VENAIR

BIOTECH

TUBING AND SINGLE USE SYSTEMS

venair

Management System ISO/TS 16949:2009

Management System ISO 9001:2008 ISO 14001:2004

VENAIR

VENAIR IS AN INTERNATIONAL GROUP LEADER IN ENGINEERING AND MANUFACTURING SILICONE HOSES FOR THE MOST DEMANDING INDUSTRIES SUCH AS PHARMACEUTICAL, BIOTECHNOLOGICAL, FOOD, CHEMICAL AND COSMETIC.

Throughout its 30 years of history, Venair has created an extensive international network that has led to three manufacturing centers in Spain, Vietnam and Romania and 28 delegations distributed in Europe, America and Asia. Thanks to Venair's internationalization strategy, accompanied by a commitment to deliver high-quality products and a constant focus on the customer's needs, today we market our wide range of products worldwide.

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.

We hold the management certificates ISO 9001, ISO 14001, EMAS and also the product 3A 62-02 & 18-03 standards, apart from the full product validations required by the top pharmaceutical and biotech industries.

INNOVATION AS A HALLMARK

Innovation is part of Venair Group's DNA, whose leading position is a direct result of great efforts in R&D projects. Over the past years, the company has implemented a new strategic innovation policy aimed at boosting its line of value-added products for the most demanding industries and improving the company's competitiveness.

Venair TechLab, which integrates all R&D projects in the Venair Group, is the face of the commitment to innovation and development.

Visit **Venair** corporate website.
www.venair.com

VENABIO®

BIOTECH TUBING RANGE

INTRODUCING VENABIO®, VENAIR'S SINGLE USE SYSTEM PRODUCTS RANGE:

- SILICONE TUBING
- THERMOPLASTIC TUBING
- FLUOROPOLYMER TUBING
- 0,5L TO 1.000L BAGS
- FLUID TRANSFER ASSEMBLIES
- OPEN ARCHITECTURE KITS

VACUUM BAGGED

- Visual bag integrity proof
- Hydrogen peroxide vapour (HPV) disinfection cycle compatible

CRUSH PROOF BOX

- Individually packed rolls
- Printed CoA inside
- Labels on both bags and box

TUBING

TUBING GUIDE

VENABIO® tubing range comprises all key materials in a broad selection of sizes. Decisive factors in selecting the appropiate material are:

- Application
- Transparency
- Chemical compatibility/material
- Temperature range
- Pressure resistance
- Sterilizability
- Flexibility
- Connections
- Pumping characteristics
- Cost
- Validations

PRODUCT DESCRIPTION	APPLICATION	MATERIAL	CLARITY	T°	PRESSURE	FLEXIBLE	PUMP	ROLL LENGTH
VENABIO® FLOW 50SHA PUMPGRADE	Extended pumplife. High biocompatibility	Platinum cured silicone. Postcured to totally eliminate volatiles.	Transparent	-60°C/ +220°C	No	Yes	Yes	50ft 100ft
VENABIO® PRECISION 60SHA	Extended pumplife. High biocompatibility	Platinum cured silicone. Postcured to totally eliminate volatiles.	Transparent	-60°C/ +220°C	No	Yes	Yes	25ft
VENABIO® FLOW 60SHA MULTIPURPOSE	General liquid handling. High biocompatibility	Platinum cured silicone. Postcured to totally eliminate volatiles.	Transparent	-60°C/ +220°C	No	Yes	Yes	50ft 100ft
VENABIO® FLOW 80SHA HIGH PRESSURE	Unreinforced pressure resistant tubing. High biocompatibility	Platinum cured silicone. Postcured to totally eliminate volatiles.	Transparent	-60°C/ +220°C	Yes	Yes	No	50ft 100ft
VENABIO® BRAIDED	General liquid handling. High biocompatibility.	Platinum cured silicone. Postcured to totally eliminate volatiles. Reinforced with PET braiding.	Transparent	-60°C / +180°C	Yes	Yes	No	25ft 50ft
VENABIO® BRAIDED PLUS	General liquid handling. Higher pressure and high biocompatibility.	Platinum cured silicone. Postcured to totally eliminate volatiles. Reinforced with high-performance PET braiding.	Transparent	-60°C / +180°C	Yes	Yes	No	50ft
VENABIO® PUMP	Longest pumplife available. High biocompatibility	Thermoplastic vulcanizate	Opaque	-45°C / +135°C	No	Yes	Yes	25ft 50ft
VENABIO® WELD	Welding / Sealing capabilities	Thermoplastic elastomer	Translucid	-45°C / +135°C	No	Yes	Yes	25ft 50ft
VENABIO® FEP	Universal chemical compatibility. Gas transfer.	Fluorinated ethylene propylene	Transparent	-200°C / +205°C	Yes	Semi rigid	No	25ft
VENABIO® PTFE	Universal chemical compatibility. Gas transfer.	Polytetrafluoroethylene	Transparent	-200°C / +205°C	Yes	Semi rigid	No	25ft

TUBING GUIDE

METRIC (mm)			IMPERIAL (inches)			PUMP SIZE*	FLOW	BRAIDED*	PUMP	WELD	FEP	PTFE
ID	OD	WALL	ID	OD	WALL							
0,5	3,7	1,6	1/50	10/69	1/16	112	x					
0,8	1,6	0,4	1/32	1/16	1/64						x	x
0,8	2,4	0,8	1/32	3/32	1/32		x					
0,8	4,0	1,6	1/32	5/32	1/16	13	x					
1,2	4,4	1,6	3/64	11/64	1/16		x					
1,6	3,2	0,8	1/16	1/8	1/32		x				x	x
1,6	4,8	1,6	1/16	3/16	1/16	14	x		x	x		
2,4	4,0	0,8	3/32	5/32	1/32		x					
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		x					
3,2	5,2	1,0	1/8	11/54	3/76						x	x
3,2	6,4	1,6	1/8	1/4	1/16	16	x		x	x		
3,2	7,9	2,4	1/8	5/16	3/32	120	x					
3,2	9,5	3,2	1/8	1/8	1/8		x	x				
3,2	6,8	1,8	1/8	15/56	1/14		x					
4,0	7,1	1,6	5/32	9/32	1/16		x					
4,0	5,6	0,8	5/32	7/32	1/32		x					
4,0	8,7	2,4	5/32	11/32	3/32		x					
4,0	6,0	1,0	5/32	4/17	3/76						x	x
4,8	6,4	0,8	3/16	1/4	1/32		x					
4,8	6,8	1,0	3/16	4/15	3/76						x	x
4,8	7,9	1,6	3/16	5/16	1/16	3-25	x		x	x		
4,8	9,5	2,4	3/16	3/8	3/32	15	x	x				
4,8	11,1	3,2	3/16	7/16	1/8	123	x					
4,8	8,8	2,0	3/16	10/29	10/127		x					
5,0	7,0	1,0	12/61	8/29	3/76						x	x
6,0	10,2	2,1	6/25	31/78	10/127		x					
6,0	8,0	1,0	13/55	23/73	3/76						x	x
6,4	7,9	0,8	1/4	5/16	1/32		x					
6,4	8,4	1,0	1/4	24/73	3/76						x	x
6,4	9,5	1,6	1/4	3/8	1/16	17	x		x	x		
6,4	11,1	2,4	1/4	7/16	3/32	24	x		x	x		
6,4	12,7	3,2	1/4	1/2	1/8	26	x	x				
7,9	11,1	1,6	5/16	7/16	1/16	18	x		x	x		
7,9	12,7	2,4	5/16	1/2	3/32	35-121	x		x	x		
7,9	14,3	3,2	5/16	9/16	1/8		x	x				
8,0	10,0	1,0	5/16	9/23	3/76						x	x
8,0	12,4	2,2	5/16	39/83	10/127		x					
9,5	11,5	1,0	3/8	5/11	3/76						x	x
9,5	12,7	1,6	3/8	1/2	1/16	96	x					
9,5	14,3	2,4	3/8	9/16	3/32	73-122	x	x	x	x		
9,5	15,9	3,2	3/8	5/8	1/8	81	x	x	x	x		
10,0	12,0	1,0	37/94	43/91	3/76						x	x
11,1	14,3	1,6	7/16	9/16	1/16		x					
12,0	14,0	1,0	43/91	43/78	3/76						x	x
12,7	14,7	1,0	1/2	11/19	3/76						x	x
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		x					
12,7	19,1	3,2	1/2	3/4	1/8	82	x	x	x	x		
15,9	22,2	3,2	5/8	7/8	1/8	184	x	x				
19,1	25,4	3,2	3/4	1	1/8		x					
19,1	28,6	4,8	3/4	1 1/8	3/16	90-191	x	x				
25,4	31,8	3,2	1	1 1/4	1/8		x					
25,4	34,9	4,8	1	1 3/8	3/16	92	x	x				
25,4	38,1	6,4	1	1 1/2	1/4		x					
31,8	41,4	4,8	1 1/4	142/67	3/16			x				

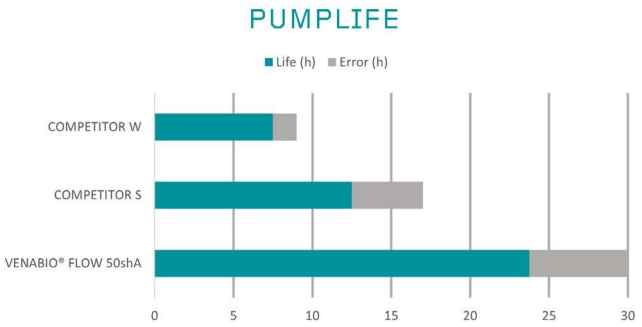
*BRAIDED: this tubing has non-standard OD, not present in this table. Please check datasheet.

