

SILICONE TUBING FOR MEDICAL AND PHARMACEUTICAL APPLICATIONS



The world's leading pharmaceutical and medical device companies rely on HelixMark to provide an extensive selection of high-quality silicone tubing and fluid handling products.

All HelixMark products are clean room manufactured in compliance with medtech and pharmaceutical industry requirements.

The following criteria apply to all articles of this program:

- Materials approved in accordance with USP Class VI, ISO 10993-1, FDA 21CFR 177-2600 and EP 3.1.9 or EP 3.1.9 without appearance of solution
- Exclusive utilization of platinum-cured silicone
- Production and packaging in ISO Class 8 clean rooms
- Certified manufacturing in compliance with ISO 13485 quality standards
- Sterilizable in autoclaves, with ethylene oxide and by gamma irradiation
- Material certification in every package
- Lot traceability
- Double bagged and box packaging
- Off-the-shelf availability guarantees short delivery times

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• Customer-specific solutions available outside the HelixMark standard product portfolio



HELIXMARK[®] STANDARD TUBING

HelixMark standard silicone tubing meets the needs of a broad range of applications and is universally applicable for the transfer of fluids under standard requirements. The tubing is offered in four types of silicone elastomer: Dow Corning, Wacker, NuSil, and Momentive. Individually packed in pre-cut lengths of 50 feet.

		SIDE METER		SIDE NETER		ALL (NESS	DOW CORNING ISO, FDA, USP, EP	WACKER ISO, FDA, EP	NUSIL ISO, USP, EP	MOMENTIVE USP, FDA
	inch	mm	inch	mm	inch	mm	REF	REF	REF	REF
	.012	0.31	.025	0.64	.006	0.15	60-011-01	60-411-40	60-795-01	60-805-01
	.020	0.51	.037	0.94	.008	0.20	60-011-02	60-411-41	60-795-02	60-805-02
	.025	0.64	.047	1.19	.011	0.28	60-011-03	60-411-42	60-795-03	60-805-03
	.030	0.76	.065	1.65	.018	0.46	60-011-04	60-411-43	60-795-04	60-805-04
	.040	1.02	.085	2.16	.023	0.58	60-011-05	60-411-44	60-795-05	60-805-05
	.058	1.47	.077	1.96	.009	0.23	60-011-06	60-411-45	60-795-06	60-805-06
	.062	1.58	.095	2.41	.016	0.41	60-011-07	60-411-46	60-795-07	60-805-07
	.062	1.58	.125	3.18	.032	0.81	60-011-08	60-411-47	60-795-08	60-805-08
	.078	1.98	.125	3.18	.024	0.61	60-011-09	60-411-48	60-795-09	60-805-09
	.104	2.64	.192	4.88	.044	1.12	60-011-10	60-411-49	60-795-10	60-805-10
	.132	3.35	.183	4.65	.026	0.66	60-011-11	60-411-50	60-795-11	60-805-11
	.125	3.18	.250	6.35	.063	1.59	60-011-21	60-411-51	60-795-21	60-805-21
Values listed are typical and may vary. Typical hardness:	.188	4.76	.313	7.94	.063	1.59	60-011-22	60-411-52	60-795-22	60-805-22
50 Shore A and 60 Shore A. 50 foot coils (~15 m).	.188	4.76	.375	9.53	.094	2.38	60-011-23	60-411-53	60-795-23	60-805-23
Packaged double bagged	.250	6.35	.375	9.53	.063	1.59	60-011-24	60-411-54	60-795-24	60-805-24
in boxes. Material certificate and lot traceability docu-	.250	6.35	.438	11.11	.094	2.38	60-011-25	60-411-55	60-795-25	60-805-25
ments included in every box.*	.250	6.35	.500	12.70	.125	3.18	60-011-26	60-411-56	60-795-26	60-805-26
IN ACCORDANCE WITH	.313	7.94	.500	12.70	.094	2.38	60-011-27	60-411-57	60-795-27	60-805-27
ISO: ISO 10993-1 FDA: FDA 21CFR 177-2600	.375	9.53	.500	12.70	.063	1.59	60-011-28	60-411-58	60-795-28	60-805-28
USP: USP-CLASS VI EP: EP 3.1.9	.375	9.53	.563	14.29	.094	2.38	60-011-29	60-411-59	60-795-29	60-805-29
(EP): EP 3.1.9 without	.375	9.53	.625	15.88	.125	3.18	60-011-30	60-411-60	60-795-30	60-805-30
appearance of solution	.500	12.70	.688	17.46	.094	2.38	60-011-31	60-411-61	60-795-31	60-805-31
* Individual measured values	.500	12.70	.750	19.05	.125	3.18	60-011-32	60-411-62	60-795-32	60-805-32
may differ from mean values. These values are not	.625	12.70	.875	22.23	.125	3.18	60-011-33	60-411-63	60-795-33	60-805-33
to be considered as product	.625	15.88	.938	23.82	.156	3.97	60-011-34	60-411-64	60-795-34	60-805-34
specifications. Non-implant- able, non-sterile.	.750	19.05	1.000	25.40	.125	3.18	N/A	60-411-65	N/A	N/A

