MASTERFLEX® PUMP

ISMATEC® PUMP

Pump Tubing Selection Guide

Accept No Substitutes—Use Only Masterflex and Ismatec Pump Tubing in Your Pumps!

+1.800.MASTERFLEX

masterflex.com

Why Masterflex® and Ismatec® Pump Tubing?

Accept No Substitutes—Use Only Masterflex and Ismatec Tubing in Your Pumps!

- Precision extruded to meet extremely tight tolerances
- Factory tested and optically inspected
- Formulated and validated to comply with regulatory standards and classifications including USP, EP, EU Food, FDA, NSF, and 3A
- 24 formulations to meet every application

To ensure accurate flow rates and long tubing life, use only Masterflex tubing in your pump tubing applications. Our tubing is your best choice because, unlike general-purpose commodity tubing, it is specifically designed and manufactured for use in demanding peristaltic pump applications.

Pump Tubing for a Wide Range of Applications and Markets

- Pharmaceutical
- Biotech
- Chemical processing
- Food & beverage
- Medical research
- Education
- Water treatment
- Environmental
- Industrial
- Laboratory
- Printing
- Semiconductors

Your Complete Masterflex Fluid Handling System

Masterflex pump systems consist of three components: pump head, tubing, and drive. You can match individual components to your specific application or select one of our convenient pump systems that can be ordered with a single catalog number:

Pump Selection Help is Available Online

Use our convenient online resources (described at right) to help you select the perfect Masterflex tubing pump system for your applications!

Certificate of Compliance

If you need documentation to prove that your specific Masterflex pump tubing complies with certain regulations or agency requirements, we can help. Simply request a FREE Certificate of Compliance at the time of your order.

Masterflex.com—*There When You Need It*

In addition to full product specifications, images, ordering information, and real-time stock availability, **masterflex.com** offers you the following features 24 hours a day:

Single-Use Applications

- Interactive biopharmaceutical workflows
- informative articles
- Comprehensive range of Masterflex Single-Use products such as sampling bottles, flow sensors, and quick-disconnect fittings

masterflex.com/singleuse

Testing C-Flex® or Silicone Tubing?

Try Puri-Flex™ tubing instead—it's our best tubing for your high-purity applications. Plus it offers lower spallation and longer pump life than silicone.

masterflex.com/siloxane

Technical Library

Our Technical Library gives you access to a wealth of helpful technical articles, application-based resources, selection guides, white papers, operating manuals, newsletters, and more!

masterflex.com/techInfo

Videos

Watch video tutorials on how to effectively use Masterflex tubing pumps.

masterflex.com/Videos

Chemical Compatibility Database

With our Masterflex Chemical Compatibility Database, you can verify the compatibility of your fluid with our unrivaled offering of tubing formulations.

masterflex.com/mflexchem

CUSTOM CUT TUBING

You tell us what tubing, how long, and how many pieces. We will take care of the rest!

masterflex.com/CCT

Masterflex® and Ismatec® Pump Tubing Formulations

Puri-Flex® Tubing

- Heat sealable and weldable
- Longest pump life when compared to silicone or many other TPE tubings
- Lowest spallation when compared to silicone or many other TPE tubings
- Ideal for sensitive cell work

Puri-Prene™ Tubing

- Long pump life; less drift over time for more accurate pumping
- Withstands repeated sterilization cycles but also suitable for single use
- Ideal for pharmaceutical, bioprocess, and critical process applications

Puri-Clear® LL Tubing

- Excellent chemical compatibility
- Optically clear to make fluid ID easier
- High elastic memory material handles viscous materials and holds a vacuum well
- Ideal for biologics, pharmaceuticals, and other aseptic industries

Pump tubing formulation	Advantages	Meets classifications
Puri-Flex® Exclusive 	Biocompatible. Heat sealable and weldable. Long pump life when compared to silicone or other TPE tubings. Low spallation when compared to silicone or some other TPE tubings. Very low protein binding. Cost effective. No halogens or phthalates. Translucent, clear to light white.	USP Class VI FDA 21 CFR 177.2600 and 177.1810 REACH (non-DEHP) compliant RoHS compliant ADCF compliant
Puri-Prene™ Exclusive 	Excellent biocompatibility; long pump life. Withstands repeated sterilization cycles. Nontoxic, nonhemolytic, extremely low permeability, Resists acids, bases, and oxidizing agents. Heat sealable, bondable, formable. Opaque, beige.	USP Class VI REACH (non-DEHP) compliant RoHS compliant ADCF compliant
Puri-Clear® LL Exclusive 	Clear for easy flow monitoring. Broad chemical resistance. Nontoxic, nonaging, nonoxidizing. Low gas permeability. Smooth bore. High dielectric constant. Transparent, clear.	USP Class VI REACH (non-DEHP) compliant RoHS compliant ADCF compliant
Silicone (platinum-cured) Exclusive 	Excellent biocompatibility. No leachable additives, DOP, or plasticizers; phthalate and latex-free; odorless and nontoxic, fungus-resistant. No taste imparted to transported fluids. Weather, ozone, corona, and radiation resistant. Minimal tendency to take a set. Translucent, clear to light amber.	USP Class V Extractables (Exceeds Class VI Implant) European Pharmacopoeia (EP 3.1.9) FDA 21 CFR 177.2600; FDA 21 CFR 210 and 211; Exceeds 3A sanitary cGMPs; REACH (non-DEHP) compliant RoHS compliant ADCF compliant
Silicone (peroxide-cured) 	Excellent biocompatibility. No additives, plasticizers or DOP; odorless and nontoxic, fungus-resistant. No taste imparted to transported fluids. Weather, ozone, corona, and radiation resistant. Minimal tendency to take a set. Translucent, clear to light amber.	USP Class VI European Pharmacopoeia (EP 3.1.9) FDA 21 CFR 177.2600 Exceeds 3A sanitary standards REACH (non-DEHP) compliant RoHS compliant ADCF compliant
BioPharm Silicone (platinum-cured) Exclusive 	Ultra-smooth inner surface minimizes particle entrapment. Lower absorption; excellent biocompatibility; no leachable additive, DOP, or plasticizers. Very low extractables. Odorless and nontoxic, fungus-resistant. No taste imparted to transported fluids. Weather, ozone, corona, and radiation resistant. Translucent, clear to light amber.	USP Class VI European Pharmacopoeia (EP 3.1.9) FDA 21 CFR 177.2600 Exceeds 3A sanitary standards REACH (non-DEHP) compliant RoHS compliant
BioPharm Plus Silicone (platinum-cured) Exclusive 	Similar to BioPharm Silicone, plus: Longest life of any silicone pump tubing. Lower spallation than regular silicone. Enhanced pressure capability. Fungus-resistant. Nontoxic, no leachable plasticizers. Lower gas permeability than other silicones. Translucent, clear to light amber.	USP Class VI European Pharmacopoeia (EP 3.1.9) FDA 21 CFR 177.2600 Exceeds 3A sanitary standards REACH (non-DEHP) compliant RoHS compliant

†E = Excellent, G = Good, F = Fair, P = Poor, N/R = not recommended, N/A = not available

Platinum-Cured Silicone Tubing

- Slightly greater clarity
- Smooth surface; lower protein binding levels
- Fewer potential leachables
- Ideal for pharmaceutical and bio-technology use

Peroxide-Cured Silicone Tubing

- Greater physical compression capability
- Economical, longer tubing life
- Potential outgassing of peroxide products

Application suitability†							Gas permeability	Sterilization
Acids	Alkalies	Organic solvents	Pressure	Vacuum	Viscous fluids	Sterile fluids		
G	G	N/R	G	G	E	E	CO_2: 1200 H_2: — O_2: 200 N_2: 80	Sterilize by EtO, autoclave up to 135°C (275°F), or gamma irradiation up to 4.5 Mrad.
Temperature range: Static: –50 to 135°C (–58 to 275°F) Dynamic (pumping): –30 to 100°C (–22 to 212°F)								
G	G	N/R	G	G	E	E	CO_2: 1200 H_2: — O_2: 200 N_2: 80	Sterlize by EtO, autoclave, or gamma irradiation.
Temperature range: Static: –51 to 132°C (–60 to 270°F) Dynamic (pumping): –20 to 100°C (–4 to 212°F)								
G	G	N/R	G	G	E	G	CO_2: 560 H_2: — O_2: 120 N_2: 60	Sterlize by EtO, autoclave, or gamma irradiation.
Temperature range: Static: –45 to 74°C (–51 to 165°F) Dynamic (pumping): 0 to 40°C (32 to 104°F)								
N/R	N/R	N/R	F	G	F	E	CO_2: 20,132 H_2: 6579 O_2: 7961 N_2: 2763	Sterilize by EtO, autoclave, or gamma irradiation.
Temperature range: Static: –50 to 230°C (–58 to 446°F) Dynamic (pumping): –40 to 100°C (–40 to 212°F)								
N/R	N/R	N/R	F	G	F	E	CO_2: 20,132 H_2: 6579 O_2: 7961 N_2: 2763	Sterilize by EtO or autoclave.
Temperature range: Static: –50 to 230°C (–58 to 446°F) Dynamic (pumping): –40 to 100°C (–40 to 212°F)								
N/R	N/R	N/R	F	G	F	E	CO_2: 25,147 H_2: — O_2: 4715 N_2: 2284	Sterilize by EtO, autoclave, or gamma irradiation.
Temperature range: Static: –60 to 232°C (–75 to 450°F) Dynamic (pumping): –40 to 100°C (–40 to 212°F)								
N/R	N/R	N/R	F	G	F	E	CO_2: 25,147 H_2: — O_2: 4715 N_2: 2284	Sterilize by EtO, autoclave, or gamma irradiation.
Temperature range: Static: –60 to 232°C (–75 to 450°F) Dynamic (pumping): –40 to 100°C (–40 to 212°F)								

Masterflex® and Ismatec® Pump Tubing Formulations

BioPharm Silicone Tubing (platinum-cured)

- Ultra-smooth inner surface minimizes particle entrapment
- Very low extractables, with documented biocompatibility for sensitive applications
- Ideal for lab, biotech, and pharmaceutical applications

BioPharm Plus Silicone Tubing (platinum-cured)

- All of the benefits of BioPharm silicone tubing, plus:
- Longest tubing life of any silicone pump tubing
- Lower spallation than regular silicone
- Enhanced pressure capability