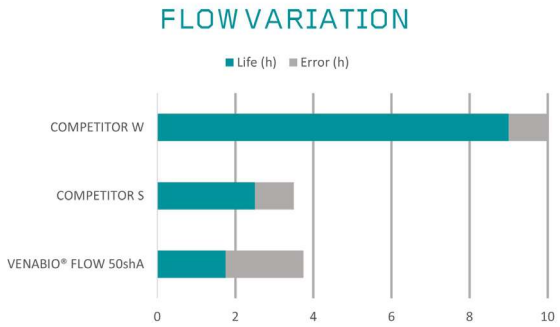
*PUMP SIZE: is a measurement designed for Masterflex pump units. It is the user's responsability to check the tubing size suitability.

TUBING GUIDE

VENABIO® FLOW PERISTALTIC PUMP PERFORMANCE

These tests were carried out at 600 rpm with a Masterflex L/S Variable speed Drive **(ref. EW-07528-10)** equipped with a Masterflex 8-channel 3 roller cartridge pump head **(ref. HV07519-05)** and a Masterflex cartridge **(ref. HV-07519-70)**. The results shown here correspond to the test performed with **ID4,8mm OD9,5mm** (pumpsize L15).





PUMPLIFE: In the following graph it is shown how **VENABIO® FLOW PUMPGRADE** tubing lasts up to 300% longer than its main competitors.

FLOW VARIATION: The variation of flow rate has been measured comparing the flow at 7 hours of work (measurement window limited by the less performing tubing's pumplife) against the initial flow rate. **VENABIO® FLOW** tubing delivers outstanding precision in filling applications, with up to 500% more accuracy than the worst performing competitor.

VALIDATION GUIDE

COMPLIANCE AND BIOCOMPATIBILITY BEFORE GAMMA DOSE							
PROPERTY	TEST PROTOCOL	FLOW	BRAIDED	PUMP	WELD	FEP	PTFE
Animal derived component free	ADCF	X	X	X	X	X	X
Phtalate/ Bisphenol free	P/BPA	X	X	X	X	X	X
BSE/ TSE free	BSE/TSE	X	X	X	X	X	X
Plastics in contact with food	EU 10/2011	X	X				
Materials in contact with food	EU 1935/ 2004	X	X				
BfR recommendation XV	BfR XV	X	X				
Multiple use rubber and materials	3A 18-03	X	X				
Silicone Elastomer for Closures and Tubing	EP 3.1.9.	X	X				
Rubber articles intended for repeated use	FDA 21CFR177.2600	X	X	X	X		
Perfluorocarbon resins	FDA 21CFR177.1550					X	X
Bacterial endotoxins	USP 85	X	X				
Biological reactivity, in vitro	USP 87	X	X	X	X		
Biological reactivity, in vivo, Class VI	USP 88	X	X	X	X	X	X
Elastomeric closure	USP 381	X	X				
Particulate matter in injections	USP 788	X	X				
Hemolysis	ISO 10993-4	X	X	X	X		
Cytotoxicity	ISO 10993-5	X	X	X	X		
Local effects after implantation	ISO 10993-6	X	X				
Irritation and delayed type hypersensitivity	ISO 10993-10	X	X				
Systemic toxicity	ISO 10993-11	X	X				
Extractables and Leachables study	BPOG[1]/ USP 665[2]	X[1]	X[1]		X[2]		

VENABIO® FLOW

MATERIAL
Platinum cured silicone. Postcured to completely eliminate volatiles.

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.

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CHEMICAL COMPATIBILITY
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FEATURES

ROLL LENGTH
Available in 50ft and 100ft

LASER ETCHED
Traceable with reference, lot number and ID/OD

CLEAN ROOM
Manufactured in ISO14644-1 Class 7

DOUBLE BAG
Double bagged under vacuum (see page 5)

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

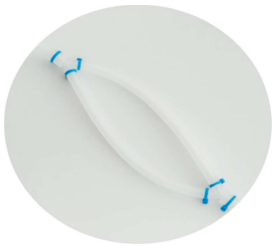
PUMPGRADE

HARDNESS
50ShA

CODE: 9200851*

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

PRECISION



HARDNESS
60ShA

CODE: 92008521*

In the filling stages where high precision pumps are used, this special tubing is recommended because of the very high dimensional stability and the tight tolerance.

MULTIPURPOSE

HARDNESS
60ShA

CODE: 9200852*

This product is the workhorse for the majority 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.

HIGH PRESSURE

HARDNESS
80ShA

CODE: 9200857*

Unreinforced tubing can withstand pressure without bursting, but suffers from diametral expansion.

Using a harder silicone we achieve a more robust product that keeps its shape under pressure while maintaining complete transparency through its wall.

VENABIO® BRAIDED

MATERIAL
Platinum cured silicone. Postcured to completely eliminate volatiles. Reinforced with a polyester or fiberglass braiding.

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.

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FEATURES

ROLL LENGTH
Available in 25ft and 50ft

LASER ETCHED
Traceable with reference, lot number and ID/OD

CLEAN ROOM
Manufactured in ISO14644-1 Class 7

DOUBLE BAG
Double bagged under vacuum (see page 5)

TEMPERATURE
-60°C / +180°C
(-76°F / +356°F)

HARDNESS
60ShA

ANIMAL FREE
Animal derived component free

SMOOTHNESS
Reduces protein binding and biofilm formation

RADIOSTABLE
Gamma/eBeam sterilization available

BRAIDED

SINGLE POLYESTER BRAIDING

CODE: 9200854*

This product is braided using a polyester yarn.
This provides moderate pressure resistance and a maximum of 180°C.

BRAIDED PLUS

SINGLE & HIGH-PERFORMANCE POLYESTER BRAIDING

CODE: 92008542*

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

DOUBLE BRAIDED

DOUBLE POLYESTER BRAIDING

CODE: 9200855*

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

BRAIDED HIGH PRESSURE

SINGLE FIBERGLASS BRAIDING

CODE: 92008541*

This product is braided using a fiberglass yarn.
This provides high pressure resistance and a maximum of 220°C.

VENABIO® PUMP

MATERIAL
Thermoplastic vulcanizate.

APPLICATIONS
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 will shorten its life considerably, therefore it should only be used when the application is single use.

CODE: 92008810*

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CHEMICAL COMPATIBILITY
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FEATURES

ROLL LENGTH
Available in 25ft and 50ft

LASER ETCHED
Traceable with reference, lot number and ID/OD

CLEAN ROOM
Manufactured in ISO14644-1 class 7

DOUBLE BAG
Double bagged under vacuum (see page 5)

PUMPLIFE
Longest pumplife available.

TEMPERATURE
-45°C / +135°C
(-49°F / +275°F)

HARDNESS
62,5 ShA

ANIMAL FREE
Animal derived component free

RADIOSTABLE
Gamma/eBeam sterilization available

VENABIO® WELD

MATERIAL
Thermoplastic elastomer.

APPLICATIONS
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.

It is important to mention that a thermoplastic is heat sensitive, so dry heat, SIP and autoclave sterilization cycles will shorten its life considerably, therefore it should only be used when the application is single use.

CODE: 92008910*

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FEATURES

ROLL LENGTH
Available in 25ft and 50ft

LASER ETCHED
Traceable with reference, lot number and ID/OD

CLEAN ROOM
Manufactured in ISO14644-1 class 7

DOUBLE BAG
Double bagged under vacuum (see page 5)

WELDING
Heat sealable and weldable biopharmaceutical tubing

TEMPERATURE
-45°C / +135°C
(-49°F / +275°F)

HARDNESS
55 ShA

ANIMAL FREE
Animal derived component free

RADIOSTABLE
Gamma/eBeam sterilization available

VENABIO® FEP

MATERIAL
Fluorinated ethylene propylene.

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.

CODE: 92201100*

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FEATURES

ROLL LENGTH
Available in 25ft

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

HARDNESS
56 ShD

UNIVERSAL
Universal chemical compatibility

LOW PERMEABILITY
Pressurized gas transfer

ANIMAL FREE
Animal derived component free

RADIOSTABLE
Gamma/eBeam sterilization available

VENABIO® PTFE

MATERIAL
Politetrafluoroethylene.

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.

CODE: 92201200*

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CHEMICAL COMPATIBILITY
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FEATURES

ROLL LENGTH
Available in 25ft

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

HARDNESS
56 ShD

UNIVERSAL
Universal chemical compatibility

LOW PERMEABILITY
Pressurized gas transfer

ANIMAL FREE
Animal derived component free

SINGLE USE SYSTEMS

VENABIO® BAG

APPLICATIONS:

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.