TYPICAL MATERIAL PROPERTIES AS CURED				
Specific Gravity [g/cm³]	1.16	1.15	1.14	1.15
Durometer Hardness, Shore A	50	60	50	50
Tear Strength, Die B, ppi	262	218	230	270
Tensile Strength, Die C, psi	1473	1385	1350	1400
Elongation [%]	903	771	810	880

HELIXMARK[®] PERISTALTIC PUMP TUBING

HelixMark peristaltic pump tubing is designed and manufactured for use with peristaltic pumps and other applications with higher effective forces. A special production process designed to meet these requirements ensures that the products provide greater stability and capacity to withstand high stress. Offered in a range of sizes suitable for use with all commonly used pump types. The tubing is individually packaged in pre-cut lengths of 25 feet.



ISO, FDA, USP	FITS PUMP TUBE SIZE		WA ТНІСК	SIDE IETER	OUT DIAN		INS DIAM
REF		mm	inch	mm	inch	mm	inch
60-825-15	#112	1.60	.063	3.71	.146	0.51	.020
60-825-23	#13	1.60	.063	3.99	.157	0.79	.031
60-825-27		0.31	.012	1.60	.063	0.99	.039
60-825-37		0.51	.020	2.52	.099	1.50	.059
60-825-43	#14	1.60	.063	4.80	.189	1.60	.063
60-825-45	#119	2.39	.094	6.38	.251	1.60	.063
60-825-51		0.51	.020	3.02	.119	2.01	.079
60-825-63		0.51	.020	3.53	.139	2.52	.099
60-825-70		0.51	.020	4.01	.158	3.00	.118
60-825-79	#16	1.60	.063	6.38	.251	3.18	.125
60-825-82	#120	2.39	.094	7.95	.313	3.18	.125
60-825-93		0.71	.028	5.44	.214	4.01	.158
60-825-104	#25	1.60	.063	7.98	.314	4.78	.188
60-825-108	#15	2.39	.094	9.55	.376	4.78	.188
60-825-110	#15TW	2.54	.100	9.86	.388	4.78	.188
60-825-112	#123	3.18	.125	11.13	.438	4.78	.188
60-825-130	#17	1.60	.063	9.55	.376	6.35	.250
60-825-133	#24	2.39	.094	11.13	.438	6.35	.250
60-825-136	#24TW	2.54	.100	11.43	.450	6.35	.250
60-825-139	#26	3.18	.125	12.70	.500	6.35	.250
60-825-141	#26TW	3.43	.135	13.21	.520	6.35	.250
60-825-160	#18	1.60	.063	11.15	.439	7.95	.313
60-825-163	#35/121	2.39	.094	12.73	.501	7.95	.313
60-825-166	#185	4.01	.158	15.98	.629	7.95	.313
60-825-191	#36/122	2.39	.094	14.30	.563	9.53	.375
60-825-194	#73	3.18	.125	15.88	.625	9.53	.375
60-825-197	#73TW	3.43	.135	16.38	.645	9.53	.375
60-825-200	#70/190	4.75	.187	19.03	.749	9.53	.375
60-825-230	#186	4.01	.158	20.03	.789	12.01	.473
60-825-243	#82	3.18	.125	19.05	.750	12.70	.500
60-825-245	#82TW	3.43	.135	19.56	.770	12.70	.500
60-825-248	#88	4.75	.187	22.20	.874	12.70	.500
60-825-262	#184	3.18	.125	22.23	.875	15.88	.625
60-825-270	#189	4.75	.187	25.38	.999	15.88	.625
60-825-288	#187	4.01	.158	24.03	.946	16.00	.630
60-825-310	#191	4.75	.187	28.55	1.124	19.05	.750
60-825-420	#92	4.75	.187	34.90	1.374	25.40	1.000
60-825-428	#92TW	5.08	.200	35.56	1.400	25.40	1.000

