

ADVANCED POLYMER COATINGS

lab report

Tailored In-House Testing: Superior Protection for Aggressive Waste Stream Environments

Storing and transporting aggressive chemicals comes with immense responsibility, especially when these commodities are moved across open roads.

When a major hazardous waste disposal provider **faced the failure of their current ISO Tank liner within a year**, they turned to the Advanced Polymer Coatings (APC) ChemLINE® Team for a more reliable alternative.

As part of our commitment to quality and customer satisfaction, APC conducted a tailored, in-house lab test to ensure our coating would meet the client's needs and offer a warranty, especially for waste streams where testing is crucial.

Summary

Study of ChemLINE® samples immersed in an 'aggressive waste stream' from a major provider of hazardous waste disposal. Samples and duplicates are rinsed and inspected weekly/semi-weekly for surface changes, defects, and weight changes.

Tests & Descriptions

Samples of standard ChemLINE® 784 cured at 122°C for 6 hours and ChemLINE® 784 ES cured at 149°C for 6 hours are immersed in the aggressive waste stream solution at a temperature of 40°C for a time period of 192 days (6 months) total.

The study evaluated the performance of ChemLINE® coatings against the customer's previous coating system. To maintain confidentiality, the test solution from a major hazardous waste disposal provider is referred to as an "Aggressive Waste Stream."

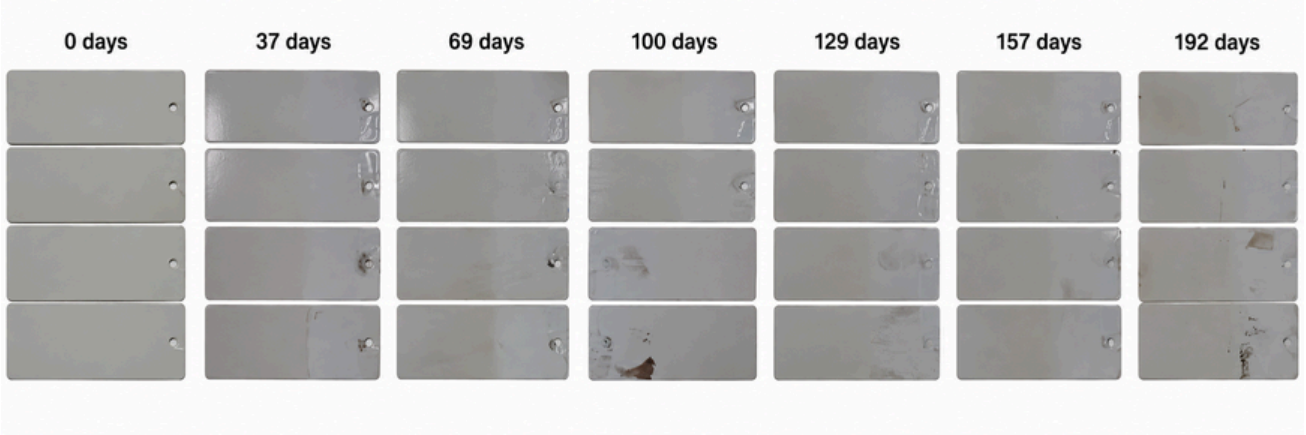
Testing

For this study, samples of ChemLINE® 784 and ChemLINE® 784 ES were prepared and cured under controlled laboratory conditions before exposure.

ChemLINE® 784 was cured at 122°C for 6 hours, while ChemLINE® 784 ES was cured at a higher temperature of 149°C for the same duration.This ensured each coating system was evaluated after reaching its intended cured state.

Once cured, the samples were immersed in the Aggressive Waste Stream solution at 40°C to simulate elevated service conditions. They remained in continuous exposure for 192 days, or approximately 6 months, allowing for evaluation of coating stability, chemical resistance, and overall performance in a representative waste stream environment.