PACKAGING AND DELIVERY:

- Manufactured in ISO14644-1 Class 7 clean room
- Double bagged under vacumm (see page 5)
- Available in preassembled SUS (see page 21)
- Available in custom shapes and sizes

FEATURES:

- Free of animal derived components, phthalates and bisphenols
- Full validation guide available on demand
- Optional gamma/eBeam sterilization at 25kGy prior delivery

VENABIO® BAG

FILM MATERIAL

FILM SPECIFICATIONS

PROPERTY	TEST PROTOCOL	VALUE
Mechanical properties after 25kGy 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/cm^3
Water vapour transmision rate at 23°C 100% RH	ASTM F-1249	0,32 g/(m^2·day)
Oxygen permeability at 23°C 0% RH	ASTM D-3985	0,05 cm^3/(m^2·day·bar)
Carbon dioxide permeability at 23°C 0% RH	ASTM F-2476	0,02 cm^3/(m^2·day·bar)
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® BAG

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 at 25kGy

VOLUME	PORT	SIZE	LENGTH	CONNECTIONS	DESCRIPTION
0,5L 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 0,3m 0,3m	**LUER**	Needlefree swabable valve female luer lock, Polycarbonate Male luer lock, Polycarbonate , cap included Female luer lock, Polycarbonate , cap included
0,5L 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 0,3m 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
0,5L 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 0,3m 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 6,40mm x OD 9,50mm ID 9,50mm x OD 15,90mm ID 9,50mm x OD 15,90mm	0,3m 0,3m 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 6,40mm x OD 9,50mm ID 9,50mm x OD 15,90mm ID 9,50mm x OD 15,90mm	0,3m 0,3m 0,3m	**TRICLAMP**	Needlefree swabable valve female luer lock, Polycarbonate Sanitary fitting triclamp 50mm, Polypropylene Sanitary fitting triclamp 50mm, Polypropylene

*All lines equipped with pinch clamps

VENABIO® TRANSFER KIT

TUBING AVAILABLE IN:
- VENABIO® FLOW
- VENABIO® PUMP
- VENABIO® WELD

CONNECTORS AVAILABLE IN:
- Polypropylene
- Polycarbonate
- PVDF

UNDER DEMAND:
- Different combination of inlet/outlet
- Other lengths and diameters
- Sanitary fitting triclamp 25mm
- Stainless steel band clamps
- Optional gamma/ eBeam sterilization at 25kGy

TUBING SIZE	LENGTH	CONNECTIONS	DESCRIPTIONS
ID 3,20mm x OD 6,40mm	0,5m 1,5m 5m	**LUER**	Inlet: Male luer lock, Polycarbonate, cap included Outlet: Needlefree swabable valve female luer lock, Polycarbonate
ID 6,40mm x OD 9,50mm	0,5m 1,5m 5m	**LUER**	Inlet: Male luer lock, Polycarbonate, cap included Outlet: Needlefree swabable valve female luer lock, Polycarbonate
		QUICK CONNECT	Inlet: RQC male quick connector, MPC compatible, Polypropylene, cap included Outlet: RQC female quick connector, MPC compatible, Polypropylene, cap included
		TRICLAMP	Inlet: Sanitary fitting triclamp 50mm, Polypropylene Outlet: Sanitary fitting triclamp 50mm, Polypropylene
ID 9,50mm x OD 15,90mm	0,5m 1,5m 5m	**QUICK CONNECT**	Inlet: RQC male quick connector, MPC compatible, Polypropylene, cap included Outlet: RQC female quick connector, MPC compatible, Polypropylene, cap included
		TRICLAMP	Inlet: Sanitary fitting triclamp 50mm, Polypropylene Outlet: Sanitary fitting triclamp 50mm, Polypropylene
ID 12,70mm x OD 19,10mm	0,5m 1,5m 5m	**QUICK CONNECT**	Inlet: RQC male quick connector, MPC compatible, Polypropylene , cap included Outlet: RQC female quick connector, MPC compatible, Polypropylene , cap included
		TRICLAMP	Inlet: Sanitary fitting triclamp 50mm, Polypropylene Outlet: Sanitary fitting triclamp 50mm, Polypropylene

VENABIO® Y PUMP KIT

PUMPABLE TUBING SECTION AVAILABLE IN:

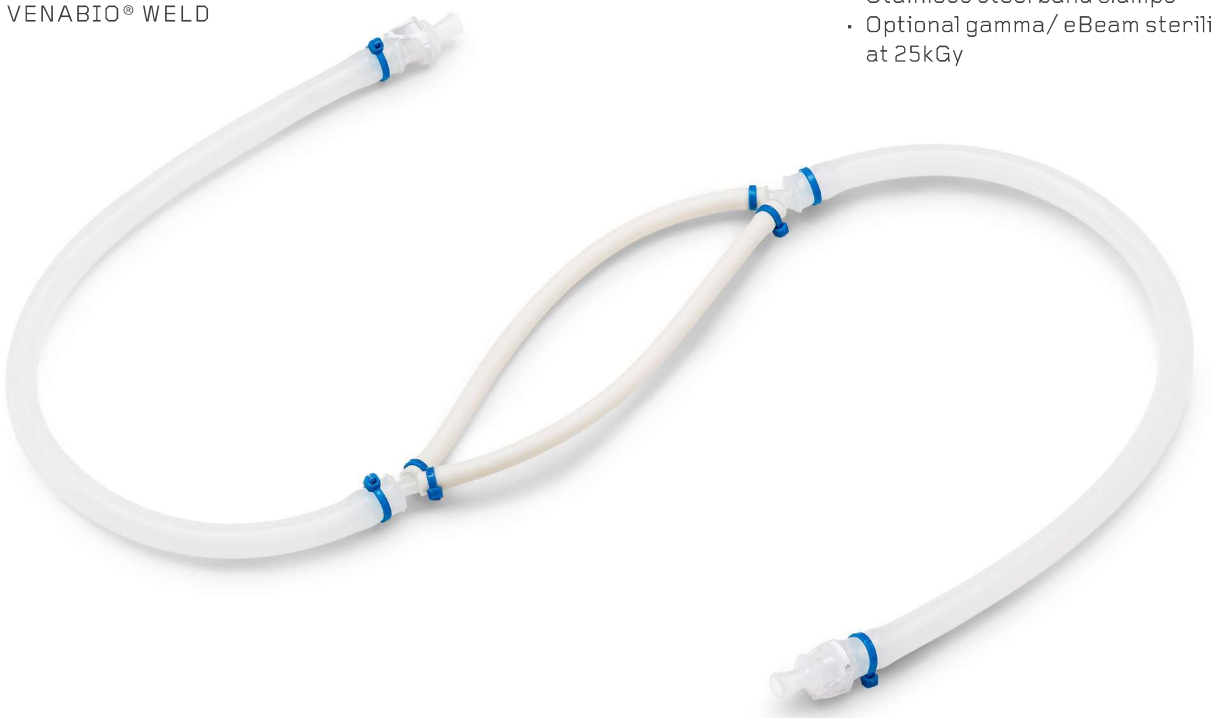
- VENABIO® FLOW
- VENABIO® PUMP
- VENABIO® WELD

CONNECTORS AVAILABLE IN:

- Polypropylene
- Polycarbonate
- PVDF

UNDER DEMAND:

- Different combination of inlet/outlet
- Other lengths and diameters
- Sanitary fitting triclamp 25mm
- Stainless steel band clamps
- Optional gamma/ eBeam sterilization at 25kGy



TUBING SIZE	LENGTH	CONNECTIONS	DESCRIPTIONS
Inlet & Outlet: ID 6,40mm x OD 9,50mm Pumpable section: ID 3,20mm x OD 6,40mm	Inlet & Outlet 0,5m Pumpable section 0,3m	**LUER**	Inlet: Male luer lock, Polycarbonate, cap included Outlet: Needlefree swabable valve female luer lock, Polycarbonate
		QUICK CONNECT	Inlet: RQC male quick connector, MPC compatible, Polypropylene , cap included Outlet: RQC female quick connector, MPC compatible, Polypropylene , cap included
		TRICLAMP	Inlet: Sanitary fitting triclamp 50mm, Polypropylene Outlet: Sanitary fitting triclamp 50mm, Polypropylene
Inlet & Outlet: ID 9,50mm x OD 15,90mm Pumpable section: ID 6,40mm x OD 9,50mm	Inlet & Outlet 0,5m Pumpable section 0,3m	**QUICK CONNECT**	Inlet: RQC male quick connector, MPC compatible, Polypropylene, cap included Outlet: RQC female quick connector, MPC compatible, Polypropylene, cap included
		TRICLAMP	Inlet: Sanitary fitting triclamp 50mm, Polypropylene Outlet: Sanitary fitting triclamp 50mm, Polypropylene
Inlet & Outlet: ID 12,70mm x OD 19,10mm Pumpable section: ID 9,50mm x OD 15,90mm	Inlet & Outlet 0,5m Pumpable section 0,3m	**QUICK CONNECT**	Inlet: RQC male quick connector, MPC compatible, Polypropylene, cap included Outlet: RQC female quick connector, MPC compatible, Polypropylene, cap included
		TRICLAMP	Inlet: Sanitary fitting triclamp 50mm, Polypropylene Outlet: Sanitary fitting triclamp 50mm, Polypropylene

*Inlet & outlet is made of **VENABIO® FLOW** in all options.