Values listed are typical. Typical hardness: 60 Shore A. TW = Thick Wall (variance between competition pump numbers), 25 foot coils (~7 m). Packaged double bagged in boxes. Material certification and lot traceability documents included in every box.*

IN ACCORDANCE WITH ISO: ISO 10993-1 FDA: FDA 21CFR 177-2600 USP: USP-CLASS VI EP: EP 3.1.9 (EP): EP 3.1.9 without

appearance of solution
* Individual measured values

may differ from mean values. These values are not to be considered as product specifications. Non-implantable, non-sterile.

HELIXMARK[®] BRAIDED REINFORCED TUBING

HelixMark braided reinforced tubing is designed and manufactured for increased pressure and high temperature applications. Pressure-proof polyester braiding, firmly embedded between two layers of silicone, lends this tubing its particular durability and resistance to pressure. The tubing is individually packaged in pre-cut lengths of 25 feet.



	DE NETER	OUTSIDE DIAMETER		MIN BURST	ISO, FDA, USP, EP
inch	mm	inch	mm	PSI	REF
.125	3.18	.365	9.27	705	60-664-20
.187	4.76	.447	11.35	655	60-664-30
.250	6.35	.520	13.21	630	60-664-40
.312	7.93	.592	15.04	555	60-664-45
.375	9.53	.655	16.64	505	60-664-50
.500	12.70	.800	20.32	430	60-664-60
.625	15.88	.965	24.51	355	60-664-70
.750	15.88	1.100	27.94	280	60-664-80
.875	22.23	1.235	31.37	255	60-664-90
1.000	25.40	1.360	27.94	230	60-664-100

Values listed are typical. Typical hardness: 65 Shore A. 25 foot coils (~7 m). Packaged double bagged in boxes. Material certification and lot traceability documents included in every box* Minimum burst pressure measured at 70°F (21°C).

IN ACCORDANCE WITH ISO: ISO 10993-1 FDA: FDA 21CFR 177-2600 USP: USP-CLASS VI EP: EP 3.1.9 (EP): EP 3.1.9 without appearance of solution

* Individual measured values may differ from mean values. These values are not to be considered as product specifications. Non-implantable, non-sterile.



HELIXMARK[®] COLOR STRIPE TUBING

HelixMark color stripe tubing helps to maintain a clear overview in complex tubing systems and enables quick and easy identification of individual applications, sizes or functional configurations. The tubing is available with stripes in red, green and white, individually packaged in pre-cut lengths of 50 feet.

Values listed are typical. Typical hardness: 60 Shore A. 50 foot coils (~15 m). Packaged double bagged in boxes. Material certification and lot traceability documents included in every box.

IN ACCORDANCE WITH ISO: ISO 10993-1 FDA: FDA 21CFR 177-2600 USP: USP-CLASS VI EP: EP 3.1.9 (EP): EP 3.1.9 without appearance of solution

al. nore A. ged in		IDE AETER		SIDE NETER	W/ THICK		RED STRIPE ISO, FDA, USP	GREEN STRIPE ISO, FDA, USP	WHITE STRIPE ISO, FDA, USP
, cation	inch	mm	inch	mm	inch	mm	REF	REF	REF
tu- ry box.*	.125	3.18	.250	6.35	.063	1.59	61-078-21	61-079-21	61-080-21
ЛТН	.188	4.76	.375	9.53	.094	2.38	61-078-23	61-079-23	61-080-23
	.250	6.35	.500	12.70	.125	3.18	61-078-26	61-079-26	61-080-26
2600	.313	7.94	.500	12.70	.094	2.38	61-078-27	61-079-27	61-080-27
t	.375	9.53	.625	15.88	.125	3.18	61-078-30	61-079-30	61-080-30
	.500	12.70	.750	19.05	.125	3.18	61-078-32	61-079-32	61-080-32



HELIXMARK[®] CLOSE TOLERANCE TUBING

HelixMark close tolerance silicone tubing maintains particularly tight tolerances with regard to inner diameter and wall thickness and is subjected to stringent quality assurance measures in production. This ensures increased dosing precision in demanding applications. The tubing is individually packaged in pre-cut lengths of 50 feet.