C-Flex® ULTRA Tubing

- Combines biocompatibility of silicone with chemical resistance similar to Tygon
- Heat sealable, weldable, economical
- Longest pump life of any C-Flex formulation
- Lowest spallation and reduced residue

Pump tubing formulation	Advantages	Meets classifications
C-Flex® ULTRA 	Physical properties similar to silicone with chemical compatibility of Tygon®. Biocompatible. Heat sealable and weldable. Longer pump life and lower spallation than C-Flex. Translucent.	USP Class VI European Pharmacopoeia (EP 3.2.9) REACH (non-DEHP) compliant RoHS compliant ADCF compliant
C-Flex® 	Physical properties similar to silicone with chemical compatibility of Tygon®. Inexpensive. Biocompatible. Heat sealable and weldable. Opaque, white.	USP Class VI European Pharmacopoeia (EP 3.2.9) REACH (non-DEHP) compliant RoHS compliant ADCF compliant
PharMed® BPT 	Great for tissue and cell work—nontoxic and nonhemolytic. Long service life (up to 10,000 hrs); reduces tubing costs and pump downtime. Opaque to UV and visible light to protect light-sensitive fluids. Low gas permeability. High-pressure 10.2 bar (150 psi) version available. Opaque, beige	USP Class VI European Pharmacopoeia (EP 3.2.9) FDA 21 CFR 177.2600 REACH (non-DEHP) compliant RoHS compliant
PharmaPure® 	Nontoxic and nonhemolytic (similar to PharMed® BPT); biocompatible. Long life even under pressure; up to 1000 hours at 2.7 bar (40 psi). Very low spallation—protects fluid purity. Low extractables. Low gas permeability. Opaque, off-white.	USP Class VI FDA 21 CFR 177.2600 European Pharmacopoeia (EP 3.2.9) REACH (non-DEHP) compliant RoHS compliant
Chem-Durance® Bio Exclusive 	Excellent chemical resistance. Excellent life and durability under pressure. Low spallation. Plasticizer-free inner liner. High dielectric constant. Excellent biocompatibility. Opaque, beige.	USP Class VI FDA 21 CFR 177.2600 REACH (non-DEHP) compliant RoHS compliant
PTFE 	Chemically inert. Excellent chemical resistance. Will not leach into or absorb out of fluid being pumped. Extremely low gas permeability. Nontoxic. Virtually nonporous. Low coefficient of friction. Translucent, white.	USP Class VI REACH (non-DEHP) compliant RoHS compliant ADCF compliant

†E = Excellent, G = Good, F = Fair, P = Poor, N/R = not recommended, N/A = not available

C-Flex® Tubing

- Combines biocompatibility of silicone with chemical resistance similar to Tygon
- Heat sealable, weldable, economical

PharMed® BPT Tubing

- Up to 10,000 hours of tubing life
- Resists ozone and UV radiation
- Noncytotoxic and nonhemolytic
- Ideal for tissue and cell culture
- Heat sealable and bondable

PharmaPure® Tubing

- Biocompatibility similar to PharMed BPT
- Long life under continuous pressure up to 40 psi (2.7 bar)
- Very low spallation and low extractables

Chem-Durance® Bio Tubing

- Excellent chemical resistance
- Excellent pumping life
- Low spallation
- USP Class VI specifications
- Masterflex exclusive

Application suitability†							Gas permeability	Sterilization
Acids	Alkalies	Organic solvents	Pressure	Vacuum	Viscous fluids	Sterile fluids		
G	G	N/R	F	G	F	E	CO_2: 2.1 H_2: — O_2: 1.1 N_2: 3.4	Sterilize by gamma irradiation or one cycle of autoclave at 121°C (250°F), 1 bar (15 psi) for 30 minutes.
Temperature range: Static: –45 to 121°C (–50 to 250°F) Dynamic (pumping): –40 to 100°C (–40 to 212°F)								
G	G	N/R	F	G	F	E	CO_2: — H_2: — O_2: 150 N_2: —	Sterilize by EtO, autoclave, or gamma irradiation.
Temperature range: Static: –45 to 121°C (–50 to 250°F) Dynamic (pumping): –40 to 100°C (–40 to 212°F)								
G	G	N/R	G	G	E	E	CO_2: 1200 H_2: — O_2: 200 N_2: 80	Sterilize by EtO, autoclave, or gamma irradiation up to 2.5 Mrad.
Temperature range: Static: –51 to 132°C (–60 to 270°F) Dynamic (pumping): –20 to 100°C (–4 to 212°F)								
G	G	N/R	G	G	E	E	CO_2: 1200 H_2: — O_2: 200 N_2: 80	Sterilize by EtO, autoclave, or gamma irradiation up to 2.5 Mrad.
Temperature range: Static: –51 to 132°C (–60 to 270°F) Dynamic (pumping): –20 to 100°C (–4 to 212°F)								
E	E	G	E	E	E	E	CO_2: 745 H_2: — O_2: 200 N_2: 80	Sterilize by EtO, autoclave, or gamma irradiation.
Temperature range: Static: –60 to 74°C (–71 to 165°F) Dynamic (pumping): 0 to 40°C (32 to 104°F)								
E	E	E	G	G	E	G	CO_2: 6.8 H_2: — O_2: — N_2: 1.0	Sterilize by EtO or autoclave.
Temperature range: Static: –240 to 260°C (–400 to 500°F) Dynamic (pumping): –40 to 150°C (–40 to 302°F)								

Masterflex® and Ismatec® Pump Tubing Formulations

PTFE Tubing

- Chemically inert; best chemical resistance of any pump tubing
- Sold in molded pump tubing elements
- Use with PTFE tubing pump head

Tygon® E-LFL Tubing

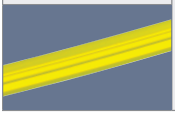
- Longest tubing life of all Tygon tubing formulations
- Broad chemical compatibility
- Low gas permeability
- Approved for pharmaceutical and biotechnology use

Tygon® E-Food Tubing

- Meets various food and sanitary regulations
- Unaffected by common commercial sanitizers
- Nonwetting properties allow flush-cleaning and complete drainage
- Smooth inner surface

Tygon® E-Lab Tubing

- Ideal for general transfer applications
- Economical
- Nontoxic, nonaging, and nonoxidizing

Pump tubing formulation	Advantages	Meets classifications
Tygon® E-LFL 	Longest life of all Tygon® peristaltic tubing. Clear for easy flow monitoring. Broad chemical resistance. Nonaging, nonoxidizing. Low gas permeability. Smooth bore. Good for viscous fluids. High dielectric constant. Transparent, clear.	USP Class VI European Pharmacopia (EP 3.2.9) FDA 21 CFR 175.300 EU Food REACH (non-DEHP) compliant RoHS compliant ADCF compliant
Tygon® E-Food (B-44-4X) 	Designed especially for handling food products. Bore is extremely smooth (better than most stainless steels) Nontoxic, will not affect taste or odor, and clear for CIP and flow verification. Excellent nonwetting properties permit flush cleaning and complete drainage. High dielectric constant. Transparent, clear.	FDA 21 CFR 175.300 EU Food NSF-51 REACH (non-DEHP) compliant RoHS compliant ADCF compliant Meets 3A sanitary standards
Tygon® E-Lab (E-3603) 	Inexpensive tubing for general laboratory applications. Clear for easy flow monitoring. Handles virtually all inorganic chemicals. Nonaging, nonoxidizing. Low gas permeability. Good for viscous fluids. High dielectric constant. Transparent, clear.	USP Class VI FDA 21 CFR 175.300 EU Food NSF-51 REACH (non-DEHP) compliant RoHS compliant ADCF compliant
Versilon™ 2001 (formerly Tygon Chemical) 	Best chemical resistance of any Tygon® formulation. Compatible with many polar solvents. Plasticizer-free. Clear for easy flow monitoring. Low extractability. Low gas permeability. High dielectric constant. Transparent, clear.	FDA 21 CFR 175.300 REACH (non-DEHP) compliant RoHS compliant ADCF compliant
Tygon® Fuel & Lubricant (F-4040-A) 	Specially formulated to transport hydrocarbons, petroleum products, and distillates. Suitable for gasoline, kerosene, heating oils, cutting fluids, and glycol-based coolants. Minimum extractability. Low gas permeability. High dielectric constant. Transparent, yellow.	REACH (non-DEHP) compliant RoHS compliant ADCF compliant

†E = Excellent, G = Good, F = Fair, P = Poor, N/R = not recommended, N/A = not available

Versilon™ 2001 Tubing
(formerly Tygon® Chemical)

- Best chemical resistance of Tygon formulations
- Compatible with some organics
- Plasticizer-free

Tygon® F-4040-A Fuel & Lubricant Tubing

- Ideal for transferring hydrocarbons, gasoline, kerosene, heating oils, cutting compounds, and glycol-based coolants
- Not for use with concentrated strong acids or alkalies

Versilon™ A-60-N Tubing
(formerly Norprene®)

- Up to 10,000 hours of tubing life
- Best choice for pressure/vacuum applications
- Resists heat, ozone, acids, and alkalies
- Heat sealable and bondable
- Nonaging, nonoxidizing

Application suitability†							Gas permeability	Sterilization
Acids	Alkalies	Organic solvents	Pressure	Vacuum	Viscous fluids	Sterile fluids		
G	G	N/R	G	G	E	G	CO_2: 563 H_2: — O_2: 124 N_2: 67	Sterilize by EtO or autoclave.
Temperature range: Static: –46 to 74°C (–51 to 165°F) Dynamic (pumping): 0 to 40°C (32 to 104°F)								
G	G	N/R	G	G	E	F	CO_2: 270 H_2: 97 O_2: 60 N_2: 30	Sterilize by EtO or autoclave.
Temperature range: Static: –36 to 74°C (–32 to 165°F) Dynamic (pumping): 0 to 40°C (32 to 104°F)								
G	G	N/R	G	G	E	P	CO_2: 360 H_2: 97 O_2: 80 N_2: 40	Sterilize by EtO or autoclave.
Temperature range: Static: –46 to 74°C (–51 to 165°F) Dynamic (pumping): 0 to 40°C (32 to 104°F)								
E	E	G	G	G	E	G	CO_2: 114 H_2: — O_2: 19 N_2: 9	Sterilize by EtO, autoclave, or gamma irradiation.
Temperature range: Static: –77 to 57°C (–108 to 135°F) Dynamic (pumping): 0 to 40°C (32 to 104°F)								
G	G	N/R	G	G	E	P	CO_2: 100 H_2: 97 O_2: 22 N_2: 12	Sterilization is not recommended.
Temperature range: Static: –37 to 74°C (–35 to 165°F) Dynamic (pumping): 0 to 40°C (32 to 104°F)								

Sterilization

Ethylene oxide (EtO): Coil tubing loosely in nonlinting cloth or sterilization paper. Follow the sterilization equipment manufacturer's directions as to gas type, concentration, times, and temperatures; maintain humidity within the prescribed limits, generally between 30 to 65%.

