Α
dow corning-1208	С	-	-	-	Α	Α
dow corning-4050	С	-	-	-	А	Α
dow corning-6620	С	-	-	-	А	Α
dow corning-F60	С	-	-	-	Α	Α
dow corning-F61	В	-	-	-	Α	Α
dow corning-XF60	С	-	-	-	Α	Α
dow guard	Α	-	-	-	А	Α
dowtherm oil	В	D	-	-	Α	Α
dowtherm A or E	D	D	-	-	Α	Α
dowtherm 209.50% solution	С	-	-	-	D	Α
driking water	Α	-	-	-	Α	Α
dry cleaning fluids	D	D	-	-	Α	А
DTE light oil	D	D	-	-	Α	Α
E			Ξ			
elco 28-EP lubricant	В	-	-	-	А	А
enichlorohydrin	D	В	_	_	D	Δ

E						
elco 28-EP lubricant	В	-	-	-	А	Α
epichlorohydrin	D	В	-	-	D	Α
epoxy resins	-	-	-	-	D	Α
esam-6 fluid	-	В	-	-	D	Α
esso fuel 208	В	-	-	-	А	Α
esso golden gasoline	D	-	-	-	А	Α
esso motor oil	D	-	-	-	А	Α
esso transmission fluid (typeA)	D	-	-	-	А	А
esso WS3812 (MIL-L-7808 A)	D	-	-	-	А	Α
esso SP90-EP lubricant	D	-	-	-	Α	Α
esstic 42,43	В	D	-	-	Α	Α
ethane	D	С	-	-	Α	Α
ethanol	А	Α	В	В	А	Α

D - unsatisfactory

Resistance to different products:

A - excellent B - good

	SILICONE	TPV	TPE	ULDPE	FKM VITOSIL	FEP/PEA/PTF
ethanol amine	В	Α	-	-	D	,
ethers	D	В	D	-	С	
ethyl acetate-organic ester	В	Α	D	-	D	
ethyl acetoacetate	В	Α	-	-	D	
ethyl acrylate	В	А	-	-	D	
ethyl acrylic acid	D	С	-	-	-	1
ethyl alcohol	В	Α	-	В	Α	1
ethyl benzene	D	D	-	D	Α	١.
ethyl benzoate	D	С	D	С	Α	١
ethyl bromide	-	С	Α	-	Α	ļ
ethyl cellosolve	D	В	-	-	D	ļ
ethyl cellulose	С	А	<u> </u>	-	D	١
ethyl chloride	D	С	A	С	Α	
ethyl chlorocarbonate	D	A	-	-	A	1
ethyl chloroformate	D	С	-	-	A	١
ethyl cyclopentane	D		<u> </u>	-	A	١
ethyl ether	D	В	D	D	D	
ethyl formate	-	A	-	-	A	
-	P				<u>.</u>	ļ
ethyl hexanol	В	-		_	A	
ethyl mercaptan	С	С	-	-	В	1
ethyl oxalate	D	A	-	-	Α .	
ethyl pentachlorobenzene	D	D	-	-	Α	1
ethyl silicate	-	Α	-	-	А	
ethylene	-	С		-	А	
ethylene chloride	D	D		D	В	
ethylene chlorohydrin	С	Α	Α	D	Α	Ľ
ethylene diamine	Α	Α	-	Α	D	
ethylene dibromide	D	С	ļ -	-	Α	Ļ
ethylene dichloride	D	С	Α	D	Α	
ethylene glycol	Α	Α	В	Α	Α	Ĺ
ethylene oxide	D	Α	Α	Α	D	
ethylene trichloride	D	-	-	-	Α	Ĺ
ethylmorpholene stannous octoate (50/50)mixture	-	-	-	-	D	,
F						
F-60 fluid (dow corning)	D	-	-	-	Α	
F-61 fluid (dow corning)	D	-	-	-	Α	ļ
fatty acids	С	В	В	D	Α	
FC-43 hetacosofluorotri-	A	-	-	-	Α	1
butylamine						ļ
FC75 fluorocarbon	Α	-	-	-	В	Ļ
ferric chloride	В	Α	Α	Α	Α	Ļ
ferric nitrate	С	Α	А	Α	Α	Į.
ferric sulfate	В	Α	Α	Α	Α	
fish oil	Α	В	-	-	А	
fluoboric acid	-	Α	Α	Α	-	Ì.
fluorine (liquid)	D	-	-	-	В	Ì,
fluorobenzene	D	С	-	-	Α	Ì,
fluorocarbon oils	-	D	-	-	-	
fluorolube	А	-	-	-	В	ļ.,
	-	D	-	-	-	<u> </u>
fluorinated cyclic ethers	-		İ	-	-	ļ
fluorinated cyclic ethers fluosilicie acid	-	Α	Α			÷
fluorinated cyclic ethers fluosilicie acid formaldehyde	- - В	A A	A	-	D	
fluorinated cyclic ethers fluosilicie acid formaldehyde formic acid	- - B	<u> </u>	1	- D	D C	ł
fluorinated cyclic ethers fluosilicie acid formaldehyde formic acid freon,11	1	Α	Α	- D C	<u> </u>	
fluorinated cyclic ethers fluosilicie acid formaldehyde formic acid	В	A	A	ļ	С	
fluorinated cyclic ethers fluosilicie acid formaldehyde formic acid freon,11 freon,12 freon,12&ASTM-oil#2	B D	A A D	A A B	С	C A	
fluorinated cyclic ethers fluosilicie acid formaldehyde formic acid freon,11 freon,12 freon,12&ASTM-oil#2 (50/50 mixture) freon, 12&SUNISO 4G	B D	A A D	A A B	С	C A B	
fluorinated cyclic ethers fluosilicie acid formaldehyde formic acid freon,11 freon,12 freon,12&ASTM-oil#2 (50/50 mixture) freon, 12&SUNISO 4G (50/50 mixture)	B D D D D	A A D	A A B	С	A A A	
fluorinated cyclic ethers fluosilicie acid formaldehyde formic acid freon,11 freon,12 freon,12&ASTM-oil#2 (50/50 mixture) freon,12&SUNISO 4G (50/50 mixture) freon,13	B D D D D D	A A D	A A B	С	A A A	
fluorinated cyclic ethers fluosilicie acid formaldehyde formic acid freon,11 freon,12 freon, 12&ASTM-oil#2 (50/50 mixture) freon, 12&SUNISO 4G (50/50 mixture) freon,13 freon, 13B1	B D D D D D D D	A A D -	A A B B	С	A A A	
fluorinated cyclic ethers fluosilicie acid formaldehyde formic acid freon,11 freon,12 freon,12&ASTM-oil#2 (50/50 mixture) freon, 12&SUNISO 4G (50/50 mixture) freon,13 freon,13B1	B D D D D D	A A D D	A A B B	С	A A A	