Values listed are typical. Typical hardness: 50 Shore A. 50 foot coils (~15 m). Packaged double bagged in boxes.* Material certification and lot traceability documents included in every box.

IN ACCORDANCE WITH	
ISO: ISO 10993-1	
FDA: FDA 21CFR 177-2600	
USP: USP-CLASS VI	
EP: EP 3.1.9	
(EP): EP 3.1.9 without	
appearance of solution	or

* Individual measured values may differ from mean values These values are not to be considered as product specifications. Non-implantable, non-sterile.

A.						
n on	INS DIAM			SIDE NETER	WALL THICKNESS	ISO, FDA, USP, EP
	inch	mm	inch	mm	bar	REF
DX.	.125	3.18	.250	6.35	1.59	60-111-21
I	.188	4.76	.313	7.95	1.60	60-111-22
0	.250	6.35	.375	9.53	1.59	60-111-24
	.250	6.35	.438	11.13	2.39	60-111-25
ion	.375	9.53	.563	14.29	2.38	60-111-29
S	.375	9.53	.625	15.88	3.18	60-111-30
ies.	.500	12.70	.688	17.48	2.39	60-111-31
C-	.500	12.70	.750	19.05	3.18	60-111-32
е,	.625	15.88	.875	22.23	3.18	60-111-33



HELIXMARK[®] PHARMAFOCUS[®] TUBING

HelixMark PharmaFocus tubing is manufactured with a platinum-cured silicone that was developed especially to meet the needs of the pharmaceutical industry. The tubing is individually packaged in pre-cut lengths of 50 feet.

INS DIAM			SIDE NETER	WALL THICKNESS		ISO, FDA, USP, EP
inch	mm	inch	mm	inch	mm	REF
.125	3.18	.250	6.35	.063	1.59	61-252-21
.188	4.76	.313	7.94	.063	1.59	61-252-22
.188	4.76	.375	9.53	.094	2.38	61-252-23
.250	6.35	.438	11.11	.094	2.38	61-252-25
.250	6.35	.500	12.70	.125	3.18	61-252-26
.313	7.94	.500	12.70	.094	2.38	61-252-27
.375	9.53	.625	15.88	.125	3.18	61-252-30
.500	12.70	.750	19.05	.125	3.18	61-252-32
.625	15.88	.875	22.23	.125	3.18	61-252-33
.750	15.88	1.000	22.23	.125	3.18	61-252-35
1.000	19.05	1.500	25.40	.250	6.35	61-252-36

Values listed are typical. Typical hardness: 50 Shore A. 50 foot coils (~15 m). Packaged double bagged in boxes. Material certification and lot traceability documents included in every box.*

IN ACCORDANCE WITH ISO: ISO 10993-1 FDA: FDA 21CFR 177-2600 USP: USP-CLASS VI EP: EP 3.1.9 (EP): EP 3.1.9 without appearance of solution



HELIXMARK[®] CLAMP GASKETS

HelixMark clamp gaskets ensure reliable sealing of radial plug-in connectors. The gaskets are suitable for all commonly used diameters and sizes and are supplied in packages of 25.

ТҮРЕ		SIDE METER	ISO, FDA, USP, EP
	inch	mm	REF
Mini	0.5	12.70	70-400-05
Mini	0.75	19.05	70-400-07
Standard	1.0	25.40	70-400-10
Standard	1.5	38.10	70-400-15
Standard	2.0	50.80	70-400-20
Standard	2.5	63.50	70-400-25
Standard	3.0	76.20	70-400-30
Standard	4.0	101.60	70-400-40
Standard	6.0	152.40	70-400-60

Values listed are typical. Typical hardness: 80 Shore A. Please contact customer service for tolerances and for custom size requests. Packaged 25 per zip bag in crush-resistant boxes.* Material Certification and Lot Traceability included. Not for implantation. Nonsterile.

IN ACCORDANCE WITH ISO: ISO 10993-1 FDA: FDA 21CFR 177-2600 USP: USP-CLASS VI EP: EP 3.1.9 (EP): EP 3.1.9 without appearance of solution

* Individual measured values may differ from mean values. These values are not to be considered as product specifications. Non-implantable, non-sterile.



