

ADVANCED POLYMER COATINGS

lab report

APC Offers Tailored In-House Testing: ChemLINE® 14 Weeks Spent H2SO4 Immersion Report

At Advanced Polymer Coatings, we understand the importance of providing our customers with tailored solutions that meet their specific needs.

That's why we offer specific, tailored in-house testing services, allowing us to assess our coatings' performance in various environments thoroughly.

Read more on a recent request we received from a customer to test spent sulfuric acid that is being transported in their railcars.

Summary

Study of ChemLINE immersions in Spent Sulfuric Acid (H2SO4); CAS 7664-93-9.

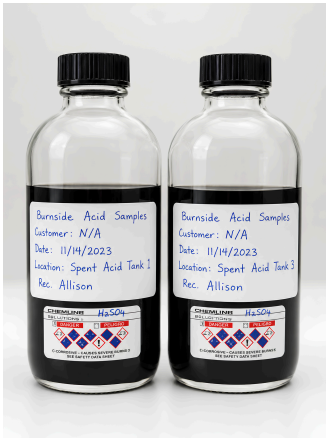
Four bottles of spent sulfuric acid supplied. Bottles were labeled Tank 1 and Tank 3. Since it is not known if there are any differences between Tank 1 and 3, both were tested separately. All liquid spent acid are black in color.

Tests & Descriptions

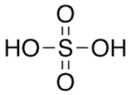
2”x5” Samples of ChemLINE® 784 and PT-WW were sprayed and cured per APC specifications of 122°C for hours.

Samples are immersed at a temperature of 40°C per the customer’s request.

We recently conducted a study on immersion in our ChemLINE® coatings in spent sulfuric acid (H2SO4) for a major environmental services company in North America who is transporting this aggressive commodity in their railcars. Four bottles of spent sulfuric acid were supplied, labeled Tank 1 and Tank 3. To ensure comprehensive testing, both tanks were evaluated separately.



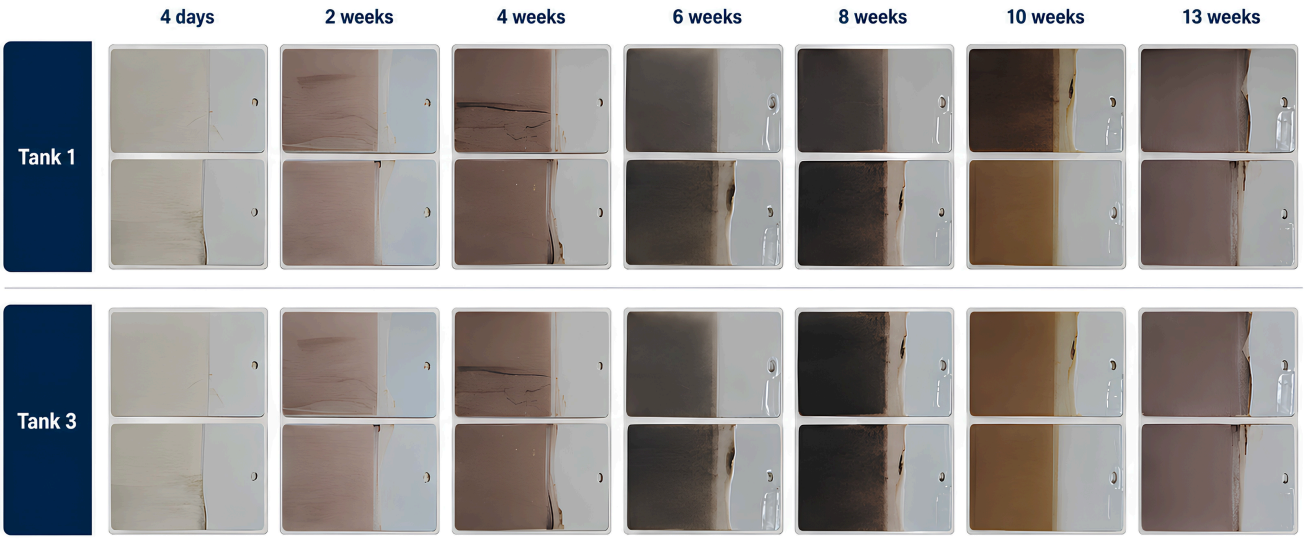
Our samples of ChemLINE® 784 and ChemLINE PT-WW were sprayed and cured according to APC specifications. They were then immersed at a temperature of 40°C, as requested by the customer.



122°C / 6 HOURS CURE

ChemLINE® 784/32 (Grey)

