# Appendix: Fluid Compatibility Tables

The following table is compiled primarily from data published by several manufacturers of elastomers and plastics. The ratings are intended only as a guide. In fact, different sources do not always agree, so it is best to test before committing to a particular compound.

In general, most chemical attack on elastomers and plastics is in the form of swelling and softening. The function of the individual part determines how much swelling and softening can be tolerated. In addition, some materials are resistant to certain fluids at room temperature, but will be attacked at an elevated temperature. Duration of exposure is also a factor, Again, it is best to test.

A considerable body of data exists beyond what is presented here. If the fluids you are concerned with do not appear in this list, please contact Genizer for our best assessment of probable compatibility.

# 1. The Elastomers

**Nitrile:**

Otherwise known as Buna N or NBR. This is one of the most common synthetic rubber materials. Nitrile is normally used in the air motor of the Homogenizer equipment, though it can certainly be used in fluid contact as well.

**EPDM:**

Also called EPR or Ethylene Propylene Rubber. A specialty elastomer with excellent resistance to ketones and most alcohols, but EPR is seriously attacked by petroleum oils, so the user must be careful about lubricating this compound. Toughness and temperature resistance are very good.

**Fluoroelastomer: (Trade name, Viton)**

Also called FKM, this a premium elastomer with a broad range of chemical compatibility. Excellent in oil services, but poor in ketones and some alcohols. Colored brown for easy identification. This is our commonly used elastomer for fluid contact services.

## 2. The Plastics

**Neoprene:**

Otherwise known as Chloroprene or CR, this is one of the earliest known types of synthetic rubber. Useful in applications such as ammonia and Freon.

**UHMWPE:**

Ultra high molecular weight polyethylene, an extremely tough, wear-resistant thermoplastic with good chemical resistance and moderate temperature resistance. Used for seals and gaskets.

**PEEK:**

Polyetheretherketone, one of the new high-strength engineering plastics. Has excellent chemical resistance and structural properties. Very high temperature capability. Used for bearings, gaskets, and back-up rings.

**PTFE:** (Trade name, Teflon)

Has broadest chemical resistance of all plastic materials and outstanding temperature capability. Limited strength and poor shape retention make PTFE a poor choice for sealing and load bearing applications unless combined with other fillers such as glass fibers, carbon graphite, or molybdenum disulfide.

| Fluid | Nitrile | EPDM | Neoprene | Fluoroelastomer | UHMWPE | PEEK | PTFE |
|---|---|---|---|---|---|---|---|
| Acetaldehyde | U | R | U | U | X | L | R |
| Acetamide | R | R | R | U | X | L | R |
| Acetic Acid | M | R | R | U | R | R | R |
| Acetone | U | R | M | U | R | R | R |
| Acetophenone | U | R | U | U | X | L | R |
| Acetylene | R | R | R | R | L | R | R |
| Acrylonitrile | U | U | U | U | X | R | R |
| Ammonia | R | R | R | U | R | R | R |
| Ammonium Hydroxide | R | R | R | R | L | R | R |
| Amyl Acetate | U | M | U | U | R | L | R |
| Anderol L-774 | M | U | U | R | L | L | - |
| Antifreeze | R | R | R | R | R | R | R |
| Aniline | U | R | U | M | R | R | R |
| Ansul Ether | M | M | U | U | X | L | L |
| Aroclors | M | R | U | R | X | L | L |
| Askarel | R | U | U | R | X | L | R |
| Asphalt | M | U | M | R | L | R | R |
| ASTM #1 | R | U | R | R | L | L | R |
| ASTM #3 | R | U | R | R | L | L | R |
| ASTM Fuel A | R | U | R | R | L | L | R |
| ASTM Fuel B | R | U | U | R | L | L | R |
| ASTM Fuel C | R | U | U | R | L | L | R |
| ASTM Fuel D | M | U | U | R | L | L | R |
| Auto Transmission Fluid | R | U | M | R | L | L | R |

