

MASTERFLEX® Tubing Introduction

MASTERFLEX® Pump Tubing Compatibility Charts

Determine the right tubing formulation for your application using the chemical compatibility tables at right. These tables are for use with all Masterflex tubing sizes. All ratings in the tables indicate tubing condition after exposure to the chemical at 21°C (70°F).

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:** PharMed® BPT, High-Pressure PharMed® BPT, PharmaPure®, Norprene®, Norprene® Food, PuriFlex™
- CF:** C-FLEX® and C-Flex® ULTRA
- S:** Silicone (peroxide/platinum-cured), BioPharm, BioPharm Plus, GORE® Style 100SC
- T:** Tygon® E-Lab, Tygon® E-LFL, Tygon® E-Food
- TU:** Tygon® Fuel & Lubricant
- TC:** Tygon® Chemical
- CD:** Chem-Durance® Bio
- PFL:** GORE® Style 500
- V:** Viton®, GORE® Style 400
- FP:** Polytetrafluoroethylene (PTFE)

Pump head materials

- PSF:** Polysulfone
- PC:** Polycarbonate
- PPS:** Polyphenylene sulfide
- SS:** Stainless steel
- PP:** Polypropylene

BPT Silicone

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

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

⚠ 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.

⚠ WARNING

The information in these tables has been supplied to Cole-Parmer 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 on page 1229. Cole-Parmer 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.