HELIXMARK[®] **STOPPERS**

HelixMark silicone stoppers enable reliable sealing of glass tubes, vials and flasks. The stoppers are suitable for all commonly used diameters and sizes and are supplied in packages of 12.

Values listed Typical hard Please conta service for to custom size Packaged 12 crush-resista Material Cer Lot Traceabil Not for impl Nonsterile.

IN ACCORE ISO: ISO 10 FDA: FDA 21 USP: USP-CL EP: EP 3.1.9 (EP): EP 3.1.9 appea of solu

* Individual m may differ fr These values considered a ifications. N non-sterile.

	sz	TC DIAM		BOTT DIAM		HEIC	бнт	ISO, FDA, USP, EP
ed are typical. dness: 50 Shore A.		inch	mm	inch	mm	inch	mm	REF
tact customer	000	.512	13	.315	8	.984	25	70-416-99
tolerances and e requests.	00	.519	15	.394	10	.984	25	70-416-90
.2 per zip bag in tant boxes.*	0	.669	17	.669	13	.984	25	70-416-00
tant boxes." ertification and	1	.748	19	.787	14	.984	25	70-416-01
pility included. plantation.	2	.787	20	.945	16	.984	25	70-416-02
	3	.945	24	1.024	18	.984	25	70-416-03
RDANCE WITH	4	1.024	26	1.063	20	.984	25	70-416-04
.0993-1 21CFR 177-2600	5	1.063	27	1.260	23	.984	25	70-416-05
CLASS VI 1.9	6	1.260	32	1.457	30	.984	25	70-416-06
1.9 without	7	1.457	37	1.457	30	.984	25	70-416-07
arance lution	8	1.614	41	1.614	33	.984	25	70-416-08
measured values	9	1.772	45	1.772	37	.984	25	70-416-09
from mean values.	10	1.969	50	1.969	42	.984	25	70-416-10
es are not to be as product spec- Non-implantable,	12	2.520	64	2.520	54	.984	25	70-416-12
	13	2.677	68	2.284	58	.984	25	70-416-13

HELIXMARK[®] **TWO-HOLE STOPPERS**

	SZ	TC DIAM		BOTT DIAM		HEIC	бНТ	HO DIAM		ISO, FDA, USP, EP
i listed are typical. I hardness: 50 Shore A.		inch	mm	inch	mm	inch	mm	inch	mm	REF
e contact customer e for tolerances and n size requests. ged 12 per zip bag in	000	.512	13	.315	8	.984	25	.118	3	70-619-99
	00	.591	15	.394	10	.984	25	.118	3	70-619-90
	0	.669	17	.512	13	.984	25	.118	3	70-619-00
resistant boxes.* ial Certification and	1	.748	19	.551	14	.984	25	.157	4	70-619-01
iceability included. ir implantation. erile.	2	.787	20	.630	16	.984	25	.196	5	70-619-02
	3	.945	24	.709	18	.984	25	.196	5	70-619-03
CORDANCE WITH	4	1.024	26	.787	20	.984	25	.196	5	70-619-04
SO 10993-1 DA 21CFR 177-2600	5	1.063	27	.906	23	.984	25	.236	6	70-619-05
JSP-CLASS VI P 3.1.9	6	1.260	32	1.024	26	.984	25	.314	8	70-619-06
P 3.1.9 without	7	1.457	37	1.181	30	.984	25	.354	9	70-619-07
appearance of solution	8	1.614	41	1.299	33	.984	25	.393	10	70-619-08
lual measured values	9	1.772	45	1.457	37	.984	25	.472	12	70-619-09
iffer from mean values. values are not to be lered as product spec-	10	1.969	50	1.654	42	.984	25	.551	14	70-619-10
	12	2.520	64	2.127	54	.984	25	.623	16	70-619-12
ons. Non-implantable, terile.	13	2.677	68	2.284	58	.984	25	.623	16	70-619-13

Values li Typical h Please c service custom Package crush-re Materia Lot Trace Not for Nonster

IN ACC ISO: ISO FDA: FD USP: US EP: EP (EP): EP ap of

* Individu may diff These va consider ification non-ste

HELIXMARK[®] CUSTOM SERVICES

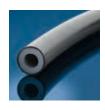
In addition to the products for the general needs of the medtech and pharmaceutical industry shown in our catalog, we also offer a wide range of options for customer-specific silicone tubing solutions. This allows the configuration of made-to-measure solutions to meet the customer's precise requirements.