Standard gravity autoclave: Coil tubing loosely in nonlinting cloth or sterilizing paper, and place in a clean, open tray for 30 minutes at 121°C (250°F) at 1 kg/cm² (15 psi); air dry at max 66°C (150°F) for 2 to 2½ hours until clear.

Masterflex® and Ismatec® Pump Tubing Formulations

Tygon® A-60-F Food & Beverage Tubing
(formerly Norprene® Food)

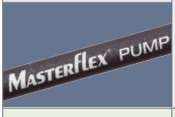
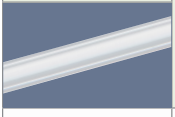
- Ideal for high-temperature food and beverage applications
- Similar characteristics as Versilon™ 2001 tubing
- Meets FDA and NSF standards

GORE® STA-PURE® Pump Tubing – Series PCS

- Unique composite of expanded PTFE and platinum-cured silicone
- Stable flow rates achievable up to 100 psig*
- No raw materials of animal origin

GORE® STA-PURE® Pump Tubing – Series PFL

- Unique composite of expanded PTFE and platinum-cured perfluoroelastomer
- Greater chemical resistance than Series PCS
- Stable flow rates achievable up to 60 psig*
- No raw materials of animal origin

Pump tubing formulation	Advantages	Meets classifications
Versilon™ A-60-N (formerly Norprene) 	Best choice for vacuum/pressure applications. Offers longest pump tubing life. Heat, ambient ozone resistant. Good resistance to acids/alkalies. Black color hides dirt and dust. Heat sealable, nonaging, and nonoxidizing. High dielectric constant. High-pressure version available. Opaque, black.	NSF-51 REACH (non-DEHP) compliant RoHS compliant
Tygon® A-60-F (formerly Norprene Food) 	Similar to Norprene® but with FDA approval. Excellent for food/dairy applications. Longest life, good flow consistency. Heat and ozone resistant. Good resistance to acids/alkalies. Heat sealable, nonaging, and nonoxidizing. High dielectric constant. Opaque, beige.	FDA 21 CFR 177.2600 NSF-51 REACH (non-DEHP) compliant RoHS compliant
GORE® STA-PURE®, Series PCS 	Unique composite structure adds strength and flex durability Greater security against rupture up to 100 psig* Consistent flow rate over long duration of use Withstands rigors of CIP/SIP processing	USP Class VI USP <87> USP Physicochemical Tests Compliant with restricted substances per REACH and RoHS No raw materials of animal origin
GORE® STA-PURE®, Series PFL 	Unique composite structure adds strength and flex durability Greater chemical resistance than Series PCS Stable flow rates achievable to 60 psig* Withstands rigors of CIP/SIP processing	USP Class VI USP <87> USP Physicochemical Tests Compliant with restricted substances per REACH and RoHS No raw materials of animal origin
Viton® FDA-Compliant 	Perfect for food and lab applications where FDA compliance is required. Excellent chemical resistance. Resistant to corrosives, solvents, and oils at elevated temperatures. Low gas permeability. Opaque, black.	FDA 21 CFR 177.2600 ADCF compliant
Solva™ Exclusive 	Resists most hydrocarbons, embrittlement, and swelling. Thermoplastic, PVC-based material with plasticizer, firm (stiff) material. Ozone- and UV-resistant, minimal extractability. Low gas permeability. High dielectric constant. Transparent, yellow.	Compliant with restricted substances per REACH and RoHS No raw materials of animal origin

†E = Excellent, G = Good, F = Fair, P = Poor, N/R = not recommended, N/A = not available

Viton® FDA-Compliant Tubing

- Excellent chemical resistance
- Resists corrosives, solvents, and oils at elevated temperatures

Solva™ Tubing

- Resists embrittlement and swelling due to hydrocarbon exposure
- Specially formulated to transport hydrocarbons, petroleum products, and distillates
- Ideal for fuels and industrial lubricants such as gasoline, kerosene, heating oils, cutting compounds, and glycol-based coolants

*Actual performance depends on the specific system in which the tubing is used and may vary depending on the pump and its integration into the system.

Application suitability†							Gas permeability	Sterilization
Acids	Alkalies	Organic solvents	Pressure	Vacuum	Viscous fluids	Sterile fluids		
G	G	N/R	E	E	E	N/R	CO_2: 1200 H_2: — O_2: 200 N_2: 80	Sterilize by EtO, autoclave, or gamma irradiation.
Temperature range: Static: –51 to 132°C (–60 to 270°F) Dynamic (pumping): –20 to 100°C (–4 to 212°F)								
G	G	N/R	E	E	E	G	CO_2: 1200 H_2: — O_2: 200 N_2: 80	Sterilize by EtO, autoclave, or gamma irradiation.
Temperature range: Static: –51 to 132°C (–60 to 270°F) Dynamic (pumping): –20 to 100°C (–4 to 212°F)								
N/R	N/R	N/R	E	G	G	E	—	Sterilize by autoclave or SIP (steam in place).
Temperature range: Contact Masterflex								
E	E	E	E	G	G	E	—	Sterilize by autoclave or SIP (steam in place).
Temperature range: Contact Masterflex								
E	E	Variable—test before using	G	G	G	F	CO_2: 76 to 79 H_2: — O_2: 13 to 15 N_2: 4.3	Sterilization is not recommended.
Temperature range: Static: –32 to 205°C (–25 to 400°F) Dynamic (pumping): 0 to 150°C (32 to 302°F)								
G	G	N/R	G	G	E	F	CO_2: 100 H_2: 97 O_2: 22 N_2: 12	N/A
Temperature range: Static: –37 to 74°C (–35 to 165°F) Dynamic (pumping): 0 to 40°C (32 to 104°F)								

ISMATEC® Pump Tubing

- Color-coded stops provide easy identification
- Precision extruded to tight tolerances for high repeatability, accuracy and reproducibility
- Extension tubing can be connected with barbed fittings or by splicing
- Flared ends are available
- **How to Order:** Choose a tubing material to determine the catalog number prefix, then find your desired tube ID to determine the suffix. Combine the two for a complete catalog number (e.g. 96518-10).

				Ismatec size	**09**
				Tube ID (mm)	0.13
Tubing		Length	Qty/pk	Color ID*	O/BK
Puri-Flex®	2-stop	40.6 cm (16")	12	**96518-XX**	**—**
	3-stop	40.6 cm (16")	12	**96519-XX**	**—**
	Extension	15.2 m (50 ft)	1	**96418-XX**	**—**
Puri-Prene™	2-stop	40.6 cm (16")	12	**05635-XX**	**—**
	3-stop	40.6 cm (16")	12	**05636-XX**	**—**
	Extension	15.2 m (50 ft)	1	**05367-XX**	**—**
Puri-Clear® LL	2-stop	40.6 cm (16")	12	**95663-XX**	**-09**
	3-stop	40.6 cm (16")	12	**95625-XX**	**—**
	Extension	15.2 m (50 ft)	1	**95679-XX**	**-09**
	Flared, 2-stop	40.6 cm (16")	12	**97616-XX**	**-09**
	Flared, 3-stop	40.6 cm (16")	12	**97617-XX**	**—**
Silicone (platinum-cured)	2-stop	40.6 cm (16")	6	**95402-XX**	**—**
	3-stop	40.6 cm (16")	6	**95403-XX**	**—**
	Extension	15.2 m (50 ft)	1	**95412-XX**	**—**
Silicone (peroxide-cured)	2-stop	40.6 cm (16")	6	**07616-XX**	**—**
	3-stop	40.6 cm (16")	6	**07624-XX**	**—**
	Extension	15.2 m (50 ft)	1	**07625-XX**	**—**
C-Flex®	Extension	15.2 m (50 ft)	1	**95718-XX**	**—**
PharMed® BPT	2-stop	40.6 cm (16")	12	**95723-XX**	**—**
	3-stop	40.6 cm (16")	12	**95714-XX**	**—**
	Extension	30.4 m (100 ft)	1	**95809-XX**	**—**
PharMed® BPT, Autoclavable	2-stop	40.6 cm (16")	6	**95692-XX**	**—**
	3-stop	40.6 cm (16")	6	**95693-XX**	**—**
Chem-Durance® Bio	2-stop	40.6 cm (16")	6	**96327-XX**	**—**
	3-stop	40.6 cm (16")	6	**96328-XX**	**—**
	Extension	30.4 m (100 ft)	1	**96329-XX**	**—**
Tygon® E-LFL	2-stop	40.6 cm (16")	12	**96449-XX**	**—**
	3-stop	40.6 cm (16")	12	**96450-XX**	**—**
	Extension	30.4 m (100 ft)	1	**06449-XX**	**—**
Tygon® E-Food (B-44-4X)	2-stop	40.6 cm (16")	12	**96457-XX**	**—**
	3-stop	40.6 cm (16")	12	**96458-XX**	**—**
	Extension	30.4 m (100 ft)	1	**06457-XX**	**—**
Tygon® E-Lab (E-3603)	2-stop	40.6 cm (16")	12	**96460-XX**	**-09**
	3-stop	40.6 cm (16")	12	**96461-XX**	**-09**
	Extension	30.4 m (100 ft)	1	**06460-XX**	**-09**
Versilon™ 2001 (formerly Tygon Chemical)	2-stop	40.6 cm (16")	6	**96465-XX**	**—**
	3-stop	40.6 cm (16")	6	**96466-XX**	**—**
	Extension	10.1 m (33 ft)	1	**96467-XX**	**—**
Viton® FDA-Compliant	2-stop	30.5 cm (12")	12	**97628-XX**	**—**
	3-stop	30.5 cm (12")	12	**97629-XX**	**—**
	Extension	15.2 m (50 ft)	1	**97632-XX**	**—**
Solva™	2-stop	40.6 cm (16")	12	**95606-XX**	**—**
	3-stop	40.6 cm (16")	12	**95605-XX**	**—**
	Extension	15.2 m (50 ft)	1	**95712-XX**	**—**
	Flared, 2-stop	40.6 cm (16")	12	**95598-XX**	**—**
	Flared, 3-stop	40.6 cm (16")	12	**95599-XX**	**—**

