

The most critical step in achieving maximum service life for your tank is the selection of the proper resin for the intended service environment. The resistance of any material to chemical attack is a function of several elements - the specific chemical, chemical concentration, temperature, and time of contact. The following pages represent a compilation of resin supplier testing and 40 years of field experience. Since minor variations in chemical mixture or service conditions

can have a major impact on the chemical resistance of a plastic part, this table is supplied only as a guide for your resin selection and does not imply a guarantee of the chemical resistance of any product. Combinations of chemicals have the potential to cause unique corrosion problems and their compatibility should be evaluated and approved by Design Tanks prior to use. It is not a safe assumption that the mixture of two approved chemicals will also be approved.

## HOW TO USE THIS GUIDE

1. Locate the chemical service in the left hand column and the concentration closest to the intended contents.
2. Following the columns to the right, identify the resin or material with a listed temperature which meets or exceeds the intended maximum operating temperature.

3. Make resin selection for tank, fittings & grommet or O-ring material, If chemical is not included or if conditions deviate from those listed, please call our engineering department for recommendations.

**NOTE:** The resins used by **Design Tanks, Inc.** comply with Title 21 of the Code of Federal Regulations (CFR 177.2420) and they are suitable for the storage of food. To meet food grade applications; the tank requires a **post cure** and the tank should be **detergent washed by the customer, prior to tank being placed in service.**

### EXAMPLE:

MATERIAL	% OF CONCENTRATION	FIBERGLASS LAMINATE		FITTINGS			GROMMETS & O-RINGS		
		Std.	Prem.	PVC	PP	316 SS	Nitrile	Viton / Fluorel	EPDM
Acetic Acid	10	170	210	140	140	NR	100 <sub>1</sub>	100 <sub>1</sub>	140
Acetic Acid	25	170	210	NR	140	140	100 <sub>1</sub>	80	140
Ammonium Hydroxide	5	NR	150 <sub>2</sub>	140	140	75	NR	120 <sub>1</sub>	140
Ammonium Hydroxide	10	NR	150 <sub>2</sub>	140	140	75	NR	120 <sub>1</sub>	140
Water (deionized)	All	NR	180 <sub>4</sub>	140	140	140	140	140	140
Water (demineralized)	All	180	180	140	140	140	140	140	140

1 - Minor Effect

2 - Synthetic Veil Required

3 - Derakane 470

4 - Steam Post Cure Recommended (required for food grade applications)

5 - Contact Factory with Specific Type for Recommendation

6 - Limited Service Life

7 - Preferred for this Service

NR - Not Recommended

NT - Not Tested

EXAMPLE:

MATERIAL	% OF CONCENTRATION	FIBERGLASS LAMINATE		FITTINGS			GROMMETS & O-RINGS		
		Std.	Prem.	PVC	PP	316 SS	Nitrile	Viton / Fluorel	EPDM
Acetic Acid	10	170	210	140	140	NR	100 <sub>1</sub>	100 <sub>1</sub>	140
Acetic Acid	25	170	210	NR	140	140	100 <sub>1</sub>	80	140
Ammonium Hydroxide	5	NR	150 <sub>2</sub>	140	140	75	NR	120 <sub>1</sub>	140
Ammonium Hydroxide	10	NR	150 <sub>2</sub>	140	140	75	NR	120 <sub>1</sub>	140
Water (deionized)	All	NR	180 <sub>4</sub>	140	140	140	140	140	140
Water (demineralized)	All	180	180	140	140	140	140	140	140

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## A RESINS

**Standard fiberglass** laminate is a FDA approved isophthalic polyester resin.

**Premium fiberglass** laminate is a FDA approved vinyl ester resin.

**Other resins** exhibiting specific properties such as organic solvent resistance and fire retardency are also available by factory quotation

**Construction Note:** Depending upon diameter, tanks can be manufactured either with a single resin throughout or with a premium resin in the corrosion barrier and an isophthalic resin utilized in the structural wall. Check with factory for details.

## B SYNTHETIC VEIL

Synthetic veil (Nexus ®) is produced from Dacron ® polyester fiber and is used as a non-glass surfacing veil in certain highly corrosive environments such as the storage of sodium hypochlorite, sodium hydroxide and hydrofluoric acid.

