

Grades Solvent Testing

Solvents (C-168/23)		FR-4 Glass Epoxy	G-3 Glass Phenolic	G-9 Glass Melamine	G-11 Glass Epoxy	L Linen Phenolic	C Canvas Phenolic
Acetone	Visual	G	G	E	G	E	F
	+/- thickness %	7.04	0.9	1.14	5.92	0.47	3.71
	+/- width %	0.09	0.07	0.02	0	0	0.26
Recommend		Caution	Ok	Good	Caution	Good	Caution
Methyl Alcohol	Visual	G	E	E	E	E	E
	+/- thickness %	2.91	-1.14	0	3.7	1.09	2.78
	+/- width %	0.07	0.05	0.1	0.1	0	0.33
Recommend		Caution	Good	Excellent	Caution	Ok	Caution
Unleaded Gasoline	Visual	E	E	E	E	E	E
	+/- thickness %	0.08	0.09	0.07	0.08	0.08	0.25
	+/- width %	0.05	0.1	0.04	0	0	0.8
Recommend		Excellent	Excellent	Excellent	Excellent	Excellent	Good
Toluene	Visual	E	E	E	E	E	E
	+/- thickness %	0.72	0.36	0.07	0.41	0	0.25
	+/- width %	0.05	0.12	0.06	0	0	0.17
Recommend		Ok	Good	Excellent	Good	Excellent	Good
TCIE	Visual	E	E	E	E	E	E
	+/- thickness %	2.44	0.09	0.43	2.51	0.08	0.5
	+/- width %	0.16	0.08	0.01	0.05	0	0.1
Recommend		Caution	Excellent	Good	Caution	Excellent	Good
ATF (#220)	Visual	E	E	E	G	E	E
	+/- thickness %	-0.39	-0.63	0	0.24	0.31	0
	+/- width %	0	0	0	0	0	0
Recommend		Good	Good	Excellent	Good	Good	Excellent

Notes Regarding Solvent Testing:

The materials on these pages have been tested in various media to determine the chemical resistance of these materials. All laminate materials were measured in thickness (.062”) and width (1.00”).

The information presented is for “Informational Purposes Only” and no specification or specific results are implied.



800.323.1408



3411 Woodhead Drive | Northbrook, IL 60062



WWW.ATLASFIBRE.COM



SALES@ATLASFIBRE.COM

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Acids / Bases (E-24/38)		FR-4 Glass Epoxy	G-3 Glass Phenolic	G-9 Glass Melamine	G-11 Glass Epoxy	L Linen Phenolic	C Canvas Phenolic
Acetone 10%	Visual	E	E	E	E	E	E
	+/- thickness %	0.63	0.55	0	0.016	1.33	1.81
	+/- width %	0.35	0.05	0	-0.1	0.15	0.71
Recommend		Ok	Good	Excellent	Good	Ok	Ok
Hydrochloric Acid 10%	Visual	E	E	G	E	G	F
	+/- thickness %	0.16	0.09	2.9	0.16	1.01	1.57
	+/- width %	0.1	0.1	0.2	0	0.2	0.29
Recommend		Good	Excellent	Caution	Good	Ok	Good
HNO ₃ 5%	Visual	E	E	G	E	E	E
	+/- thickness %	0.24	0.54	1.1	0	1.42	2.43
	+/- width %	0.05	0.25	0.05	0.1	0.3	0.25
Recommend		Good	Ok	Ok	Excellent	Ok	Caution
H ₃ PO ₄ 25%	Visual	E	E	E	E	E	E
	+/- thickness %	0.39	0.91	0.07	0.08	0.63	1.55
	+/- width %	0	0.69	0	0	0	0.2
Recommend		Good	Ok	Excellent	Excellent	Ok	Ok
NH ₄ OH 1N	Visual	E	E	E	E	E	E
	+/- thickness %	0.08	0.18	0	0	0.86	2.59
	+/- width %	0	0.05	0.05	0.05	0.2	0.54
Recommend		Excellent	Good	Excellent	Excellent	Ok	Caution
NaOH 1N	Visual	E	NA	E	E	F	X
	+/- thickness %	0.08	0	0.22	0	4.03	12.61
	+/- width %	0	0	0.05	0.05	0.3	20.3
Recommend		Excellent	Excellent	Good	Excellent	Caution	NR

Key to abbreviations:

Visual

E = Excellent

F = Fair

G = Good

No Data

Recommendation

Excellent = Excellent for that application

Good = Good resistance to chemical

Ok = May be used, minor changes width and/or thickness <10%

Caution = Use caution because of thickness increase in chemical

N/R = not recommended for use in this chemical



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Acids (C-168/23)		FR-4 Glass Epoxy	G-3 Glass Phenolic	G-9 Glass Melamine	G-11 Glass Epoxy	L Linen Phenolic	C Canvas Phenolic
Acetic Acid 10%	Visual	E	E	E	E	E	E
	+/- thickness %	0	0.99	0.07	0.48	2.43	2.76
	+/- width %	0.34	0.27	0.01	0	0.41	0.46
Recommend		Good	Ok	Excellent	Good	Caution	Caution
HCl 10%	Visual	E	E	F	E	E	F
	+/- thickness %	0	0.98	4.4	0.24	2.21	2.32
	+/- width %	0.05	0.07	0	0.05	0.45	0.17
Recommend		Excellent	Ok	Caution	Ok	Caution	Caution
H ₃ PO ₄ 25%	Visual	E	E	E	E	E	E
	+/- thickness %	0.31	0.81	0.58	0	1.09	1.55
	+/- width %	-0.12	-0.26	0.13	0	0.2	0.41
Recommend		Good	Ok	Ok	Excellent	Ok	Ok
H ₂ SO ₄ 25%	Visual	E	E	G	F	E	E
	+/- thickness %	0.08	0.99	1.83	0	1.66	2.23
	+/- width %	0.06	0.15	0.63	0	0.3	0.18
Recommend		Excellent	Ok	Ok	Excellent	Ok	Caution
HNO ₃ 5%	Visual	E	E	G	E	E	E
	+/- thickness %	0.31	0.72	1.85	0	2.03	3.81
	+/- width %	0.06	0.25	0.11	0.05	0.4	0.72
Recommended		Good	Ok	Ok	Excellent	Ok	Caution
Bases (C-168/23)		FR4 Glass Epoxy	G-3 Glass Phenolic	G-9 Glass Melamine	G-11 Glass Epoxy	L Linen Phenolic	C Canvas Phenolic
KOH 1N	Visual	E	X	E	G	F	X
	+/- thickness %	0.7	3.28	0.85	0.4	6.52	14.32
	+/- width %	0.08	0.26	0.08	0	0.61	1.33
Recommend		Ok	Caution	Ok	Good	Caution	NR
NH ₄ OH 1N	Visual	E	G	E	E	E	E
	+/- thickness %	1.1	0.72	0.51	0.08	2.44	3.91
	+/- width %	0.01	0.43	0.05	0	0.4	0.62
Recommend		Ok	Ok	Good	Excellent	Caution	Caution
NaOH 1N	Visual	E	F	E	E	F	F
	+/- thickness %	0.4	0.81	0.15	0	12.92	5.85
	+/- width %	0.09	0.16	0.09	0	0.91	0.56
Recommend		Good	Ok	Good	Excellent	NR	Caution



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