*Color ID key: B = blue, BK = black, G = green, GY = gray, O = orange, P = purple, R = red, W = white, Y = yellow

	10	12	14	18	22	24	26	28	30
	0.19	0.25	0.38	0.51	0.64	0.76	0.89	1.02	1.14
	O/R	O/B	O/G	O/Y	O/W	BK/BK	O/O	W/W	R/R
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	—	-12	-14	-18	-22	-24	-26	-28	-30
	—	-12	-14	-18	-22	-24	-26	-28	-30
	—	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	—	—	-26	-28	-30
	—	—	—	—	-22	-24	-26	-28	-30
	—	—	—	—	-22	-24	-26	-28	-30
	—	—	—	—	-22	-24	-26	-28	-30
	—	-12	-14	-18	-22	-24	-26	-28	-30
	—	—	—	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	—	-18	—	—	-26	—	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	—	-12	—	-18	—	—	-26	-28	—
	—	-12	—	-18	—	—	-26	-28	—
	—	—	-14	-18	—	-24	-26	—	-30
	—	—	-14	-18	—	-24	-26	—	-30
	—	—	-14	-18	—	-24	-26	—	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	—	-18	—	—	-26	—	-30
	—	-12	—	-18	—	—	-26	—	-30
	-10	-12	—	-18	—	—	-26	—	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	—	—	-14	—	-22	—	—	-28	—
	—	—	-14	—	-22	—	—	-28	—
	—	—	-14	—	-22	—	—	-28	—
	—	—	—	-18	-22	-24	-26	-28	-30
	—	—	—	-18	-22	-24	-26	-28	-30
	—	—	—	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30
	-10	-12	-14	-18	-22	-24	-26	-28	-30

More sizes on next page

ISMATEC® Pump Tubing

- Color-coded stops provide easy identification
- Precision extruded to tight tolerances for high repeatability, accuracy and reproducibility
- Extension tubing can be connected with barbed fittings or by splicing
- Flared ends are available
- **How to Order:** Choose a tubing material to determine the catalog number prefix, then find your desired tube ID to determine the suffix. Combine the two for a complete catalog number (e.g. 96518-10).

				Ismatec size
				Tube ID (mm)
Tubing		Length	Qty/pk	Color ID*
Puri-Flex®	2-stop	40.6 cm (16")	12	**96518-XX**
	3-stop	40.6 cm (16")	12	**96519-XX**
	Extension	15.2 m (50 ft)	1	**96418-XX**
Puri-Prene™	2-stop	40.6 cm (16")	12	**05635-XX**
	3-stop	40.6 cm (16")	12	**05636-XX**
	Extension	15.2 m (50 ft)	1	**05367-XX**
Puri-Clear® LL	2-stop	40.6 cm (16")	12	**95663-XX**
	3-stop	40.6 cm (16")	12	**95625-XX**
	Extension	15.2 m (50 ft)	1	**95679-XX**
	Flared, 2-stop	40.6 cm (16")	12	**97616-XX**
	Flared, 3-stop	40.6 cm (16")	12	**97617-XX**
Silicone (platinum-cured)	2-stop	40.6 cm (16")	6	**95402-XX**
	3-stop	40.6 cm (16")	6	**95403-XX**
	Extension	15.2 m (50 ft)	1	**95412-XX**
Silicone (peroxide-cured)	2-stop	40.6 cm (16")	6	**07616-XX**
	3-stop	40.6 cm (16")	6	**07624-XX**
	Extension	15.2 m (50 ft)	1	**07625-XX**
C-Flex®	Extension	15.2 m (50 ft)	1	**95718-XX**
PharMed® BPT	2-stop	40.6 cm (16")	12	**95723-XX**
	3-stop	40.6 cm (16")	12	**95714-XX**
	Extension	30.4 m (100 ft)	1	**95809-XX**
PharMed® BPT, Autoclavable	2-stop	40.6 cm (16")	6	**95692-XX**
	3-stop	40.6 cm (16")	6	**95693-XX**
Chem-Durance® Bio	2-stop	40.6 cm (16")	6	**96327-XX**
	3-stop	40.6 cm (16")	6	**96328-XX**
	Extension	30.4 m (100 ft)	1	**96329-XX**
Tygon® E-LFL	2-stop	40.6 cm (16")	12	**96449-XX**
	3-stop	40.6 cm (16")	12	**96450-XX**
	Extension	30.4 m (100 ft)	1	**06449-XX**
Tygon® E-Food (B-44-4X)	2-stop	40.6 cm (16")	12	**96457-XX**
	3-stop	40.6 cm (16")	12	**96458-XX**
	Extension	30.4 m (100 ft)	1	**06457-XX**
Tygon® E-Lab (E-3603)	2-stop	40.6 cm (16")	12	**96460-XX**
	3-stop	40.6 cm (16")	12	**96461-XX**
	Extension	30.4 m (100 ft)	1	**06460-XX**
Versilon™ 2001 (formerly Tygon Chemical)	2-stop	40.6 cm (16")	6	**96465-XX**
	3-stop	40.6 cm (16")	6	**96466-XX**
	Extension	10.1 m (33 ft)	1	**96467-XX**
Viton® FDA-Compliant	2-stop	30.5 cm (12")	12	**97628-XX**
	3-stop	30.5 cm (12")	12	**97629-XX**
	Extension	15.2 m (50 ft)	1	**97632-XX**
Solva™	2-stop	40.6 cm (16")	12	**95606-XX**
	3-stop	40.6 cm (16")	12	**95605-XX**
	Extension	15.2 m (50 ft)	1	**95712-XX**
	Flared, 2-stop	40.6 cm (16")	12	**95598-XX**
	Flared, 3-stop	40.6 cm (16")	12	**95599-XX**

*Color ID key: B = blue, BK = black, G = green, GY = gray, O = orange, P = purple, R = red, W = white, Y = yellow

	32	34	36	38	40	42	44	48	49
	1.3	1.42	1.52	1.65	1.85	2.06	2.29	2.79	3.17
	GY/GY	Y/Y	Y/B	B/B	G/G	P/P	P/BK	P/W	BK/W
	-32	-34	-36	-38	—	-42	-44	-48	—
	-32	-34	-36	-38	—	-42	-44	-48	—
	-32	-34	-36	-38	—	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	-49
	-32	-34	-36	-38	-40	-42	-44	—	—
	-32	-34	-36	-38	-40	-42	-44	—	—
	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	—	-34	—	—	—	-42	—	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	—	-36	—	—	-42	—	-48	—
	-32	—	-36	—	—	-42	—	-48	—
	—	-34	-36	—	—	-42	—	-48	—
	—	-34	-36	—	—	-42	—	-48	—
	—	-34	-36	—	—	-42	—	-48	—
	—	-34	-36	—	-40	-42	—	-48	—
	—	-34	-36	—	-40	-42	—	-48	—
	—	-34	-36	—	-40	-42	—	-48	—
	—	-34	—	—	—	-42	—	-48	—
	—	-34	—	—	—	-42	—	-48	—
	—	-34	—	—	—	-42	—	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	-49
	-32	-34	-36	-38	-40	-42	-44	-48	-49
	-32	-34	-36	-38	-40	-42	-44	-48	-49
	—	—	-36	—	—	-42	—	-48	—
	—	—	-36	—	—	-42	—	-48	—
	—	—	-36	—	—	-42	—	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	-32	-34	-36	-38	-40	-42	-44	-48	—
	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—

MASTERFLEX® L/S® Precision Pump Tubing

– L/S pump tubing is manufactured to extremely close tolerances that match our L/S pump heads, ensuring accurate, repeatable flow and long tubing life

Pump tubing cross sections	L/S Precision pump tubing	
	 L/S 13	 L/S 14
Inside diameter (nominal)	0.8 mm (0.03")	1.6 mm (0.06")
Hose barb size	1.6 mm (1/16")	1.6 mm (1/16")
Flow range (approximate)† with 1 to 600 rpm drive	0.06 to 36 mL/min	0.21 to 130 mL/min
Maximum pressure‡	2.7 bar (40 psig)	
Maximum vacuum‡	660 mm Hg (26" Hg)	
Suction lift‡	8.8 m H_2O (29 ft H_2O)	

†Determined under the following conditions: 0 psi at inlet, 0.5 psi at outlet; water temperature at 22°C (72°F).

Tubing	L/S Pump Head Compatibility: Standard	Easy-Load®	Easy-Load II	Easy-Load 3	Multichannel cartridge	Cytoflow®	High-Performance
Puri-Flex® 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	✓	
Silicone (platinum-cured) 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	✓	✓
Silicone (peroxide-cured) 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	✓	✓
BioPharm silicone (platinum-cured) 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓		✓
BioPharm Plus silicone (platinum-cured) 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓		✓
C-Flex® ULTRA 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	✓	✓
C-Flex® 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	✓	✓
PharMed® BPT 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	✓	✓
PharMed® BPT High-Pressure 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	✓	✓
PharmaPure® 7.6 m (25 ft)/pk		✓	✓			✓	✓
Chem-Durance® Bio 15.2 m (50 ft)/pk		✓	✓			✓	✓
Tygon® E-LFL 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	✓	✓
Tygon® E-Food (B-44-4X) 15.2 m (50 ft)/pk	✓	✓	✓	✓	✓		✓
Tygon® E-Lab (E-3603) 15.2 m (50 ft)/pk	✓	✓	✓	✓	✓		✓
Versilon™ 2001 15.2 m (50 ft)/pk		✓	✓				
Tygon® Fuel & Lubricant (F-4040-A) 15.2 m (50 ft)/pk	✓	✓	✓	✓	✓		✓
Versilon™ (A-60-N) 15.2 m (50 ft)/pk	✓	✓	✓	✓	✓		
Tygon® (A-60-F) 15.2 m (50 ft)/pk	✓	✓	✓	✓	✓		✓
GORE® STA-PURE®, PCS 30.5 cm (12")/pk	✓	✓	✓			✓	✓
GORE® STA-PURE®, PFL 30.5 cm (12")/pk	✓	✓	✓			✓	✓
Viton® FDA-Compliant 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓		✓

††Sizes L/S 13 and L/S 14 are not compatible with Cytoflow pump head or thin-wall version of the High-Performance pump head.