MULTI-LUMEN TUBING



CUSTOM COLORS



UV-LIGHT SHIELDING TUBING



RADIOPAQUE TUBING



PACKAGING ON SPOOLS



PAD	PR	INT	ING



DOUBLE BRAIDED TUBING







TUBING SYSTEMS



ADDITIONAL SERVICES

- Precision cut-to-length
- Tip trimming
- Hole Punching
- Skiving
- Overmolding



Freudenberg Medical manufactures products exclusively for the medical and pharmaceutical industry. This focus enables us to understand and rapidly and efficiently fulfill our customers' precise requirements. Our capabilities as a supplier and partner in the development of products and solutions are distinguished by exceptional flexibility and innovation.

We are your global partner for the design, development and production of innovative medical technology and combination products. Our portfolio is comprised of complex medical components and catheter solutions for minimally invasive devices. We are a leading manufacturer not only in the field of precision molded components and tubing in silicone and thermoplastics, but also in coating technologies and the production of metal hypotubes.

Freudenberg Medical is a part of the Freudenberg Group, a technology group with a tradition reaching back over 165 years and a provider of innovative products for more than 30 market segments around the globe. In our daily work, both our corporation and individual employees are committed to upholding the values for which we all stand:

- Value for customers
- Innovation
- Leadership
- People
- Responsibility and
- Long term orientation

As a development partner, we ensure that every innovation project our customers entrust to us is realized and led to commercial success by our unique combination of technical expertise, a global R & D network, financial stability and enormous flexibility.

