

venair

FLEXIBLE SOLUTIONS

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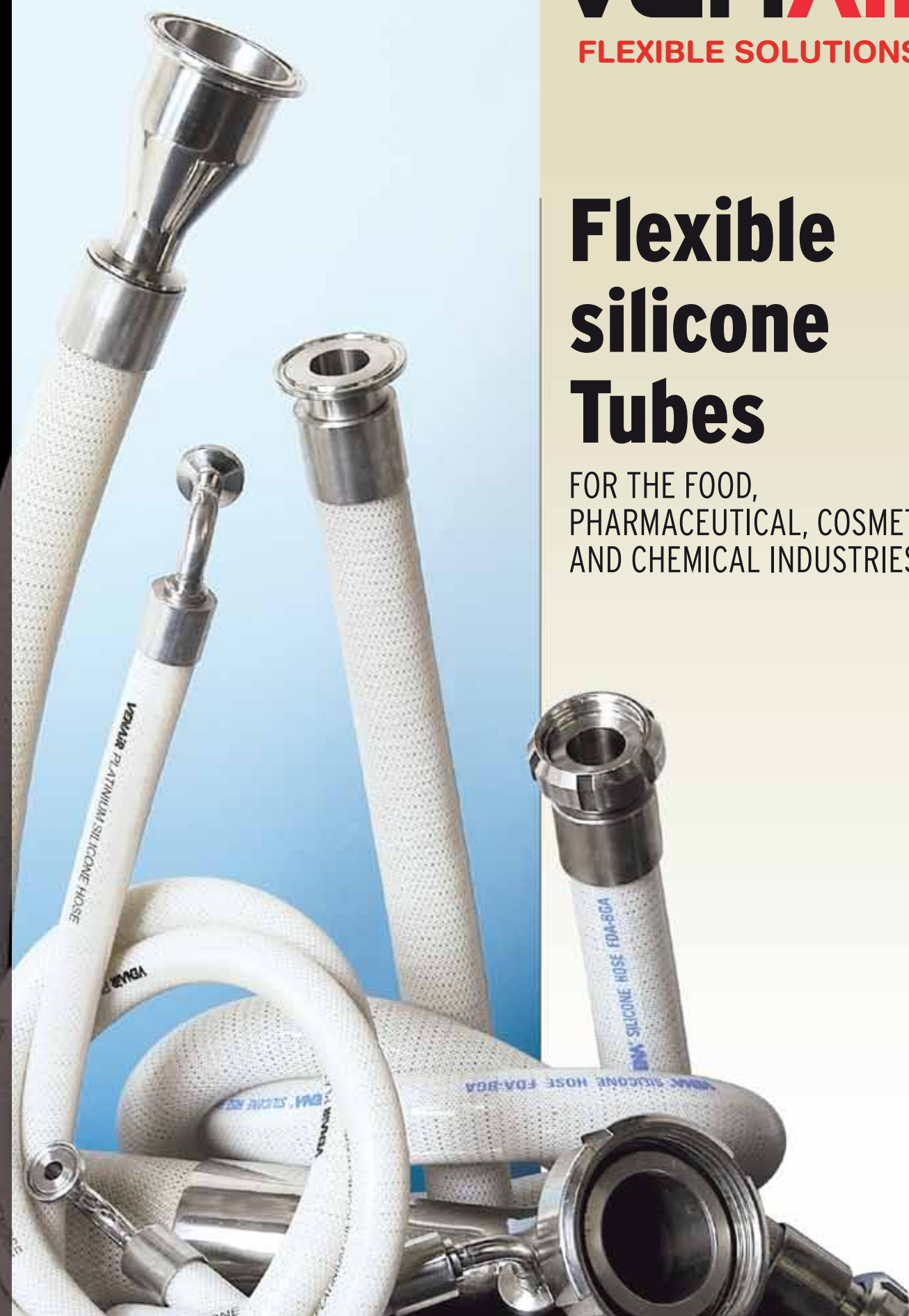
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FLEXIBLE SOLUTIONS

Flexible silicone Tubes

FOR THE FOOD,
PHARMACEUTICAL, COSMETICS
AND CHEMICAL INDUSTRIES



CAT. 24.ENG. rev.01

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Introduction



INTRODUCTION

The food, pharmaceutical, cosmetic and chemical industries have always worked intensively towards improving processes and materials to avoid any problem that could directly affect the health of the final consumer. This has meant that over the last few years various Standards and Certifications have appeared which are now being consolidated at a global level.

This catalogue confirms that VENAIR is able to offer the product that the client requires while fulfilling the highest quality demands that are essential for this market.

At VENAIR Technosil, we have been granted ISO 9001 certification on our entire product range, ranging from flexible silicone hoses to the well-known SZR (without retention zone) connection systems. We are also certified under ISO 14001 and EMAS environmental standards. This clearly shows our commitment to environmental issues, as well as our constant drive to perfect our products.

One particular key factor in this type of industry is the purity of the materials that need to be in contact with the processed products. At VENAIR Technosil we offer a product line that is peroxide or platinum cured, according to requirements, in order to guarantee the high standards of our products in this area. We are constantly striving to ensure that our clients can always choose the most suitable top-quality product.

This continual drive for perfection during our 20 years of existence has put us in the position where today we can offer a wide range of the highest quality products to fully meet your needs. Even so, we will still continue to strive for improvements in every area possible.

VENAIR



ISO 9001



ISO 14001



EMAS

Flexible Silicone Hoses

FOR USE IN THE FOOD,
PHARMACEUTICAL, COSMETIC
AND CHEMICAL INDUSTRY.

Characteristics and applications:

Food-grade silicone elastomer hoses for conveying liquid or semi-liquid products by suction or pumping in the food, pharmaceutical and cosmetic industries.

All hoses are peroxide or platinum cured in accordance with U.S. FDA (Foods and Drugs Administration) Standard 21 CFR 177.2600 and the German BfR Standard part XV. They can also be produced in accordance with the US USP class VI Standard.

NOT AUTHORISED FOR USE IN MEDICAL APPLICATIONS.

Silicone properties:

This elastomer is fully non-toxic, stable, odorless, non-stick, hydrophobic, and steam sterilizable (for a maximum recommended time of 1.5 hrs at 135°C (275°F)). It is composed of elements such as silicon, talc and quartz as well as additional elements authorized by the FDA.

The raw material used can operate unaltered at temperatures of between -80°C to +240°C (de -112°F to +464°C).

Platinum cured:

VENAIR Technosil's platinum cured silicone hoses (peroxide free) are recommended for any process within the food industry and especially the pharmaceutical industry. They guarantee a superior level of hygiene compared to peroxide cured silicone, as shown by the high level of purity in the chromatography phase.

SZR system:

We recommend our hoses for high-grade aseptic quality requirements, since they can also be connected using 316L stainless steel connection terminals equipped with the SZR system (system without retention zone)*. This allows the connection area between the hose and the metal connection terminal to be completely free of any areas of possible contamination, thus facilitating CIP (cleaning in place). Therefore, hoses do not need to be removed for cleaning.

Certifications:

U.S. FDA (Foods and Drugs Administration) Standard 21 CFR 177.2600, German BfR Standard part XV, US USP class VI Standard.

Other characteristics:

Temperature:

The mechanical properties of the hoses remain unaltered at working temperatures of between -60°C (-76°F) and +180°C (+356°F). We can also produce silicone hoses that can withstand more extreme temperatures.

PVMQ Silicone for very low temperatures (-100°C / -148°F).

THT Silicone for very high temperatures (+300°C/+572°F).

Length:

Depending on the model.

Color:

Standard color: translucent

The outer color can be changed as required by the customer to facilitate product identification.

Construction:

Elastomer: VMQ Silicone

Internal reinforcement: Polyester

Other options: MIF Polyester, Nomex**

Standard hardness: 60 Shores

INOX 302L wire reinforcement: in VENA SIL 650/V and VENA SIL 655 models.



* SZR is a registered trademark of Venair.

** Nomex is a registered trademark of Dupont.



VENA SIL 640

Elastomer: Platinum cured silicone produced in accordance with the U.S. FDA Standard 21 CFR 177.2600, the German BfR Standard part XV, and optionally with the USP class VI Standard.

Fabric reinforcement: Polyester fabric reinforcement.

It is possible to produce a more reinforced version named VENA SIL 640 MIF, manufactured with a special high tenacity polyester fabric for higher pressure.

Stainless steel inside: No

Inner appearance: Translucent and smooth.

Outer appearance: Translucent, white or colored, and smooth.

Length of manufacture: : The standard length of manufacture is 4m (13'). Upon request, 6m length hoses (19' 8") can be manufactured..

Temperature scale: -60° C / +180° C (-76° F / +356° F).

Applications: For use in straight sections equipped with metal fittings terminals, where flexibility is not required.

This model is often used to detect metal particles which may occur during filling of food products such as cream or baby food. This model is not recommended for operation with negative pressure (vacuum).

Silicone material option:

- FDA / BfR part XV
- FDA / BfR part XV platinum cured
- USP Class VI platinum cured



VENA SIL 640

INNER DIAMETER*		WALL THICKNESS	WORKING PRESSURE**				BURSTING PRESSURE**			
			bar at 20°C iso1402/1994		psi at 68°F iso1402/1994		bar at 20°C iso1402/1994		psi at 68°F iso1402/1994	
(mm)	(inch)	+1 -0.5 (mm)	640	640 MIF	640	640 MIF	640	640 MIF	640	640 MIF
6	1/4	↑ 4.5 ↓	11,7	23,6	169	342	35	71	508	1030
8	5/16		10,7	20,5	155	297	32	61	464	885
10	3/8		9,7	18,3	140	265	29	55	421	798
13	1/2		8,7	16,0	126	232	26	48	377	696
16	5/8		8,0	14,5	116	210	24	43	348	624
19	3/4		7,7	12,9	111	187	23	39	334	566
22	7/8		7,0	12,3	102	178	21	37	305	537
25	1		6,7	11,6	97	168	20	35	290	508
32	1 1/4		5,7	10,2	82	148	17	31	247	450
38	1 1/2		5,0	9,4	73	136	15	28	218	406
51	2	4,0	8,1	58	117	12	24	174	348	
63	2 1/2	3,3	6,9	48	100	10	21	145	305	
76	3	2,7	5,7	39	83	8	17	116	247	
102	4	1,7	3,3	24	48	5	10	73	145	

*Other diameters can also be manufactured. Please consult.

**Pressure data is noted at ambient temperature. Please reduce pressure values by 20% for each increase of 100°C / 212°F.



VENA SIL 650 V

Elastomer: Peroxide or platinum cured silicone produced in accordance with the U.S. FDA Standard 21 CFR 177.2600, the German BfR Standard part XV, and optionally the USP class VI Standard.

Fabric reinforcement: Polyester fabric reinforcements.

Stainless steel inside: 302L stainless steel wire spring encased inside the hose wall.

Inner appearance: Translucent and smooth.

Outer appearance: Translucent, white or colored, and smooth.

Length of manufacture: The standard length of manufacture is 4m (13'). Upon request, 6m length hoses (19' 8") can be manufactured.

Temperature scale: -60° C / +180° C (-76° F / +356° F).