MOLDED CLAMPS

- Using Venair's fully validated silicone
- Completely smooth transition from the tubing through the clamp
- Constant diameter without internal reductions
- Pregasketed for easier installation and reduced assembly time
- Available in mini and standard triclamp sizes
- Backup cups available in stainless steel and plastic

STERILIZATION GUIDE

METHOD	FLOW	BRAIDED	PUMP	WELD	FEP	PTFE	ULDPE
Dry heat	x	x				x	
Autoclave	x	x	Limited*	Limited*	x	x	
CIP	x	x	x	x	x	x	
SIP	x	x	Limited*	Limited*	x	x	
Ethylene oxide	x	x	x	x	x	x	
Hydrogen peroxide	x	x	x	x	x	x	
eBeam (25kGy)	x	x	x	x	x		x
Gamma (25kGy)	x	x	x	x	x		x

*Limited: Compatible method for a few cycles since product is heat sensitive.

DISCLAIMER: Venair provides this chart as a product compatibility chart with existing technologies. It is the end user responsibility to adjust each method's parameters accordingly to achieve the required sterility level.

COMPATIBILITY TABLE

COMPATIBILITY TABLE

A - excellent B - good C - insufficient D - unsatisfactory

A	SILICONE	TPV	TPE	FEP/PTFE	ULDPE
acetaldehyde	A	A	A	A	C
acetamide	B	A	B	A	A
acetic acid 5%	A	A	A	A	-
acetic acid 30%	A	C	A	A	-
acetic acid, hot high press	C	-	-	A	-
acetic acid, glacial	B	A	C	A	D
acetic anhydride	C	A	B	A	D
acetone	B	A	C	A	B
acetophenone	D	B	-	A	D
acetyl acetone	D	A	-	A	-
acetyl chloride	C	D	A	A	D
acetylene	B	A	A	A	D
acetylene tetrabromide	-	D	-	A	-
acrylonitrile	D	D	D	A	A
adipic acid	-	B	C	A	A
aero lubriplate	B	C	-	A	-
aero safe 2300	C	B	-	A	-
aero safe 2300 w	C	B	-	A	-
aero shell IAC	B	D	-	A	-
aero shell 7 A grease	B	D	-	A	-
aero shell 17 grease	B	D	-	A	-
aero shell 750	D	D	-	A	-
air-below 300°F	A	D	A	A	-
air-above 300°F	A	D	A	A	-
alkazene	D	D	-	A	-
alum NH3 CR-K	A	A	-	A	-
aluminum acetate	D	A	-	A	-
aluminum bromide	A	B	-	A	-
aluminum chloride	B	A	A	A	B
aluminum fluoride	B	A	-	A	A
aluminum nitrate	B	A	-	A	A
aluminum phosphate	A	A	-	A	-
aluminum salts	A	A	A	A	A
aluminum sulfate	A	A	A	A	A
ambrex 33 mobile	D	-	-	A	-
amines, mixed	B	A	A	A	C
ammonia anhydrous(liquid)	C	A	A	A	B
ammonia gas, cold	A	A	A	A	-
ammonia gas, hot	A	-	A	A	-
ammonia & lichium metali solution	D	-	-	A	-
ammonium carbonate	-	A	A	A	B
ammonium chloride	-	A	A	A	A
ammonium hydroxide (concentrated)	A	A	A	A	A

	SILICONE	TPV	TPE	FEP/PTFE	ULDPE
ammonium nitrite	B	A	-	A	-
ammonium persulfate solution	-	A	-	A	A
ammonium persultate 10%	-	-	-	A	-
ammonium phosphate	A	A	A	A	-
ammonium phosphate, mono-basic	A	A	-	A	A
ammonium phosphate, dibasic	A	A	-	A	A
ammonium phosphate, tribasic	A	A	-	A	C
ammonium salts	A	A	A	A	A
ammonium sulfate	A	A	A	A	A
ammonium sulfide	-	A	-	A	-
amyl acetate	D	D	D	A	C
amyl alcohol	D	A	D	A	B
amyl borate	-	B	-	A	-
amyl chloride	D	D	D	A	D
amyl chloronaphthalene	D	C	-	A	-
amyl naphthalene	D	D	-	A	-
anderol L 774 (di-ester)	D	-	-	A	-
anderol L 826 (di-ester)	D	D	-	A	-
anderol L 829 (di-ester)	D	D	-	A	-
ang-25 (glycerol ester)	B	-	-	A	-
ang-25 (di-ester base)	B	D	-	A	-
anhydrous ammonia	B	A	-	A	-
anhydrous hydrazine	-	-	-	A	-
anhydrous hydrogen fluo	-	C	-	A	-
aniline	D	A	D	A	C
aniline dyes	C	A	-	A	-
aniline hydrochloride	D	A	D	A	D
aniline oils	D	C	-	A	-
animal fats	B	B	-	A	-
animal oil (lard oil)	B	B	-	A	-
AN-03 grade M	B	B	-	A	-
AN-0-6	D	-	-	A	-
AN-0-366	D	-	-	A	-
AN-V V-0-366 b hydrofluid	D	D	-	A	-
ansul ether	D	D	-	A	-
aqua regia	D	C	B	A	B
argon	B	A	-	A	-
aroclor 1248	B	D	-	A	-
aroclor 1254	C	D	-	A	-

	SILICONE	TPV	TPE	FEP/PTFE	ULDPE
arsenic acid	A	A	C	A	B
arsenic trichloride	-	B	-	A	-
askatel	D	D	-	A	-
asphalt	D	C	-	A	A
ASTM oit #1	A	C	D	A	-
ASTM oil #2	D	D	D	A	-
ASTM oil #3	C	D	D	A	-
ASTM oil #4	D	D	-	A	-
ASTM reference fuel A	D	C	-	A	-
ASTM reference fuel B	D	C	-	A	-
ASTM reference fuel C	D	C	-	A	-
ATL-857	D	-	-	A	-
atlantic dominion F	D	C	-	A	-
aurex 903R mobil	D	-	-	A	-
automatic transmission fluid	D	D	-	A	-
automotive brake fluid	C	-	-	A	-

B					
bardol B	D	D	-	A	-
barium chloride	A	A	-	A	A
barium hydroxide	A	A	A	A	B
barium salts	A	-	A	A	-
barium sulfate	A	A	-	A	B
barium sulfide	A	A	-	A	B
bayol D	D	D	-	A	-
beer	A	A	A	A	A
beet sugar liquors	A	A	-	A	A
benzaldehyde	D	B	D	A	A
benzene	D	D	D	A	C
benzene sulfonic acid	D	A	A	A	A
benzine	D	D	-	A	-
benzochloride	-	-	-	A	-
benzoic acid	B	A	D	A	A
benzophenone	-	-	-	A	-
benzyl alcohol	-	C	B	A	D
benzyl benzoate	-	C	-	A	-
benzyl chloride	D	C	-	A	-
black point 77	C	-	-	A	-
black sulphate liquors	B	-	-	A	-
blast furnace gas	A	A	-	A	-
bleach solution	B	B	-	A	-
borax	B	A	A	A	A
bordeaux mixture	B	A	-	A	-
boric acid	A	A	A	A	A

A - excellent B - good C - insufficient D - unsatisfactory

	SILICONE	TPV	TPE	FEP/PTFE	ULDPE
brake fluid (non petroleum)	C	A	-	A	-
bray GG-130	D	-	-	A	-
brayco 719-R (VV-H-910)	B	-	-	A	-
brayco 885 MI-LL-L-6085 A	D	-	-	A	-
brayco 910	D	-	-	A	-
bret 710	D	-	-	A	-
brine	-	A	-	A	-
brom-113	D	-	-	A	-
brom-114	D	-	-	A	-
bromine	D	C	A	A	D
bromine anhydrous	C	C	-	A	-
bromine pentafluoride	D	D	-	A	-
bromine trifluoride	D	C	-	A	-
bromine water	D	B	-	A	-
bromobenzene	D	D	-	A	-
bromochloro trifluoroethane	D	D	-	A	-
bunker oil	B	B	-	A	-
butadiene	D	D	-	A	D
butane	D	D	D	A	C
butane 2.2-dimethyl	D	-	-	A	-
butane 2.3-dimethyl	D	-	-	A	-
butanol (butyl alcohol)	B	A	B	A	B
1-butane.2-ethyl	D	-	-	A	-
butter	B	B	-	A	-
butyl acetate	D	D	D	A	C
butyl acetyl ricinoleate	-	B	-	A	-
butyl acrylate	-	D	-	A	-
butyl alcohol	B	A	-	A	-
butyl amine	B	A	-	A	C
butyl benzoate	-	C	-	A	-
butyl butyrate	-	C	-	A	-
butyl carbitol	D	C	-	A	-
butyl cellosolve	-	A	-	A	-
butyl cellosolve adipate	B	-	-	A	-
butyl ether	D	B	-	A	-
butyl oleate	-	B	-	A	-
butyl stearate	-	B	-	A	-
butylene	D	C	-	A	B
butyraldehyde	D	A	-	A	-
butyric acid	-	A	A	A	D