Label： R = Recommended, M = Marginal, U = Unsatisfactory, X＝Insufficient Data, L = Likely to be Compatible

| Fluid | Nitrile | EPDM | Neoprene | Fluoroelastomer | UHMWPE | PEEK | PTFE |
|---|---|---|---|---|---|---|---|
| Beer | R | R | R | R | R | R | R |
| Benzaldehyde | U | R | U | U | R | R | R |
| Benzene | U | U | U | R | M | R | R |
| Benzoic Acid | U | U | U | R | X | R | R |
| Benzophenone | U | R | X | R | X | X | R |
| Benzyl Alcohol | U | R | R | R | R | X | R |
| Bleach | R | R | R | R | R | L | R |
| Borax | R | R | U | R | L | L | R |
| Boric Acid | R | R | R | R | L | L | R |
| Brake Fluid (non-petroleum) | U | R | R | U | R | R | R |
| Bromine | U | U | U | R | X | X | R |
| Bromobenzene | U | U | U | R | X | L | R |
| Bunker Oil | R | U | U | R | R | R | R |
| ButaneR | U | R | R | L | L | R | |
| Butter | R | M | R | R | R | R | R |
| Butyl Acetate | U | U | U | U | R | L | R |
| Butyl Alcohol | R | R | R | R | R | L | R |
| Butyl Amine | M | U | U | U | X | X | R |
| Butyl Carbitol | U | R | M | M | X | X | R |
| Butyl Cellosolve | M | R | M | U | X | X | R |
| Butyl Ether | U | U | U | U | L | R | R |
| Butraldehyde | U | R | U | U | X | X | L |

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| Fluid | Nitrile | EPDM | Neoprene | Fluoroelastomer | UHMWPE | PEEK | PTFE |
|---|---|---|---|---|---|---|---|
| Carbitol | R | R | R | R | X | X | L |
| Carbitol Acetate | U | U | U | R | X | X | L |
| Carbon Disulfide | U | U | U | R | M | X | R |
| Carbon Tetrachloride | R | U | U | R | U | R | R |
| Carbonic Acid | R | R | R | R | L | R | R |
| Castor Oil | R | R | R | R | R | R | R |
| Cellosolve | U | U | U | U | X | L | R |
| Chassis Grease | R | U | M | R | R | R | R |
| Chloroacetic Acid | U | R | U | U | L | L | R |
| Chloroacetone | U | R | M | R | L | L | R |
| Chlordane | R | U | M | R | L | L | R |
| Chlorine | U | R | U | R | M | X | R |
| Chlorobenzol | U | U | U | R | X | X | L |
| Chloroform | U | U | U | R | M | L | R |
| Chlorosulfonic Acid | U | U | U | U | X | R | L |
| Chrome Plating Solution | U | R | U | R | L | L | R |
| Chromic Acid | U | X | U | R | R | R | R |
| Citric Acid | R | R | R | R | R | R | R |
| Cod Liver Oil | R | U | R | R | R | R | R |
| Coffee | R | R | R | R | R | R | R |
| Corn Oil | R | U | U | R | R | R | R |
| Creosote | R | U | R | R | R | R | R |
| Creosote Oil | R | U | M | R | R | R | R |
| Crude Oil | R | U | U | R | R | R | R |
| Cyclohexane | R | U | M | R | R | L | R |
| Cyclohexanol | R | U | R | R | R | L | R |

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| Fluid | Nitrile | EPDM | Neoprene | Fluoroelastomer | UHMPWE | PEEK | PTFE |
|---|---|---|---|---|---|---|---|
| Decalin | U | U | U | R | R | L | R |
| Decane | R | U | U | R | L | R | R |
| Denatured Alcohol | R | R | R | U | R | R | R |
| Diacetone | U | R | U | U | X | X | R |
| Dibutylamine | U | U | M | U | X | X | R |
| Dibutyl Phthalate | U | R | U | M | R | X | R |
| Dichloroaniline | U | U | U | M | X | X | R |
| Dichloro Butane | R | U | U | R | L | L | R |
| Diesel Oil | R | U | M | R | R | R | R |
| Diethylamine | R | R | R | U | L | L | R |
| Diethyl Benzene | M | U | U | R | X | X | R |
| Diethylene Glycol | R | R | R | R | R | L | R |
| Dimethyl Ether | U | U | M | U | X | X | R |
| Dimethyl Ether Formamide | U | R | X | U | R | R | R |
| Dimethyl Terephthalate | U | U | U | R | X | L | R |
| Dioctyl Phthalate | U | R | U | R | X | L | R |
| Dioxane | U | R | U | R | X | X | R |
| Diphenyl | U | U | U | R | X | X | R |
| Dow Corning 550 | R | R | R | R | L | L | R |
| Dow Guard | R | R | R | R | L | L | R |
| Dowtherm A & E | U | U | U | R | R | R | R |