Applications: Broad application field due to the balance between strength and flexibility, with a small bending radius. Ideal for use in proportioning and loading tanks in any length. These hoses compensate vibrations and level differences. Suitable for pressure or vacuum.

Silicone material option:

- FDA / BfR part XV
- FDA / BfR part XV platinum cured
- USP Class VI platinum cured

VENA SIL 650 V

INNER DIAMETER*		WALL THICKNESS	THEORETICAL OUTER DIAMETER		BENDING RADIUS (mm) ISO 1746/1983	WORKING PRESSURE**		BURSTING PRESSURE**		VACUUM TOLERANCE	
(mm)	(inch)		(mm)	(pinch)		bar at 20°C ISO 1402/1994	psi at 68°F ISO 1402/1994	bar at 20°C ISO 1402/1994	psi at 68°F ISO 1402/1994		
6	1/4	+1 -0,5 (mm)	17	0,67	29	13,0	188	38,9	565	684 Torr (mmHg)	
8	5/16		19	0,75	31	12,0	174	36,0	522		
10	3/8		21	0,83	34	11,0	159	32,9	478		
13	1/2		24	0,94	39	9,9	144	29,8	433		
16	5/8		27	1,06	45	9,1	132	27,4	397		
19	3/4		5,5	30	1,18	54	8,3	120	24,8		359
22	7/8		33	1,30	60	7,9	114	23,7	343		
25	1		36	1,42	68	7,4	107	22,2	321		
32	1 1/4		43	1,69	94	6,4	93	19,3	279		
38	1 1/2		49	1,93	112	5,7	83	17,2	250		
51	2	-1 -0,5 (mm)	62	2,44	144	4,6	67	13,8	200	0,91 bar	
63	2 1/2		74	2,91	181	3,8	55	11,3	164	0,90 atm	
76	3		88	3,46	232	3,0	44	9,1	132	9,29 mH ₂ O	
102	4		114	4,49	367	1,9	27	5,6	82	13,23 psi	
										26,93 inHg	

*Other diameters can also be manufactured. Please consult.

**Pressure data is noted at ambient temperature. Please reduce pressure values by 20% for each increase of 100°C / 212°F.



VENA SIL 655

Elastomer: Peroxide or platinum cured silicone produced in accordance with the U.S. FDA Standard 21 CFR 177.2600, the German BfR Standard part XV, and optionally the USP class VI Standard.

Fabric reinforcement: Polyester fabric reinforcements.

Stainless steel inside: double 302L stainless steel wire spring encased inside the hose wall at different levels.

Inner appearance: Translucent and smooth.

Outer appearance: Translucent, white or colored, and smooth.

Length of manufacture: The standard length of manufacture is 4m (13'). Upon request, 6m length hoses (19' 8") can be manufactured.

Temperature scale: -60° C / +180° C (-76° F / +356° F).

Applications: It is the strongest hose of the VENA SIL range. Designed for use at specific points where there may be sudden high pressure high surges (hammering).

Ideal for use in proportioning and loading tanks in any length. These hoses compensate vibrations and level differences. Suitable for pressure or vacuum.

Silicone material option:

- FDA / BfR part XV
- FDA / BfR part XV platinum cured
- USP Class VI platinum cured

INNER DIAMETER*		WALL THICKNESS	THEORETICAL OUTER DIAMETER		BENDING RADIUS (mm) ISO 1746/1983	WORKING PRESSURE**		BURSTING PRESSURE**		VACUUM TOLERANCE	
(mm)	(inch)		(mm)	(inch)		bar at 20°C ISO 1402/1994	psi at 68°F ISO 1402/1994	bar at 20°C ISO 1402/1994	psi at 68°F ISO 1402/1994		
6	1/4	↑ 6,5 ↓	19	0,75	43	21,0	305	63	914	684 Torr (mmHg)	
8	5/16		21	0,83	46	19,3	280	58	841		
10	3/8		23	0,91	49	18,0	261	54	783		
13	1/2		26	1,02	54	16,3	237	49	711	0,91 bar	
16	5/8		29	1,14	59	15,0	218	45	653	0,90 atm	
19	3/4		32	1,26	68	13,7	198	41	595		
22	7/8		35	1,38	72	13,3	193	40	580	9,29 mH2O	
25	1		38	1,50	80	12,3	179	37	537		
32	1 1/4		↓	45	1,77	100	11,0	160	33	479	13,23 psi
38	1 1/2		↑	52	2,05	121	10,0	145	30	435	
51	2	65	2,56	185	8,0	116	24	348			
63	2 1/2	7	77	3,03	273	6,7	97	20	290	26,93 inHg	
76	3	↓	90	3,54	318	5,7	82	17	247		
102	4	↓	116	4,57	423	4,0	58	12	174		

*Other diameters can also be manufactured. Please consult.

**Pressure data is noted at ambient temperature. Please reduce pressure values by 20% for each increase of 100°C / 212°F.

VENA TECHNOSIL

Elastomer: Extruded platinum cured silicone produced in accordance with the U.S. FDA Standard 21 CFR 177.2600, the German BfR Standard part XV, and optionally the USP class VI Standard.

Fabric reinforcement: Polyester braiding.

Stainless steel inside: No

Inner appearance: Translucent and smooth.

Outer appearance: Translucent or colored, and smooth.

Standard length of manufacture: 10m and 20m.

Temperature scale: -60° C / +180° C (-76° F / 356° F).

INNER DIAMETER		OUTER DIAMETER (mm)	WORKING PRESSURE* ISO 1402/1994		BURSTING PRESSURE* ISO1402/1994		BENDING RADIUS (mm) ISO1746/1983
(mm)	(inch)		bar at 20°C	psi at 68°F	bar at 20°C	psi at 68°F	
6,35	1/4	13,2	9,3	135,4	28	406	40
7,93	5/16	15,0	7,7	111,2	23	334	45
9,52	3/8	16,6	7,0	101,5	21	305	55
12,70	1/2	20,3	5,7	82,2	17	247	70
15,87	5/8	24,5	4,3	62,9	13	189	85
19,05	3/4	27,9	3,7	53,2	11	160	95
22,22	7/8	31,3	3,3	48,3	10	145	110
25,40	1	34,5	3,0	43,5	9	131	135
31,75	1 1/4	40,8	2,3	33,8	7	102	160



Applications: For conveying liquids at low pressure where a tight bending radius is not required.

Ideal for use in proportioning and loading tanks in any length.

These hoses compensate vibrations and level differences.

It is not recommended for vacuum.

Silicone material option:

- FDA / BfR part XV platinum cured
- USP Class VI platinum cured

*Pressure data is noted at ambient temperature of 20°C / 68°F. Please reduce pressure values by 20% for each increase of 100°C / 212°F.



VENA TECHNOSIL H-PTV

Elastomer: Extruded platinum cured silicone hose produced in accordance with the U.S. FDA Standard 21 CFR 177.2600 and the German BfR Standard part XV.

Fabric reinforcement: Fiberglass braiding.

Stainless steel inside: No

Inner appearance: Translucent and smooth.

Outer appearance: Orange and smooth.

Standard length of manufacture: 10 and 20m

Temperature scale: -60° C / +200° C (-76° F / +392° F).

Applications: For conveying liquids at high temperature where a tight bending radius is not required.

Ideal for use in proportioning and loading tanks in any length.

These hoses compensate vibrations and level differences.

Although it is not specially designed for vacuum, it can withstand a low vacuum.

Silicone material option:

- FDA / BfR part XV platinum cured.

INNER DIAMETER		OUTER DIAMETER (mm)	WORKING PRESSURE* ISO 1402/1994		BURSTING PRESSURE* ISO1402/1994		BENDING RADIUS (mm) ISO1746/1983
(mm)	(inch)		bar at 20°C	psi at 68°F	bar at 20°C	psi at 68°F	
3,00	1/8	8,00	23,33	338,42	70	1015,26	30
4,00	5/32	9,00	21,67	314,25	65	942,75	35
5,00	3/16	11	20,66	299,65	62	899,23	40
6,35	1/4	12	18,66	270,64	56	812,21	45
7,93	5/16	15	15,33	222,34	46	667,17	55
9,52	3/8	17	14	203,05	42	609,16	70
12,70	1/2	22	11,33	164,33	34	493,13	85
15,87	5/8	25	10	145,04	30	435,11	95
19,05	3/4	31	7,33	106,31	22	319,08	135
22,20	7/8	31,30	6,66	96,60	20	290,08	141
25,40	1	38	6	87,02	18	261,07	160
31,75	1 1/4	46	5	72,52	15	217,56	200

*Pressure data is noted at ambient temperature of 20°C / 68°F. Please reduce pressure values by 20% for each increase of 100°C / 212°F.

VENA SIL KITCHEN®

Elastomer: Extruded silicone produced in accordance with the U.S. FDA Standard 21 CFR 177.2600, the German BfR Standard part XV.

Fabric reinforcement: Polyester braiding.

Stainless steel inside: No

Inner appearance: translucent and smooth.

Outer appearance: grey with a yellow strip.

Temperature scale: -60°C / +180°C (-76°F / +392°F)

Working pressure: 6 bar (87 psi)

Available Diameters: 12, 15, 19mm (1/2", 5/8", 3/4")

Available Lengths: 5, 10, 20, 76mm (15', 33', 60', 250')

Applications: Hi-Tech silicone recommended for industrial Kitchens and Catering. Product chemically resistant. Long life product, can be exposed indefinitely to sunlight and bad weather without drying out or hardening and staying always flexible. Sil Kitchen® can be supplied with brass fittings suitable for many standard ends.



VENA SIL KITCHEN - PHARMALoader - SILICONE SLEEVES - CONDUCTOR HOSES



The Pharmaloader® is a flexible compensator for the pharmaceutical and food industries.

Made from platinum-catalysed silicone, it complies with the requirements of the FDA 21 CFR 177.2600 and BfR part XV and USP class VI standards.

It is made with pressure-resistant polyester reinforcements between the silicone layers. To obtain the correct elastic compensation, it is fitted with 3 stainless steel rings, which also prevent volumetric dilatation.

The Pharmaloader® is a standard element fitted with molded Tri-Clamp seals on the ends of the compensator.

The counter-flange elements are made from INOX 304L steel. It is the ideal solution for all tank, hopper, pump and weighing tank outlets to compensate vibrations and level differences. Autoclavable and sterilisable, the Pharmaloader® can work at a temperature range of between -50°C and 180°C (-76°F / 356°F).

NOMINAL CLAMP Ø (INCH)	CLAMP HEAD Ø (MM)	INNER Ø (MM)	OVERALL LENGTH (INCHES) (MM)	WORKING PRESSURE (BAR)
1"	50,5	22,1	4" (102)	1,00
1 1/2"	50,5	34,7	4" (102)	0,90
2"	64	47,5	4" (102)	0,80
2 1/2"	77,5	60	4" (102)	0,70
3"	91	73	6" (152)	0,60
4"	119	97,6	5" (152)	0,50
5"	155	125	7" (178)	0,40
6"	183	150	7" (178)	0,35
8"	233,5	200	7" (178)	0,20
10"	270	250	8" (204)	0,10

CONDUCTOR HOSES



All our standard hoses (SIL 640, SIL 650 V, SIL 655) can be equipped with several tin-plated copper wires joined to the metal fittings by a welding point. The completely equipotent joint ensures that users will be protected from discharges of static electricity resulting from contact with the hose.