	SILICONE	TPV	TPE	ULDPE	FKM VITOSIL	FEP/PFA/PTFE
freon,22&ASTM OIL#2D (50/50 mixture)	В	-	-	-	Α	Α
freon,31	-	-	-	-	D	Α
freon,32	-	-	-	-	D	Α
freon,112	D	-	-	-	Α	Α
freon, 113	D	D	-	-	В	А
freon,114	D	D	-	-	В	Α .
freon,114B2	D	-	-	-	В	A
freon,115 feron,142b	D	D -			B D	A
freon,152a	_	_	_	_	D	A
freon, 218	-	-	-	-	Α	Α
freon, C316	-	-	-	-	-	Α
freon, C318	-	-	-	-	Α	Α
freon, 502	-	-	-	-	В	Α
freon, BF	D	-	-	-	Α	Α
freon, MF	D	-	-	-	В	Α
freon, TF	D	D	-	В	В	А
freon, TA	Α	-	-	-	С	Α
freon, TC	D	-	-	-	Α	Α
freon, TMC	С	-	-	-	Α	Α
freon, t-P35	Α	-	-	-	Α	Α
freon, T-WD602	D	-	-	-	Α	Α
freon, PCA	D	-	-	-	В	Α
fuel oil	D	D	D	В	Α	A
fuel oil acidic	Α .	-	-	-	Α .	Α .
fuel oil #6	A	-	-	-	A	Α .
fumaric acid	В	Α	_	-	A A	A A
fuming sulphuric acid (20/25% oleum)	D	_	_	_	А	А
furan	-	Α	-	D	-	Α
furfural	D	Α	D	D	D	Α
furfuraldehyde	D	-	-	-	D	Α
furfuraly alcohol	D	С	-	-	-	Α
furyl carbinol	D	-	-	-		Α .
fyrquel A60	С	-	-	-	D	A
fyrquel 90, 100, 150, 220, 300 500	А	-	-	-	Α	А
G			ı			3
gallic acid	-	В	D	Α	Α	Α
gasoline	D	D	D	-	Α .	Α .
gelatin	Α	Α	Α	Α	Α	A
grilling brake fluid	-	-	-	-	D	A
glacial acetic-acid	В	-	-	-	D	A
glauber's salt	_	_		_	В	A
glue (depending on type)	A A	A A	A A	A A	A A	A A
glycerine-glycerol	A	A	В	A	A	A
glycols	Α	A	-	-	A	Α
green sulphate liquor	Α	Α	_	-	A	A
gulfcrown grease	D	-	-	-	A	A
gulf endurance oils	D	-	-	-	Α	A
gulf FR fluids (emulsion)	D	-	-	-	А	А
gulf FRG-fluids	Α	-	-	-	Α	А
gulf FRp-fluids	А	-	-	-	В	А
gulf harmony oils	D	-	-	-	Α	Α
gulf high temperature	D	-	-	-	Α	Α
grease	0					
gulf paraquet oils	D		-		A	Α
gulf paraount oils gulf security oils	D D		_		A	A
guil security oils		Ī	<u> </u>	Ĺ	I	L