## C POST CURE

The application of dry heat or steam to the cured fiberglass part elevates the temperature and serves to drive off residual styrene. Steam post cure is required for all food grade applications and for certain highly aggressive environments such as the storage of sodium hypochlorite.

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MAXIMUM SERVICE TEMPERATURE IN DEGREES F.									
MATERIAL	% OF CONCENTRATION	LAMINATE		FITTINGS			GROMMETS & O-RINGS		
		Std.	Prem.	PVC	PP	316 SS	Nitrile	Viton / Fluorel	EPDM
Acetic Acid	10	170	210	140	140	NR	100 <sub>1</sub>	100 <sub>1</sub>	140
Acetic Acid	25	170	210	NR	140	140	100 <sub>1</sub>	80	140
Acetic Acid	50	150	180	NR	140	140	NR	80	140
Acetic Acid	75	NR	150	NR	140	140	NR	NR	140
Acetic Acid	glacial	NR	100 <sub>3</sub>	NR	120	140	NR	NR	75
Acetone	100	NR	NR	NR	140	140	NR	NR	140
Aluminum Chloride	All	170	210	75	140	NR	140	140	140
Aluminum Chlorohydroxide	50	170	80	NT	NT	NT	NT	NT	NT
Aluminum Potassium Sulfate	All	180	210	140	140	120	140	140	140
Aluminum Sulfate	All	180	210	120	140		140	140	140
Ammonium Bicarbonate	10	130	150	140	140	140	NT	NT	NT
Ammonium Bicarbonate	50	NR	150	140	140	140	NT	NT	NT
Ammonium Carbonate	50	NR	100	140	140	140	120	NT	140
Ammonium Chloride	All	180	210	120	120	NR	120 <sub>1</sub>	140	140
Ammonium Hydroxide	5	NR	150 <sub>2</sub>	140	140	75	NR	120 <sub>1</sub>	140
Ammonium Hydroxide	10	NR	150 <sub>2</sub>	140	140	75	NR	120 <sub>1</sub>	140
Ammonium Hydroxide	20	NR	150 <sub>2</sub>	140	140	75	NR	120 <sub>1</sub>	140
Ammonium Hydroxide	29	NR	100 <sub>2</sub>	140	140	75	NR	120 <sub>1</sub>	140
Ammonium Nitrate	All	160	210	120 <sub>1</sub>	140	140	140	140	140
Ammonium Persulfate	All	NR	180	NR	140	120	NR	140	140
Ammonium Sulfate	All	170	210	120	140	75	140	140	140
Ammonium Thiosulfate	60	NR	100	NT	NT	140	140	NT	NT
Amyl Alcohol	All	100	120	120	75 <sub>1</sub>	140	120 <sub>1</sub>	120 <sub>1</sub>	140
Aniline Sulfate	All	NR	210	NR	75	140	NR	75	NT