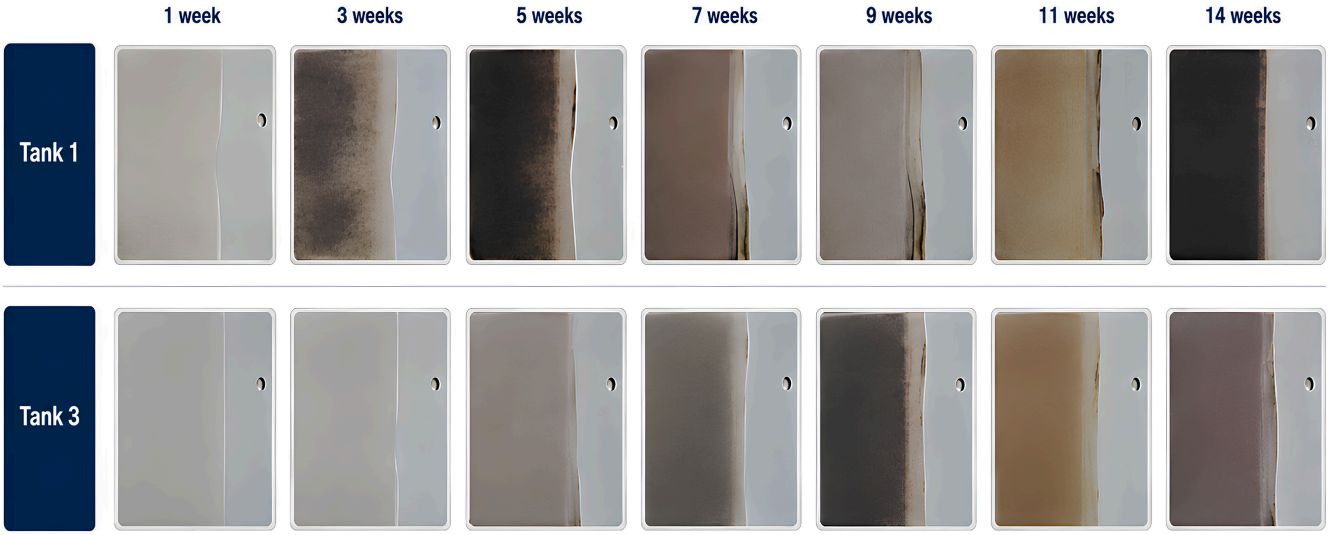
TEST CONDITIONS	Cure: 122°C / 6 hours Temperature: 40°C	DAYS OF IMMERSION													
		0	7	13	20	34	48	62	76	92	106	148	162	190	246	279
			12/04/23	12/11/23	12/26/23	1/08/24	1/22/24	2/06/24	3/12/24	3/12/24	12/26/24	3/18/24	12/28/23	12/28/24	12/08/23	12/06/23
TANK 1 40°C	Total Wt, g	150.6851		150.6172		150.6128		150.6079		150.5988	150.5951		150.5985		150.6043	
	Wt Ctg, g			9.9168		9.9124		9.9075		9.8984	9.8947		9.8981		9.9039	
	ΔWt g			−0.0679		−0.0723		−0.0772		−0.0863	−0.0900		−0.0866		−0.0808	
	ΔWt (%)			−0.68%		−0.72%		−0.77%		−0.86%	−0.90%		−0.87%		−0.81%	
	mg/cm^2			−0.4619		−0.4918		−0.5252		−0.5871	−0.6122		−0.5891		−0.5497	
	Visual			sl.discolor		discolor		discolor		discolor	discolor		discolor		discolor	
TANK 3 40°C	Total Wt, g	154.5843		154.5217		154.5143		154.5069		154.4936	154.4889		154.4915		154.5078	
	Wt Ctg, g			9.9221		9.9147		9.9073		9.8940	9.8893		9.8919		9.9082	
	ΔWt g			−0.0626		−0.0700		−0.0774		−0.0907	−0.0954		−0.0928		−0.0765	
	ΔWt (%)			−0.63%		−0.70%		−0.78%		−0.91%	−0.96%		−0.93%		−0.77%	
	mg/cm^2			−0.4259		−0.4762		−0.5265		−0.6170	−0.6490		−0.6313		−0.5204	
	Visual			matted		discolor		discolor		discolor	discolor		discolor		discolor	



122°C / 6 HOURS CURE

PT-WW | ChemLINE® 784/32 (Grey)

TEST CONDITIONS	Cure: 122°C / 6 hours Coating: ChemLINE® 784/32 (Grey) Solution: PT-WW Temperature: 40°C	DAYS OF IMMERSION						
		4	15	28	42	57	71	92
		12/11/23	12/15/23	12/26/23	1/08/24	2/06/24	2/20/24	3/12/24
TANK 1 40°C	Total Wt, g	151.4986	151.4590	151.4728	151.4784	151.4257	151.4334	151.4378
	Wt Ctg, g	10.3334	10.3472	10.3528	10.3474	10.3001	10.3078	10.3122
	ΔWt g	−0.0396	−0.0258	−0.0202	−0.0256	−0.0729	−0.0652	−0.0608
	ΔWt (%)	−0.382%	−0.249%	−0.195%	−0.247%	−0.703%	−0.629%	−0.586%
	mg/cm²	−0.2694	−0.1755	−0.1374	−0.1741	−0.4959	−0.4435	−0.4136
	Visual	sl.discolor	discolor	discolor	discolor	dark	dark	dark
TANK 3 40°C	Total Wt, g	151.6933	151.6641	151.6714	151.6684	151.6161	151.6164	151.6216
	Wt Ctg, g	10.3438	10.3511	10.3481	10.3372	10.2958	10.2961	10.3013
	ΔWt g	−0.0292	−0.0219	−0.0249	−0.0358	−0.0772	−0.0769	−0.0717
	ΔWt (%)	−0.282%	−0.211%	−0.240%	−0.345%	−0.745%	−0.742%	−0.692%
	mg/cm²	−0.1988	−0.1492	−0.1696	−0.2437	−0.5254	−0.5233	−0.4880
	Visual	sl.discolor	discolor	discolor	discolor	dark	dark	dark



The results were impressive. The weight change stabilized within the test period, and visually, all samples appeared to be in excellent condition. Despite the nature of sulfuric acid, which can cause varying shades of grey in the liquid phase, our coatings maintained their integrity. The vapor phase remained semi-gloss, with no signs of blistering, cracking, or delamination.

This study showcases the effectiveness of Advanced Polymer Coatings' tailored in-house testing services.

By offering these services, we can ensure that our coatings meet the highest performance and durability standards, providing our customers with peace of mind and confidence in their choice of protective coatings.

This accelerated testing has made our customer feel comfortable and confident that ChemLINE® 784 is the right choice when protecting their railcars from aggressive spent sulfuric acid service.