SILICONE SLEEVES



Silicone sleeves are food and pharmaceutical grade, with or without textile reinforcement, to convey liquids or semi liquids at low pressure (gravity drop) or protecting against contamination outer-inner or inner-outer in areas of product handling, for example in stirrers with Universal joints.

The high flexibility allows a perfect absorption of vibrations. The translucent aspect allows a visual of the conveyed product.

Standard constructions:

- Sleeve without textile reinforcement with a wall thickness of 1,3mm (+1/-0,5mm)

- Sleeve with 1 textile reinforcement with a wall thickness of 2,3mm (+1/-0,5mm)

Maximum length of manufacture: 4m.

Possibility of producing other wall thicknesses by request.

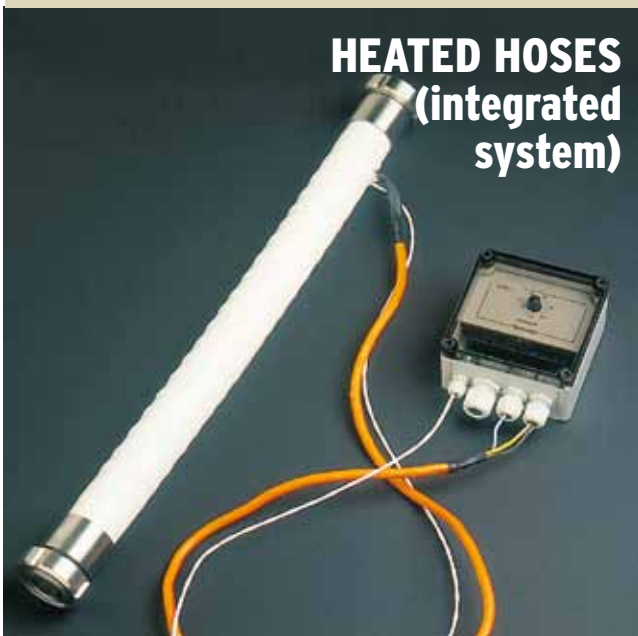
Silicone material option:

- FDA / BfR part XV

- FDA / BfR part XV platinum cured

- USP Class VI platinum cured

HEATED HOSES (integrated system)



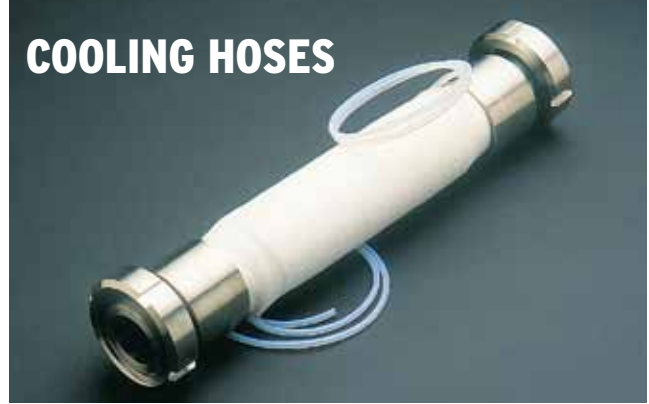
Characteristics: Silicone hose equipped with an electrical resistance encased inside the wall in order to provide a regular temperature to the hose for an optimum fluidity of the conveyed product. Inner cable is connected to an electronic regulator and is also equipped with a PT 100 Ohm gauge connected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

Voltage: Depending on specific user needs.

Temperature: +5°C / +200°C (+41°F / +392°F)

Main applications: To convey viscous products that needs to maintain a regular temperature during the production process, such as caramel, glycerin or chocolate.

COOLING HOSES



Characteristics: Silicone hose equipped with a cylindrical PTFE (Teflon*) conduit encased in spiral along the length of the hose. Fittings are assembled on both ends.

This system provides a regular temperature of the conveyed product by steam or hot water through the inside of the PTFE conduit, and nitrogen for cooling.

Main applications: For products that require high or low handling temperatures.

*Teflon is a registered trademark of Dupont.

VENA VITOSIL



Characteristics:

When the product conveyed is not compatible with the silicone elastomer, VENAIR can produce the standar hoses SIL 640, SIL 650V, SIL 655 with an inner liner of white, Class A, food grade Viton®** in accordance with the FDA and BfR part XV Standards.

Main applications: To conveying fluids particularly aggressive with silicone, such as some acids or fats, in a temperatura scale of -30°C a +180°C (-22°F a +356°F).

**Viton is a registered trademark of DUPONT



VENA SIL ATEX

Conductive silicone cover for explosive environments

All our standard hoses (VENA SIL 640, SIL 650 V, SIL 655) can be modified externally in order to fulfill the ATEX norm for potentially explosive atmosphere: (but the hose not designed to convey explosive substances)

- Electrical Surface Resistance of the exterior ply $< 10^3 \Omega$ according to the specification EN 60079-0 Part 26.13
- Meets the requirements of European ATEX directive 94/9/EC.
- The hose must be properly grounded, to permit the correct dissipation of the static charge (grounding the hose metal fittings or directly the copper wire of both ends of the hose). Will be customer's responsibility to properly ground the hose.

SPECIAL SHAPES



Any special shape or construction in silicone according to the customer's requirements can be produced.



VENAFLON

Characteristics: Silicone hose with an inner liner of smooth PTFE, polyester textile reinforcements and stainless steel spiral incases inside the wall.

Temperature scale: -60°C / +180°C (-76°F / +356°F)

Maximum length of manufacture: 4 o 6m, depending on the diameter.

Main applications: To conveying aggressive chemical products.

Ø INNER DIAMETER (mm)	WALL THICKNESS (mm)	WORKING PRESSURE (bar)	BURSTING PRESSURE (bar) WATER AT 20° C	VACUUM(bar) WATER AT 20° C	BENDING RADIUS (mm)
13	6,2	26,0	78	-0,95	88
19	6,2	21,7	65	-0,90	135
25	6,2	17,7	53	-0,90	182
32	6,2	15,3	46	-0,90	228
38	6,2	14,0	42	-0,90	275
51	6,2	10,7	32	-0,85	318

VENA BUTYLFOOD | VENAFLON

VENA BUTYLFOOD

Characteristics:

- . Rubber hoses manufactured with food grade Butyl in accordance with FDA 1 CFR 177.2600.
- . Equipped with textile reinforcements inside the wall of the hose, with 304 L double stainless steel spring wire and copper braiding to ensure an equipotent joint with the metal fittings and to protect from discharges of static electricity.
- . Hoses with strong, durable construction that can withstand excessive physical handling.
- . Operable with pressure or vacuum.

Inner appearance: White, smooth

Outer appearance: violet, smooth. Includes white information strip.

Operating pressure: 10 bar / 145 psi (all diameters)

Bursting pressure: 30 bar / 435 psi (all diameters)

Maximum operating temperature:

-30°C to +120°C (-22°F to +248°F)



Sterilization temperature: 150°C (302°F)

Can be sterilized on-site by major Cleaning in Place (CIP) products.

Maximum manufacturing length: 40 metres

Major applications: The Butylfood flexible tube is recommended for all types of food products, even at high temperatures (milk, chocolate, drinking water, fruit juice, fresh cream, oil, cosmetic cream, alcohol, etc)

INNER DIAMETER (mm)	INNER DIAMETER (inch)	OUTER DIAMETER (mm)	BENDING RADIUS (mm)	WORKING PRESSURE		WORKING PRESSURE	
				bar at 20°C ISO 1402/1994	psi at 68°F ISO 1402/1994	bar at 20°C ISO 1402/1994	psi at 68°F ISO 1402/1994
15,8	5/8	26	40				
19,05	3/4	29	45				
25,4	1	37	50				
31,7	1 1/4	45	60				
38,1	1 1/2	51	65	10	145	30	435
50,8	2	65	85				
63,5	2 1/2	78	130				
76,2	3	92	220				
101,6	4	120	320				

PROTECTION FOR THE CONNECTIONS



VENAIR Technosil offers supplementary protection devices for its entire product line in order to increase service life.

SILICONE COVER FOR THE METALLIC CONNECTIONS

In order to avoid burns while handling any hot metallic connections after a sterilization process.

ANTI-SHOCK STOPS

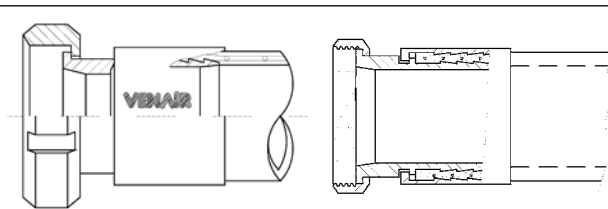
Used to protect the metal fittings of our hoses in order to prevent damage and deformation in case of dropping or excessive hose assembly handling.

METAL CONNECTIONS

SZR* SYSTEM (without retention zone)

The concept of SZR* has been fully researched for the flexible hoses produced by VENAIR. This system ensures that the hoses equipped with metal fittings on both ends satisfy even the most demanding requirements of the food, pharmaceutical, cosmetics and chemical market, since all areas where contamination may occur between the joint of the hose and the fittings are eliminated by placing them at the same level.

The SZR* system is designed to prevent the utmost differences in diameter between the metal fitting and the hose, ensuring



continuous product flow without inner turbulence. This leads to time saving by allowing on-site cleaning (CIP) to be performed without disassembly. The SZR assembly system ensures a higher level of non-retention in the flexible hoses, as well as greater safety of use. All connections are manufactured in a single block, without welds, and the flexed 45° or 90° connections are secured by an orbital weld.

QUALITY OF FINISH

The roughness of the inner surface of the SZR* fittings presents a maximum rugosity of 0.8 microns and can be improved on request. The lot number for the raw material used is indicated on each fitting. After the fitting process the ferrules can be polished.

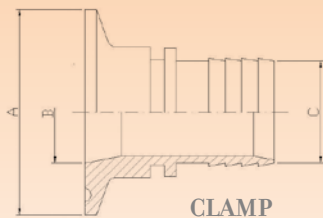
*SZR is a registered trademark of VENAIR

STAINLESS STEEL FITTINGS 316L

STAINLESS STEEL FITTINGS 316L

TRI-CLAMP

A (mm)	B (mm)	C (mm)	PART NUMBER
25	6,0	6	021276060625
34	8,0	8	021276080834
50	8,0	8	021276080850
25	10,0	10	021276101025
34	10,0	10	021276101034
50	10,0	10	021276101050
25	10,0	13	021276101325
34	10,0	13	021276101334
25	13,0	13	021276131325
34	13,0	13	021276131334
50	13,0	13	021276131350
25	16,0	16	021276161625
34	16,0	16	021276161634
50	16,0	16	021276161650
25	16,0	20	021276162025
50	16,0	20	021276162050
34	18,0	18	021276181834
50	18,0	18	021276181850
34	20,0	20	021276202034
50	20,0	20	021276202050
50	22,5	18	021276221850
50	22,5	20	021276222050
50	22,5	25	021276222550
64	22,5	25	021276222564
50	29,0	32	021276293250
64	32,0	32	021276323264
50	35,5	20	021276352050
50	35,5	25	021276352550
50	35,5	38	021276353850
64	35,5	38	021276353864
64	38,0	38	021276383864
64	48,5	50	021276485064
77	60,3	63	021276606377
91	72,9	76	021276737691
119	101,0	102	021276101119



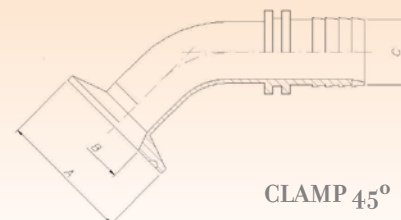
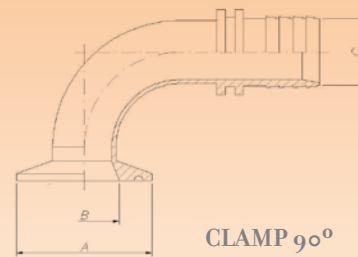
All Tri-Clamp fittings can be assembled in 90° or 45°.