– Our pump tubing is factory-tested and optically inspected to provide the best performance from your peristaltic pump

	 L/S 16	 L/S 25	 L/S 17	 L/S 18
	3.1 mm (0.12")	4.8 mm (0.19")	6.4 mm (0.25")	7.9 mm (0.31")
	3.2 mm (⅛")	4.8 mm (3⁄16")	6.4 mm (¼")	9.5 mm (⅜")
	0.8 to 480 mL/min	1.7 to 1000 mL/min	2.8 to 1700 mL/min	3.8 to 2300 mL/min
	2.7 bar (40 psig)	2 .4 bar (35 psig)	1.4 bar (20 psig)	1.0 bar (15 psig)
	660 mm Hg (26" Hg)		510 mm Hg (20" Hg)	
	8.8 m H_2O (29 ft H_2O)		6.7 m H_2O (22 ft H_2O)	

‡Actual performance varies depending on tubing formulation—values shown are for firm tubing.

	L/S 13††	L/S 14††	L/S 16	L/S 25	L/S 17	L/S 18
	96419-13	96419-14	96419-16	96419-25	96419-17	96419-18
	96410-13	96410-14	96410-16	96410-25	96410-17	96410-18
	96400-13	96400-14	96400-16	96400-25	96400-17	96400-18
	96420-13	96420-14	96420-16	96420-25	96420-17	96420-18
	96440-13	96440-14	96440-16	96440-25	96440-17	96440-18
	—	06434-14	06434-16	06434-25	06434-17	06434-18
	06424-13	06424-14	06424-16	06424-25	06424-17	06424-18
	06508-13	06508-14	06508-16	06508-25	06508-17	06508-18
	—	05664-14	05664-16	—	—	—
	06435-13	06435-14	06435-16	06435-25	06435-17	06435-18
	06442-13	06442-14	06442-16	06442-25	06442-17	06442-18
	06440-13	06440-14	06440-16	06440-25	06440-17	06440-18
	06418-13	06418-14	06418-16	06418-25	06418-17	06418-18
	06509-13	06509-14	06509-16	06509-25	06509-17	06509-18
	06475-13	06475-14	06475-16	06475-25	06475-17	06475-18
	06401-13	06401-14	06401-16	06401-25	06401-17	06401-18
	06404-13	06404-14	06404-16	06404-25	06404-17	06404-18
	06402-13	06402-14	06402-16	06402-25	06402-17	06402-18
	—	96241-14	96241-16	96241-25	96241-17	96241-18
	—	96242-14	96242-16	96242-25	96242-17	96242-18
	96412-13	96412-14	96412-16	96412-25	96412-17	96412-18

MASTERFLEX® L/S® High-Performance

– Our High-Performance Precision pump tubing features a thicker wall compared to our Precision pump tubing

Pump tubing cross sections	L/S High-Performance Precision pump tubing	
	 L/S 15	 L/S 24
Inside diameter (nominal)	4.8 mm (0.19")	6.4 mm (0.25")
Hose barb size	4.8 mm (3/16")	6.4 mm (1/4")
Flow range (approximate)† with 1 to 600 rpm drive Value in ( ) obtained with High-Performance pump head	1.7 to 1000 mL/min (1.8 to 1100 mL/min)	2.8 to 1700 mL/min (3.0 to 1800 mL/min)
Maximum pressure‡	2.7 bar (40 psig)	
Maximum vacuum‡	660 mm Hg (26" Hg)	
Suction lift‡	8.8 m H_2O (29 ft H_2O)	

†Determined under the following conditions: 0 psi at inlet, 0.5 psi at outlet; water temperature at 22°C (72°F).

	L/S Pump Head Compatibility					
Tubing	Standard	Easy-Load®	Easy-Load II	Easy-Load 3	High-Performance	
Puri-Flex® 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	
Silicone (platinum-cured) 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	
Silicone (peroxide-cured) 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	
BioPharm silicone (platinum-cured) 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	
BioPharm Plus silicone (platinum-cured) 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	
C-Flex® ULTRA 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	
C-Flex® 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	
PharMed® BPT 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	
PharMed® BPT High-Pressure 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	
PharmaPure® 7.6 m (25 ft)/pk		✓	✓			
Chem-Durance® Bio 15.2 m (50 ft)/pk		✓	✓			
Tygon® E-LFL 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	
Tygon® E-Food (B-44-4X) 15.2 m (50 ft)/pk		✓	✓	✓	✓	
Tygon® E-Lab (E-3603) 15.2 m (50 ft)/pk	✓	✓	✓	✓	✓	
Versilon™ 2001 15.2 m (50 ft)/pk		✓	✓			
Tygon® Fuel & Lubricant (F-4040-A) 15.2 m (50 ft)/pk	✓	✓	✓	✓	✓	
Versilon™ (A-60-N) 15.2 m (50 ft)/pk	✓	✓	✓	✓	✓	
Tygon® (A-60-F) 15.2 m (50 ft)/pk	✓	✓	✓	✓	✓	
GORE® STA-PURE®, PCS 35.6 cm (14")/pk	✓	✓	✓		✓	
GORE® STA-PURE®, PFL 35.6 cm (14")/pk	✓	✓	✓		✓	
Viton® FDA-Compliant 7.6 m (25 ft)/pk	✓	✓	✓	✓	✓	

Precision Pump Tubing

– Ideal choice for applications involving pressure, suction lift, viscous fluids, or long tubing life

	 L/S 35	 L/S 36
	7.9 mm (0.31")	9.7 mm (0.38")
	9.5 mm (⅜")	9.5 mm (⅜")
	3.8 to 2300 mL/min (4.3 to 2600 mL/min)	4.8 to 2900 mL/min (5.8 to 3400 mL/min)
	2.4 bar (35 psig)	1.4 bar (20 psig)
	660 mm Hg (26" Hg)	610 mm Hg (24" Hg)
	8.8 m H_2O (29 ft H_2O)	8.3 m H_2O (27 ft H_2O)

‡Actual performance varies depending on tubing formulation—values shown are for firm tubing.

	L/S 15	L/S 24	L/S 35	L/S 36
	96419-15	96419-24	96419-35	96419-36
	96410-15	96410-24	96410-35	96410-36
	96400-15	96400-24	96400-35	96400-36
	96420-15	96420-24	96420-35	96420-36
	96440-15	96440-24	96440-35	96440-36
	06434-15	06434-24	06434-35	06434-36
	06424-15	06424-24	06424-35	06424-36
	06508-15	06508-24	06508-35	06508-36
	05664-15	05664-24	—	—
	06435-15	06435-24	—	—
	06442-15	06442-24	06442-35	06442-36
	06440-15	06440-24	06440-35	06440-36
	06418-15	06418-24	06418-35	06418-36
	06509-15	06509-24	06509-35	06509-36
	06475-15	06475-24	—	—
	06401-15	06401-24	06401-35	06401-36
	06404-15	06404-24	06404-35	06404-36
	06402-15	06402-24	06402-35	06402-36
	96241-15	96241-24	96241-35	96241-36
	96242-15	96242-24	96242-35	96242-36
	96412-15	96412-24	96412-35	96412-36

MASTERFLEX® I/P® Precision and

- I/P pump tubing is manufactured to extremely close tolerances that match our I/P pump heads, ensuring accurate, repeatable flow and long tubing life
- Our tubing is factory-tested and optically inspected to provide the best performance from your peristaltic pump

	I/P Precision pump tubing		
Pump tubing cross sections			
	I/P 26	**I/P 73**	**I/P 82**
Inside diameter (nominal)	6.4 mm (0.25")	9.5 mm (0.37")	12.7 mm (0.5")
Hose barb size (nominal)	6.4 mm (¼")	9.5 mm (⅜")	12.7 mm (½")
Flow range (approximate)† with 1 to 650 rpm drive	0.01 to 4 LPM (0.002 to 1.1 GPM)		0.02 to 13 LPM (0.005 to 3.5 GPM)
Maximum pressure‡	2.7 bar (40 psi)		1.4 bar (20 psi)
Maximum vacuum†	660 mm Hg (26" Hg)		510 mm Hg (20" Hg)
Suction lift†	8.8 m H_2O (29 ft H_2O)		7.0 m H_2O (23 ft H_2O)

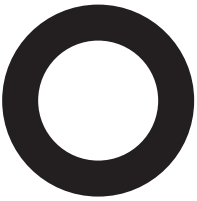
†Determined under the following conditions: 0 psi at inlet, 0.5 psi at outlet; water temperature at 22°C (72°F).

