VERSAMATIC® Materials Compatibility Guide

This publication is intended as a general guide for **pump material selection**. It includes many common liquids used in chemical, paint, industrial and food processing applications.

This chart has been compiled using many sources, all believed to be reliable. However, the information accuracy of these ratings cannot be guaranteed. Due to the extensive scope of this field, the tabulation is not complete, nor is it conclusive.

Corrosion is the destructive attack of metals by chemical or electrochemical reaction with its environment. Corrosion rates vary widely with concentration, temperature and the presence of abrasives. Impurities or other trace elements common in industrial liquids may inhibit or accelerate corrosion. Aeration or deaeration of the substance being pumped can also affect the rate of corrosion. Materials used in the pump and pumping systems must be chemically compatible.

Halogenated Solvents Warning

The corrosive action of halogenated solvents which come in contact with aluminum or galvanized wetted parts can, in certain situations, cause an explosion. Solvent manufacturers typically add inhibitors to prevent this corrosive action, but there is no guarantee that the inhibitors will work in all circumstances. This is especially true of reclaimed or used solvents in which the inhibitors are degraded. Versa-Matic® advises that stainless steel or PVDF pumps be used to pump halogenated solvents.

Consult your material supplier for compatibility with aluminum.

Typical examples of halogenated hydrocarbon solvents include, but are not limited to:

Carbon Tetrachloride
Chloroform
Dichlorethylene
Methyl Chloride
Methylene Chloride
Trichloroethane
Trichloroethylene

Elastomers are subject to destructive attack by chemicals or solvents. Attack may be evident as hardening, swelling, loss of elasticity, increased permeability, or more subtle changes.

CAUTION: Plastic pumps and components are not UV stabilized. Ultraviolet radiation can damage these parts and negatively affect material properties. Do not expose to UV light for extended periods of time.

In general, destructive reaction on all materials of construction increases as temperatures increase. Temperature limitations are listed below.

Elastomer Material Color Code

NITRILE	Black w/ Red Dot
FDA HYTREL®	Cream
NEOPRENE	Black w/ Green Dot
E.P.D.M.	Black w/ Blue Dot
PTFE	White
POLYURETHANE	Pale Yellow
PFA	White
FLUOROCARBON (VT)	Black w/ Silver Dot
XL TPE (Santoprene®)	Tan or Bright Yellow
XL TPE (FDA Santoprene®)	Tan

These colors are used for Versa-Matic® manufactured elastomer products. The color codes of products made by other manufacturers may differ from those made by Versa-Matic.

Temperature Limits

NEOPRENE	-10°F (-23°C) to +200°F (+93°C)
NITRILE	-10°F (-23°C) to +190°F (+88°C)
EPDM	-40°F (-40°C) to +280°F (+138°C)
(FKM) FLUOROCARBON	-40°F (-40°C) to +350°F (+177°C)
PTFE	-35°F (-37°C) to +220°F (+104°C)
POLYURETHANE	+32°F (0°C) to +150°F (+66°C)
SANTOPRENE® (XL TPE)	-40°F (-40°C) to +275°F (+135°C)
PFA	-20°F (-29°C) to +300°F (+149°C)
FDA HYTREL	-20°F (-29°C) to +220°F (+104°C)

METALLIC PUMPS can operate above 212°F (100°C). However, if you are operating above these limits, consult the factory for assistance.

NON-METALLIC PUMPS can operate to the following temperature limits:

• **ACETAL**	-20°F (-29°C) to +190°F (88°C)
• **POLYPROPYLENE**	+32°F (0°C) to +180°F (82°C)
• **PVDF**	0°F (-18°C) to +250°F (121°C)

NOTE: These are average temperatures. Chemicals and solvents can have an effect on temperature limit.

Materials of Construction, Temperature Limits & Compatibility

Materials of Construction — Pumps

MODEL	Acetal®	Aluminum	Cast Iron	Hastelloy C	Polypropylene	PVDF	Stainless Steel
E6 (1/4")	■				■	■	
E8 (3/8")					●	●	
E5 (1/2")	●	●		●	●▲	●▲	●
E7 (3/4")		●					
E1 (1")		●		●	●▲	●▲	●
E4 (1-1/4" – 1-1/2")		■	■	●■	●	●	●■
E40 (1-1/2")		●	●				●
E2 (2")		●■	●■	●■	●	●	●■▲▼
E2-FV (2")		■					
E3 (3")		●■	■	●■	●	●	●■

● *Bolted Construction* ■ *Clamped Construction* ▲ *Split Manifold Model Available* ▼ *High Pressure Model Available*

Diaphragms, Valve Balls, Valve Seats & Valve Seat O-rings

ELASTOMERS	Aluminum	Nitrile	PVDF	Neoprene	EPDM	Polypropylene	Polyurethane	316 Stainless Steel	PTFE: 2-Piece	PTFE: Versa-Tuff™	PTFE: FUSION™	Encapsulated Silicone	Thermoplastics: Santoprene® (TPE XL)	Thermoplastics: FDA Hytrel®	(FKM) Fluorocarbon
DIAPHRAGMS		✔		✔	✔				✔	✔	✔		✔	✔	✔
VALVE BALLS		✔		✔	✔			✔	✔				✔	✔	✔
VALVE SEATS	✔	✔	✔	✔	✔	✔	✔	✔	✔				✔	✔	✔
VALVE SEAT O-RINGS		✔		✔	✔							✔	✔		✔