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MATERIAL	% OF CONCENTRATION	LAMINATE		FITTINGS			GROMMETS & O-RINGS		
		Std.	Prem.	PVC	PP	316 SS	Nitrile	Viton / Fluorel	EPDM
Antimony Trichloride	All	160	210	120	140	NR	NT	140	75 <sub>1</sub>
Barium Carbonate	All	100 <sub>6</sub>	210	140	140	140	140	140	140
Barium Chloride	All	180	210	75	140	75	140	140	140
Barium Hydroxide	10	NR	150 <sub>2</sub>	140	140	140	140	140	140
Barium Sulfide	All	NR	180	120	140	120 <sub>1</sub>	140	140	140
Benzaldehyde	100	NR	NR	NR	75	140	NR	NR	140
Benzene	100	NR	100 <sub>3</sub>	NR	NR	140	NR	140	NR
Benzene Sulfonic Acid	0 - 75	NR	150	NT	NT	NT	NT	NT	75
Benzoic Acid	All	170	210	120	NR	140	NR	140	120 <sub>1</sub>
Benzylol	All	NR	100 <sub>3</sub>	NT	140	75	NR	NR	68
Boric Acid	All	180	210	120	140	120	140	140	140
Bromine	gas/vapor	NR	100	NR	NR	NR	NR	140	NR
Butyl Alcohol	All	NR	120	75	75	75	140	140	120 <sub>1</sub>
Butyric Acid	25	120	210	75	NR	120	NR	75 <sub>1</sub>	120 <sub>1</sub>
Butyric Acid	50	150	210	NR	NR	120	NR	75 <sub>1</sub>	120 <sub>1</sub>
Calcium Chlorate	All	150	210	140	NT	NT	NR	140	140
Calcium Chloride	All	180	210	140	120	120 <sub>1</sub>	140	140	140
Calcium Hydroxide	25	160	210 <sub>2</sub>	120	120	140 <sub>1</sub>	140	140	140
Calcium Hypochlorite	All	120	160 <sub>2</sub>	75 <sub>1</sub>	120	140 <sub>1</sub>	NR	140	75 <sub>1</sub>
Calcium Sulfate	All	180	210	140	140	140 <sub>1</sub>	140	140	140
Carbon Dioxide	All	170	210	140	120	75	140	120 <sub>1</sub>	120 <sub>1</sub>
Carbon Disulfide	100	NR	NR	NR	NR	140 <sub>1</sub>	NR	75	NR
Carbon Monoxide	All	170	210	120	140	140	140	140	140
Carbon Tetrachloride	100	80 <sub>6</sub>	150	75 <sub>1</sub>	75 <sub>1</sub>	140 <sub>1</sub>	NR	140	NR

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MATERIAL	% OF CONCENTRATION	LAMINATE		FITTINGS			GROMMETS & O-RINGS		
		Std.	Prem.	PVC	PP	316 SS	Nitrile	Viton / Fluorel	EPDM
Chlorine Water	All	100 <sub>6</sub>	180	120	NR	NR	NR	140	NR
Chlorobenzene	100	NR	100 <sub>3</sub>	NR	NR	140 <sub>1</sub>	NR	75	NR
Chloroform	100	NR	NR	NR	NR	140	NR	140	NR
Chromic Acid	5	80	150	140	140	140	NR	140	140
Chromic Acid	10	NR	150	120	120	140	NR	140	120 <sub>1</sub>
Chromic Acid	30	NR	NR	120 <sub>1</sub>	120	120 <sub>1</sub>	NR	140	120 <sub>1</sub>
Chromic Acid	50	NR	NR	NR	75 <sub>1</sub>	120 <sub>1</sub>	NR	140	NR
Citric Acid	All	160	210	120 <sub>1</sub>	140	120	140	140	140
Copper Chloride	All	180	210	140	140	NR	140	140	140
Copper Cyanide	All	90	210	120	140	140 <sub>1</sub>	140	140	140
Copper Sulfate	All	180	210	140	140	140	140	140	140
Crude Oil, sweet & sour	100	180	210	140	NR	140	140	140	NR
Dichlorobenzene	100	NR	120 <sub>3</sub>	NR	NR	75	NR	75	NT
Electrosol	5	NT	150	NT	NT	140	NT	NT	NT
Ethyl Alcohol	50	ambient	100	140	140 <sub>1</sub>	140 <sub>1</sub>	75	75	75
Ethyl Alcohol	95	NR	100 <sub>3</sub>	75	140	140	75	75	75
Ethyl Ether	100	NR	NR	NR	NR	75 <sub>1</sub>	75	NR	NT
Ethylene Chloride	100	NR	NR	NR	NR	75	NR	120 <sub>1</sub>	NR
Ethylene Dichloride	100	NR	NR	NR	NR	75	NR	140	NR
Ethylene Glycol	100	180	210	75	120	75	140	140	140
Ferric Chloride	All	180	210	120	75 <sub>1</sub>	NR	140	140	140
Ferric Nitrate	All	180	210	120 <sub>1</sub>	140	75	140	140	140
Ferric Sulfate	All	180	210	120	140 <sub>1</sub>	75	140	140	140
Ferrous Chloride	All	180	210	120	140	NR	140	140	NT