C

	SILICONE	TPV	TPE	FEP/PTFE	ULDPE
calcine liquors	-	-	-	A	-
calcium carbonate	A	A	-	A	B
calcium chloride	A	A	-	A	B
calcium cyanide	A	-	-	A	-
calcium hydroxide	A	A	-	A	A
calcium hypochloride	-	A	-	A	-
calcium hypochlorite	B	B	-	A	A
calcium nitrate	B	A	-	A	A
calcium phosphate	A	-	-	A	-
calcium salts	B	A	A	A	-
calcium silicate	-	-	-	A	-
calcium sulfide	B	A	-	A	-
calcium sulfite	A	A	-	A	-
calcium thiosulfate	A	A	-	A	-
caliche liquors	B	-	-	A	-
cane sugar liquors	A	A	-	A	-
caproic aldehyde	B	-	-	A	-
carbanate	-	A	-	A	-
carbitol	B	A	-	A	-
carbolic acid	D	A	-	A	-
carbon bisulfide	-	D	D	A	-
carbon dioxide, dry	B	-	A	A	A
carbon dioxide, wet	B	-	A	A	A
carbon disulfide	-	D	D	A	C
carbon monoxide	A	A	A	A	A
carbon tetrachloride	D	D	B	A	D
carbonic acid	A	A	A	A	B
castor oil	A	B	C	A	-
cellosolve	D	C	D	A	B
cellosolve acetate	D	A	D	A	-
cellosolve butyl	D	C	-	A	-
celluguard	A	B	-	A	-
cellulube A60 (now fyrquel)	-	-	-	A	-
cellulube 90,100,150,220,300 and 500	A	-	-	A	-
cellutherm 2505A	-	D	-	A	-
cetate (hexadecane)	D	D	-	A	-
china wood oil (tunf oil)	D	B	-	A	-
chloroacetic acid	-	D	B	A	D
chlorodane	D	B	-	A	-
chlorextol	D	-	-	A	-
chlorinated salt brine	D	-	-	A	-
chlorinated solvents, dry	D	-	-	A	-
chlorinated solvents, wet	D	-	-	A	-
chlorine, dry	D	C	A	A	D

	SILICONE	TPV	TPE	FEP/PTFE	ULDPE
chlorine dioxide (8%CI as NAC102 in solution)	-	-	-	A	-
chlorine trifluoride	D	D	-	A	-
chloroacetone	D	B	-	A	-
chloroacetic acid	-	D	A	A	D
chlorobenzene	D	D	D	A	D
chlorobenzene (mono)	D	C	D	A	C
chlorobromo methane	D	D	D	A	A
chlorobutadiene	D	C	-	A	-
chrorododecane	D	D	-	A	-
chloroform	D	D	D	A	C
0-chloroaphtanene	D	D	-	A	-
I-chloro-I-nitro ethane	D	C	-	A	-
chlorosulfonic acid	D	B	A	A	D
chlorotoluene	D	C	-	A	-
chlorox	-	B	-	A	-
0-chlorphenol	D	C	-	A	-
chrome alum	A	-	-	A	-
chrome plating solution	B	A	-	A	-
chromic acid	C	B	A	A	D
chromic oxide 88 Wt, % aqueous solution	B	-	-	A	-
circo light process oil	D	-	-	A	-
citric acid	A	A	-	A	D
city service koolmotor-AP gear oil 140 E,P,Lube	D	-	-	A	-
city service pacemaker #2	D	-	-	A	-
city service #65,#120,#250	D	-	-	A	-
cobalt chloride	B	A	-	A	-
cobalt chloride, 2N	A	-	-	A	-
cocoanut oil	A	B	C	A	-
cod liver oil	B	C	-	A	-
coffe	A	A	-	A	-
coke oven gas	B	C	-	A	-
coliche liquors	-	B	-	A	-
convelex 10	D	D	-	A	-
coolanol (monsanto)	D	D	-	A	-
coolanol 45 (monsanto) +A269	D	D	-	A	-
copper acetate	D	A	-	A	-
copper chloride	A	C	-	A	-
copper cyanide	A	C	-	A	B
copper salts	A	-	A	A	-
copper sulfate	A	C	-	A	A
copper sulfate 10%	A	-	-	A	-

A - excellent B - good C - insufficient D - unsatisfactory

	SILICONE	TPV	TPE	FEP/PTFE	ULDPE
cottonseed oil	A	B	C	A	-
creosol	D	C	D	A	D
creosote	D	B	-	A	-
creosote, coal tard	D	D	-	A	-
creosote, wood	D	D	-	A	-
creosvlic acid	D	B	-	A	-
crude oil	D	C	-	A	-
cumene	D	C	-	A	-
cutting oil	D	C	-	A	-
cyclohexane	D	D	D	A	B
cyclohexanol	D	B	-	A	-
cyclohexanone	D	B	D	A	D
P-cymene	D	D	-	A	-
D					
decalin	D	D	-	A	C
decane	B	B	-	A	-
delco brake fluid	C	-	-	A	-
denatured alcohol	A	B	-	A	-
detergent solutions	A	B	-	A	D
developing fluids (photo)	A	A	-	A	A
dextrin	D	A	-	A	-
diacetone	D	C	-	A	-
diacetone alcohol	D	A	A	A	-
diazinon	D	D	-	A	-
dibenzyl ether	-	C	-	A	-
dibenzyl sebacate	C	C	-	A	-
dibromoethyl benzene	D	C	-	A	-
dibutylamine	C	B	-	A	-
dibutyl ether	D	B	-	A	-
dibutyl phthalate	B	B	C	A	-
dibutyl sebacate	B	B	-	A	-
O-dichlorobenzene	D	D	-	A	-
P-dichlorobenzene	D	D	-	A	-
dichloro-butane	D	-	-	A	-
dichloro-isopropyl ether	D	D	-	A	-
dicyclohexylamine	-	B	-	A	-
diesel oil	D	C	D	A	C
di-ester lubricant MIL-L-7808	D	D	-	A	-
di-ester synthetic lubricants	D	D	-	A	-
diethylamine	B	A	A	A	D
diethyl benzene	D	C	-	A	-
diethyl ether	D	B	-	A	-
diethyl sebacate	B	B	-	A	-
diethylene glycol	B	A	A	A	B
diisobutylene	D	C	-	A	-
diisooctyl sebacate	C	B	-	A	-
diisopropyl benzene	-	C	-	A	-
diisopropyl ketone	D	C	-	A	-
dimethyl aniline	-	B	-	A	-
dimethyl formamide	B	A	A	A	A
dimethyl phthalate	-	B	-	A	-
dinitro toluene	D	B	-	A	-
dioctyl phthalate	C	B	-	A	-
dioctyl sebacate	C	C	-	A	-
dioxane	D	B	D	A	C
dioxolane	D	C	-	A	-
dipentene	A	C	-	A	-
diphenyl	D	C	-	A	-
diphenyl oxides	C	C	-	A	-
dow chemical 50-4	-	-	-	A	-
dow chemical ET378	D	-	-	A	-
dow chemical ET588	-	-	-	A	-
dow corning-3	C	-	-	A	-
dow corning-4	C	-	-	A	-
dow corning-5	C	-	-	A	-
dow corning-11	C	-	-	A	-
dow corning-33	C	-	-	A	-
dow corning-44	C	-	-	A	-
dow corning-55	C	-	-	A	-
dow corning-200	C	-	-	A	-
dow corning-220	C	-	-	A	-
dow corning-510	C	-	-	A	-
dow corning-550	C	-	-	A	-
dow corning-704	-	-	-	A	-
dow corning-705	-	-	-	A	-
dow corning-710	C	-	-	A	-
dow corning-1208	C	-	-	A	-
dow corning-4050	C	-	-	A	-
dow corning-6620	C	-	-	A	-
dow corning-F60	C	-	-	A	-
dow corning-F61	B	-	-	A	-
dow corning-XF60	C	-	-	A	-
dow guard	A	-	-	A	-
dowtherm oil	B	D	-	A	-
dowtherm A or E	D	D	-	A	-
dowtherm 209.50%solution	C	-	-	A	-
driking water	A	-	-	A	-
dry cleaning fluids	D	D	-	A	-
DTE light oil	D	D	-	A	-
epichlorohydrin	D	B	-	A	-
epoxy resins	-	-	-	A	-
esam-6 fluid	-	B	-	A	-
esso fuel 208	B	-	-	A	-
esso golden gasoline	D	-	-	A	-
esso motor oil	D	-	-	A	-
esso transmission fluid (typeA)	D	-	-	A	-
esso WS3812 (MIL-L-7808 A)	D	-	-	A	-
esso SP90-EP lubricant	D	-	-	A	-
esstic 42,43	B	D	-	A	-
ethane	D	C	-	A	-
ethanol	A	A	B	A	B
ethanol amine	B	A	-	A	-
ethers	D	B	D	A	-
ethyl acetate-organic ester	B	A	D	A	-
ethyl acetoacetate	B	A	-	A	-
ethyl acrylate	B	A	-	A	-
ethyl acrylic acid	D	C	-	A	-
ethyl alcohol	B	A	-	A	B
ethyl benzene	D	D	-	A	D
ethyl benzoate	D	C	D	A	C
ethyl bromide	-	C	A	A	-
ethyl cellosolve	D	B	-	A	-
ethyl cellulose	C	A	-	A	-
ethyl chloride	D	C	A	A	C
ethyl chlorocarbonate	D	A	-	A	-
ethyl chloroformate	D	C	-	A	-
ethyl cyclopentane	D	-	-	A	-
ethyl ether	D	B	D	A	D
ethyl formate	-	A	-	A	-
ethyl hexanol	B	-	-	A	-
ethyl mercaptan	C	C	-	A	-
ethyl oxalate	D	A	-	A	-
ethyl pentachloroben-zene	D	D	-	A	-
ethyl silicate	-	A	-	A	-
ethylene	-	C	-	A	-
ethylene chloride	D	D	-	A	D
ethylene chlorohydrin	C	A	A	A	D
ethylene diamine	A	A	-	A	A
ethylene dibromide	D	C	-	A	-
ethylene dichloride	D	C	A	A	D
ethylene glycol	A	A	B	A	A
ethylene oxide	D	A	A	A	A
ethylene trichloride	D	-	-	A	-