halotane	D	-	-	-	Α	
halowax oil	D	D	-	-	Α	
hannifin lube A	В	D	_		A	
						<u> </u>
heavy water	A	В	-			
HEF-2 (high energy fuel)	D	D	-	-	Α	<u>.</u>
helium	Α	Α	-	-	Α	ļ.
N-heptane	D	С	D	В	Α	
N-hexaldehyde	В	С	-	-	D	
hexane	D	D	-	D	Α	
N-hexane-1	D	С	-	-	Α	
hexyl alcohol	В	В	-	l -	A	ļ
high viscosity lubricant U14	А	l		l	A	İ
	A	İ		ļ	A	ļ
high viscosity lubricant H2		ļ		ļ		ļ
hilo MS #1	С	Ī	-	ļ -	D	
houghto-safe271 (water and glycol base)	В	Α	-	-	В	
houghto-safe 620(water/ glycol)	В	Α	-	-	В	
houthto-safe 1010 phospha- te ester	С	А	-	-	А	
houghto-safe 1055 phos- phate ester	С	А	-	-	А	
houghto-safe 1120 phos- phate ester	С	Α	-	-	А	
houghto-safe 5040 (water/ oil emulsion)	С	D	-	-	А	
hydraulic oil (petroleumbase)	С	D	-	С	Α	ļ
hydrazine	С	Α	D	D	-	
hydrobromic acid	D	В	Α	В	С	•
hydrobromic acid 40%	D	-	Α	-	Α	
hydrocarbons (saturated)	D	_	-	<u> </u>	А	<u>.</u>
hydrochloric acid hot 37%	D	В	Α	_	A	<u> </u>
-	В	В	A	<u> </u>	A	<u> </u>
hydrochloric acid cold 37%		В		<u> </u>	<u> </u>	<u> </u>
hydrochloric acid 3 M	D	-	-		Α	<u> </u>
hydrochloric acid concen- trated	D	-	-	-	Α	
hydrocyanic acid	С	В	В	Α	A	<u> </u>
hydro-drive, MIH-50 (petro-	В	_			A	
leum base) hydro-drive, MIH-10 (petro-	В				A	ļ
leum base) hydrofluoric acid, 65%	D			_	A	ļ
max.cold hydrofluoric acid, 65%	D		-	_	A	ļ
min.cold					ļ	ļ
hydrofluoric acid, 65% max.hot	D	-	-	-	С	
hydrofluoric acid, 65% min.hot	D	-	-	-	С	<u>.</u>
hydrofluosilicic acid	D	В	-	В	Α	ļ
hydrogen gas	С	Α	Α	Α	Α	ļ
hydrogen peroxide	Α	Α	Α	-	Α	
hydrogen 90%	В	-	D	-	В	
hydrogen sulfide, dry	С	Α	Α	Α	D	
hydrogen sulfide, wet	С	А	Α	Α	D	
hydrolube-water/ethylene glycol	В	А	-	-	А	
hydroquinone	-	А	В	Α	D	
hydyne	D	D	-	-	D	
hyjet	-	-	-	-	D	
hyjet III	_				D	
					<u> </u>	<u> </u>
hyjet S					D	<u>.</u>
hyjet W	-	-	-	-	D	<u>.</u>
hypochlorous acid	-	-	_	-	А	
I					Ī	
industron FF44	D	-	-	-	Α	<u>.</u>
industron FF48	D	-	-	-	Α	
industron FF53	D	-	-	-	Α	
					à	1