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		Std.	Prem.	PVC	PP	316 SS	Nitrile	Viton / Fluorel	EPDM
Ferrous Nitrate	All	160	210	140	140	75	NT	NT	NT
Ferrous Sulfate	All	180	210	120	140	140 <sub>1</sub>	140	NT	140
Fluoboric Acid	All	ambient	210 <sub>2</sub>	120	140	NR	140	NT	140
Fluosilicic Acid (or Hydro...)	35	NR	100 <sub>2</sub>	75	140 <sub>1</sub>	75 <sub>1</sub>	140	NT	140
Formic Acid	98	NR	100	75	75	NR	120 <sub>1</sub>	NR	140
Gasoline	100	100	100 <sub>5</sub>	NR	NR	140	140	140	NR
Glycerin (Glycerol)	180	210	75	140	140	140	140	140	140
Heptane	100	200	210	75 <sub>1</sub>	120 <sub>1</sub>	140	140	140	NR
Hydrobromic Acid	25	160	180	120	120	NR	140	NR	140
Hydrobromic Acid	48	160	150	75	75	NR	140	NR	140
Hydromromic Acid	62	NR	100	75	75	NR	NR	140	140
Hydrochloric (muriatic) Acid	10	160	180	120	120	NR	140	NT	NT
Hydrochloric Acid	20	125	180	120	120	NR	140	NT	140
Hydrochloric Acid	37	NR	150	120	120 <sub>1</sub>	NR	140	NR	NR
Hydrocyanic Acid	10	100	210	75	140	75	120 <sub>1</sub>	140	140
Hydrofluoric Acid	10	NR	150 <sub>2</sub>	120 <sub>1</sub>	120	NR	75 <sub>1</sub>	75	75
Hydrofluoric Acid	20	NR	100 <sub>2</sub>	120 <sub>1</sub>	120	NR	75 <sub>1</sub>	75	75
Hydrogen Peroxide	30	NR	150	120	75	120	NT	140	140
Hypochlorous Acid	10	100	150	140	75	NR	NT	NT	NT
Hypochlorous Acid	20	80	120	140	75	NR	NT	NT	NT
Hypochlorous Acid	50	NR	ambient	140	75	NR	NT	NT	NT
Kerosene	100	180	180	140	75	140	140	140	NR
Lactic Acid	All	160	210	75 <sub>1</sub>	75	75	140	140	140
Latex	All	ambients	120	NT	120	120	140	140	140

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MATERIAL	% OF CONCENTRATION	LAMINATE		FITTINGS			GROMMETS & O-RINGS		
		Std.	Prem.	PVC	PP	316 SS	Nitrile	Viton / Fluorel	EPDM
Lead Acetate	All	160	210	140	75	75	120 <sub>1</sub>	NR	140
Lime Slurry	All	270	180	75	NT	140	140	140	NR
Linseed Oil	100	160	210	140	140	140	140	140	NR
Magnesium Carbonate	All	180	180	120	140	75	140	140	140
Magnesium Chloride	All	180	210	140	140	75	140	140	140
Magnesium Sulfate	All	180	210	120	140	140	140	140	140
Maleic Acid	All	160	210	120	140	140	NR	140	NR
Mercuric Chloride	All	180	210	120	140	75 <sub>1</sub>	140	140	140
Mercurous Chloride	All	180	210	140	140	75	140	140	NT
Methyl Alcohol	All	NR	100 <sub>3</sub>	120	140	140	100	100	100
Methylene Chloride	100	NR	NR	NR	75	140	NR	120 <sub>1</sub>	NR
Methylethyl Ketone	100	NR	70 <sub>3</sub>	NR	75	140	NR	NR	75
Naptha	100	180	180	NR	75 <sub>1</sub>	140	NR	140	NR
Napthalene	100	150	210	NR	120	140	NR	140	NR
Nickel Chloride	All	180	210	120	140	NR	140	140	140
Nickel Nitrate	All	180	210	140	140	75	140	140	NT
Nickel Sulfate	All	180	210	120	140	120	140	140	140
Nitric Acid	5	160	150	75	120	140	NR	140	120 <sub>1</sub>
Nitric Acid	20	NR	120	75	120	140	NR	140	120 <sub>1</sub>
Nitric Acid	40	NR	80 <sub>3</sub>	75	NR	75	NR	140	NR
Nitrobenzene	100	NR	100 <sub>3</sub>	NR	75	140	NR	120 <sub>1</sub>	NR
Oleic Acid	All	180	210	NR	75	140	NR	120 <sub>1</sub>	120 <sub>1</sub>
Oleum (fuming sulfuric acid)	All	NR	NR	NR	NR	120	NR	100	NR
Oxalic Acid	All	180	210	75	120	75	140	120 <sub>1</sub>	NR