A - excellent B - good C - insufficient D - unsatisfactory

F	SILICONE	TPV	TPE	FEP/PTFE	ULDPE
F-60 fluid (dow corning)	D	-	-	A	-
F-61 fluid (dow corning)	D	-	-	A	-
fatty acids	C	B	B	A	D
FC-43 hetacosofluoro-tri- butylamine	A	-	-	A	-
FC75 fluorocarbon	A	-	-	A	-
ferric chloride	B	A	A	A	A
ferric nitrate	C	A	A	A	A
ferric sulfate	B	A	A	A	A
fish oil	A	B	-	A	-
fluoboric acid	-	A	A	A	A
fluorine (liquid)	D	-	-	A	-
fluorobenzene	D	C	-	A	-
fluorocarbon oils	-	D	-	A	-
fluorolube	A	-	-	A	-
fluorinated cyclic ethers	-	D	-	A	-
fluosilicie acid	-	A	A	A	-
formaldehyde	B	A	A	A	-
formic acid	B	A	A	A	D
freon,11	D	D	B	A	C
freon,12	D	D	B	A	A
freon, 12&ASTM-oil#2 (50/50 mixture)	D	-	-	A	-
freon, 12&SUNISO 4G (50/50 mixture)	D	-	-	A	-
freon,13	D	-	-	A	-
freon, 13B1	D	-	-	A	-
freon,14	D	-	-	A	-
freon,21	D	D	-	A	-
freon,22	D	D	B	A	-
freon,22&ASTM OI-L#2D (50/50 mixture)	B	-	-	A	-
freon,31	-	-	-	A	-
freon,32	-	-	-	A	-
freon,112	D	-	-	A	-
freon, 113	D	D	-	A	-
freon,114	D	D	-	A	-
freon,114B2	D	-	-	A	-
freon,115	D	D	-	A	-
feron,142b	-	-	-	A	-
freon,152a	-	-	-	A	-
freon, 218	-	-	-	A	-
freon, C316	-	-	-	A	-
freon, C318	-	-	-	A	-
freon, 502	-	-	-	A	-
freon, MF	D	-	-	A	-
freon, TF	D	D	-	A	B
freon, TA	A	-	-	A	-
freon, TC	D	-	-	A	-
freon, TMC	C	-	-	A	-
freon, t-P35	A	-	-	A	-
freon, T-WD602	D	-	-	A	-
freon, PCA	D	-	-	A	-
fuel oil	D	D	D	A	B
fuel oil acidic	A	-	-	A	-
fuel oil #6	A	-	-	A	-
fumaric acid	B	A	-	A	-
fuming sulphuric acid (20/25% oleum)	D	-	-	A	-
furan	-	A	-	A	D
furfural	D	A	D	A	D
furfuraldehyde	D	-	-	A	-
furfuraly alcohol	D	C	-	A	-
furyl carbinol	D	-	-	A	-
fyrquel A60	C	-	-	A	-
fyrquel 90, 100, 150, 220, 300 500	A	-	-	A	-
G					
gallic acid	-	B	D	A	A
gasoline	D	D	D	A	-
gelatin	A	A	A	A	A
grilling brake fluid	-	-	-	A	-
glacial acetic-acid	B	-	-	A	-
glauber's salt	-	-	-	A	-
glucose	A	A	A	A	A
glue (depending on type)	A	A	A	A	A
glycerin	A	A	B	A	A
glycerol	A	A	B	A	A
glycols	A	A	-	A	-
green sulphate liquor	A	A	-	A	-
gulfcrown grease	D	-	-	A	-
gulf endurance oils	D	-	-	A	-
gulf FR fluids (emulsion)	D	-	-	A	-
gulf FRG-fluids	A	-	-	A	-
gulf FRp-fluids	A	-	-	A	-
gulf harmony oils	D	-	-	A	-
gulf high temperature grease	D	-	-	A	-
gulf lesion oils	D	-	-	A	-
gulf paraount oils	D	-	-	A	-
gulf security oils	D	-	-	A	-
H					
halotane	D	-	-	A	-
halowax oil	D	D	-	A	-
hannifin lube A	B	D	-	A	-
heavy water	A	B	-	A	-
HEF-2 (high energy fuel)	D	D	-	A	-
helium	A	A	-	A	-
N-heptane	D	C	D	A	B
N-hexaldehyde	B	C	-	A	-
hexane	D	D	-	A	D
N-hexane-1	D	C	-	A	-
hexyl alcohol	B	B	-	A	-
high viscosity lubricant U14	A	-	-	A	-
high viscosity lubricant H2	A	-	-	A	-
hilo MS #1	C	-	-	A	-
houghto-safe271 (water and glycol base)	B	A	-	A	-
houghto-safe 620(water/glycol)	B	A	-	A	-
houthto-safe 1010 phosphate ester	C	A	-	A	-
houghto-safe 1055 phosphate ester	C	A	-	A	-
houghto-safe 1120 phosphate ester	C	A	-	A	-
houghto-safe 5040 (water/oil emulsion)	C	D	-	A	-
hydraulic oil (petroleumbase)	C	D	-	A	C
hydrazine	C	A	D	A	D
hydrobromic acid	D	B	A	A	B
hydrobromic acid 40%	D	-	A	A	-
hydrocarbons (saturated)	D	-	-	A	-
hydrochloric acid hot 37%	D	B	A	A	-
hydrochloric acid cold 37%	B	B	A	A	-
hydrochloric acid 3 M	D	-	-	A	-
hydrochloric acid concentrated	D	-	-	A	-
hydrocyanic acid	C	B	B	A	A
hydro-drive, MIH-50 (petroleum base)	B	-	-	A	-
hydro-drive, MIH-10 (petroleum base)	B	-	-	A	-
hydrofluoric acid, 65% max.cold	D	-	-	A	-
hydrofluoric acid, 65% min.cold	D	-	-	A	-
hydrofluoric acid, 65% max.hot	D	-	-	A	-

A - excellent B - good C - insufficient D - unsatisfactory

	SILICONE	TPV	TPE	FEP/PTFE	ULDPE
hydrofluosilicic acid	D	B	-	A	B
hydrogen gas	C	A	A	A	A
hydrogen peroxide	A	A	A	A	-
hydrogen 90%	B	-	D	A	-
hydrogen sulfide, dry	C	A	A	A	A
hydrogen sulfide, wet	C	A	A	A	A
hydrolube-water/ ethylene glycol	B	A	-	A	-
hydroquinone	-	A	B	A	A
hydyne	D	D	-	A	-
hyjet	-	-	-	A	-
hyjet III	-	-	-	A	-
hyjet S	-	-	-	A	-
hyjet W	-	-	-	A	-
hypochlorous acid	-	-	-	A	-
I					
industron FF44	D	-	-	A	-
industron FF48	D	-	-	A	-
industron FF53	D	-	-	A	-
industron FF80	D	-	-	A	-
iodine	-	A	C	A	A
iodine pentafluoride	D	D	C	A	-
iodoform	-	B	-	A	-
isobutyl alcohol	A	A	C	A	A
iso-butyl N-butyrade	-	-	-	A	-
isododecane	-	-	-	A	-
iso-octane	D	D	D	A	-
isophorone (ketone)	D	B	-	A	-
isopropanol	A	B	-	A	A
isopropyl acetate	D	B	D	A	B
isopropyl alcohol	A	A	C	A	A
isopropyl chloride	D	C	-	A	-
isopropyl ether	D	C	D	A	B
J					
JP 3 (MIL-J-5624)	D	C	-	A	-
JP 4 (MIL-J-5624)	D	D	-	A	-
JP 5 (MIL-J-5624)	D	C	-	A	-
JP 6 (MIL-J-25656)	D	C	-	A	-
JP X (MIL-J-25604)	D	C	-	A	-
K					
kel F liquid	A	-	-	A	-
kerosene	D	D	D	A	C
keystone #87HX-grea-se	D	-	-	A	-