Available in 316L stainless steel, with the exception of the DIN11851 and SMS female nuts which are made of 304L stainless steel. Other fittings can be assembled upon request (RTJ, FIL, ISS, MACON, GAS JIC, flanges).

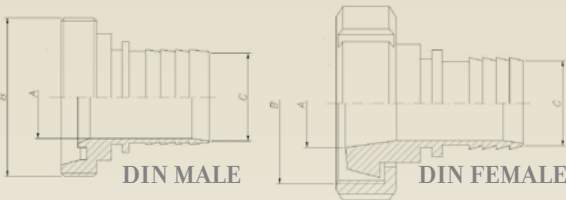
Clamps and auxiliary parts for welding can also be manufactured.

TRI-CLAMP IMPERIAL

DN (inch)	A (mm)	B (inch)	C (mm)	C (inch)	PART NUMBER	
1/2	25	1	9.5	6.35	1/4	021277100625
3/4	25	1	15.8	6.35	1/4	021277160625
1/2	25	1	9.5	9.52	3/8	021277101025
3/4	25	1	15.8	9.52	3/8	021277161025
1/2	25	1	9.5	12.7	1/2	011277101325
3/4	25	1	15.8	12.7	1/2	021277161325
1/2	25	1	9.5	19.05	3/4	021277101925
3/4	25	1	15.8	19.05	3/4	021277161925
1	50	2	22.1	6.35	1/4	021277220650
1 1/2	50	2	34.8	6.35	1/4	021277350650
1	50	2	22.1	9.52	3/8	021277221050
1 1/2	50	2	34.8	9.52	3/8	021277351050
1	50	2	22.1	12.7	1/2	021277221250
1 1/2	50	2	34.8	12.7	1/2	021277351250
1	50	2	22.1	19.05	3/4	021277221950
1 1/2	50	2	34.8	19.05	3/4	021277351950
1	50	2	22.1	25.4	1	021277222550
1 1/2	50	2	34.8	25.4	1	021277352550
2	64	2 1/2	47.5	25.4	1	021277482564
1 1/2	50	2	34.8	38.1	1 1/2	021277353850
2	64	2 1/2	47.5	38.1	1 1/2	021277483864
2	64	2 1/2	47.5	50.8	2	021277485064
2 1/2	77	3	60.2	50.8	2	021277605077
2 1/2	77	3	60.2	63.5	2 1/2	021277606377
3	91	3 9/16	72.9	63.5	2	021277736391
3	91	3 9/16	72.9	76.2	3	021277737691
4	119	4 11/16	97.4	101.6	4	021277102119



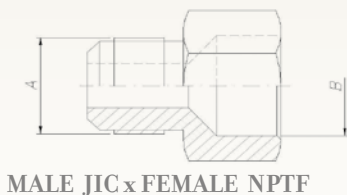
DIN 11851					
DN	A	B(DIN405)	C	PART NUMBER	PART NUMBER
	(mm)	thread	(mm)	MALE	FEMALE
10	10	28x1/8"	10	021100001010	021000001010
15	16	34x1/8"	15	021100001516	021000001615
20	20	44x1/6"	20	021100002020	021000002020
25	26	52x1/6"	25	021100002525	021000002525
32	32	58x1/6"	32	021100003232	021000003232
40	38	65x1/6"	38	021100003840	021000003840
50	50	78x1/6"	50	021100005050	021000005050
65	66	95x1/6"	63	021100006365	021000006365
80	81	110x1/4"	75	021100007580	021000007580
100	100	130x1/4"	102	021100102100	021000102100
125	125	160x1/4"	127	021100127125	021000127125
150	150	190x1/4"	152	021100150152	021000150152



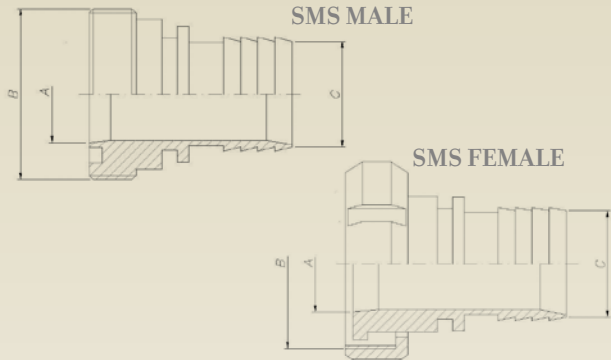
MALE JIC x MALE NPTF ADAPTOR		
A MALE JIC	B MALE NPT	PART NUMBER
7/16	1/4	021534700613
1/2	1/4	021534700813
3/4	3/8	021534701217
7/8	1/2	021534701621
1 1/16	3/4	021534702026
1 5/16	1	021534702533
1 5/8	1 1/4	021534703242
1 7/8	1 1/2	021534703848



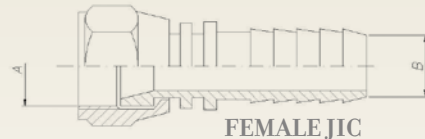
MALE JIC x FEMALE NPTF ADAPTOR		
A MALE JIC	B MALE NPT	PART NUMBER
7/16	1/4	021550000613
1/2	1/4	021550000813
3/4	3/8	021550001217
7/8	1/2	021550001621
1 1/16	3/4	021550002026
1 5/16	1	021550002533
1 5/8	1 1/4	021550003242
1 7/8	1 1/2	021550003848



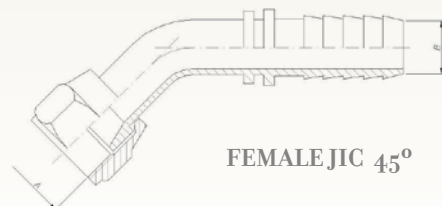
SMS					
DN	A	B	C	PART NUMBER	PART NUMBER
	(mm)	thread	(mm)	MALE	FEMALE
25	22.5	39.7x1/6"	25	021400002525	021300002525
38	35.5	59.8x1/6"	38	021400003838	021300003838
51	48.5	69.8x1/6"	50	021400005051	021300005051
63	60.5	84.8x1/6"	63	021400006363	021300006363
76	72.8	97.5x1/6"	75	021400007576	021300007576
101.6	97.6	132x1/6"	102	021400100102	021300102102
104	100	124.4x1/6"	102	021400102104	021300102104



FEMALE JIC STRAIGHT INSERT			
A	B Ø FOR HOSE		PART NUMBER
(inch)	(inch)	(mm)	
7/16	1/4	6.35	021564600671
1/2	1/4	6.35	021564600804
3/4	3/8	9.52	021564601206
7/8	1/2	12.7	021564601408
1 1/16	3/4	19.05	021564601712
1 5/16	1	25.4	021564602515
1 5/8	1 1/4	31.75	021564602620
1 7/8	1 1/2	38.10	021564603024

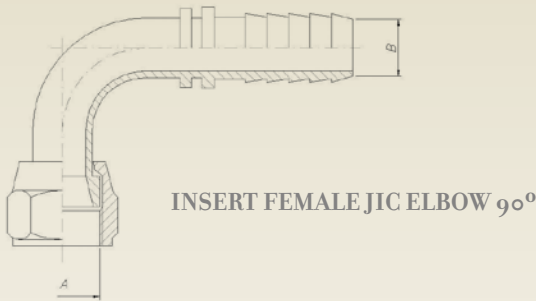


FEMALE JIC ELBOW 45° INSERT			
A	B Ø FOR HOSE		PART NUMBER
(inch)	(inch)	(mm)	
7/16	1/4	6.35	021564610704
1/2	1/4	6.35	021564610804
3/4	3/8	9.52	021564611206
7/8	1/2	12.7	021564611408
1 1/16	3/4	19.05	021564611712
1 5/16	1	25.4	021564612116
1 5/8	1 1/4	31.75	021564612620
1 7/8	1 1/2	38.10	021564613024

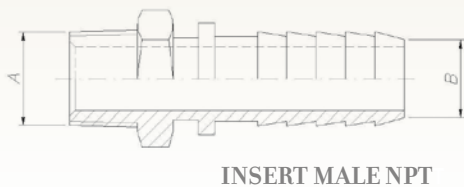


STAINLESS STEEL FITTINGS 316L

INSERT FEMALE JIC ELBOW 90°			
A	B Ø FOR HOSE		PART NUMBER
(inch)	(inch)	(mm)	
7/16	1/4	6.35	021574600671
1/2	1/4	6.35	021574600804
3/4	3/8	9.52	021574601206
7/8	1/2	12.7	021574601408
11/16	3/4	19.05	021574601712
15/16	1	25.4	021574602116
15/8	11/4	31.75	021574602620
17/8	11/2	38.10	021574603024



INSERT MALE NPT			
A	B Ø FOR HOSE		PART NUMBER
(inch)	(inch)	(mm)	
1/8	1/4	6.35	021534650204
1/4	1/4	6.35	021534650404
3/8	3/8	9.52	021534650606
1/2	1/2	12.7	021534650808
3/4	3/4	19.05	021534651212
1	1	25.4	021534651616
11/4	11/4	31.75	021534652020
11/2	11/2	38.10	021534652424



FERRULES			
INSIDE DIAMETER		Ø FOR HOSE	PART NUMBER
(inch)	(mm)		
1/4	6.35	650V – TECHNOSIL - 655 - 640	022000450006
5/16	7.93	650V – TECHNOSIL - 655 - 640	022000450008
3/8	9.52	650V – TECHNOSIL - 655 - 640	022000450010
1/2	12.7	650V – TECHNOSIL - 655 - 640	022000450012
5/8	15.8	650V – TECHNOSIL - 655 - 640	022000450016
3/4	19.05	650V – TECHNOSIL - 655 - 640	022000450019
1	25.4	650V – TECHNOSIL - 655 - 640	022000450025
11/4	31.75	650V – TECHNOSIL 640	022000450032
11/2	38.10	650V – 640	022000450038
2	50.8	650V – 640	022000450050
2 1/2	63.5	650V – 640	022000450063
3	76.2	650V – 640	022000450076
4	101.6	650V – 640	022004500100
11/4	31.75	655 – BUTYLFOOD	022000455032
11/2	38.10	655 – BUTYLFOOD	022000455038
2	50.8	655 – BUTYLFOOD	022000455050
2 1/2	63.5	655 – BUTYLFOOD	022000455063
3	76.2	655 – BUTYLFOOD	022000455076
4	101.6	655	022004555100
4	101.6	BUTYLFOOD	022004550100



MALE GAS, FEMALE GAS

A	B
(thread)	(mm)
1/4"	6
3/8"	8
3/8"	10
1/2"	10
1/2"	13
5/8"	16
3/4"	19
1"	25
1 1/2"	38



FEMALE GAS



REFERENCES

FOOD:
 DANONE
 NESTLE
 SCHWEPES
 COCA COLA
 KRONENBOURG

PHARMACEUTICAL:
 PFIZER
 GLAXO-WELLCOME
 AVENTIS
 MILLIPORE
 SCHERING-PLOUGH

COSMETICS:
 L'OREAL
 NIVEA
 ROC
 LANCASTER

CHEMICAL:
 RONE POULENC
 BAYER
 HENKEL

VENAIR Technosil's reputation as a world-wide leader in flexible silicone tubes has caught the attention of some of the most well-known brands across many sectors:

PRECAUTIONS FOR USE

STERILISATION

All flexible hoses must be sterilized before use and must only be used for the intended purpose for which they were designed.