SILICONE

TPV TPE ULDPE

FKM VITOSIL

FEP/PFA/PTFE

	SILICONE	TPV	TPE	ULDPE	FKM VITOSIL	FEP/PFA/PTFE		SILICONE	TPV	TPE	ULDPE	FKM VITOSIL	FEP/PFA/PTFE		SILICONE	TPV	TPE	ULDPE	FKM VITOSIL	FEP/PFA/PTFE
iodine	-	А	С	А	А	А	MCS312	Α	-	-	-	Α	А	neatsfoot oil	В	В	-	-	А	Α
iodine pentafluoride	D	D	С	-	D	Α	MCS352	С	-	-	-	D	Α	neon	Α	А	-	-	Α	А
iodoform	-	В	-	-	-	Α	MCS463	С	-	-	-	D	А	neville acid	D	А	-	-	Α	А
isobutyl alcohol	Α	Α	С	Α	Α	Α	mercuric chloride	-	Α	Α	Α	Α	А	nickel acetate	D	А	-	-	D	Α
iso-butyl N-butyrade	-	-	-	-	Α	Α	mercury	-	Α	Α	Α	Α	Α	nickel chloride	Α	А	Α	Α	Α	Α
isododecane	-	-	-	-	Α	Α	mercury vapor	-	Α	-	-	Α	Α	nickel salts	Α	Α	А	-	Α	Α
iso-octane	D	D	D	-	Α	Α	mesityl oxide (ketone)	D	С	-	-	D	Α	nickel sulfate	Α	Α	Α	Α	Α	Α
isophorone (ketone)	D	В	-	-	D	Α	methane	D	С	D	-	Α	Α	niter cake	Α	Α	-	-	Α	Α
isopropanol	Α	В	-	Α	Α	Α	methanol	Α	Α	-	Α	Α	Α	nitric acid 3 M	D	-	-	-	Α	Α
isopropyl acetate	D	В	D	В	D	Α	methyl acetate	D	Α	D	D	D	Α	nitric acid concentrated	D	С	-	С	Α	А
isopropyl alcohol	Α	Α	С	Α	Α	Α	methyl acetoacetate	В	Α	-	-	D	Α	nitric acid dilute	В	-	Α	С	Α	Α
isopropyl chloride	D	С	-	-	Α	Α	methyl acrylate	D	D	-	-	D	Α	nitric acid red fuming (RFNA)	D	D	-	-	С	А
isopropyl ether	D	С	D	В	D	Α	methylacrylic acid	D	Α	-	-	С	Α	nitric acid inhidited red	D	D	-	-	В	Α
							methyl alcochol	Α	Α	Α	-	D	Α	fuming (IRFNA)	_		_		D.	
J							methyl benzoate	D	-	-	-	Α	Α	nitrobenzene	D -	D	D	С	В	A
JP 3 (MIL-J-5624)	D	С	-	-	Α	Α	methyl bromide	-	С	D	С	Α	Α	nitrobenzine	-	-	_	-	A	A
JP 4 (MIL-J-5624)	D	D	-	-	Α	Α	methyl butyl ketone	D	С	-	-	D	Α	nitroethane	D	A	_	_	D	A
JP 5 (MIL-J-5624)	D	С	-	-	А	Α	methyl carbonate	D	D	-	-	Α	Α	nitrogene	A	A	_	-	A	A
JP 6 (MIL-J-25656)	D	С	-	-	Α	Α	methyl cellosolve	D	Α	-	-	D	Α	nitrogene (textroxide) (N204)	D	D	-	_	D	A
JP X (MIL-J-25604)	D	С	-	-	D	Α	methyl cellulose	В	-	-	-	D	Α	nitromethane	D	A	D	А	D	A
							methyl chloride	D	В	Α	С	Α	Α	nitropropane	D	В	-	-	D	А
K							methyl chloroformate	D	-	-	-	Α	Α							
kel F liquid	Α	-	-	-	В	Α	methyl D-bromide	D	-		-	Α	Α	0					_	
kerosene	D	D	D	С	А	Α	methyl cyclopenthane	D	С	_	-	Α	Α	o-a-548 A	В	-	_	-	В .	A
keystone #87HX-grease	D	-	-	-	А	Α	methylene chloride	D	С	-	D	В	А	o-t-634b	D	-	-	-	A	A
							methylene dichloride	D	-	-	-	В	А	octachlorotoluene	D	-	_	-	A	A
L							methyl ether	Α	-	-	-	Α	Α	octadecane	D	В	-	-	Α .	A
lactams-amino acids	-	-	-	-	D	Α	methyl ethyl ketone (MEK)	D	D	-	D	D	Α	N-octane	D	D	-	-	A	A
lactic acid	Α	А	В	Α	А	Α	methyl ethyl ketone peroxyde	В	-	-	-	D	А	octyl alcohol	D -	В	-	-	A	A
lacquers	D	С	-	Α	D	Α	methyl format	В	В	-	-	<u> </u>	А	oleic acid		С	В	С	В	A
lacquer solvents	D	D	D	-	D	Α	methyl isobutyl ketone	D	С	D	С	D	A	oleum (fuming sulfuric acid)	D	D	-	-	A	A
lard, animals fats	В	В	С	-	А	Α	(MIBK)					ļ -		oleum spirits	D	D	-		A	A