	SILICONE	TPV	TPE	FEP/PTFE	ULDPE
L					
lactams-amino acids	-	-	-	A	-
lactic acid	A	A	B	A	A
lacquers	D	C	-	A	A
lacquer solvents	D	D	D	A	-
lard, animals fats	B	B	C	A	-
lavender oil	D	C	-	A	-
lead acetate	D	A	A	A	A
lead nitrate	B	A	-	A	A
lead sulfamate	B	A	-	A	A
lehigh x 1169	D	-	-	A	-
lehigh x 1170	D	-	-	A	-
light greas	D	-	-	A	-
ligroin (petroleum ether or benzine)	D	B	-	A	A
lime bleach	B	A	-	A	A
lime sulphur	A	B	-	A	-
lindol, hydraulic fluid (phosphate ester type)	C	A	-	A	-
linoleic acid	B	C	C	A	A
linseed oil	A	C	D	A	-
liquid oxygen	D	-	-	A	-
liquid petroleum gas (LPG)	C	D	-	A	-
liquimoly	D	-	-	A	-
lubricating oils, di-ester	D	D	-	A	D
lubricating oils, petro-leum base	D	D	D	A	D
lye solutions	B	B	-	A	D
M					
magnesium chloride	A	A	A	A	A
magnesium hydroxyde	-	A	A	A	-
magnesium sulfate	A	A	A	A	A
magnesium sulfite	A	A	-	A	-
magnesium salt	A	A	-	A	-
malathion	D	-	-	A	-
maleic acid	-	A	A	A	B
maleic anhydride	-	A	-	A	D
malicacid	B	A	A	A	-
MCS312	A	-	-	A	-
MCS352	C	-	-	A	-
MCS463	C	-	-	A	-
mercuric chloride	-	A	A	A	A
mercury	-	A	A	A	A
mercury vapor	-	A	-	A	-
mesityl oxide (ketone)	D	C	-	A	-

	SILICONE	TPV	TPE	FEP/PTFE	ULDPE
methyl acetate	D	A	D	A	D
methyl acetoacetate	B	A	-	A	-
methyl acrylate	D	D	-	A	-
methylacrylic acid	D	A	-	A	-
methyl alcochol	A	A	A	A	-
methyl benzoate	D	-	-	A	-
methyl bromide	-	C	D	A	C
methyl butyl ketone	D	C	-	A	-
methyl carbonate	D	D	-	A	-
methyl cellosolve	D	A	-	A	-
methyl cellulose	B	-	-	A	-
methyl chloride	D	B	A	A	C
methyl chloroformate	D	-	-	A	-
methyl D-bromide	D	-	-	A	-
methyl cyclopenthane	D	C	-	A	-
methylene chloride	D	C	-	A	D
methylene dichloride	D	-	-	A	-
methyl ether	A	-	-	A	-
methyl ethyl ketone (MEK)	D	D	-	A	D
methyl ethyl ketone peroxyde	B	-	-	A	-
methyl format	B	B	-	A	-
methyl isobutyl ketone (MIBK)	D	C	D	A	C
methyl isopropyl ketone	D	C	-	A	D
methyl methacrylic	C	B	-	A	-
methyl oleate	-	C	-	A	-
methyl salicylate	-	B	-	A	-
milk	A	A	A	A	A
mineral oils	B	D	B	A	-
mobil 24 DTE	D	-	-	A	-
mobil HF	-	-	-	A	-
mobil delvac 1100,1110,1130	D	-	-	A	-
mobil nyvac 20 and 30	A	-	-	A	-
mobil velocite C	D	-	-	A	-
mobilgas wa 200, type A automatic trans. Fluid	D	-	-	A	-
mobil oil SAE20	D	-	-	A	-
mobiltherm 600	D	-	-	A	-
mobilux	D	-	-	A	-
mono bromobenzene	D	-	-	A	-
mono chlorobenzene	D	D	-	A	-
monoethanolamine	B	A	B	A	C
monomerthyl aniline	-	B	-	A	-
monomerthylether	-	C	-	A	-

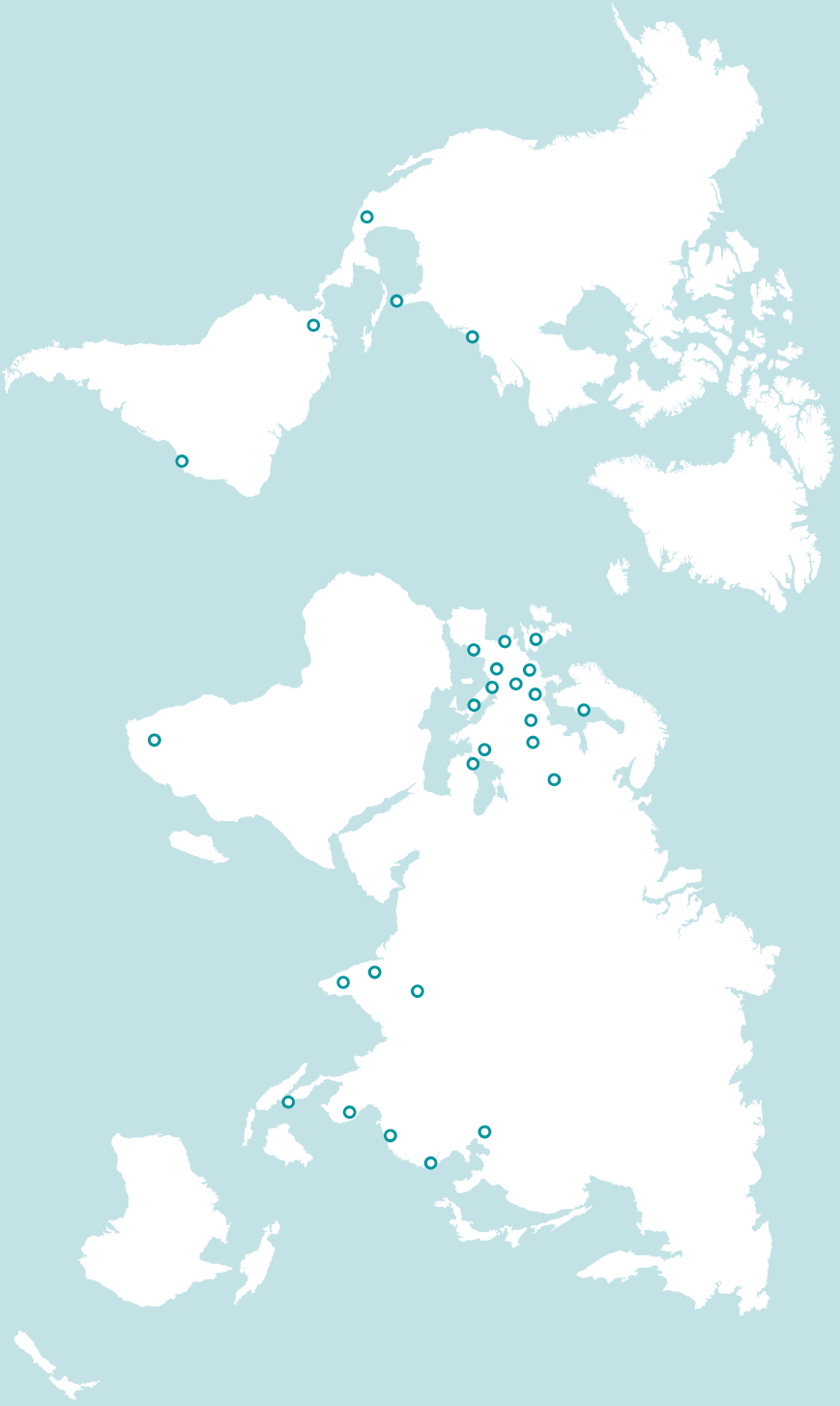
A - excellent B - good C - insufficient D - unsatisfactory