Panel Immersions								6 months
Waste Profile		2/21/23	3/30/23	5/1/23	6/1/23	6/30/23	7/28/23	9/1/23
		0	37	69	100	129	157	192
784/32 / 122°C tagged: cone	Total Wt, g	153.2255	153.2917	153.332	153.3418	153.3337	153.3665	153.3548
	Wt Ctg, g	10.3253	10.3915	10.4316	10.4416	10.4335	10.4663	10.4546
	ΔWt g	—	0.0662	0.1063	0.1163	0.1082	0.1410	0.1293
	ΔWt (%)	—	0.64%	1.03%	1.13%	1.05%	1.37%	1.25%
	mg/cm²	—	0.4503	0.7231	0.7912	0.7361	0.9592	0.8796
		—	discolored	discolored	discolored	discolored	discolored	discolored
784/32 / 122°C tagged: square	Total Wt, g	155.8007	155.8947	155.933	155.9393	155.9245	156.0048	155.9467
	Wt Ctg, g	10.3253	10.4193	10.4578	10.4639	10.4491	10.5294	10.4713
	ΔWt g	—	0.0940	0.1325	0.1386	0.1238	0.2041	0.1460
	ΔWt (%)	—	0.91%	1.28%	1.34%	1.20%	1.98%	1.41%
	mg/cm²	—	0.6395	0.9014	0.9429	0.8422	1.3884	9932
		—	discolored	discolored	discolored	discolored	discolored	discolored
784/31 / 149°C tagged: cone	Total Wt, g	153.4103	153.4760	153.5212	153.5103	153.5031	153.5761	153.5100
	Wt Ctg, g	10.3253	10.390	10.4362	10.4253	10.4181	10.4911	10.4250
	ΔWt g	—	0.0657	0.1109	0.1000	0.0928	0.1658	0.0997
	ΔWt (%)	—	0.64%	1.07%	0.97%	0.90%	1.61%	0.97%
	mg/cm²	—	0.4469	0.7544	0.6803	0.6313	1.1279	0.6782
		—	discolored	discolored	discolored	discolored	discolored	discolored
784/31 / 149°C tagged: square	Total Wt, g	154.2355	154.3151	154.362	154.3502	154.3416	154.4235	154.3525
	Wt Ctg, g	10.3253	10.4049	10.4513	10.4400	10.4314	10.5133	10.4423
	ΔWt g	—	0.0796	0.1260	0.1147	0.1061	0.1880	0.1170
	ΔWt (%)	—	0.77%	1.22%	1.11%	1.03%	1.82%	1.13%
	mg/cm²	—	0.5415	0.8571	0.7803	0.7218	1.2789	0.7959
		—	discolored	discolored	discolored	discolored	discolored	discolored



Throughout the immersion period, the coated samples were removed at regular intervals, rinsed, and visually examined either weekly or semi-weekly depending on the stage of the test. This process was used to monitor how the coating surfaces responded over time when exposed to the aggressive waste stream environment.

Each inspection focused on identifying any visible signs of coating degradation or surface change. Particular attention was given to defects such as pitting, blistering, softening, cracking, loss of adhesion, delamination, discoloration, or any other irregularities that could indicate chemical attack or coating breakdown. The samples were also checked for noticeable changes in weight, which can help indicate absorption, swelling, material loss, or other changes not always immediately visible on the coating surface.

These ongoing observations provided an important measure of how the ChemLINE® coatings performed under sustained chemical exposure. By tracking the condition of the samples throughout the test, rather than only evaluating them at the end, it was possible to better understand the coating's resistance, stability, and overall durability in a highly aggressive service environment.

Results

ChemLINE® 784 and ChemLINE® 784 ES demonstrated strong performance throughout exposure to the aggressive waste stream solution. While the samples developed a slight greenish discoloration, the change appeared cosmetic and did not indicate coating breakdown or loss of protection.

No signs of degradation were observed during the inspection period. The coating surfaces remained intact, with no evidence of softening, pitting, blistering, delamination, dulling, loss of gloss, or significant weight change. These results suggest the coatings maintained their stability, resisted absorption or material loss, and continued to provide a protective barrier under aggressive exposure conditions.

The study supports the use of ChemLINE® coatings in waste stream applications where chemical resistance and long-term durability are critical.

It also reinforces **the importance of application-specific laboratory testing**, since waste streams can vary widely in chemistry, temperature, concentration, and exposure duration.

Contact a member of the APC ChemLINE® Team to ensure your operation is protected properly with tailored, in-house lab testing.