lavender oil	D	С	-	-	А	Α	methyl isopropyl ketone	D	С		D	D	Α	olive oil	D D	В	-	Α	A	A A
lead acetate	D	А	А	А	D	Α	methyl methacrylic	С	В	_	-	D	Α	-	D					<u> </u>
lead nitrate	В	А	-	Α	-	Α	methyl oleate	-	С	_	-	Α	Α	oronite 8515	+				A	A
lead sulfamate	В	А	-	Α	А	Α	methyl salicylate	-	В	-	-	-	Α	orthochloroethylbenzene	D	-			A	A
lehigh x 1169	D	-	-	-	А	Α	milk	Α	Α	Α	Α	Α	Α	ortho-dichlorobenzene	D	D		_	Α .	A
lehigh x 1170	D	-	-	-	А	Α	mineral oils	В	D	В	-	Α	Α	os45 type III (os54)	D	_	_	_	A	A
light greas	D	-	-	-	А	Α	mobil 24 DTE	D	-	-	-	Α	Α	os45 type IV (os45)	D	_	_	_	A	A
ligroin (petroleum ether or	D	В	-	А	А	Α	mobil HF	-	-	-	-	Α	Α	OS70	D B	_	_	_	A	A
benzine)							mobil delvac 1100,1110,1130	D	-	-	-	Α	Α	oxalic acid	+	А	A	А	A	A
lime bleach	В	A	ļ -	A	A	Α .	mobil nyvac 20 and 30	Α	-	-	-	Α	Α	oxygen, cold	A B	-	А	_	A	A
lime sulphur	A	В	ļ -	-	A	Α .	mobil velocite C	D	-	-	-	Α	Α	oxygen, cold 200-400°F	1	- А	_	-	B A	A
lindol, hydraulic fluid (phos- phate ester type)	С	А	-	-	В	Α	mobilgas wa 200, type A automatic trans. Fluid	D	-	-	-	Α	А	ozone	Α	A	А	С	A	Α
linoleic acid	В	С	С	Α	В	Α	mobil oil SAE20	D	_	-	-	A	Α	D						
linseed oil	Α	С	D	-	А	Α	mobiltherm 600	D	-		-	A	А	P			Ī			
liquid oxygen	D	-	-	-	D	Α	mobilux	D	-	-	-	A	Α	p-s-66 lb	D	-		-	Α .	Α .
liquid petroleum gas (LPG)	С	D	-	-	А	Α	mono bromobenzene	D	-	-	-	A	A	p-d-680	D	-		-	A	A
liquimoly	D	-	-	-	А	Α	mono chlorobenzene	D	D	-	-	A	A	paint thinner duco	D	С	-	-	В .	A
lubricating oils, di-ester	D	D	-	D	Α	Α	monoethanolamine	В	A	В	С	D	А	palmitic acid	D	В	_	-	A	A
lubricating oils, petroleum	D	D	D	D	А	Α	monomerthyl aniline		В	İ -	-	В	А	para-dichlorobenzene	D	С	-	-	Α	Α
base							monomerthylether	-	С	-	-	<u> </u>	A	par-al-keton	D	-	-	-	D	Α
lye solutions	В	В	-	D	В	Α	monomerthyl hydrazine	D	-	-	-	<u> </u>	A	parker o lube	В	-	-	-	A	A
							monotrotoluene & dinitroto-	D	-	-	-	С	А	peanut oil	A	В	-	-	A	A
M							luene(40-60mix)					ļ		pentane 2 methyl	D	-	-	-	A	A
magnesium chloride	Α	Α .	Α .	А	Α .	Α .	monovinyl acethylene	В	-	-	-	А	А	pentane, 2-4 dimethyl	D	-	-	-	Α .	A
magnesium hydroxyde	-	A	A	-	Α	Α	mopar brake fluid	С	-	-	-	D	А	pentane, 3 dimethyl	D	-	-	-	A	A
magnesium sulfate	Α .	Α .	А	А	Α .	Α .	mustard gas	Α	Α	-	-	-	А	N-pentane	D	_	_	D	Α .	A
magnesium sulfite	Α .	Α .	-	-	Α .	Α .								perchloric acid	D	A	A	В	Α .	A
magnesium salt	A	А	-	-	Α .	Α .	N			,		,	,	perchloroethylene	D	D	В	D	Α .	A
malathion	D	-	ļ -	-	Α .	Α .	naphtha	D	С	D	Α	Α	Α	petroleum oil, crude	D	С	_	С	Α .	Α
maleic acid	-	Α .	Α	В	Α .	Α .	naphthalene	D	С	D	С	Α	Α	petroleum oil, below 250°FB	В	-	_	-	A	
maleic anhydride	-	A		D	A	A	napthenic	D	В	-	-	Α	Α	petroleum oil, above 250°F	D	-	-		В	A
malicacid	В	Α	Α	-	Α	Α	natural gas	Α	В	D	Α	Α	Α	phenol	D	С	D	D	Α	А