All hoses can be hot-air sterilized at a temperature of +250° C (+482° F) or steam sterilized at +135° C (+275° F) and a pressure of with 3,5 bars.

Recommended maximum time: 1,5 hours +135° C (+275° F).

A minimum of 1 hour must be left between successive sterilisation treatments in order for the hose to stabilise.

It is important to note that steam alters the mechanical and volumetric properties of the silicone elastomer. We therefore recommend that all hoses are examined after 150 hours of steam sterilization treatments.

The product may suffer from the effects of hydrolysis if the sterilisation time is exceeded.

COMPATIBILITY OF THE PRODUCTS FOR TRANSPORTATION

Ensure that the flexible hose used is chemically compatible with the product.

Cleaning products, such as caustic soda and nitric acid will not alter the quality of the product when diluted to 5 %.

The type of fluid to be transported, the usage temperature and the maximum pH of the product must always be known. Silicone hoses are not recommended for conveying abrasive products.

CRUSHING

A vehicle driving over a hose can cause the hose's textile elements to fray under the pressure, even if the hose does not have an

inner spiral. Avoid stepping on hoses. The sudden pressure could damage them.

PRESSURE

The pressure and temperature levels should be those indicated for each type of hose. During use, ensure that "water hammer" that could affect the hose does not occur. Water hammer can multiply the initially expected operating pressure by ten.

USE. STORAGE.

Under no circumstances should flexible hoses be used to attempt to pull heavy loads.

Avoid dragging hoses along the floor.

If the hoses are temporarily out of service, they should be stored in a clean, dry place on non-sulfur steel shelving to avoid any reactions. Protect from light and ozone.

Elbow adaptors of 45° or 90° must be connected to the bypass frame to eliminate any excessive curvature of the hose.

Our flexible hoses have a useful life of between 10 and 20 times that of conventional hoses.

Remember that once the hose is installed, it is a live and moving element. These hoses that have been manufactured with the greatest care, especially for use in such demanding industries. Taking good care of them will ensure a return on your investment.

VENAIR Technosil shall not be held responsible for improper use of its hoses. Failure to comply with the precautions for use may result in unfavorable conditions.

GOOD PRACTICE GUIDELINES

Fascicle of documentation published by Afnor, September 1986.

Correspondence:

At the time that this fascicle was published, the ISO/DIN 18831 standard on the same subject already existed. Both documents are equivalent.

Analysis:

The present fascicle is intended to help users of rubber or plastic based elastic and flexible hoses to obtain optimal hose life by considering the different conditions of use.

Information source:

Thésarus Internacional Técnico: Tubo de caucho (rubber hose), tubo en materias plásticas (plastic hose), elección (selection), almacenado (storage). enado (storage).

The purpose of the present fascicle is to provide users of rubber or plastic-based flexible hoses with recommendations to enable them to maintain the hoses in a similar condition to when supplied once they are in operation and to obtain an optimal service life by considering the conditions of use.

These good practice guidelines are comprised of two parts:

PART A: GENERAL RECOMMENDATIONS

Chapter 1 – Selection criteria

Chapter 2 – Storage conditions

Chapter 3 – Rules for use and maintenance

CRITERIA FOR SELECTION

PART B: ADDITIONAL RECOMMENDATIONS FOR SPECIFIC APPLICATIONS

Chapter 1 – Bending radius / Abrasive products

Chapter 2 – Corrosive and aggressive products

Chapter 3 – Inflammable products

PART A: GENERAL RECOMMENDATIONS

1. SELECTION CRITERIA

1.1 When choosing a flexible hose for a certain application the following points must be considered:

1.1.1 Pressure – Vacuum

Operational pressure and vacuum values

Water hammer

1.1.2 Conveyed products

Nature, designation, concentration, working temperature.

Form: liquid, gas, or solid. In the case of the latter: granulated, density, behavior of transported solid product, nature, speed of travel and flow of transported fluid. Frequency of use.

1.1.3 Environment

Place of use, ambient temperature, hygrometric grade, exposure or lack of exposure to atmospheric agents and ozone. Products that may be in contact with the end of the flexible hose.

1.1.4 Mechanical limitations

Minimum bending radius in service. Limitations in terms of traction, torsion, flexion, vibration or compression. Risk of impact, abrasion, corrosion. Work position: on the floor, suspended or submerged.

1.1.5 Connection used or expected to be used

Connection: type, dimension and class of thread.

Hose: Outer and inner diameter. Adjustment length.

1.1.6 Particular conditions

With relation to this matter, it is in the user's interest to choose flexible hoses that conform to the standards in force in the country of use, provided that these exist within the field of application in question.

1.2 In cases of difficulties regarding interpretation or where the necessary information does not appear in the available documentation, the user of the flexible hose is advised to consult the manufacturer.

2. STORAGE CONDITIONS**2.1 General information**

During use, flexible hoses are exposed to different factors which can cause their physical properties to alter, which in turn may lead to the hoses being unsuitable for use when the time comes. Listed below are some general storage conditions that will help prevent the deterioration of the products during storage.

2.2 Length of storage

Storage length should be reduced as much as possible. Therefore stock rotation should be ensured, applying the rule "first in, first out". When long term storage cannot be avoided, e.g. for one year, the item should be thoroughly checked before it is put into operation..

2.3 Temperature and humidity

Storage temperature should be kept at between 0°C and 35°C wherever possible (optimum temperature 15°C). Relative humidity should preferably not exceed 65%..

2.4 Light

Items should be stored in a dark place, away from direct sunlight and intense artificial lighting. If storage facilities have windows or glazed areas, these should be covered with red, orange or white paint.

2.5 Ozone

Ozone has an adverse affect on rubber products. The storage areas must therefore not contain any material that can produce ozone, such as lamps or mercury vapor strip lighting, high voltage electrical material, electric motors or other materials that may cause sparks or electrical discharges.

2.6 Environment

The hoses must not come into contact with certain products or be exposed to their vapors, particularly in the case of solvents, fuels, oils, fats, volatile components, acids, disinfectant products, etc. Moreover, some materials such as copper, iron and manganese can be harmful to some rubber-based mixtures.

2.7 Heat source

The distance between heat sources (e.g. heating units) and stored items must be sufficient to ensure that the temperature remains within the temperature limits defined in paragraph 2.3. If this is impossible, a heat screen should be used.

2.8 Electric or magnetic field

Electric or magnetic field variations should be prevented in the

storage area since they can induce current in the metal connections and cause them to heat up. These fields can be caused by high voltage lines or high frequency generators.

2.9 Storage conditions

Flexible hoses should be stored without excessive restriction, lengthening or deformation.

All contact with sharp or angular objects or material must be avoided. Hoses must be stored in a dry place in storage boxes wherever possible. Flexible hoses that are coiled up should be stored flat and preferably not stacked. In cases where this is impossible, the height of stacks should be limited so that the items at the bottom of the stack are not deformed. Heavier items should be placed at the bottom and lighter items should be placed at the top. The coil must be at least equal to the minimum curvature radius specified by the product manufacturer or standards. Hanging coiled hoses from spikes or hooks is not recommended. Flexible hoses that are supplied in lengths should be stored flat without folds.

2.10 Rodents

Flexible hoses must be protected from rodents and suitable precautions should be taken if there is any risk.

2.11 Removal from storage

Precautions should be taken to ensure that the hoses requested are in perfect condition and are the correct hoses for the required use. Therefore, the ability to identify the different hoses stored is essential. Furthermore, and particularly in the case of flexible hoses that have been in storage for a long period of time, the metal connection elements should be checked to confirm they are correctly fitted.

2.12 Return to storage

Hoses that have been removed from service must be emptied of the substances they have carried before being returned to storage. Special care must be taken with items that have transported chemical, explosive, inflammable, or corrosive products. After cleaning, and before storage, their condition and suitability for later use must be checked.

2.13 Cleaning

Cleaning with brushes, sponges or cloths must be carried out with soap and water or surfactant based products. Metal brushes and abrasive, pointed or sharp instruments must not be used and the use of solvents should be avoided.

3. RULES FOR USE**3.1 Handling**

Flexible hoses should always be handled with some minimum precautions. For example: they should not be scraped over sharp or abrasive surfaces, subjected to impacts or cut, deformed or squashed by vehicles.

Heavy flexible hoses supplied in lengths should be transported appropriately, especially when being lifted..

3.2 Impermeability test

A pressurized hydraulic test is recommended after fitting the metal connectors to ensure they are in good condition (no leaks and connector has not moved on the hose). The test pressure value is usually indicated by the hose manufacturer if it is not specified by test regulations or by standards.

If in doubt, check with the manufacturer.

3.3 Elimination of static electricity

The manufacturer's advice should be strictly followed when considering electrical conductivity requirements and a check should be carried out after installing the connections.

3.4 Fixed installations

Flexible hoses used for fixed installations must be connected using the appropriate fixing device wherever possible. This device

should not hinder normal variations in the flexible hose when under pressure, such as longitudinal or diametric variations and/or torsion. When used under special conditions whether mechanical, pressurized, vacuum or geometric, the manufacturer should be consulted.

3.5 Moving parts

When flexible hoses need to be installed on moving parts, care must be taken to ensure that the motion does not cause the hose is not be subjected to impacts, blockages or friction and that the hose is not forced into abnormal curvatures, folds, traction or torsion.

3.6 References

Apart from some fields of use where special standards exist, all flexible hoses must be subjected to regular controls to ensure their suitability for continued use. In particular, attention needs to be paid to the condition of the connections and to the appearance of certain faults indicating hose degradation, whether due to normal ageing or to damage attributable to improper use or accidents during maintenance.

It is therefore particularly important to check for the appearance of:

- Cracks, scratches, breaks or tears in the coating that reveal the structure.
- Deformities, blisters, or swellings that appear when the hose is subjected to pressure.
- Leaks.

These faults require the affected hose to be replaced. In certain areas of use, and for safety reasons, there may be a use-by-date which will be indicated on the marking of the flexible hose. This use-by-date must be observed even if the hose shows no apparent signs of wear and tear.

3.8 Repairs

Repairing hoses is not generally recommended.

However, in the particular cases when hoses can be repaired, the manufacturer's recommendations must be strictly adhered to and a pressure test must be carried out after the repair. If there is any deterioration as a result of a cut at one end and if the length of the remaining hose is in good condition, then the hose can be repaired by cutting away the defective part.