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		Std.	Prem.	PVC	PP	316 SS	Nitrile	Viton / Fluorel	EPDM
Perchloric Acid	10	NR	150	140	140	75	NR	140	NT
Perchloric Acid	30	NR	100	75	140	75	NR	75	NT
Phosphoric Acid	10	170	210	120 <sub>1</sub>	75	120	NR	140	120 <sub>1</sub>
Phosphoric Acid	50	170	210	120 <sub>1</sub>	120	120	NR	140	120 <sub>1</sub>
Phosphoric Acid	85	180	210	120 <sub>1</sub>	120	120	NR	140	75
Phosphoric Acid (super)	100	100	210	NT	NT	NT	NR	140	NR
Photographic Solutions	All	100	100	140	140	140	80	100	NT
Phthalic Acid	All	NT	210	NT	NR	140	120 <sub>1</sub>	140	NT
Pictric (alcoholic) Acid	10	80	100 <sub>3</sub>	NR	75	140	120 <sub>1</sub>	140	120 <sub>1</sub>
Potassium Bicarbonate	10	160	150 <sub>2</sub>	140	140	140	140	140	140
Potassium Bicarbonate	50	140	180 <sub>2</sub>	140	140	140	140	140	140
Potassium Carbonate	10	100	150 <sub>2</sub>	140	140	75	140	140	140
Potassium Carbonate	50	NR	180 <sub>2</sub>	140	140	75	140	140	140
Potassium Chloride	All	180	210	140	140	75	140	140	140
Potassium Dichromate	All	180	210	140	140	140	NR	75	140
Potassium Ferricyanide	All	180	210	100 <sub>1</sub>	140	140	140	140	NT
Potassium Hydroxide	10	NR	150 <sub>2</sub>	75	140	140	75	NT	140
Potassium Hydroxide	25	NR	150 <sub>2</sub>	75	140	140	120 <sub>1</sub>	140	140
Potassium Hydroxide	40	NR	180 <sub>2</sub>	75	140	140	140	120 <sub>1</sub>	140
Potassium Nitrate	All	180	210	140	140	140	140	140	140
Potassium Permanganate	All	125	210	75	75	75	140	140	140
Potassium Persulfate	All	100	210	140	140	75	140	140	NT
Potassium Sulfate	All	180	210	140	140	75	140	140	140
Selenious Acid	All	NT	210	75	NT	NT	NT	NT	NT