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| Fluid | Nitrile | EPDM | Neoprene | Fluoroelastomer | UHMPWE | PEEK | PTFE |
|---|---|---|---|---|---|---|---|
| Elco 28 | R | U | M | R | X | X | L |
| Epoxy Resins | X | R | R | U | R | R | R |
| Ethane | R | U | R | R | L | L | R |
| Ethanol | R | R | R | U | R | R | R |
| Ethanolamine | R | R | R | U | X | X | R |
| Ethyl Acetate | U | R | U | U | R | R | R |
| Ethyl Acrylate | U | R | U | U | L | L | R |
| Ethyl Benzene | U | U | U | R | X | X | R |
| Ethyl Cellulose | R | R | R | U | L | L | R |
| Ethyl Chloride | R | R | R | R | X | X | R |
| Ethyl Ether | M | M | U | U | R | X | R |
| Ethyl Formate | U | R | R | R | X | X | R |
| Ethylene Glycol | R | R | R | R | R | R | R |
| Ethyl Hexanol | M | R | R | R | X | X | L |
| Ethyl Mercaptan | U | X | M | R | X | X | L |
| Ethylene Chloride | U | U | U | R | M | X | R |
| Ethylene Oxide | U | R | U | U | X | X | R |
| Ferric Chloride | R | R | M | R | L | L | R |
| Formaldehyde | M | R | M | U | X | X | R |
| Formic Acid | M | R | R | U | R | M | R |
| Freon 11 | R | U | M | M | L | L | R |
| Freon 22 | U | M | R | U | L | L | R |
| Freon 12 | M | M | R | M | L | L | R |
| Fuel Oil | R | U | R | R | R | R | R |
| Furan | U | X | U | X | L | L | L |
| Furfural | U | R | U | U | R | X | R |
| Furfuryl Alcohol | U | R | U | X | X | X | R |

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| Fluid | Nitrile | EPDM | Neoprene | Fluoroelastomer | UHMPWE | PEEK | PTFE |
|---|---|---|---|---|---|---|---|
| Gallic Acid | R | R | R | R | X | X | R |
| Gasoline | R | U | U | R | M | R | R |
| Gelatin | R | R | R | R | R | R | R |
| Glucose | R | R | R | R | R | R | R |
| Glycerine | R | R | R | R | R | R | R |
| Heptane | R | U | R | R | R | R | R |
| Hexaldehyde | U | R | R | U | X | X | R |
| Hexane | R | U | R | R | R | X | R |
| Hexanol | R | M | R | R | X | X | R |
| Home Heating Oil | R | U | M | R | R | R | R |
| Hydrazine | R | R | R | X | X | X | R |
| Hydrochloric Acid | R | R | R | R | R | R | R |
| Hydrocyanic Acid | R | R | R | R | R | X | L |
| Hydrogen Peroxide | R | R | R | R | R | R | R |
| Hydrogen Sulfide | U | R | R | U | X | R | R |
| Hydroquinone | M | U | U | R | X | X | R |
| Hypoid Gear Lube | R | U | M | R | R | R | R |
| Iodine | R | R | U | R | R | L | R |
| Isocyanate | X | X | X | R | X | X | R |
| Iso Octane | R | U | R | R | R | L | R |
| Isopar | R | U | R | R | R | R | R |
| Isopropanol | R | R | R | R | R | R | R |
| Isopropyl Acetate | U | R | U | U | X | X | R |
| JP-4 (MIL-J-5624) | R | U | U | R | R | R | R |
| JP-5 (MIL-J-5624) | R | U | U | R | R | R | R |
| Kerosene | R | U | R | R | R | R | R |
| Lactic Acid | R | R | R | R | R | L | R |
| Lacquers | U | U | U | U | L | L | R |

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| Fluid | Nitrile | EPDM | Neoprene | Fluoroelastomer | UHMPWE | PEEK | PTFE |
|---|---|---|---|---|---|---|---|
| Lard | R | R | R | R | R | R | R |
| Linoleic Acid | R | U | R | R | X | X | R |
| Linseed Oil | R | M | M | R | R | R | R |
| Lye Solutions | R | R | R | R | R | L | R |
| Malathlon | R | U | X | R | L | L | R |
| Maleic Acid | U | U | U | R | R | L | R |
| Mercury | R | R | R | R | R | L | R |
| Methane | R | U | R | R | L | L | R |
| Methanol | R | R | R | U | R | R | R |
| Methyl Acetate | U | R | R | U | L | L | R |
| Methacrylic Acid | U | R | R | M | X | X | R |
| Methyl Cellosolve | M | R | M | U | X | X | R |
| Methylene Chloride | U | U | U | R | M | X | R |
| Methyl Ethyl Ketone | U | R | U | U | X | R | R |
| Methyl Mercaptan | X | R | X | X | X | X | R |
| Milk | R | R | R | R | R | R | R |
| Mineral Oil | R | U | R | R | R | R | R |
| Mineral Spirits | R | U | U | R | R | R | R |
| Monovinyl Acetylene | R | R | R | R | X | X | R |
| Mustard | X | R | X | R | R | R | R |
| Naphtha | R | U | U | R | L | R | R |
| Naphthalene | U | U | U | R | R | R | R |
| Naphthenic Acid | R | U | U | R | X | X | R |
| Natural Gas | R | U | R | R | R | R | R |
| Neatsfoot Oil | R | M | U | R | R | R | R |
| Nitric Acid | U | M | U | M | M | M | R |
| Nitrobenzene | U | R | U | M | R | R | R |
| Nitropropane | U | R | U | U | R | R | R |