PART B: ADDITIONAL RECOMMENDATIONS

In addition to the general recommendations in part A there are some other particular points that should also be noted.

1. BENDING RADIUS/ABRASIVE PRODUCTS

In order to obtain the optimal useful life, flexible hoses must be kept as straight as possible, avoiding any unnecessary curvature. The widest possible bending radius should therefore be used, since a radius that is too small will cause unwanted turbulence inside the hose. Good electrical conductivity will also need to be tested. This is ensured in these hoses with the effective discharge of the static electricity generated by rubbing the friction of transported particles against the wall of the hoses.

With regard to connections, it should be ensured that exterior connections are not subjected to abrasion. However, connections included in the hoses avoid the formation of turbulence that, as already mentioned, can cause increased and unsuitable consumption.

2. CORROSIVE OR AGGRESSIVE PRODUCTS

This point refers specifically to acids, bases, solvents, agro-pharmaceutical products and other chemical products. Should these products not appear in the list of compatible products specified in the technical documentation or if the temperature and concentration limits do not fall within acceptable parameters, the hose manufacturer should be consulted. Fluids should not be allowed to stagnate in the flexible hoses, especially in the case of solutions or emulsions, as the resulting decantation can cause concentrations that exceed the admissible limits. Cleaning and rinsing should be performed after each use in order to prevent this phenomenon. It is essential that all necessary technical precautions are taken in order to avoid leaks caused by the accidental explosion of the flexible hoses.

3. INFLAMMABLE PRODUCTS

This family of products is comprised in part by liquid hydrocarbons (essences, petroleum, and kerosene) or gaseous hydrocarbons (LPG). Most countries have regulations governing the storage and transport of these products. In the field of flexible hoses, attention must be paid to the regulations concerning electrical resistance, as well as the nature and frequency of controls for checking suitability for use over time.

In the case of hydrocarbons, care must be taken to ensure that the percentage of aromatic hydrocarbons (benzene, toluene, xylene) falls within the limits established by the flexible hose manufacturers.

BENDING RADIUS

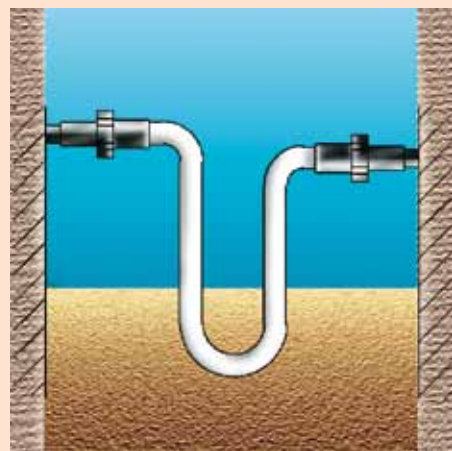
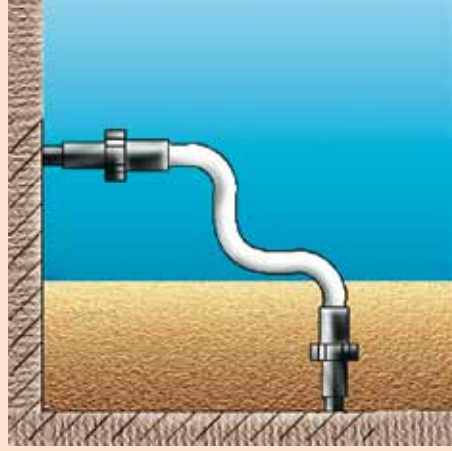
FOR FLEXIBLE TUBES

BENDING RADIUS | GOOD PRACTICE GUIDELINES/CRITERIA FOR SELECTION

RECOMMENDED



NOT RECOMMENDED



COMPATIBILITY TABLE

The following guidelines are RECOMMENDATIONS that do not imply responsibility of VENAIR under any circumstances. Our specialists are available to advise you on the most suitable tube for all chemical products.

Resistance to different products:
A - excellent
B - good
C - insufficient
D - unsatisfactory
E - please, consult

A

	SILICONE	FLUOSIL	BUTYLFLOOD	VITOSIL	PTFSIL
acetaldehyde	A	D	A	D	A
acetamide	B	A	A	B	A
acetic acid 5%	A	B	A	A	A
acetic acid 30%	A	B	A	B	A
acetic acid, hot high press	C	D	C	D	A
acetic acid, glacial	B	D	B	D	A
acetic anhydride	C	D	B	D	A
acetone	B	D	A	D	A
acetophenone	D	D	A	D	A
acetyl acetone	D	D	A	D	A
acetyl chloride	C	A	D	A	A
acetylene	B	E	A	A	A
acetylene tetrabromide	E	E	A	A	A
acrylonitrile	D	D	D	D	A
adipic acid	E	A	E	E	A
aero lubriplate	B	A	D	A	A
aero safe 2300	C	C	A	D	A
aero safe 2300 w	C	C	A	D	A
aero shell IAC	B	A	D	A	A
aero shell 7 A grease	B	A	D	A	A
aero shell 17 grease	B	A	D	A	A
aero shell 750	D	B	D	A	A
aerozene 50	D	D	A	D	A
(50% hydrazine 50% UDMH)					
air-below 300° F	A	A	B	A	A
air-above 300° F	A	B	D	A	A
alkazene	D	B	D	B	A
alum NH3 Cr-K	A	E	A	D	A
aluminum acetate	D	D	A	D	A
aluminum bromide	A	A	A	A	A
aluminum chloride	B	A	A	A	A
aluminum fluoride	B	A	A	A	A
aluminum nitrate	B	E	A	A	A
aluminum phosphate	A	E	A	A	A
aluminum salts	A	A	A	A	A
aluminum sulfate	A	A	A	A	A
ambrex 33 mobile	D	C	D	A	A
amines, mixed	B	D	B	D	A
ammonia anhydrous(liquid)	C	D	A	D	A
ammonia gas, cold	A	A	A	D	A
ammonia gas, hot	A	D	B	D	A
ammonia & lichium	D	D	B	D	A
metali solution					
ammonium carbonate	E	E	A	E	A
ammonium chloride	E	E	A	A	A
ammonium hydroxide (concentrated)	A	B	A	B	A
ammonium nitrate	E	E	A	E	A
ammonium nitrite	B	E	A	E	A
ammonium persulfate solution	E	E	A	E	A

ammonium persulfate 10%	E	E	A	E	A
ammonium phosphate	A	E	A	E	A
ammonium phosphate, mono-basic	A	E	A	E	A
ammonium phosphate, dibasic	A	E	A	E	A
ammonium phosphate, tribasic	A	E	A	E	A
ammonium salts	A	C	A	C	A
ammonium sulfate	A	A	A	A	A
ammonium sulfide	E	E	A	D	A
amyl acetate	D	D	A	D	A
amyl alcohol	D	A	A	B	A
amyl borate	E	E	D	E	A
amyl chloride	D	B	D	A	A
amyl chloronaphthalene	D	B	D	A	A
amyl naphthalene	D	A	D	A	A
anderol L 774 (di-ester)	D	B	D	A	A
anderol L 826 (di-ester)	D	B	D	A	A
anderol L 829 (di-ester)	D	B	D	A	A
ang-25 (glycerol ester)	B	B	A	A	A
ang-25 (di-ester base)	B	B	D	A	A
anhydrous ammonia	B	D	A	D	A
anhydrous hydrazine	E	D	B	D	A
anhydrous hydrogen fluo	E	D	A	D	A
aniline	D	C	B	C	A
aniline dyes	C	B	B	B	A
aniline hydrochloride	D	B	C	B	A
aniline oils	D	C	B	C	A
animal fats	B	A	B	A	A
animal oil (lard oil)	B	A	B	A	A
AN-0-3 grade M	B	A	D	A	A
AN-0-6	D	A	D	A	A
AN-0-366	D	A	D	A	A
AN-V V-0-366 b hydrofluid	D	A	D	A	A
ansul ether	D	C	C	D	A
aqua regia	D	C	C	B	A
argon	B	B	A	A	A
aroclor 1248	B	B	B	A	A
aroclor 1254	C	B	B	A	A
aroclor 1260	A	A	E	A	A
aromatic fuel 50%	D	B	D	A	A
arsenic acid	A	A	A	A	A
arsenic trichloride	E	E	E	E	A
askatel	D	B	D	A	A
asphalt	D	B	D	A	A
ASTM oil #1	A	A	D	A	A
ASTM oil #2	D	A	D	A	A
ASTM oil #3	C	A	D	A	A
ASTM oil #4	D	B	D	A	A
ASTM reference fuel A	D	A	D	A	A
ASTM reference fuel B	D	A	D	A	A
ASTM reference fuel C	D	B	D	A	A
ATL-857	D	B	D	A	A
atlantic dominion F	D	A	D	A	A
aurex 903R mobil	D	D	D	A	A
automatic transmission fluid	D	E	D	A	A
automotive brake fluid	C	D	A	D	A

B

bardol B	D	B	E	A	A
barium chloride	A	A	A	A	A
barium hydroxide	A	A	A	A	A

barium salts	A	A	A	A	A
barium sulfate	A	A	A	A	A
barium sulfide	A	A	A	A	A
bayol D	D	A	D	A	A
beer	A	A	A	A	A
beet sugar liquors	A	A	A	A	A
benzaldehyde	D	D	A	D	A
benzene	D	A	D	A	A
benzene sulfonic acid	D	B	D	A	A
benzine	D	A	D	A	A
benzochloride	E	A	A	A	A
benzoic acid	B	B	D	A	A
benzophenone	E	A	B	A	A
benzyl alcohol	E	B	B	A	A
benzyl benzoate	E	A	B	A	A
benzyl chloride	D	A	D	A	A
black point 77	C	C	A	A	A
black sulphate liquors	B	B	B	A	A
blast furnace gas	A	B	D	A	A
bleach solution	B	B	A	A	A
borax	B	B	A	A	A
bordeaux mixture	B	B	A	A	A
boric acid	A	A	A	A	A
boron fluids (HEF)	D	B	D	A	A
brake fluid (non petroleum)	C	D	A	D	A
bray GG-130	D	B	D	A	A
brayco 719-R (VV-H-910)	B	B	A	D	A
brayco 885 MIL-L-6085 A	D	B	D	A	A
brayco 910	D	D	A	D	A
bret 710	D	D	A	D	A
brine	E	E	A	E	A
brom-113	D	E	D	E	A
brom-114	D	E	D	B	A
bromine	D	B	D	A	A
bromine anhydrous	C	B	E	A	A
bromine pentafluoride	D	D	D	D	A
bromine trifluoride	D	D	D	D	A
bromine water	D	B	D	A	A
bromobenzene	D	A	D	A	A
bromochloro trifluoroethane	D	B	D	A	A
bunker oil	B	A	D	A	A
butadiene	D	B	D	B	A
butane	D	A	D	A	A
butane 2,2-dimethyl	D	A	D	A	A
butane 2,3-dimethyl	D	A	D	A	A
butanol (butyl alcohol)	B	A	D	A	A
1-butane.2-ethyl	D	C	D	A	A
butter	B	A	B	A	A
butyl acetate	D	D	B	D	A
butyl acetyl ricinoleate	E	B	A	A	A
butyl acrylate	E	D	D	D	A
butyl alcohol	B	A	B	A	A
butyl amine	B	D	D	D	A
butyl benzoate	E	A	B	A	A
butyl butyrate	E	A	A	A	A
butyl carbitol	D	D	A	C	A
butyl cellosolve	E	D	A	D	A
butyl cellosolve adipate	B	B	B	B	A
butyl ether	D	C	C	D	A
butyl oleate	E	B	B	A	A
butyl stearate	E	B	B	A	A
butylene	D	B	D	A	A
butyraldehyde	D	D	B	D	A

