



MarineLine® Cargo Tank Coating Challenges Stainless Steel for Cargo Tanks

Before the MarineLine® cargo tank coating system from Advanced Polymer Coatings, stainless steel was typically used for the cargo tanks of chemical tankers. Shipowners invested vast sums for stainless steel construction to provide product purity and to resist corrosion from the chemicals carried. However, even today, stainless steel is still an expensive metal to use. Special skills are needed for fabricating and welding the stainless steel tanks in the newer, larger volume chemical carriers, thus further increasing construction costs.

INNOVATION CHANGES THE INDUSTRY

It is easy to see how MarineLine® has emerged to capture the imagination of shipowners by carrying the full range of chemicals handled by stainless steel, AND an even more extended product range for greater versatility including aggressive acids. MarineLine® also dramatically reduces overall new construction costs by allowing tank construction with less expensive mild (carbon) steel to deliver faster Return on Investment (ROI). Now, with more than 700 ships operating worldwide and a growing share of the chemical and product tanker market, MarineLine® is challenging stainless steel across all fronts.



Above: A MarineLine®-coated tank with more than 5 years service. The last 20 voyages were loaded with Methanol traveling for a month. No special cleaning needed; only ventilation.



Left: Stainless steel tank in good working order. Below: Typical problems in stainless steel tanks include rusting, staining, pitting, etc.



TECHNICAL REPORT



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1 Lower Initial Construction Savings Without exception, mild (carbon) steel is now the foremost choice for tank cargo tank construction due to its relatively low cost, high mechanical strength and ease of fabrication. A study comparing newbuilding costs illustrates that a ship built with mild steel tanks and coated with MarineLine® costs LESS than one with stainless steel tanks, as shown in this cost analysis comparison.

	3166 Stainless Steel	1040 Carbon Steel & Coated w/ MarineLine®
Thickness	0.390 in. (9.9 mm)	0.562 in. (14.27 mm)
USD\$ per Metric Ton Installed	\$9,722.00	\$1,690.00
Number Square Meters per Metric Ton	13	9
USD\$ Sq.M per Ton (13 for stainless; 9 for carbon steel)	\$747.85	\$187.78
USD\$ - 1 Square Meter MarineLine® Coating - Fully Coated & Cured	NA	\$70.00
TOTALS	\$747.85	\$257.78
COST PERCENTAGE DIFFERENTIAL - 34.5%	SAVINGS PERCENTAGE - 65.5%	

2 Polymer Engineering Translates into Easier, Faster Cleaning Easy tank cleaning between cargoes is of vital importance. MarineLine® creates a protective barrier that is easily cleaned, eliminating long ventilation times and putting the ship back into service faster. MarineLine® has a much smoother surface than stainless steel and this superior 'slip' promotes significant savings in fuel, energy, time and in cleaning chemicals used, all of which have a positive impact on the environment. With stainless steel, inherent problems with chloride attack can make tank cleaning costly. Typical washing of stainless steel tanks is first carried out with seawater at a certain temperature to remove cargo residues, where possible followed by washing with freshwater to remove chlorides that can damage the stainless steel service. And for some cargoes only fresh water can be used on stainless steel tanks, which are limitations that do not apply to MarineLine®.

3 Less Maintenance, Less Expense Periodic surveys of the tank and regular maintenance are needed to ensure a long service life. Whenever salt water is used for cleaning stainless steel tanks, fresh water must be used immediately afterwards to remove all salts that can roughen and cause pitting if allowed to remain on the surface. If exposed to halogen salts, especially chlorides that penetrate the surface and allow corrosive attack, stainless steel tanks may need extensive repair and maintenance. Maintaining a quality stainless steel tank also requires passivation at various points throughout the cargo tank's lifecycle. MarineLine®-coated tanks do not require any passivation. Key maintenance points for MarineLine® are to only carry approved chemicals, properly clean the tanks, and touch up any areas as needed with the MarineMend coating repair kit.

4 Versatility & More Cargo Sequencing Possibilities Tanker shipowners know their cargo tanks provide their income. MarineLine® allows you to handle the widest range of cargoes possible to ensure full capacity on each voyage and the most profitable high specification cargoes. When customers ask you... "Can you carry..." then the answer should be "yes." MarineLine® can carry a wide range of aggressive chemicals, CPPs, DPPs PFADs, bio-fuels, methanol, ethanol and others, and to easily switch between these cargoes, surpassing the capabilities of stainless steel. This higher versatility translates to faster ROI when compared to stainless steel tanks.