	•					
producer gas	В	D	_	-	Α	Α
propane	D	D	А	С	Α	Α
propane propionitrile	D	-	-	-	Α	Α
propyl acetate	D	В	-	-	D	Α
N-propyl acetone	D	-	-	-	D	Α
propyl alcohol	Α	Α	С	-	Α	Α
propyl nitrate	D	В	-	-	D	Α
S						
shell diala	D	-	-	-	Α	Α
shell iris 905	D	-	-	-	Α	Α
shell iris 3XF mine fluid (fire resist.hydr.)	-	-	-	-	А	Α
shell iris tellus #2 pet.base	D	-	-	-	Α	Α
shell iris tellus #33	D	-	-	-	Α	Α
shell iris tellus UMF (5% aromatic)	D	-	-	-	Α	А
shell Lo hydrax 27 & 29	D	-	-	-	Α	Α
shell macoma 72	D	-	-	-	Α	Α
silicate esters	D	Α	-	-	Α	Α
silicone greases	С	В	-	-	Α	Α
silicone oils	С	С	В	В	Α	Α
silver nitrate	Α	Α	Α	Α	Α	А
sinclair,opaline CX-EPLIube	D	-	-	-	Α	Α
skelly,solvent B,C,E	-	-	-	-	Α	Α
skydrol 500	С	-	-	С	D	Α
skydrol 7000	С	В	-	-	В	А
soap solution	Α	Α	Α	D	Α	Α
socony mobile type A	D	-	-	-	Α	Α
socony vacuum AMV AC781 (grease)	D	-	-	-	А	Α
socony vacuum PD959B	D	-	-	-	Α	Α

