

## Chemical Chart — Acids

The following is a list of Laminates that have been tested in various solvents to determine the chemical resistance of the product. Materials were measured in width and thickness ( 1.00" and 0.062" ) then immersed in the solvent and re-measured after the time and temperature of testing. In addition, a visual examination was performed when the samples were removed from the solutions. This information is presented for information only and no specification or specific results are implied.

ACIDS						
Acids	G-10 Epoxy/Glass	G-3 Phenolic/Glass	G-11 Epoxy/Glass	C Pheolic/Cotton	XX Phenolic/Paper	
<i>Acetic Acid</i>						
<b>10%</b>	VISUAL	E	E	E	E	E
	± THK %	0	0.99	0.48	2.76	15.07
	± WTH %	0.34	0.27	0	0.46	0
	RECOM.	GOOD	OK	GOOD	T-C	NR
<i>Hydrogen Chloride (Hydrochloric Acid)</i>						
<b>HCl</b>	VISUAL	E	E	E	F	E
<b>10%</b>	± THK %	0	0.98	0.24	2.32	16.53
	± WTH %	0.05	0.07	0.05	0.17	0.01
	RECOM.	EXEC	OK	OK	T-C	NR
<i>Hydrogen Phosphate</i>						
<b>H3P04</b>	VISUAL	E	E	E	E	G
<b>25%</b>	± THK %	0.31	0.81	0	1.55	6.69
	± WTH %	-0.12	-0.26	0	0.41	0.05
	RECOM.	GOOD	OK	EXEC	OK	T-C
<i>Hydrogen Sulfide (Sour Gas)</i>						
<b>H2S04</b>	VISUAL	E	E	F	E	G
<b>10%</b>	± THK %	0.08	0.99	0	2.23	7.38
	± WTH %	0.08	0.15	0	0.18	0
	RECOM.	EXEC	OK	EXEC	T-C	T-C
<i>Nitric Acid</i>						
<b>HN03</b>	VISUAL	E	E	E	E	E
<b>5%</b>	± THK %	0.31	0.72	0	3.81	18.09
	± WTH %	0.06	0.25	0.05	0.72	0
	RECOM.	GOOD	OK	EXEC	T-C	NR

### KEY TO ABBREVIATIONS

#### *visual*

E - Excellent  
 F - Fair  
 G - Good  
 N/D - No Data  
 X - Bad

#### *recommendation*

EXEC - Excellent  
 GOOD - Good Resistance to Chemical  
 OK - May be used, minor changes in width and/or thickness <10%  
 T-C - Use caution because of thickness increase in chemical  
 NR - Not Recommended for use in this chemical

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## Chemical Chart — Bases

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BASES						
Bases		G-10 Epoxy/Glass	G-3 Phenolic/Glass	G-11 Epoxy/Glass	C Pheolic/Cotton	XX Phenolic/Paper
<i>Potassium Hydroxide (Caustic Potassium)</i>						
<b>KOH</b>	VISUAL	E	X	G	X	F
<b>1N</b>	± THK %	0.07	3.28	0.4	14.32	113.9
	± WTH %	0.08	0.26	0	1.33	0
	RECOM.	OK	T-C	GOOD	NR	NR
<i>Ammonium Hydroxide</i>						
<b>NH4OH</b>	VISUAL	E	G	E	E	G
<b>1N</b>	± THK %	1.1	0.72	0.08	3.91	17.91
	± WTH %	0.01	0.43	0	0.62	0
	RECOM.	OK	OK	EXEC	T-C	NR
<i>Sodium Hydroxide (Caustic Soda)</i>						
<b>NAOH</b>	VISUAL	E	F	E	F	X
<b>1N</b>	± THK %	0.4	0.81	0	5.66	134.8
	± WTH %	0.09	0.16	0	0.56	0
	RECOM.	GOOD	OK	EXEC	T-C	NR

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## Chemical Chart - Solvents

