CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2024
DateRun:	07/15/2024
Experimenters:	Alicia McCarthy, Amelia Wagner
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #2
Substrates:	Painted metal
PartType:	Coupon
Contaminants:	Dirt, Films, Algae
Cleaning Methods:	Manual Wipe
Analytical Methods:	Colorimeter, Visual
Purpose:	To test the efficacy of GeoProX in removing biofouling from stainless steel coated in boat paint and antifouling paint.

Experimental Procedure:

This trial was intended to simulate boat hull cleaning. Three coupons of stainless steel coated in boat paint and three coupons of stainless steel coated in antifouling paint were used. The coupons were analyzed with a colorimeter and the L value of each coupon was recorded. The L value tells us how light or dark and object is. The coupons were also visually analyzed according to the parameters listed below. The coupons were then submerged in a canal for two weeks to allow biofouling to occur. When the coupons were removed, they again were analyzed visually and with a colorimeter in order to see how much the color of the coupons had changed (how much biofouling occurred). The coupons were then subjected to manual wipe cleaning via the straight line washability unit set to a 30 second cycle, allowing for 20 wipes. Each coupon received a total of 2.5 ml of the GeoProX chemistry. After cleaning, the coupons had their final visual analysis and colorimeter analysis to see how close to the initial L readings the cleaned coupons are.

Visual Analysis Parameters

1 = 100% removal

2 = 75% removal

3 = 50% removal

4 = 25% removal

5 = No removal

Results:

The L values from the colorimeter represent the difference in lightness (higher value) and darkness (lower value). Percent detergency demonstrates the amount of restoration to the original that has occurred after the cleaning test has been performed. A higher average percent detergency indicates that the cleaner has been effective and has restored the dirty substrate and cleaned it so that it now is much closer to how it originally was measured.

Data recorded from the readings can be calculated as percent detergency in the following equation to determine the cleaning efficacy of each formulation:

% DET = R(cleaned) - R(soiled) / R(unsoiled) - R(soiled) X 100

Colorimeter

Substrate	L initial	L Dirty	L Clean	% DET	AVG % DET	% Closeness to original value	AVG Closeness to original value
Metal Coated Boat Paint	90.4	75.95	85.14	63.60	67.2	94.2	95.5
	90.43	80.21	89.97	95.50		99.5	
	90.48	79.15	83.97	42.54		92.8	
Metal Coated Antifouling Paint	44.13	46.74	46.03	27.20	26.6	98.96	99.0
	43.82	46.52	46.18	12.59		98.95	
	43.68	46.08	45.12	40.00		98.97	

Visual

Substrate	Visual	AVG Visual
Boat paint	1	1.3
	1.5	
	1.5	
Antifouling paint	1	1

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Summary:

Conclusion: The GeoProX was highly effective in removing biofouling from both boat paint coated metal and antifouling paint coated metal. The % detergencies may show an underestimated value due to the cleaner itself causing a difference in color from the initial color of the coupons.