SILICONE CHEMICAL COMPATIBILITIES

• Ethylene Diamine

• Ethylene Glycol

• Ethylene Oxide

• Ferric Chloride

• Fluorobenzene

• Formaldehyde

Formic Acid

Fumaric Acid

• Fuel Oil

• Gasoline

Gelatin

Glucose

Glycerin

Glycols

• Hexane

• Hydrazine

Hot 37%

Acid

Halowax Oil

Hexaldehyde

Green Sulfate Liquor

• Hydrobromic Acid

• Hydrochloric Acid,

3 Molar to 158°F

• Hydrochloric Acid,

• Hydrocyanic Acid

• Hydrofluoric Acid,

Hydrofluorosilicic

Hydrogen Peroxide

Hydrogen Sulfide,

• Hydrogen Sulfide,

Isobutyl Alcohol

Isopropyl Acetate

• Lactic Acid, Cold

• Lithium Hydroxide

Lubricating Oils,

Magnesium Salts

Magnesium Sulfate

Manganese Sulfate

• Lead Acetate

Lead Nitrate

Petroleum

Magnesium

Chloride

Mercury

Methane

Methanol

• Mesityl Oxide

• Methyl Bromide

Linseed Oil

Hydrogen Gas

Dry Cold

Wet Cold

Isooctane

Kerosene

I ard

Lve

Isopropanol

Concentrated Hot

• Ferric Sulfate

• Fatty Acids

• Ethylene Dichloride

• Ethylene Trichloride

Methyl Chloride

Di-P-Phenylene

• Methyl Ethyl Ketone

• Methyl Methacrylate

• Methylene Chloride

• Monochlorobenzene

Nitric Acid, 50-100%

• Methylene

Isocyanate

Ketone

Milk

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• Ozone

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• Pyrrole

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Petrol

• Phenol

Methyl Isobutyl

Mineral Oils

Naphthalene

Natural Gas

• Nickel Chloride

Nickel Salts

• Nitrobenzene

Nitrogen Oxides

• Lubricating Oils,

Petroleum

Mineral Oils

Oleic Acid

Paraffins

Oxalic Acid

Oxygen, Cold

Perchloric Acid

Perchloroethylene

Phosphoric Acid

Phthalic Acid

Picric Acid

Potassium

Carbonate

Potassium Dichromate

• Potassium

Hydroxide

• Potassium Chlorate

Potassium Cyanide

Potassium lodide

Potassium Nitrate

Potassium Salts

Producer Gas

• Propane

• Pyridine

Sea Water

• Silicone Oils

Silver Nitrate

Soda Ash

Soap Solutions

Sodium Bisulfate

Sodium Bicarbonate

Sewage

Pinene

Vegetable Oils

• Nitroethane

Nitrogen

Animal Oil

Naphtha

• Sodium Bisulfide

Sodium Chloride

Sodium Cyanide

Hypochlorite

• Sodium Nitrate

• Sodium Perborate

• Sodium Peroxide

Sodium Sulfate

Sodium Sulfide

Sodium Sulfite

• Stannic Chloride • Stannous Chloride

Stoddard Solvent

Sulfur Chloride

• Sulfur Dioxide

Sulfur Dioxide

• Sulfur Trioxide

Concentrated

Concentrated

Sulfurous Acid

• Tar, Bituminous

• Trichloroethane

• Trichloroethylene

• Tricresyl Phosphate

• Tributyl Mercaptan

Room Temp

Sulfuric Acid,

to 158°F

Tannic Acid

Tartaric Acid

• Tin Chloride

• Turpentine

Vinegar

Whiskey

Water

• Wine

Xylol

Xylene

Vegetable Oils

• Yeast, Aqueous

Note: Volume swell is only

one indicator of elastomer

be based on the solubility parameter alone. Fluid attack

fluid compatibility and may

on the backbone of the polymer

may show up as a change in

physical properties such as

Tensile Strength, Elongation at

Break, and Hardness. Elevated

temperature and extended exposure times may create

more aggressive conditions

than cited in this guide.

• Toluene

• Sulfuric Acid,

• Sulfur Hexafluoride

Stearic Acid

• Styrene

• Sodium Phosphate,

 Sodium Thiosulfate Soybean Oil

• Sodium

Dibasic

• Sodium Hydroxide

• Sodium Borate

- Little or no effect (Volume swell <10%)
- Possible loss of physical properties (Volume swell 10-20%)
- Noticeable change (Volume swell 20-40%)
- Not suitable for service

Chemical Medium

- Acetaldehyde
- Acetamide
- Acetic Acid, 25% to 60%
- Acetic Anhydride
- Acetone
- Acetylene
- Acrylonitrile
- Alums
- Aluminum Chloride
- Aluminum Salts
- Aluminum Sulfate
- Ammonia Gas, Cold
- Ammonia Gas, Hot
- Ammonium Hydroxide, Concentrated
- Ammonium Nitrate
- Ammonium Phosphate
- Ammonium Salts
- Ammonium Sulfate
- Amyl Acetate
- Amyl Alcohol
- Amyl Borate
- Amyl Chloride • Amyl
- Chloronaphthalene
- Amyl Naphthalene
- Aniline
- Aniline
- Hydrochloride
- Asphalt
- Barium Chloride
- Barium Hydroxide
- Barium Salts
- Beer
- **Beet Sugar Liquors** •
 - Benzaldehyde
- Benzene
- Benzoic Acid ۲
- **Bleach Liquor**
- Borax
- Boric Acid
- Bromine
- Bromobenzene
- Butane
- Butyl Acetate
- Butyl Alcohol

- Butyraldehyde
- Calcium Bisulfide
- Calcium Chloride Calcium Hydroxide
- Calcium
- Hypochlorite
- Calcium Nitrate
- Calcium Salts
- Cane Sugar Liquors
- Carbitol
- Carbolic Acid
- Carbon Dioxide
- Carbon Monoxide

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- Carbon Tetrachloride
 - Carbonic Acid
- Castor Oil
- Caustic Soda
- Chlorinated Solvents
- Chlorinated
- Solvents, Dry
- Chlorinated
- Solvents, Wet
- Chlorobenzene Chlorobromo-
- methane
- Chloroform
- Chloronaphthalene
- Chlorosulfonic Acid
- Chlorotoluene
- Chrome Plating
 - Solution Chromic Acid
 - Citric Acid
 - Coconut Oil
 - Cod Liver Oil

 - Copper Salts
 - Corn Oil
 - Creosote, Coal Tar
 - Creosote, Wood
 - Cresol
 - Cyclohexane
 - Detergent Solutions
 - Dextrose •
 - Diacetone Alcohol
 - Dichlorobenzene • Diethyl Ether
 - Diethylamine
 - Diethylene Glycol
 - Dimethyl Formamide
 - Dioctyl Phthalate
 - Dioxane

Ethanolamine

• Ethyl Acetoacetate

Ethyl Acetate

Ethyl Alcohol

Ethyl Cellulose

• Ethyl Chloride

Chlorohydrin

• Ethylene

• Ethylene

Diphenyl

• Ethers

• Ethers

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