	SILICONE	TPV	TPE	FEP/PTFE	ULDPE
monotrotoluene & dini-trotoluene(40-60mix)	D	-	-	A	-
monovinyl acethylene	B	-	-	A	-
mopar brake fluid	C	-	-	A	-
mustard gas	A	A	-	A	-
N					
naphtha	D	C	D	A	A
naphthalene	D	C	D	A	C
napthenic	D	B	-	A	-
natural gas	A	B	D	A	A
neatsfoot oil	B	B	-	A	-
neon	A	A	-	A	-
neville acid	D	A	-	A	-
nickel acetate	D	A	-	A	-
nickel chloride	A	A	A	A	A
nickel salts	A	A	A	A	-
nickel sulfate	A	A	A	A	A
niter cake	A	A	-	A	-
nitric acid 3 M	D	-	-	A	-
nitric acid concen-trated	D	C	-	A	C
nitric acid dilute	B	-	A	A	C
nitric acid red fuming (RFNA)	D	D	-	A	-
nitric acid inhidited red fuming (IRFNA)	D	D	-	A	-
nitrobenzene	D	D	D	A	C
nitrobenzine	-	-	-	A	-
nitroethane	D	A	-	A	-
nitrogene	A	A	-	A	-
nitrogene (textroxide) (N204)	D	D	-	A	-
nitromethane	D	A	D	A	A
nitropropane	D	B	-	A	-
O					
o-a-548 A	B	-	-	A	-
o-t-634b	D	-	-	A	-
octachlorotoluene	D	-	-	A	-
octadecane	D	B	-	A	-
N-octane	D	D	-	A	-
octyl alcohol	D	B	-	A	-
oleic acid	-	C	B	A	C
oleum (fuming sulfuric acid)	D	D	-	A	-
oleum spirits	D	D	-	A	-
olive oil	D	B	-	A	A
oronite 8200	D	-	-	A	-
oronite 8515	D	-	-	A	-
orthochloroethylben-zene	D	-	-	A	-
ortho-dichlorobenzene	D	D	-	A	-
os45 type III (os54)	D	-	-	A	-
os45 type IV (os45)	D	-	-	A	-
OS70	D	-	-	A	-
oxalic acid	B	A	A	A	A
oxygen, cold	A	-	A	A	-
oxygen, cold 200-400°F	B	-	-	A	-
ozone	A	A	A	A	C
P					
p-s-66 Ib	D	-	-	A	-
p-d-680	D	-	-	A	-
paint thinner duco	D	C	-	A	-
palmitic acid	D	B	-	A	-
para-dichlorobenzene	D	C	-	A	-
par-al-keton	D	-	-	A	-
parker o lube	B	-	-	A	-
peanut oil	A	B	-	A	-
pentane 2 methyl	D	-	-	A	-
pentane, 2-4 dimethyl	D	-	-	A	-
pentane, 3 dimethyl	D	-	-	A	-
N-pentane	D	-	-	A	D
perchloric acid	D	A	A	A	B
perchloroethylene	D	D	B	A	D
petroleum oil, crude	D	C	-	A	C
petroleum oil, below 250°FB	B	-	-	-	-
petroleum oil, above 250°F	D	-	-	A	-
phenol	D	C	D	A	D
phenol, 70%/30%H20	D	-	D	A	-
phenol, 85%/15%H20	D	-	D	A	-
phenylbenzene	D	C	-	A	-
phenyl ethy ether	D	-	-	A	-
phenyl hydrazine	-	B	-	A	-
phorone	D	B	-	A	-
phosphoric acid 20%	B	A	A	A	A
phosphoric acid 45%	D	C	A	A	B
phosphoric acid 3 M	B	-	-	A	-
phosphoric acid con-centrated	C	-	-	A	-
phosphorus trichloride	-	B	B	A	B
pickling solution	D	A	-	A	-
picric acid H2O solution	D	A	-	A	A
picric acid molten	D	B	-	A	D
pinene	D	D	-	A	-
pine oil	D	D	-	A	D
piperidine	D	B	-	A	-
plating solutions, chrome	D	A	B	A	-
plating solutions, other	D	A	B	A	-
pneumatic service	D	-	-	A	-
polyvinyl acetate emulsion	D	A	-	A	-
potassium acetate	D	A	-	A	-
potassium chloride	A	A	-	A	A
potassium cupro cyanide	A	A	-	A	-
potassium cyanide	A	A	A	A	A
potassium dichromate	A	A	-	A	A
potassium hydroxide	C	A	A	A	A
potassium nitrate	A	A	-	A	A
potassium salts	A	-	A	A	-
potassium sulfate	A	A	-	A	A
potassium sulfite	A	-	-	A	-
prestone antifreeze	A	A	-	A	-
PRL-high temp.hydr.oil	B	-	-	A	-
producer gas	B	D	-	A	-
propane	D	D	A	A	C
propane propionitrile	D	-	-	A	-
propyl acetate	D	B	-	A	-
N-propyl acetone	D	-	-	A	-
propyl alcohol	A	A	C	A	-
propyl nitrate	D	B	-	A	-
S					
shell diala	D	-	-	A	-
shell iris 905	D	-	-	A	-
shell iris 3XF mine fluid (fire resist.hydr.)	-	-	-	A	-
shell iris tellus #2 pet. base	D	-	-	A	-
shell iris tellus #33	D	-	-	A	-
shell iris tellus UMF (5% aromatic)	D	-	-	A	-
shell Lo hydrax 27 & 29	D	-	-	A	-
shell macoma 72	D	-	-	A	-
silicate esters	D	A	-	A	-
silicone greases	C	B	-	A	-
silicone oils	C	C	B	A	B

A - excellent B - good C - insufficient D - unsatisfactory

	SILICONE	TPV	TPE	FEP/PTFE	ULDPE
silver nitrate	A	A	A	A	A
sinclair,opaline CX-EP-Llube	D	-	-	A	-
skelly,solvent B,C,E	-	-	-	A	-
skydrol 500	C	-	-	A	C
skydrol 7000	C	B	-	A	-
soap solution	A	A	A	A	D
socony mobile type A	D	-	-	A	-
socony vacuum AMV AC781 (grease)	D	-	-	A	-
socony vacuum PD959B	D	-	-	A	-
soda ash	A	A	-	A	-
sodium acetate	D	A	-	A	A
sodium bicarbonate (baking soda)	A	A	A	A	A
sodium bisulfite	A	A	B	A	A
sodium borate	A	A	B	A	A
sodium carbonate (sodium ash)	A	A	A	A	A
sodium chloride	A	A	A	A	A
sodium cyanide	A	A	A	A	A
sodium hydroxide	B	A	C	A	-
sodium hydrochlorite	B	B	-	A	-
sodium metaphospate	-	-	-	A	-
sodium nitrate	D	A	A	A	A
sodium perborate	B	A	-	A	A
sodium peroxide	D	A	-	A	A
sodium phosphate (mono)	D	A	-	A	A
sodium phosphate (dibasic)	D	A	-	A	A
sodium phosphat (tribasic)	A	A	-	A	A
sodium salts	A	-	A	A	-
sodium silicate	-	A	A	A	A
sodium sulphate	A	A	-	A	-
sodium sulphide	A	A	A	A	-
sodium sulphite	A	A	A	A	-
sodium trisultate	A	-	-	A	-
sovasol #1, 2 & 3	D	-	-	A	-
sovalsol # 73 & 74	D	-	-	A	-
soybean oil	A	B	-	A	-
spry	A	-	-	A	-
SR-6 fuel	D	-	-	A	-
SR-10 fuel	D	-	-	A	-
standard oil mobilube GX90-EP lube	D	-	-	A	-
stannic chloride	B	A	-	A	A
stannic chloride 50%	B	-	-	A	-
stannous chloride	B	A	-	A	B
stauffer 7700	D	-	-	A	-
steam, below 350°F	D	-	-	A	-
steam, above 350°F	D	-	-	A	-
stearic acid	B	A	A	A	B
stoddard solvent	D	D	-	A	C
T					
TT-S-735,type II	D	-	-	A	-
TT-S-735,type III	D	-	-	A	-
TT-S-735,type IV	C	-	-	A	-
TT-S-735,type V	C	-	-	A	-
TT-S-735,type VI	C	-	-	A	-
TT-T-656b	D	-	-	A	-
tannic acid	B	A	A	A	B
tannic acid 10%	B	-	-	A	-
tar bituminous	B	D	-	A	-
tartaric acid	A	A	A	A	A
terpineol	-	B	-	A	-
tertiary butyl alcohol	B	A	-	A	-
tertiary butyl catechol	-	B	-	A	-
tertiary butyl mercaptan	D	B	-	A	-
tetrabromomethane	D	D	-	A	-
tertabutyl titanate	-	B	-	A	-
tetrachloroethylene	-	D	-	A	B
tetraethyl lead	-	C	-	A	-
"tetraethyl lead" blend	-	-	-	A	-
tetrahydrofuran	-	C	-	A	C
tetralin	D	C	-	A	-
texaco 3450 gear oil	D	-	-	A	-
texaco capella A & AA	D	-	-	A	-
texaco meropa #3	D	-	-	A	-
texaco regal B	D	-	-	A	-
texaco uni-ttemp grease	B	-	-	A	-
texamatic "A" trans.oil	D	-	-	A	-
texamatic 1581 fluid	D	-	-	A	-
texamatic 3401 fluid	D	-	-	A	-
texamatic 3525 fluid	D	-	-	A	-
texamatic 3528 fluid	D	-	-	A	-
texas 1500 oil	B	-	-	A	-
thiodol TP-90B	-	-	-	A	-
thiodol TP-95	-	-	-	A	-
thionyl chloride	-	-	-	A	D
tidewater oil-beedol	B	-	-	A	-
tidewaater oil multi-gear 140, EP lube	-	-	-	A	-
titanium tetrachloride	-	B	-	A	-
toluene	-	D	D	A	C
toluene discocyanids	-	B	-	A	-
transformer oil	B	D	-	A	-
transmission fluid type A	B	C	-	A	-
triacetin	-	A	-	A	-
triaryl phosphate	C	B	-	A	-
tributoxyethyl phosphate	-	B	-	A	-
tributyl mercaptan	D	B	-	A	-
tributyl phosphate	-	A	-	A	-
trichloroacetic acid	-	B	A	A	-
trichloroethane	D	B	D	A	-
trichloroethylene	D	B	D	A	D
tricresyl phosphate	C	A	B	A	-
triethanol amine	-	A	D	A	-
triethyl aluminium	-	B	-	A	-
triethyl borane	-	B	-	A	-
trifluoroethane	D	-	-	A	-
trinitroluene	-	A	-	A	-
trioctyl phosphate	C	B	-	A	-
tripoly phosphate	C	-	-	A	-
tung oil (china wood oil)	D	B	-	A	D
X					
xylene	D	D	D	A	B
sylidepenes-mixed-aromatic amines	D	-	-	A	-
xylol	D	-	-	A	-
xenon	A	A	-	A	-
Z					
zeolites	-	A	-	A	-
zinc aceate	D	A	-	A	-
zinc chloride	-	A	A	A	A
zinc salts	A	A	A	A	-
zinc sulfate	A	A	-	A	A

VENAIR IN THE WORLD



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