				I/P Pump Head Compatibility		
Tubing	Standard	Easy-Load®	Cytoflow®	I/P 26	I/P 73	I/P 82
Puri-Flex® 7.6 m (25 ft)/pk	✓	✓	✓	96419-26	96419-73	96419-82
Silicone (platinum-cured) 7.6 m (25 ft)/pk	✓	✓	✓	96410-26	96410-73	96410-82
Silicone (peroxide-cured) 7.6 m (25 ft)/pk	✓	✓	✓	96400-26	96400-73	96400-82
BioPharm silicone (platinum-cured) 7.6 m (25 ft)/pk	✓	✓	✓	96420-26	96420-73	96420-82
BioPharm Plus silicone (platinum-cured) 7.6 m (25 ft)/pk	✓	✓	✓	96440-26	96440-73	96440-82
C-Flex® ULTRA 7.6 m (25 ft)/pk	✓	✓	✓	06434-26	06434-73	06434-82
C-Flex® 7.6 m (25 ft)/pk	✓	✓	✓	06424-26	06424-73	06424-82
PharMed® BPT 7.6 m (25 ft)/pk	✓	✓	✓	06508-26	06508-73	06508-82
PharmaPure® 7.6 m (25 ft)/pk		✓	✓	06435-26	06435-73	06435-82
Chem-Durance® Bio 15.2 m (50 ft)/pk		✓	✓	06442-26	06442-73	06442-82
Tygon® E-LFL 7.6 m (25 ft)/pk	✓	✓	✓	06440-26	06440-73	06440-82
Tygon® E-Food (B-44-4X) 15.2 m (50 ft)/pk	✓	✓	✓	06418-26	06418-73	06418-82
Tygon® E-Lab (E-3603) 15.2 m (50 ft)/pk	✓	✓	✓	06509-26	06509-73	06509-82
Versilon™ 2001 15.2 m (50 ft)/pk		✓	✓	06475-26	06475-73	06475-82
Tygon® Fuel & Lubricant (F-4040-A) 15.2 m (50 ft)/pk	✓	✓	✓	—	06401-73	06401-82
Versilon™ (A-60-N) 15.2 m (50 ft)/pk	✓	✓	✓	06404-26	06404-73	06404-82
Tygon® (A-60-F) 15.2 m (50 ft)/pk	✓	✓	✓	06402-26	06402-73	06402-82
GORE® STA-PURE®, PCS 61 cm (24")/pk	✓	✓	✓	96241-26	96241-73	96241-82
GORE® STA-PURE®, PFL 61 cm (24")/pk	✓	✓	✓	96242-26	96242-73	96242-82
Viton® FDA-Compliant 7.6 m (25 ft)/pk	✓	✓	✓	96412-26	96412-73	—

High-Performance Precision Pump Tubing

– Our High-Performance Precision pump tubing features a thicker wall compared to our Precision pump tubing, making it the best choice for applications involving pressure, suction lift, viscous fluids, or long tubing life

I/P High-Performance Precision pump tubing



	I/P 70	I/P 88	I/P 89
	9.5 mm (0.37")	12.7 mm (0.5")	15.88 mm (0.62")
	9.5 mm (⅜")	12.7 mm (½")	15.88 mm (⅝")
	0.01 to 8 LPM (0.002 to 2.1 GPM)	0.02 to 17 LPM (0.005 to 4.5 GPM)	0.03 to 19 LPM (0.007 to 5.0 GPM)
	2.7 bar (40 psi)	2.4 bar (35 psi)	1.4 bar (20 psi)
	660 mm (Hg 26" Hg)		610 mm Hg (24" Hg)
	8.8 m H_2O (29 ft H_2O)		8.2 m H_2O (27 ft H_2O)

‡Actual performance varies depending on tubing formulation—values shown are for firm tubing.

I/P Pump Head Compatibility

	High-performance	Length	I/P 70	I/P 88	I/P 89
	✓	3.0 m (10 ft)/pk	**96419-70**	**96419-88**	**96419-89**
	✓	3.0 m (10 ft)/pk	**96510-70**	**96510-88**	**96510-89**
		—	—	—	—
	✓	3.0 m (10 ft)/pk	**96421-70**	**96421-88**	**96421-89**
	✓	3.0 m (10 ft)/pk	**96441-70**	**96441-88**	**96441-89**
	✓	—	—	—	—
	✓	3.0 m (10 ft)/pk	**06424-70**	**06424-88**	**06424-89**
	✓	7.6 m (25 ft)/pk	**06508-70**	**06508-88**	—
		—	—	—	—
	✓	15.2 m (50 ft)/pk	**06442-70**	**06442-88**	**06442-89**
	✓	7.6 m (25 ft)/pk	**06440-70**	**06440-88**	**06440-89**
	✓	15.2 m (50 ft)/pk	**06418-70**	**06418-88**	**06418-89**
	✓	15.2 m (50 ft)/pk	**06509-70**	**06509-88**	**06509-89**
		—	—	—	—
		—	—	—	—
	✓	7.6 m (25 ft)/pk	**06404-70**	**06404-88**	**06404-89**
	✓	7.6 m (25 ft)/pk	—	**06402-88**	**06402-89**
	✓	61.0 cm (24")/pk	—	**96241-88**	**96241-89**
	✓	61.0 cm (24")/pk	—	**96242-88**	**96242-89**
		—	—	—	—

Spooled Pump Tubing

- Eliminate waste by cutting the exact length to fit your application
- Cost-effective, efficient, and convenient
- Always have enough tubing on hand
- Save space and shipping costs

96403-15

L/S Spooled Pump Tubing

Size	Platinum-cured silicone (96410, 96510-series)		Peroxide-cured silicone (96400-series)		PharMed® BPT (06508-series)	
	m (ft)	Cat. no.	m (ft)	Cat. no.	m (ft)	Cat. no.
L/S 13	152.4 (500)	**96403-13**	76.2 (250)	**96407-13**	—	—
L/S 14	152.4 (500)	**96403-14**	76.2 (250)	**96407-14**	152.4 (500)	**95687-14**
L/S 16	152.4 (500)	**96403-16**	76.2 (250)	**96407-16**	152.4 (500)	**95687-16**
L/S 25	152.4 (500)	**96403-25**	76.2 (250)	**96407-25**	—	—
L/S 17	152.4 (500)	**96403-17**	76.2 (250)	**96407-17**	152.4 (500)	**95687-17**
L/S 18	121.9 (400)	**96403-18**	61.0 (200)	**96407-18**	121.9 (400)	**95687-18**
L/S 15	121.9 (400)	**96403-15**	76.2 (250)	**96407-15**	121.9 (400)	**95687-15**
L/S 24	91.4 (300)	**96403-24**	61.0 (200)	**96407-24**	91.4 (300)	**95687-24**
L/S 35	91.4 (300)	**96403-35**	—	—	91.4 (300)	**95687-35**
L/S 36	30.5 (100)	**96403-36**	—	—	30.5 (100)	**95687-36**

I/P Spooled Pump Tubing

I/P 26	61.0 (200)	**96403-26**	—	—	61.0 (200)	—
I/P 73	45.7 (150)	**96403-73**	45.7 (150)	**96402-73**	45.7 (150)	**95687-73**
I/P 82	30.5 (100)	**96403-82**	30.5 (100)	**96402-82**	30.5 (100)	**95687-82**
I/P 88	—	—	—	—	—	—
I/P 89	—	—	—	—	—	—

L/S Spooled Pump Tubing

Size	BioPharm silicone (96420, 96421-series)		C-Flex® (06424-series)	
	m (ft)	Cat. no.	m (ft)	Cat. no.
L/S 13	—	—	121.9 (400)	**06427-13**
L/S 14	121.9 (400)	**96423-14**	121.9 (400)	**06427-14**
L/S 16	121.9 (400)	**96423-16**	121.9 (400)	**06427-16**
L/S 25	121.9 (400)	**96423-25**	121.9 (400)	**06427-25**
L/S 17	121.9 (400)	**96423-17**	121.9 (400)	**06427-17**
L/S 18	121.9 (400)	**96423-18**	121.9 (400)	**06427-18**
L/S 15	121.9 (400)	**96423-15**	121.9 (400)	**06427-15**
L/S 24	121.9 (400)	**96423-24**	121.9 (400)	**06427-24**
L/S 35	—	—	121.9 (400)	**06427-35**
L/S 36	—	—	121.9 (400)	**06427-36**

I/P Spooled Pump Tubing

I/P 26	121.9 (400)	**96423-26**	121.9 (400)	**06427-26**
I/P 73	30.5 (100)	**96423-73**	30.5 (100)	**06427-73**
I/P 82	—	—	30.5 (100)	**06427-82**
I/P 88	30.5 (100)	**96423-88**	—	—
I/P 89	30.5 (100)	**96423-89**	—	—

Bulk-Packed Pump Tubing

- Tubing coils are individually bagged and sealed to prevent contamination
- Save on shipping costs and reduce storage space
- Up to 20 sealed bags of tubing (depending on tubing size) in each case

Order above right

96404-16

L/S Bulk-Packed Pump Tubing

Size	Number of 7.6-m (25-ft) bags per box	Platinum-cured silicone (96410-series)	C-Flex® (06424-series)
		Cat. no.	Cat. no.
L/S 13	20	**96404-13**	**06436-13**
L/S 14	20	**96404-14**	**06436-14**
L/S 16	20	**96404-16**	**—**
L/S 25	20	**96404-25**	**06436-25**
L/S 17	20	**96404-17**	**06436-17**
L/S 18	10	**96404-18**	**—**
L/S 15	20	**96404-15**	**06436-15**
L/S 24	20	**96404-24**	**06436-24**
L/S 35	10	**96404-35**	**06436-35**
L/S 36	10	**96404-36**	**06436-36**

I/P Bulk-Packed Pump Tubing

I/P 26	10	**96404-26**	**06436-26**
I/P 73	10	**96404-73**	**06436-73**
I/P 82	10	**96404-82**	**06436-82**

Sanitary Pump Tubing Assemblies

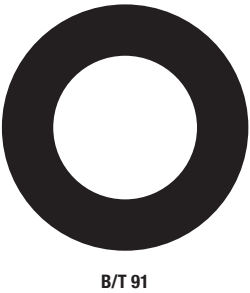
- Meets stringent demands of biotechnology, pharmaceutical, and the food, beverage, and dairy processing industries
- Smooth, pre-molded tubing ends allow quick connection to an adapter or to another length of sanitary tubing
- Connectors help maintain cleanliness and purity of your fluids
- FREE Certificate of resin or elastomer Compliance is available upon request

96112-24

Size	Platinum-cured silicone (96410, 96510-series)		PharMed® BPT (06508-series)	
	1.5 m (5 ft)	3 m (10 ft)	1.5 m (5 ft)	3 m (10 ft)
	Cat. no.	Cat. no.	Cat. no.	Cat. no.
L/S Precision sanitary pump tubing				
L/S 13	**96100-13**	**96101-13**	**96112-13**	**96113-13**
L/S 14	**96100-14**	**96101-14**	**96112-14**	**96113-14**
L/S 16	**96100-16**	**96101-16**	**96112-16**	**96113-16**
L/S 25	**96100-25**	**96101-25**	**96112-25**	**96113-25**
L/S 17	**96100-17**	**96101-17**	**96112-17**	**96113-17**
L/S 18	**96100-18**	**96101-18**	**96112-18**	**96113-18**
L/S High-Performance Precision sanitary pump tubing				
L/S 15	**96100-15**	**96101-15**	**96112-15**	**96113-15**
L/S 24	**96100-24**	**96101-24**	**96112-24**	**96113-24**
L/S 35	—	—	**96112-35**	**96113-35**
L/S 36	—	—	**96112-36**	**96113-36**
I/P Precision sanitary pump tubing				
I/P 26	**96100-26**	**96101-26**	**96112-26**	**96113-26**
I/P 73	**96100-73**	**96101-73**	**96112-73**	**96113-73**
I/P 82	**96100-82**	**96101-82**	**96112-82**	**96113-82**
I/P High-Performance Precision sanitary pump tubing				
I/P 70	—	—	**96112-70**	**96113-70**
I/P 88	—	—	**96112-88**	**96113-88**