COMPATIBILITY TABLE

Resistance to different products:
A - excellent
B - good
C - insufficient
D - unsatisfactory
E - please, consult

butyric acid

C

calceine liquors
 calcium acetate
 calcium bisulfite
 calcium carbonate
 calcium chloride
 calcium cyanide
 calcium hydroxide
 calcium hypochloride
 calcium hypochlorite
 calcium nitrate
 calcium phosphate
 calcium salts
 calcium silicate
 calcium sulfide
 calcium sulfite
 calcium thiosulfate
 caliche liquors
 cane sugar liquors
 caproic aldehyde
 carbanate
 carbitol
 carbolic acid
 carbon bisulfide
 carbon dioxide, dry
 carbon dioxide, wet
 carbon disulfide
 carbon monoxide
 carbon tetrachloride
 carbonic acid
 castor oil
 cellosolve
 cellosolve acetate
 cellosolve butyl
 celluguard
 cellulube A60 (now fyrquel)
 cellulube 90,100,150,220, 300 and 500
 cellutherm 2505A
 cetate (hexadecane)
 china wood oil (tung oil)
 chloracetic acid
 chlorodane
 chlorextol
 chlorinated salt brine
 chlorinated solvents, dry
 chlorinated solvents, wet
 chlorine, dry
 chlorine, wet
 chlorine dioxide
 chlorine dioxide (8%Cl as NAC102 in solution)
 chlorine trifluoride
 chloroacetone
 chloroacetic acid
 chlorobenzene

	S	F	B	V	P
	SILICONE	FLUOSIL	BUTYFLOOD	VITOSIL	PTFSIL
butyric acid	E	E	B	B	A
calceine liquors	E	A	A	A	A
calcium acetate	D	D	A	D	A
calcium bisulfite	A	A	D	A	A
calcium carbonate	A	A	A	A	A
calcium chloride	A	A	A	A	A
calcium cyanide	A	E	A	E	A
calcium hydroxide	A	A	A	A	A
calcium hypochloride	E	A	A	A	A
calcium hypochlorite	B	B	A	A	A
calcium nitrate	B	A	A	A	A
calcium phosphate	A	E	A	A	A
calcium salts	B	A	A	A	A
calcium silicate	E	E	A	A	A
calcium sulfide	B	A	A	A	A
calcium sulfite	A	A	A	A	A
calcium thiosulfate	A	A	A	A	A
caliche liquors	B	A	A	A	A
cane sugar liquors	A	A	A	A	A
caproic aldehyde	B	D	B	D	A
carbanate	E	A	B	A	A
carbitol	B	B	B	B	A
carbolic acid	D	A	B	A	A
carbon bisulfide	E	A	D	A	A
carbon dioxide, dry	B	B	B	B	A
carbon dioxide, wet	B	B	B	B	A
carbon disulfide	E	A	D	A	A
carbon monoxide	A	B	A	A	A
carbon tetrachloride	D	A	D	A	A
carbonic acid	A	A	A	A	A
castor oil	A	A	B	A	A
cellosolve	D	D	B	D	A
cellosolve acetate	D	D	B	D	A
cellosolve butyl	D	D	B	D	A
celluguard	A	A	A	A	A
cellulube A60 (now fyrquel)	E	C	A	B	A
cellulube 90,100,150,220, 300 and 500	A	B	A	A	A
cellutherm 2505A	E	B	D	A	A
cetate (hexadecane)	D	C	D	A	A
china wood oil (tung oil)	D	B	C	A	A
chloracetic acid	E	D	B	D	A
chlorodane	D	B	D	A	A
chlorextol	D	B	D	A	A
chlorinated salt brine	D	A	D	A	A
chlorinated solvents, dry	D	A	D	A	A
chlorinated solvents, wet	D	A	D	A	A
chlorine, dry	D	A	D	A	A
chlorine, wet	E	B	C	A	A
chlorine dioxide	E	B	C	A	A
chlorine dioxide (8%Cl as NAC102 in solution)	E	B	D	A	A
chlorine trifluoride	D	B	D	D	A
chloroacetone	D	D	A	D	A
chloroacetic acid	E	E	B	E	A
chlorobenzene	D	B	D	A	A

chl orobenzene (mono)
 chlorobromo methane
 chlorobutadiene
 chlorododecane
 chloroform
 O-chloroaphtanene
 l-chloro- l-nitro ethane
 chlorosulfonic acid
 chlorotoluene
 chlorox
 O-chlorophenol
 chrome alum
 chrome plating solution
 chromic acid
 chromic oxide 88 Wt, % aqueous solution
 circo light process oil
 citric acid
 city service koolmotor-AP gear oil 140 E, P, Lube
 city service pacemaker #2
 city service #65, #120, #250
 cobalt chloride
 cobalt chloride, 2N
 cocoanut oil
 cod liver oil
 coffee
 coke oven gas
 coliche liquors
 convelex 10
 coolanol (monsanto)
 coolanol 45 (monsanto) +A269
 copper acetate
 copper chloride
 copper cyanide
 copper salts
 copper sulfate
 copper sulfate 10%
 copper sulfate 50%
 corn oil
 cottonseed oil
 creosols
 creosote
 creosote, coal tar
 creosote, wood
 creosylic acid
 crude oil
 cumene
 cutting oil
 cyclohexane
 cyclohexanol
 cyclohexanone
 P-cymene

D

decalin
 decane
 delco brake fluid
 denatured alcohol
 detergent solutions
 developing fluids (photo)
 dextron
 diacetone
 diacetone alcohol
 diazinon
 dibenzyl ether
 dibenzyl sebacate
 dibromoethyl benzene
 dibutylamine

	S	F	B	V	P
chl orobenzene (mono)	D	B	D	A	A
chlorobromo methane	D	B	B	B	A
chlorobutadiene	D	B	D	A	A
chlorododecane	D	A	D	A	A
chloroform	D	B	D	A	A
O-chloroaphtanene	D	B	D	A	A
l-chloro- l-nitro ethane	D	D	D	C	A
chlorosulfonic acid	D	D	D	C	A
chlorotoluene	D	B	D	A	A
chlorox	E	A	B	A	A
O-chlorophenol	D	B	D	A	A
chrome alum	A	E	A	A	A
chrome plating solution	B	B	D	A	A
chromic acid	C	C	C	A	A
chromic oxide 88 Wt, % aqueous solution	B	B	B	A	A
circo light process oil	D	A	D	A	A
citric acid	A	A	A	A	A
city service koolmotor-AP gear oil 140 E, P, Lube	D	A	D	A	A
city service pacemaker #2	D	A	D	A	A
city service #65, #120, #250	D	A	D	A	A
cobalt chloride	B	A	A	A	A
cobalt chloride, 2N	A	A	A	A	A
cocoanut oil	A	A	C	A	A
cod liver oil	B	A	A	A	A
coffee	A	A	A	A	A
coke oven gas	B	B	D	A	A
coliche liquors	E	E	B	E	A
convelex 10	D	E	E	E	A
coolanol (monsanto)	D	B	D	A	A
coolanol 45 (monsanto) +A269	D	B	D	A	A
copper acetate	D	D	A	D	A
copper chloride	A	A	A	A	A
copper cyanide	A	A	A	A	A
copper salts	A	A	A	A	A
copper sulfate	A	A	B	A	A
copper sulfate 10%	A	A	B	A	A
copper sulfate 50%	A	A	B	A	A
corn oil	A	A	C	A	A
cottonseed oil	A	A	C	A	A
creosols	D	B	D	A	A
creosote	D	C	D	A	A
creosote, coal tar	D	A	D	A	A
creosote, wood	D	A	D	A	A
creosylic acid	D	B	D	A	A
crude oil	D	B	D	A	A
cumene	D	B	D	A	A
cutting oil	D	A	D	A	A
cyclohexane	D	A	D	A	A
cyclohexanol	D	A	D	A	A
cyclohexanone	D	D	B	D	A
P-cymene	D	B	D	A	A
decalin	D	A	D	A	A
decane	B	A	D	A	A
delco brake fluid	C	D	A	D	A
denatured alcohol	A	A	A	A	A
detergent solutions	A	A	A	A	A
developing fluids (photo)	A	A	B	A	A
dextron	D	B	D	A	A
diacetone	D	D	A	D	A
diacetone alcohol	D	D	A	D	A
diazinon	D	B	D	B	A
dibenzyl ether	E	E	B	D	A
dibenzyl sebacate	C	C	B	B	A
dibromoethyl benzene	D	B	D	A	A
dibutylamine	C	D	D	D	A

dibutyl ether
 dibutyl phthalate
 dibutyl sebacate
 O-dichlorobenzene
 P-dichlorobenzene
 dichloro-butane
 dichloro-isopropyl ether
 dicyclohexylamine
 diesel oil
 di-ester lubricant MIL-L-7808D
 di-ester synthetic lubricants
 diethylamine
 diethyl benzene
 diethyl ether
 diethyl sebacate
 diethylene glycol
 difluorodibromomethane
 diisobutylene
 diisooctyl sebacate
 diisopropyl benzene
 diisopropyl ketone
 dimethyl aniline
 dimethyl formamide
 dimethyl phthalate
 dinitro toluene
 dioctyl phthalate
 dioctyl sebacate
 dioxane
 dioxolane
 dipentene
 diphenyl
 diphenyl oxides
 dow chemical 50-4
 dow chemical ET378
 dow chemical ET588
 dow corning-3
 dow corning-4
 dow corning-5
 dow corning-11
 dow corning-33
 dow corning-44
 dow corning-55
 dow corning-200
 dow corning-220
 dow corning-510
 dow corning-550
 dow corning-704
 dow corning-705
 dow corning-710
 dow corning-1208
 dow corning-4050
 dow corning-6620
 dow corning-F60
 dow corning-F61
 dow corning-XF60
 dow guard
 dowtherm oil
 dowtherm A or E
 dowtherm 209.50% solution
 driking water
 dry cleaning fluids
 DTE light oil

E

elco 28-EP lubricant
 epichlorohydrin
 epoxy resins
 esam-6 fluid
 esso fuel 208
 esso golden gasoline