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		Std.	Prem.	PVC	PP	316 SS	Nitrile	Viton / Fluorel	EPDM
Silver Nitrate	All	180	210	140	75	140	140	140	140
Sodium Acetate	All	150	210	75 <sub>1</sub>	140	140	120 <sub>1</sub>	NR	140
Sodium Bicarbonate	10	180	180 <sub>2</sub>	140	140	140	120 <sub>1</sub>	140	140
Sodium Bicarbonate	All	140	180 <sub>2</sub>	140	140	140	120 <sub>1</sub>	140	140
Sodium Bisulfate	All	180	210	140	140	75	120 <sub>1</sub>	140	140
Sodium Carbonate	32	100 <sub>6</sub>	180 <sub>2</sub>	140	140	140	140	140	140
Sodium Chlorate	All	NR	210	75	140	75	NR	140	140
Sodium Chloride	All	180	200	140	140	75 <sub>1</sub>	140	140	140
Sodium Chlorite	50	NR	100	75	NR	NT	NT	NT	NT
Sodium Cyanide	All	100	210	140	140	75	140	NT	140
Sodium Ferricyanide	All	180	210	140	140	75	NT	NT	NT
Sodium Hydroxide	5	NR	180 <sub>2</sub>	140	140	140	120 <sub>1</sub>	120 <sub>1</sub>	140
Sodium Hydroxide	10	NR	180 <sub>2</sub>	140	140	140	120 <sub>1</sub>	120 <sub>1</sub>	140
Sodium Hydroxide	25	NR	180 <sub>2</sub>	140	140	140	120 <sub>1</sub>	120 <sub>1</sub>	140
Sodium Hydroxide	50	NR	210 <sub>2</sub>	140	140	75 <sub>1</sub>	120 <sub>1</sub>	120 <sub>1</sub>	140
Sodium Hypochlorite	5.25	NR	150 <sub>2 4</sub>	140	140	75 <sub>1</sub>	120 <sub>1</sub>	140	120 <sub>1</sub>
Sodium Hypochlorite	10	NR	180 <sub>2 4</sub>	140	140	NR	120 <sub>1</sub>	140	120 <sub>1</sub>
Sodium Hypochlorite	18	NR	180 <sub>2 4</sub>	140	140	NR	120 <sub>1</sub>	140	120 <sub>1</sub>
Sodium Nitrate	All	180	210	140	140	75 <sub>1</sub>	120 <sub>1</sub>	140	140
Sodium Silicate	All	NR	210	140	140	140	140	140	140
Sodium Sulfate	All	175	210	140	140	140 <sub>1</sub>	140	140	140
Sodium Sulfide	All	NR	210	140	140	140 <sub>1</sub>	140	140	140
Sodium Sulfite	All	80	210	140	120	140 <sub>1</sub>	140	NT	140
Stannic Chloride	All	180	210	140	140	NR	140	140	120 <sub>1</sub>

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		Std.	Prem.	PVC	PP	316 SS	Nitrile	Viton / Fluorel	EPDM
Stannous Chloride	All	180	210	75	140	120	140	140	140
Stearic Acid	All	180	210	120 <sub>1</sub>	120	140	120 <sub>1</sub>	140	120 <sub>1</sub>
Sulfonated Detergents	100	NT	160	NT	75	140	NT	NT	NT
Sulfuric Acid	25	180	210	75	120	NR	NR	140	120 <sub>1</sub>
Sulfuric Acid	50	150	210	75	75 <sub>1</sub>	NR	NR	140	120 <sub>1</sub>
Sulfuric Acid	75	NR	100	75	75 <sub>1</sub>	NR	NR	140	120 <sub>1</sub>
Sulfuric Acid	93	NR	NR	NR	NR	NR	NR	75	NR
Tannic Acid	All	180	210	75	140	140	140	140	140
Tartaric Acid	All	180	210	75	140	NR	140	140	120 <sub>1</sub>
Tetrachloroethylene	100	NR	80	NR	100 <sub>1</sub>	140	NR	140	NR
Toluene	100	80	80	NR	NR	140	NR	140	NR
Trichloroacetic Acid	50	80 <sub>6</sub>	210	NT	NT	NT	140	NR	NT
Trisodium Phosphate	All	NR	210	140	140	120	NT	NT	NT
Urea-ammonium Nitrate Fertilizer	100	100	120	140	140	140	140	140	NT
Water (deionized )	All	NR	180 <sub>4</sub>	140	140	140	140	140	140
Water (demineralized )	All	180	180	140	140	140	140	140	140
Water (distilled )	All	160 <sub>6</sub>	180 <sub>4</sub>	140	140	140	140	140	140
Water (potable)	All	NR	180 <sub>4</sub>	140	140	140	140	140	140
Xylen	100	90	80	NR	NR	140	75	NR	NR
Zinc Chlorid	All	180	210	140	140	NR	140	140	140
Zinc Sulfate	All	180	210	140	140	140	140	140	140
8-8-8 Fertilizer	100	100	100	140	140	140	100	100	100

1 - Minor Effect

2 - Synthetic Veil Required

3 - Derakane 470

4 - Steam Post Cure Recommended (required for food grade applications)

5 - Contact Factory with Specific Type for Recommendation

6 - Limited Service Life

7 - Preferred for this Service

NR - Not Recommended

NT - Not Tested