PerfectPosition® Pump Tubing
for 77110- and 77111-Series B/T® Rapid-Load® Pump Heads

- Ensure optimal performance from your Masterflex pump
- PerfectPosition tubing retention marks indicate the exact placement of tubing in the pump head to provide the best performance and life of the tubing
- Custom extruded to fit 77110-series and 77111-series Masterflex B/T pumps and pump heads
- Engineered for long life in peristaltic pump applications

	B/T PerfectPosition® pump tubing	
Tubing cross sections		
	B/T 87	B/T 91

Pump tubing size	PerfectPosition® pump tubing	
	B/T 87	B/T 91
Inside diameter (nominal)	12.7 mm (0.5")	19.0 mm (0.75")
Hose barb size	12.7 mm (½")	19.0 mm (¾")
Flow range (approximate)† with 12 to 321 rpm drive	0.65 to 18.9 LPM (0.16 to 5.0 GPM)	1.4 to 42 LPM (0.3 to 11.1 GPM)
Maximum pressure‡	2.4 bar (35 psi)	2.06 bar (30 psi)
Maximum vacuum‡	660 mm Hg (26" Hg)	
Suction lift‡	8.8 m H_2O (29 ft H_2O)	

†Determined under the following conditions: 0 psi at inlet, 0.5 psi at outlet; water temperature at (22°C) 72°F . ‡Actual performance varies depending on tubing formulation—values shown are for firm tubing.

Pump tubing formulation		B/T PerfectPosition pump tubing	
		B/T 87	B/T 91
Puri-Flex®	3.0 m (10 ft) per pack	**96419-87**	**96419-91**
Silicone (platinum-cured)	3.0 m (10 ft) per pack	**96510-87**	**96510-91**
Silicone (peroxide-cured)	3.0 m (10 ft) per pack	**96400-87**	**96400-91**
BioPharm Plus silicone (platinum-cured)	3.0 m (10 ft) per pack	**96445-87**	**96445-91**
C-Flex®	3.0 m (10 ft) per pack	**06424-87**	**06424-91**
PharMed® BPT	3.0 m (10 ft) per pack	**06507-87**	**06507-91**
PharmaPure®	3.0 m (10 ft) per pack	**06437-87**	**06437-91**
Chem-Durance® Bio	3.0 m (10 ft) per pack	**06443-87**	**06443-91**
Tygon® E-LFL	3.0 m (10 ft) per pack	**06440-87**	**06440-91**
Tygon® E-Food (B-44-4X)	3.0 m (10 ft) per pack	**06418-87**	**06418-91**
GORE® STA-PURE®, Series PCS	68.6 cm (27") per pack	**96241-87**	**96241-91**
Tygon® (A-60-F)	3.0 m (10 ft) per pack	**06399-87**	**06399-91**

Chemical Compatibility Charts

Determine the right tubing formulation for your application using the chemical compatibility tables on pages 26–27. These tables are for use with all Masterflex and Ismatec tubing sizes. All ratings in the tables indicate tubing condition after exposure to the chemical at 21ºC (70ºF). As every application for our tubing is different and may be outside of our testing parameters, we still recommend using the Masterflex tubing test kit to determine the tubing's specific compatibility to your purposes.

Ratings & Materials Legend

Ratings

A: No effect; little noticeable change

B: Minor effect; slight corrosion or discoloration

C: Moderate effect; not recommended for continuous use; softening, loss of strength, swelling and/or shrinkage

D: Severe effect; not recommended for use; severe softening, swelling and/or shrinkage

— No data available

Tubing formulations

PN: Puri-Flex®, Puri-Prene™, PharMed® BPT, High-Pressure PharMed® BPT, PharmaPure®, Versilon™ A-60-N, Tygon® A-60-F

CF: C-Flex® ULTRA and C-Flex®

S: Silicone (platinum-/peroxide-cured), BioPharm, BioPharm Plus, GORE® STA-PURE® Pump Tubing – Series PCS

T: Puri-Clear® LL, Tygon® E-LFL, Tygon® E-Food, Tygon® E-Lab

TU: Tygon® Fuel & Lubricant, Solva™

TC: Versilon™ 2001

CD: Chem-Durance® Bio

PFL: GORE® STA-PURE® Pump Tubing – Series PFL

V: Viton®

FP: Polytetrafluoroethylene (PTFE)

Technical Info

Tubing Test Procedure

1. Measure and weigh a sample of tubing.
2. Immerse the sample in the fluid for 72 hours in a closed vessel.
3. Dry sample, then measure and weigh it. Inspect carefully for signs of deterioration such as swelling, embrittlement, cracking, softness, or change of size or weight.
4. If there is no sign of deterioration, test a sample in pump under the conditions of your application.

Note: PharmaPure® and Chem-Durance® Bio tubing formulations have different inner and outer materials and require modified testing methods. Contact your Masterflex office or dealer for chemical testing instructions.

⚠Caution

The ratings in the charts do not reflect the extent to which extraction or leaching may occur or the extent to which fluids may undergo any physical changes in properties or composition as a result of coming into contact with the wetted materials. it is the user's responsibility to test and ensure the suitability of wetted materials for all intended users, including establishing the compatibility of any fluid with the material through which it is coming into contact.

⚠Warning

The information in these tables has been supplied to Masterflex by the tubing manufacturers and is to be used **ONLY** as a guide to select your tubing. Test fluids and tubing using the tubing test procedure above. Masterflex does not warrant (neither express or implied) that the information in these tables is accurate or complete or that any material is suitable for any purpose.

⚠Danger

Even if tubing passes the immersion test, variations in temperature, pressure, or concentration may cause tubing failure.

SERIOUS INJURY MAY RESULT.

Use suitable guards and/or personal protection when pumping chemicals.

Masterflex® and Ismatec® Chemical Compatibility

Fluid	Tubing formulation									
	PN	CF	S	T	TU	TC	CD	PFL	V	FP
Acetaldehyde	D	A	B	D	D	D	C	A	D	A
Acetate LMW	A	A	—	D	D	C	D	—	—	A
Acetic acid <5%	A	A	A	A	A	B	A	A	—	A
Acetic acid >5%	A	A	A	B	A	B	A	A	B	A
Acetic anhydride	A	B	C	D	D	A	A	A	D	A
Acetone	D	C	C	D	D	C	B	A	D	A
Acetonitrile	B	A	—	D	D	B	B	—	D	A
Acetyl bromide	C	A	—	D	D	C	D	—	—	A
Acetyl chloride	C	A	C	D	D	C	D	A	A	A
Air	A	A	A	A	A	A	A	A	A	A†
Aliphatic hydrocarbons	D	D	—	D	B	D	D	—	—	—
Aluminum chloride	A	A	B	A	A	A	A	—	A	A
Aluminum sulfate	A	A	A	A	A	A	A	—	A	A
Alums	A	A	A	A	A	A	A	—	A	A
Ammonia, gas / liquid	A	A	C	B	B	B	B	—	D	A
Ammonium acetate	A	A	—	A	A	A	A	A	D	A
Ammonium carbonate	A	A	C	A	A	A	A	A	A	A
Ammonium chloride	A	A	C	A	A	A	A	A	A	A
Ammonium hydroxide	A	A	A	B	C	A	A	A	B	A
Ammonium nitrate	A	A	C	A	A	A	A	A	A	A
Ammonium phosphate	A	A	A	A	A	A	A	A	A	A
Ammonium sulfate	A	A	A	A	A	A	A	A	A	A
Amyl acetate	B	D	D	D	D	D	D	B	D	A
Amyl alcohol	D	D	D	D	A	A	A	A	A	A
Amyl chloride	C	D	D	D	D	D	D	—	A	A
Aniline	C	B	D	D	D	D	D	A	B	A
Aniline hydrochloride	C	B	D	D	D	D	D	A	B	A
Aqua regia (80% HCl, 20% H)	D	—	D	D	D	A	A	—	B	A
Aromatic hydrocarbons	D	D	—	D	D	D	D	—	A	—
Arsenic salts	A	—	—	A	A	A	A	—	D	—
Barium salts	A	A	A	A	A	A	A	A	A	A
Benzaldehyde	D	D	B	D	D	C	C	A	D	A
Benzenesulfonic acid	D	A	D	D	D	D	D	A	A	A
Bleaching liquors	A	B	B	A	A	A	A	—	A	A
Boric acid	A	A	A	A	A	A	A	A	A	A
Bromine	D	A	D	D	D	D	D	—	A	A
Butane	A	D	D	A	A	B	B	B	A	A
Butanol (butyl alcohol)	D	B	B	D	A	A	A	A	A	A
Butyl acetate	B	D	D	D	D	D	D	B	D	A
Butyric acid	B	A	D	D	C	D	D	A	B	A
Calcium oxide	A	—	A	A	A	A	A	—	A	A
Calcium salts	A	A	B	A	A	A	A	A	A	A
Carbon bisulfide	D	D	D	D	D	D	D	—	—	A
Carbon dioxide	A	A	B	A	A	A	A	A	A	A†
Carbon tetrachloride	D	B	D	D	D	D	D	B	A	A
Chlorine, dry	C	A	D	A	A	C	C	—	A	A†
Chlorine, wet	D	A	D	C	A	C	C	—	B	A
Chloroacetic acid	B	A	—	A	D	A	A	B	D	A
Chlorobenzene	D	D	D	D	D	D	D	A	A	B
Chlorobromomethane	B	D	D	D	D	—	D	—	A	A
Chloroform	C	D	D	D	D	D	D	B	A	A
Chlorosulfonic acid	D	A	D	D	D	D	D	A	D	A
Chromic acid, 30%	A	A	C	C	C	B	B	—	A	A
Chromium salts	A	A	—	A	A	A	A	—	—	—
Copper salts	A	A	A	A	A	A	A	—	A	A
Cresol	D	D	D	B	C	A	A	A	A	A
Cyclohexane	D	D	D	D	C	D	D	B	A	A
Cyclohexanone	D	D	D	D	D	C	C	—	D	A
Diacetone alcohol	A	A	B	D	D	A	A	A	D	A
Dimethyl formamide	B	B	B	D	D	A	A	A	D	A
Dimethyl Sulfoxide (DMSO)	A	—	—	—	—	—	—	—	—	A
Essential oils	D	B	C	D	C	D	D	—	—	—
Ethanol (ethyl alcohol)	C	B	A	D	B	A	A	A	A	A
Ether	C	D	D	D	C	D	D	B	D	A
Ethyl acetate	B	D	B	D	D	D	D	A	D	A
Ethyl bromide	D	A	D	D	D	C	D	—	A	A
Ethyl chloride	C	A	D	D	D	D	D	—	A	A
Ethylamine	D	A	C	D	D	B	B	B	D	—
Ethylene chlorohydrin	A	A	C	D	B	A	A	—	A	A
Ethylene dichloride	C	A	D	D	D	D	D	B	A	A
Ethylene glycol	A	B	A	A	A	A	A	A	A	A
Ethylene oxide	A	A	D	A	A	A	A	B	D	A
Fatty acids	C	B	C	B	B	C	C	A	A	A
Ferric chloride	A	A	B	A	A	A	A	—	A	A
Ferric sulfate	A	A	B	A	A	A	A	A	A	A
Ferrous chloride	A	A	C	A	A	A	A	—	A	A
Ferrous sulfate	A	A	C	A	A	A	A	A	A	A
Fluoboric acid	D	A	A	C	D	A	A	—	—	A
Fluoroborate salts	A	A	—	A	A	A	A	—	—	—
Fluosilicic acid	C	A	D	A	A	A	A	—	A	A
Formaldehyde	D	A	B	D	D	C	C	A	D	A
Formic acid, 25%	A	A	B	B	C	A	A	A	D	A
Freon® TMS	D	C	—	D	D	A	A	D	—	A
Gasoline, high-aromatic	D	D	D	D	B	D	D	B	A	B
Gasoline, nonaromatic	D	D	D	D	B	D	D	B	A	A
Glucose	A	A	A	A	A	A	A	A	A	A
Glue, P.V.A.	A	A	A	A	A	—	A	—	A	A
Glycerin	A	B	A	A	A	A	A	—	A	A
Hydriodic acid	D	A	—	A	A	A	A	—	A	—
Hydrobromic acid, 30%	D	A	D	B	A	A	A	—	A	A
Hydrochloric acid (dil)	A	A	D	A	A	A	A	A	A	A
Hydrochloric acid (med)	B	A	D	C	D	A	A	A	A	A
Hydrochloric acid (conc)	—	B	D	C	D	A	A	A	A	A
Hydrocyanic acid	A	A	C	A	A	A	A	A	A	A
Hydrocyanic acid, gas, 10%	A	A	C	A	A	A	A	—	A	A
Hydrofluoric acid, 50%	D	A	D	C	D	A	A	D	D	A