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| Fluid | Nitrile | EPDM | Neoprene | Fluoroelastomer | UHMPWE | PEEK | PTFE |
|---|---|---|---|---|---|---|---|
| Octane | R | U | U | R | R | R | R |
| Octanol | R | R | R | R | X | X | R |
| Oleic Acid | M | U | M | R | R | R | R |
| Oleum | R | U | M | R | U | X | R |
| Oxalic Acid | M | R | M | R | R | R | R |
| Peanut Oil | R | M | M | R | R | R | R |
| Pentane | R | U | R | R | L | L | R |
| Perchloreothylene | R | U | U | R | X | X | R |
| Petrolatum | R | U | R | R | R | R | R |
| Petroleum Ether | U | U | U | R | R | X | R |
| Phenol | U | U | U | R | R | R | R |
| Phenylthydrazine | U | U | U | R | X | X | R |
| Phosphoric Acid | R | R | R | R | R | R | R |
| Pine Oil | R | U | U | R | U | R | R |
| Potassium Hydroxide | R, | R | R | U | R | R | R |
| Propane | R | U | R | R | R | R | R |
| Propanol | R | R | R | R | L | L | R |
| Propyl Acetate | U | R | U | U | L | L | R |
| Pyranol | R | U | R | R | L | L | R |
| Pyridine | U | U | U | U | R | L | R |
| Rapeseed Oil | R | R | R | R | R | R | R |
| Resorcinol | X | R | X | X | L | L | R |
| SAE10W30 | R | U | M | R | R | R | R |
| Seawater | R | R | R | X | R | R | R |
| Silicone Oils | R | R | R | R | R | R | R |
| Silver Nitrate | R | R | R | R | R | R | R |

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| Fluid | Nitrile | EPDM | Neoprene | Fluoroelastomer | UHMPWE | PEEK | PTFE |
|---|---|---|---|---|---|---|---|
| Skydrol | U | R | U | M | L | L | R |
| Sodium Hydroxide | R | R | R | R | R | R | R |
| Sodium Hypochlorite | M | R | M | R | R | R | R |
| Sodium Peroxide | M | R | M | R | L | L | R |
| Soy Bean Oil | R | M | M | R | R | R | R |
| Stearic Acid | R | R | R | X | R | L | R |
| Stoddard Solvent | R | U | R | R | X | X | R |
| Styrene Monomer | U | U | R | U | R | R | R |
| Sucrose | R | R | R | R | R | R | R |
| Sulfuric Acid | R | R | R | R | R | M | R |
| Tall Oil | R | U | M | R | L | L | R |
| Tannic Acid | R | R | R | R | L | L | R |
| Tar | R | U | M | R | R | R | R |
| Tartaric Acid | R | R | R | R | X | X | R |
| Tetrachloroethane | U | U | U | R | X | X | L |
| Tetrachloroethylene | U | U | U | R | M | R | R |
| Tetraline | U | U | U | R | R | X | R |
| Toluene | U | U | U | R | M | R | R |
| Trichloroethylene | M | U | U | R | M | R | R |
| Triethanolamine | M | R | R | U | R | L | R |
| Turbine Oil | R | U | U | R | R | R | R |
| Turpentine | R | U | U | R | R | R | R |
| Varnish | R | U | U | R | R | R | R |
| Vinegar | R | R | R | R | R | R | R |
| Vinyl Chloride | U | U | X | R | R | R | R |
| Water | R | R | R | R | R | R | R |
| Wheat Germ Oil | R | U | M | R | R | R | R |
| Whiskey & Wine | R | R | R | R | R | R | R |
| Wood Oil | R | U | R | R | L | L | R |
| Xylene | U | U | U | R | M | R | R |

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