SILICONE TPV

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phenol, 70%/30%H20

phenol, 85%/15%H20

phenylbenzene

phenyl ethy ether

phenyl hydrazine

phosphoric acid 20%

phosphoric acid 45%

phosphoric acid 3 M

phosphoric acid concen-trated

phosphorus trichloride

picric acid H2O solution

plating solutions, chrome

polyvinyl acetate emulsion

potassium cupro cyanide

plating solutions, other

pneumatic service

potassium acetate potassium chloride

potassium cyanide

potassium dichromate

potassium hydroxide

potassium nitrate potassium salts

potassium sulfate

potassium sulfite

prestone antifreeze

PRL-high temp.hydr.oil

pickling solution

picric acid molten

pinene

pine oil

piperidine

phorone

ULDPE FKM VITOSIL FEP/PFA/PTFE

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	SILICONE	TPV	TPE	ULDPE	FKM VITOSIL	FEP/PFA/PTFE
soda ash	А	А	-	-	А	А
sodium acetate	D	Α	-	Α	D	Α
sodium bicarbonate (baking soda)	Α	А	Α	Α	А	А
sodium bisulfite	А	Α	В	Α	Α	Α
sodium borate	Α	Α	В	Α	Α	Α
sodium carbonate (sodium ash)	А	Α	Α	Α	Α	Α
sodium chloride	А	Α	Α	Α	Α	Α
sodium cyanide	Α	Α	Α	Α	Α	Α
sodium hydroxide	В	Α	С	-	В	Α
sodium hydrochlorite	В	В	_	-	Α	Α
sodium metaphospate	-	-	-	-	Α	Α
sodium nitrate	D	Α	Α	Α	-	Α
sodium perborate	В	Α	-	Α	А	Α
sodium peroxide	D	Α	-	Α	Α	Α
sodium phosphate (mono)	D	Α	-	Α	Α	Α
sodium phosphate (dibasic)	D	Α	-	Α	Α	Α
sodium phosphat (tribasic)	Α	Α	Ī -	Α	Α	Α
sodium salts	Α	-	Α	-	Α	Α
sodium silicate	-	Α	Α	Α	А	А
sodium sulphate	А	Α	-	-	Α	А
sodium sulphide	Α	Α	Α	-	А	А
sodium sulphite	Α	Α	Α	-	А	Α
sodium trisultate	А	-	-	-	Α	Α
sovasol #1, 2 & 3	D	-	-	-	Α	Α
sovalsol # 73 & 74	D	-	-	-	А	А
soybean oil	Α	В	-	-	А	А
spry	Α	-	-	-	А	Α
SR-6 fuel	D	-	-	-	Α	А
SR-10 fuel	D	-	-	-	Α	Α
standard oil mobilube GX90-EP lube	D	-	-	-	А	А
stannic chloride	В	Α	-	Α	Α	Α
stannic chloride 50%	В	-	-	-	Α	А
stannous chloride	В	Α	-	В	Α	А
stauffer 7700	D	-	-	-	Α	Α
steam, below 350°F	D	-	-	-	D	Α
steam, above 350°F	D	-	-	-	D	Α
stearic acid	В	Α	Α	В	-	Α
stoddard solvent	D	D	-	С	Α	Α

TT-S-735,type II	D	-	-	-	А	Α
TT-S-735,type III	D	-	-	-	Α	Α
TT-S-735,type IV	С	-	-	-	Α	Α
TT-S-735,type V	С	-	-	-	Α	Α
TT-S-735,type VI	С	-	-	-	Α	Α
TT-T-656b	D	-	-	-	D	Α
tannic acid	В	Α	Α	В	Α	Α
tannic acid 10%	В	-	-	-	А	Α
tar bituminous	В	D	-	-	А	Α
tartaric acid	Α	А	А	Α	А	Α
terpineol	-	В	-	-	Α	Α
tertiary butyl alcohol	В	А	-	-	Α	Α
tertiary butyl catechol	-	В	-	-	А	А
tertiary butyl mercaptan	D	В	-	-	Α	Α
tetrabromomethane	D	D	-	-	А	Α
tertabutyl titanate	-	В	-	-	А	Α
tetrachloroethylene	-	D	-	В	А	Α
tetraethyl lead	-	С	-	-	А	Α
"tetraethyl lead" blend	-	-	-	-	Α	Α
tetrahydrofuran	-	С	-	С	D	Α
tetralin	D	С	-	-	Α	Α
texaco 3450 gear oil	D	-	-	-	Α	Α

