

Chemical Resistance of Poly-Triplex Liner Systems Base Liner Resin, Parts A & B

The chemical resistance of any polymer must be judged on more than just its performance in laboratory immersion tests. Percent weight gain, by itself is not necessarily indicative of a cured resin's chemical resistance. Drying to constant weight will determine if a sample absorbed a chemical while at the same time losing material by leaching. Visual observation of color change and general appearance is also important indications of a system's suitability for particular exposure. Every application must be individually evaluated. Exposure to a chemical to which a polymer has relatively low resistance may be possible for a short period of time and intermittent exposure may allow for recovery. The following selective list of chemicals and their effect on carefully prepared samples is only a guide to the resin/hardener system's strong and weak points.

Sample Size For Immersion: 1" X 3" X 1/8"

Sample Size For Strength Retention: 1" X 4" X 1/8"

Immersion Temperature: 25° Degrees Celsius, 77 °Fahrenheit

Immersion Time: One (1) Week

Chemical	Weight Gain		Flexible Strength & Modulus Retention			
	RT(1)	P/C(8)	RT(1)		P/C(8)	
			Strength	Modulus	Strength	Modulus
NaOH, 10%	0.44	0.38	94.1	88.1	88.4	92.1
NaOH, 25%	0.18	0.18	95.3	93.3	93	94.9
NaOH, 50%	-0.09	-0.1	100	99.6	96.4	98.9
NH OH, 28%	1.21	0.84	83	72.2	75.5	81.7
HCL, 10%	0.76	0.63	96.1	92	89	93.4
H ₂ SO ₄ , 20%	1.15	0.96	92	86.7	88.3	90.2
HNO ₃ , 10%	1.18	1.08	92.8	86.9	87.5	90
H ₃ PO ₄ , 10%	4.4	1.74	87.2	75	85.3	85.1
ACETIC ACID	2.94	1.09	73.9	60.3	83	83.8
OLEIC ACID	0.31	0.07	100	95.5	95.4	98.3
XYLENE	3.24	0.13	67	78.9	93	96.8
DISTILLED	0.57	0.47	92	87.9	85.4	94.5

Visual Observation: All samples were free from cracking, crazing, swelling or discoloration after immersion.

(1) Cured 7 days at 25°C/77°F, (2) Cured overnight at 25°C/77°F, Post-cured 2 hours at 121°C/250°F •

Test Performed By: Reichhold Chemical, Inc., Raleigh, NC

Poly-Triplex Liner Systems Chemical Resistance & Physical Properties

Received 02/03/92, Date Completed 02/25/92 • Chemical Resistance & Physical Properties on panel based on 37-40/37-620. Fourteen Days (2Weeks) Chemical immersion at room temperature 25°C.

Solution:	(A) 10% Sulfuric		(B) 20% Sulfuric		(C) Dist. Water 100%	
Spc.	Flex.St	Flex.Mod.	Flex.St.	Flex.Mod.	Flex.St.	Flex.Mod.
	Psi.	psix10 ⁵	Psi.	psix10 ⁵	Psi.	psix10 ⁵
Barcol	10-20		18-28		15-30	
1	25623	8.433	20414	7.175	25503	10.16
2	21627	7.474	25580	8.469	23471	9.65
3	27108	9.023	23927	7.741	24265	7.52
Ave.	24786	8.31	23307	7.795	24413	9.11
StDev.	2315	63846	2154	51956	836	114470
%Ret.	89.53	87.75	84.19	82.31	88.13	96.2
%Weight Gain	+1.7622		+2.0202		+0.6918	

Average of 3 specimens.

Solution:	(D) 10% Caustic		(E) 10% Nitric		(F) 20% Nitric	
Barcol	22-31		10-18		10-20	
1	25889	9.376	24305	7.492	26652	8.941
2	27021	9.017	26229	8.587	27598	8.563
3	27347	9.077	24154	8.347	25396	8.417
Ave.	26753	9.157	24896	8.142	26549	8.64
St.Dev.	625	15697	944	46966	902	22098
%Ret.	96.63	96.69	89.93	85.98	95.9	91.23
%Wt.Gain	+0.8907		+1.4906		+2.3095	

Observation on specimens after immersion: Specimens in Solutions A and B developed small blisters around the edges, and some penetration. The other specimens on solutions C, D, E, and F do not have any change in appearance.