Charts (See Legend on page 25)

Fluid	Tubing formulation									
	PN	CF	S	T	TU	TC	CD	PFL	V	FP
Hydrofluoric acid, 75%	—	A	D	D	D	—	C	D	D	A
Hydrogen peroxide (dil)	A	A	A	A	A	A	A	A	A	A
Hydrogen peroxide, 90%	B	D	B	D	D	B	B	A	A	A
Hypochlorous acid	A	A	D	A	A	A	A	A	A	A
Iodine solutions	A	C	C	A	A	A	A	—	A	A
Iodoform	—	—	—	—	—	—	D	—	C	—
Kerosene	D	D	D	D	B	D	D	A	A	A
Ketones	D	B	—	D	D	C	C	—	—	A
Lacquer solvents	B	D	D	D	D	D	D	A	D	A
Lactic acid, 3–10%	A	A	A	A	A	A	A	A	A	A
Lead acetate	A	A	D	A	A	A	A	—	D	A
Linseed oil	C	D	A	D	A	B	B	A	A	A
Lithium hydroxide	B	A	D	A	A	—	B	—	C	A
Magnesium chloride	A	A	A	A	A	A	A	A	A	A
Magnesium sulfate	A	A	A	A	A	A	A	A	A	A
Malic acid	A	A	B	A	A	A	A	A	A	A
Manganese salts	A	A	B	A	A	A	A	—	A	A
Mercury salts	A	A	—	A	A	A	A	—	A	A
Methane	A	D	D	A	A	A	A	B	A	A†
Methanol (methyl alcohol)	A	—	A	C	C	A	A	A	B	A
Methyl chloride	C	A	D	D	D	D	D	B	B	A
Methyl ethyl ketone (MEK)	D	—	D	D	D	C	C	B	D	A
Mixed acid (40% H_2SO_4, 15% HNO_3)	B	—	—	B	D	—	A	—	—	A
Molybdenum disulfide	—	A	—	—	—	—	A	—	A	—
Monoethanolamine	C	B	B	D	D	D	D	—	D	A
Naphtha	D	D	D	D	B	D	D	B	A	B
Natural gas	A	D	A	A	A	A	A	B	A	A†
Nickel salts	A	A	A	A	A	A	A	A	A	A
Nitric acid (dil)	A	A	B	A	D	A	A	A	B	A
Nitric acid (med)	A	—	C	C	D	A	A	A	A	A
Nitric acid (conc)	D	—	D	D	D	A	A	A	A	A
Nitrobenzene	D	D	D	D	D	D	D	A	B	A
Nitrogen oxides	A	A	D	A	A	A	A	—	D	A
Nitrous acid	A	A	—	A	C	A	A	—	—	A
Oils, animal	C	B	B	D	B	B	B	—	A	A
Oils, mineral	D	B	B	C	A	D	D	—	A	A
Oils, vegetable	C	B	B	D	A	B	B	A	A	A
Oleic acid	C	A	D	D	B	D	C	A	B	A
Oxalic acid, cold	B	A	B	C	D	A	A	A	A	A
Oxygen, gas	A	A	B	A	A	A	A	A	B	A†
Palmitic acid, 100% in ether	C	—	D	D	B	C	C	A	A	A
Perchloric acid	A	A	D	C	D	A	A	A	A	A
Perchloroethylene	C	B	D	D	D	D	D	B	A	A
Phenol (carbolic acid)	A	D	D	B	C	A	A	A	A	A
Phosphoric acid, 50%	A	A	C	C	A	A	A	A	A	A
Phthalic acid	A	D	B	D	A	A	A	—	B	A
Plating solutions	A	A	D	A	D	A	A	—	A	A
Polyglycol	B	B	A	A	A	—	B	—	A	—
Potassium carbonate	A	A	—	A	A	A	A	A	A	—
Potassium chlorate	B	A	B	B	A	—	A	A	A	A
Potassium hydroxide (med)	A	A	B	B	D	—	A	B	D	A
Potassium hydroxide (conc)	A	A	C	D	D	—	A	B	D	A
Potassium iodide	A	A	—	A	A	A	A	—	A	A
Propanol (propyl alcohol)	C	—	A	D	A	A	A	A	A	A
Pyridine	C	A	D	D	D	C	C	A	D	A
Silicone fluids	A	B	C	B	A	B	A	—	A	A
Silicone oils	C	B	C	B	A	B	A	—	A	A
Silver nitrate	A	A	A	A	A	A	A	A	A	A
Soap solutions	B	A	A	A	A	A	A	A	A	A
Sodium bicarbonate	A	A	A	A	A	A	A	A	A	A
Sodium bisulfate	A	A	—	A	A	A	A	A	A	A
Sodium bisulfite	A	A	A	A	A	—	A	A	A	A
Sodium borate	A	A	A	A	A	—	A	—	A	A
Sodium carbonate	A	A	A	A	A	A	A	A	A	A
Sodium chlorate	A	A	C	A	A	A	A	—	A	A
Sodium chloride	A	A	A	A	A	A	A	A	A	A
Sodium ferrocyanide	A	A	—	B	B	—	A	—	A	A
Sodium hydrosulfite	B	A	—	A	A	—	A	—	—	A
Sodium hydroxide (dil)	A	A	A	A	D	A	A	A	A	A
Sodium hydroxide, 25%	A	B	B	C	D	A	A	—	A	A
Sodium hydroxide (conc)	—	C	—	C	D	A	A	—	A	A
Sodium hypochlorite, <5%	A	A	B	A	A	A	A	A	A	A
Sodium hypochlorite, >5%	A	A	B	A	A	A	A	A	A	A
Sodium nitrate	A	A	D	A	A	A	A	A	A	A
Sodium silicate	A	A	A	A	A	—	A	A	A	A
Sodium sulfide	A	A	A	A	A	A	A	A	A	A
Sodium sulfite	A	A	A	A	A	A	A	A	A	A
Steam, up to 40 psi	C	—	A	D	D	—	D	A	B	A†
Stearic acid	C	A	B	A	B	C	C	A	A	A
Styrene	D	D	D	D	D	D	D	A	A	A
Sulfuric acid (dil)	A	A	D	A	A	A	A	A	A	A
Sulfuric acid (med)	A	A	D	A	B	A	A	—	A	A
Sulfuric acid (conc)	D	A	D	D	D	D	A	C	A	A
Sulfurous acid	A	A	D	A	A	A	A	—	B	A
Tannic acid	B	A	B	C	D	A	A	—	A	A
Tanning liquors	A	B	—	A	A	A	A	—	—	A
Tartaric acid	A	A	A	A	A	A	A	A	A	A
Tin salts	A	A	B	A	A	A	A	—	—	A
Toluene (toluol)	D	D	D	D	D	D	D	A	A	A
Trichloroacetic acid	B	A	D	A	D	A	A	—	C	A
Trichloroethylene	D	D	D	D	D	D	D	B	A	A
Trisodium phosphate	A	A	—	A	A	A	A	—	A	A
Turpentine	D	D	D	D	B	D	D	A	A	A
Urea	A	A	B	A	A	A	A	A	—	A
Uric acid	A	A	—	A	C	A	A	—	—	A
Water, fresh	A	A	B	A	A	A	A	A	A	A
Water, salt	A	A	A	A	A	A	A	A	A	A
Xylene	D	D	D	D	D	D	D	A	A	A
Zinc chloride	A	A	A	A	A	A	A	A	A	A

†Do not use the L/S® PTFE-tubing pump head with gases due to excessive heat buildup.

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