	SILICONE	TPV	TPE	ULDPE	FKM VITOSIL	FEP/PFA/PTFE
texaco capella A & AA	D	-	-	-	Α	Α
texaco meropa #3	D	-	-	-	Α	Α
texaco regal B	D	-	-	-	Α	Α
texaco uni-ttemp grease	В	-	-	-	Α	Α
texamatic "A" trans.oil	D	-	_	-	Α	Α
texamatic 1581 fluid	D	-	_	-	Α	Α
texamatic 3401 fluid	D	-	-	-	Α	Α
texamatic 3525 fluid	D	-	-	-	Α	Α
texamatic 3528 fluid	D	-	-	-	Α	Α
texas 1500 oil	В	-	-	-	Α	Α
thiodol TP-90B	-	-	-	-	Α	Α
thiodol TP-95	-	-	-	-	Α	Α
thionyl chloride	-	-	-	D	Α	Α
tidewater oil-beedol	В	-	-	-	Α	Α
tidewaater oil multigear 140, EP lube	-	-	-	-	Α	Α
titanium tetrachloride	-	В	-	-	Α	Α
toluene	-	D	D	С	Α	Α
toluene discocyanids	-	В	-	-	D	Α
transformer oil	В	D	-	-	Α	Α
transmission fluid type A	В	С	-	-	Α	Α
triacetin	-	Α	-	-	D	Α
triaryl phosphate	С	В	-	-	Α	Α
tributoxyethyl phosphate	-	В	-	-	Α	Α
tributyl mercaptan	D	В	-	-	Α	Α
tributyl phosphate	-	Α	-	-	D	Α
trichlorroacetic acid	-	В	Α	-	С	Α
trichloroethane	D	В	D	-	Α	Α
trichloroethylene	D	В	D	D	Α	Α
tricresyl phosphate	С	Α	В	-	В	Α
triethanol amine	-	Α	D	-	D	Α
triethyl aluminium	-	В	-	-	В	Α
triethyl borane	-	В	-	-	Α	Α
trifluoroethane	D	-	-	-	Α	Α
trinitroluene	-	Α	-	-	В	Α
trioctyl phosphate	С	В	-	-	В	Α
tripoly phosphate	С	-	-	-	В	Α
tung oil (china wood oil)	D	В	-	D	Α	Α

xylene	D	D	D	В	Α	Α
sylidepenes-mixed-aromatic amines	D	-	-	-	D	А
xylol	D	-	-	-	Α	Α
xenon	Α	Α	-	-	Α	Α

Z						
zeolites	-	А	-	-	Α	Α
zinc aceate	D	Α	-	-	D	Α
zinc chloride	-	Α	Α	А	Α	Α
zinc salts	Α	Α	А	-	Α	Α
zinc sulfate	Α	Α	-	Α	Α	Α

4. Venair in the world

EUROPE

- VENAIR GMBH NORTH
 Dortmund-Germany
 kontakt@venair.com
- VENAIR GMBH SOUTH
 Freiberg am Neckar Germany kontakt@venair.com
- VENAIR SARL
 Lyon France
 contact@venair.com
- VENAIR SARL WEST
 Nantes France
 contact@venair.com
- VENAIR SWEDEN
 Stockholm Sweden sesales@venair.com
- VENAIR SP. Z O.O.
 Warszawa Poland plsales@venair.com
- VENAIR O.O.O Moscow - Russia rusales@venair.com
- VENAIR ESPAÑA
 Terrassa España
 esventas@venair.com
- VENAIR ÜRÜNLER Istanbul - Turkey venairtr@venair.com
- VENAIR LTD
 Warrington UK
 uksales@venair.com
- VENAIR SRL
 Castellazzo Bormida Italy commerciale@venair.com
- VENAIR D.O.O
 Zagreb Croatia
 hrsales@venair.com

ASIA

- VENAIR INDIA SOUTH
 Karnataka India insales@venair.com
- VENAIR INDIA WEST
 Maharashtra India insales@venair.com
- TRADING CO LTD

 Shangai China
 cnsales@venair.com

VENAIR SHANGAI

- VENAIR SHANGAI TRADING CO LTD Guangzhou - China cnsales@venair.com
- VENAIR SHANGAI
 TRADING CO LTD
 Beijing China
 cnsales@venair.com
- VENAIR SINGAPORE PTE LTD
 Singapore Singapore
 sgsales@venair.com
- VENAIR THAILAND
 Bangkok Thailand
 thsales@venair.com
- VINASIL VIETNAM CO LTD
 Ho Chi Mihn City Vietnam vnsales@venair.com
- VENAIR ISRAEL
 Petah Tikva Israel
 ilsales@venair.com

AMERICA

- VENAIR INC
 Miami gardens USA
 usasales@venair.com
- VENAIR INC
 Merrimack USA
 usasales@venair.com
- VENAIR MEXICO
 Cuautitlan Izcalli México
 mxsales@venair.com
- VENAIR EIRELI
 São Paulo Brasil
 brsales@venair.com
- VENAIR COLOMBIA
 Ciudad de Bogotá Colombia
 cosales@venair.com
- VENAIR ARGENTINA Buenos Aires arsales@venair.com

AFRICA

VENAIR SOUTH AFRICA
 Johannesburg - South Africa zasales@venair.com

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