	S	F	B	V	P
dibutyl ether	D	C	C	C	A
dibutyl phthalate	B	C	C	B	A
dibutyl sebacate	B	B	B	B	A
O-dichlorobenzene	D	B	D	A	A
P-dichlorobenzene	D	E	D	E	A
dichloro-butane	D	B	D	A	A
dichloro-isopropyl ether	D	C	C	C	A
dicyclohexylamine	E	D	D	D	A
diesel oil	D	A	D	A	A
di-ester lubricant MIL-L-7808D	B	D	B	D	A
di-ester synthetic lubricants	D	B	D	A	A
diethylamine	B	D	B	D	A
diethyl benzene	D	C	D	A	A
diethyl ether	D	C	D	D	A
diethyl sebacate	B	B	B	B	A
diethylene glycol	B	B	A	A	A
difluorodibromomethane	D	E	B	E	A
diisobutylene	D	C	D	A	A
diisooctyl sebacate	C	C	C	B	A
diisopropyl benzene	E	B	D	A	A
diisopropyl ketone	D	D	A	D	A
dimethyl aniline	E	D	B	D	A
dimethyl formamide	B	D	B	D	A
dimethyl phthalate	E	B	B	B	A
dinitro toluene	D	D	D	D	A
dioctyl phthalate	C	B	B	B	A
dioctyl sebacate	C	C	B	B	A
dioxane	D	D	B	D	A
dioxolane	D	D	B	D	A
dipentene	A	D	D	A	A
diphenyl	D	B	D	A	A
diphenyl oxides	C	B	D	A	A
dow chemical 50-4	E	D	A	D	A
dow chemical ET378	D	E	E	E	A
dow chemical ET588	E	D	B	D	A
dow corning-3	C	A	A	A	A
dow corning-4	C	A	A	A	A
dow corning-5	C	A	A	A	A
dow corning-11	C	A	A	A	A
dow corning-33	C	A	A	A	A
dow corning-44	C	A	A	A	A
dow corning-55	C	A	A	A	A
dow corning-200	C	A	A	A	A
dow corning-220	C	A	A	A	A
dow corning-510	C	A	A	A	A
dow corning-550	C	A	A	A	A
dow corning-704	E	E	A	A	A
dow corning-705	E	E	A	A	A
dow corning-710	C	A	A	A	A
dow corning-1208	C	A	A	A	A
dow corning-4050	C	A	A	A	A
dow corning-6620	C	A	A	A	A
dow corning-F60	C	A	A	A	A
dow corning-F61	B	A	A	A	A
dow corning-XF60	C	A	A	A	A
dow guard	A	A	A	A	A
dowtherm oil	B	A	D	A	A
dowtherm A or E	D	B	D	A	A
dowtherm 209.50% solution	C	E	A	D	A
driking water	A	A	A	A	A
dry cleaning fluids	D	B	D	A	A
DTE light oil	D	A	D	A	A
elco 28-EP lubricant	B	A	D	A	A
epichlorohydrin	D	D	B	D	A
epoxy resins	E	E	A	D	A
esam-6 fluid	E	D	A	D	A
esso fuel 208	B	A	D	A	A
esso golden gasoline	D	A	D	A	A

Resistance to different products:
A - excellent
B - good
C - insufficient
D - unsatisfactory
E - please, consult

	S	F	B	V	P
	SILICONE				
	FLUOSIL				
	BUTYFLOOD				
	VITOSIL				
	PTFSIL				
palmitic acid	D	A	B	A	A
para-dichlorobenzene	D	B	D	A	A
par-al-keton	D	D	D	D	A
parker o lube	B	A	D	A	A
peanut oil	A	A	C	A	A
pentane 2 methyl	D	C	D	A	A
pentane, 2-4 dimethyl	D	C	D	A	A
pentane, 3 dimethyl	D	C	D	A	A
N-pentane	D	C	D	A	A
perchloric acid	D	A	B	A	A
perchloroethylene	D	B	D	A	A
petroleum oil, crude	D	A	D	A	A
petroleum oil, below 250°F	B	D	A	A	A
petroleum oil, above 250°F	D	D	D	B	A
phenol	D	B	B	A	A
phenol, 70%/30%H2O	D	B	D	A	A
phenol, 85%/15%H2O	D	B	D	A	A
phenylbenzene	D	B	D	A	A
phenyl ethy ether	D	D	D	D	A
phenyl hydrazine	E	E	D	A	A
phorone	D	D	B	D	A
phosphoric acid 20%	B	B	A	A	A
phosphoric acid 45%	D	B	B	A	A
phosphoric acid 3 molar	B	B	A	A	A
phosphoric acid concent.	C	B	B	A	A
phosphorus trichloride	E	A	A	A	A
pickling solution	D	D	C	B	A
picric acid H2O solution	D	B	B	A	A
picric acid molten	D	B	B	A	A
pinene	D	B	D	A	A
pine oil	D	A	D	A	A
piperidine	D	D	D	D	A
plating solutions, chrome	D	E	A	A	A
plating solutions, other	D	E	A	A	A
pneumatic service	D	D	A	A	A
polyvinyl acetate emulsion	D	E	A	E	A
potassium acetate	D	B	A	D	A
potassium chloride	A	A	A	A	A
potassium cupro cyanide	A	A	A	A	A
potassium cyanide	A	A	A	A	A
potassium dichromate	A	A	A	A	A
potassium hydroxide	C	C	A	B	A
potassium nitrate	A	A	A	A	A
potassium salts	A	A	A	A	A
potassium sulphate	A	A	A	A	A
potassium sulphite	A	A	A	A	A
prestone antifreeze	A	A	A	A	A
PRL-high temp.hydr.oil	B	A	D	A	A
producer gas	B	B	D	A	A
propane	D	B	D	A	A
propane propionitrile	D	C	D	A	A
propyl acetate	D	D	B	D	A
N-propyl acetone	D	D	A	D	A
propyl alcohol	A	A	A	A	A
propyl nitrate	D	D	B	D	A

S

shell diala	D	A	D	A	A
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shell iris 905	D	A	D	A	A
shell iris 3XF mine fluid (fire resist.hydr.)	E	A	D	A	A
shell iris tellus #2 pet.base	D	A	D	A	A
shell iris tellus #33	D	A	D	A	A
shell iris tellus UMF (5%aromatic)	D	A	D	A	A
shell Lo hydrax 27 & 29	D	A	D	A	A
shell macoma 72	D	A	D	A	A
silicate esters	D	A	D	A	A
silicone greases	C	A	A	A	A
silicone oils	C	A	A	A	A
silver nitrate	A	A	A	A	A
sinclair,opaline CX-EPLube	D	A	D	A	A
skelly, solvent B,C,E	E	A	D	A	A
skydrol 500	C	C	A	D	A
skydrol 7000	C	C	A	B	A
soap solution	A	A	A	A	A
socony mobile type A	D	B	D	A	A
socony vacuum AMV AC781 (grease)	D	B	D	A	A
socony vacuum PD959B	D	A	D	A	A
soda ash	A	A	A	A	A
sodium acetate	D	D	A	D	A
sodium bicarbonate (baking soda)	A	A	A	A	A
sodium bisulfite	A	A	A	A	A
sodium borate	A	A	A	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	B	A	B	A
sodium hydrochlorite	B	B	B	A	A
sodium metaphosphate	E	A	A	A	A
sodium nitrate	D	E	A	E	A
sodium perborate	B	A	A	A	A
sodium peroxide	D	A	A	A	A
sodium phosphate (mono)	D	E	A	A	A
sodium phosphate (dibasic)	D	E	A	A	A
sodium phosphate (tribasic)	A	E	A	A	A
sodium salts	A	A	A	A	A
sodium silicate	E	E	A	A	A
sodium sulphate	A	A	A	A	A
sodium sulphide	A	A	A	A	A
sodium sulphite	A	A	A	A	A
sodium trisulfate	A	A	A	A	A
sovasol #1, 2 & 3	D	A	D	A	A
sovasol # 73 & 74	D	A	D	A	A
soybean oil	A	A	C	A	A
spry	A	A	B	A	A
SR-6 fuel	D	A	D	A	A
SR-10 fuel	D	A	D	A	A
standard oil mobilube GX90-EP lube	D	A	D	A	A
stannic chloride	B	A	B	A	A
stannic chloride 50%	B	A	B	A	A
stannous chloride	B	A	A	A	A
stauffer 7700	D	B	D	A	A
steam, below 350°F	D	D	A	D	A
steam, above 350°F	D	D	C	D	A
stearic acid	B	E	B	E	A
stoddard solvent	D	A	D	A	A

T

TT-S-735, type II	D	A	D	A	A
TT-S-735, type II	D	A	D	A	A
TT-S-735,type III	D	A	D	A	A
TT-S-735, type IV	C	A	D	A	A
TT-S-735, type V	C	A	D	A	A

TT-S-735, type VI	C	A	D	A	A
TT-T-656b	D	C	A	D	A
tannic acid	B	E	A	A	A
tannic acid 10%	B	A	A	A	A
tar bituminous	B	A	D	A	A
tartaric acid	A	A	B	A	A
terpineol	E	A	C	A	A
tertiary butyl alcohol	B	B	B	A	A
tertiary butyl catechol	E	A	B	A	A
tertiary butyl mercaptan	D	E	D	A	A
tetrabromomethane	D	B	D	A	A
tertabutyl titanate	E	A	A	A	A
tetrachloroethylene	E	B	D	A	A
tetraethyl lead	E	E	D	A	A
"tetraethyl lead" blend	E	E	B	D	A
tetrahydrofuran	E	E	B	D	A
tetralin	D	A	D	A	A
texaco 3450 gear oil	D	A	D	A	A
texaco capella A & AA	D	A	D	A	A
texaco meropa #3	D	A	D	A	A
texaco regal B	D	A	D	A	A
texaco uni-temp grease	B	A	D	A	A
texamatic "A" trans.oil"	D	B	D	A	A
texamatic 1581 fluid	D	B	D	A	A
texamatic 3401 fluid	D	B	D	A	A
texamatic 3525 fluid	D	B	D	A	A
texamatic 3528 fluid	D	B	D	A	A
texas 1500 oil	B	A	D	A	A
thiodol TP-90B	E	B	A	A	A
thiodol TP-95	E	B	A	A	A
thionyl chloride	E	E	D	A	A
tidewater oil-beedol	B	A	D	A	A
tidewater oil multigear 140, EP lube	E	A	D	A	A
titanium tetrachloride	E	B	D	A	A
toluene	E	B	D	A	A
toluene discocyanids	E	D	B	D	A
transformer oil	B	A	D	A	A
transmission fluid type A	B	A	D	A	A
triacetin	E	D	A	D	A
triaryl phosphate	C	B	A	A	A
tributoxyethyl phosphate	E	B	A	A	A
tributyl mercaptan	D	C	D	A	A
tributyl phosphate	E	D	A	D	A
trichloroacetic acid	E	D	B	C	A
trichloroethane	D	E	D	A	A
trichloroethylene	D	B	D	A	A
tricresyl phosphate	C	B	A	B	A
triethanol amine	E	D	B	D	A
triethyl aluminum	E	E	E	B	A
triethyl borane	E	E	E	A	A
trifluoroethane	D	B	D	A	A
trinitroluene	E	B	D	B	A
trioctyl phosphate	C	B	A	B	A
tripoly phosphate	C	B	A	B	A
tung oil (china wood oil)	D	B	D	A	A

X

xylene	D	A	D	A	A
syldipenes-mixed-aromatic amines	D	D	D	D	A
xylo	D	A	D	A	A
xenon	A	A	A	A	A

Z

zeolites	E	A	A	A	A
zinc acetate	D	D	A	D	A
zinc chloride	E	A	A	A	A
zinc salts	A	A	A	A	A
zinc sulfate	A	A	A	A	A