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SOLVENTS						
Solvents	G-10 Epoxy/Glass	G-3 Phenolic/Glass	G-11 Epoxy/Glass	C Pheolic/Cotton	XX Phenolic/Paper	
<i>Acetone</i>						
VISUAL	G	G	G	F	G	
± THK %	7.04	0.9	5.92	3.71	4.49	
± WTH %	0.09	0.07	0	0.26	0	
RECOM.	T-C	OK	T-C	T-C	T-C	
<i>Methyl Alcohol</i>						
VISUAL	G	E	E	E	E	
± THK %	2.91	-1.14	3.7	2.78	21.14	
± WTH %	0.07	0.05	0.1	0.33	0	
RECOM.	T-C	GOOD	T-C	T-C	NR	
<i>Unleaded Gasoline</i>						
VISUAL	E	E	E	E	E	
± THK %	0.08	0.09	0.08	0.25	0	
± WTH %	0.05	0.1	0	0.08	0.05	
RECOM.	EXEC	EXEC	EXEC	GOOD	EXEC	
<i>Toluene</i>						
VISUAL	E	E	E	E	E	
± THK %	0.72	0.36	0.41	0.25	0	
± WTH %	0.05	0.12	0	0.17	0.05	
RECOM.	OK	GOOD	GOOD	GOOD	EXEC	
<i>Tetrachloroethylene</i>						
<b>TCE</b>	VISUAL	E	E	E	E	E
	± THK %	2.44	0.09	2.51	0.5	0.08
	± WTH %	0.16	0.08	0.05	0.1	0
	RECOM.	T-C	EXEC	T-C	GOOD	EXEC
<i>Automatic Transmission Fluid</i>						
<b>ATF</b>	VISUAL	E	E	G	E	E
<b>#220</b>	± THK %	-0.39	-0.63	0.24	0	0.08
	± WTH %	0	0	0	0	0.5
	RECOM.	GOOD	GOOD	GOOD	EXEC	EXEC

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## Chemical Chart - Acids & Bases

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ACIDS & BASES						
Acids & Bases	G-10 Epoxy/Glass	G-3 Phenolic/Glass	G-11 Epoxy/Glass	C Pheolic/Cotton	XX Phenolic/Paper	
<i>Acetic Acid</i>						
<b>10%</b>	VISUAL	E	E	E	E	E
	± THK %	0.63	0.55	0.16	1.81	8.54
	± WTH %	0.35	0.05	-0.1	0.71	0.05
	RECOM.	OK	GOOD	GOOD	OK	T-C
<i>Hydrochloric Acid (Hydrogen Chloride)</i>						
<b>HCl</b>	VISUAL	E	E	E	F	G
<b>10%</b>	± THK %	0.16	0.09	0.16	1.57	10.99
	± WTH %	0.1	0.1	0	0.29	0
	RECOM.	GOOD	EXEC	GOOD	GOOD	NR
<i>Nitric Acid</i>						
<b>HN03</b>	VISUAL	E	E	E	E	G
<b>5%</b>	± THK %	0.24	0.54	0	2.43	11.16
	± WTH %	0.05	0.25	0.1	0.25	0.1
	RECOM.	GOOD	OK	EXEC	T-C	NR
<i>Hydrogen Phosphate</i>						
<b>H3P04</b>	VISUAL	E	E	E	E	G
<b>25%</b>	± THK %	0.39	0.91	0.08	1.55	3.59
	± WTH %	0	0.69	0	0.02	0
	RECOM.	GOOD	OK	EXEC	OK	T-C
<i>Ammonium Hydroxide</i>						
<b>NH40H</b>	VISUAL	E	E	E	E	E
<b>1N</b>	± THK %	0.08	0.18	0	2.59	9.39
	± WTH %	0	0.05	0.05	0.54	0.05
	RECOM.	EXEC	GOOD	EXEC	T-C	NR
<i>Sodium Hydroxide</i>						
<b>NAOH</b>	VISUAL	E	NA	E	X	X
<b>1N</b>	± THK %	0.08	0	0	12.61	107
	± WTH %	0	0	0.05	20.3	0
	RECOM.	EXEC	EXEC	EXEC	NR	NR

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