CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2018
DateRun:	05/07/2018
Experimenters:	Abigail Giarrosso, Kevin Smith, Hayley Byra
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Aluminum, Ceramics, Plastic
PartType:	Coupon
Contaminants:	Carbon Deposits, Dirt, Clay, Oxides, Silicones
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Visual
Purpose:	To evaluate the supplied product for car wheel dirt removal from aluminum and plastic surfaces after the cleaner has been applied and dried for a known amount of time.
Experimental Procedure:	Supplied products, Alpha wheel Guard 1, Alpha Wheel Guard 2, and Alpha Wheel Guard 3 were poured into individual beakers. Aluminum, ceramic, and plastic coupons were then quickly immersed in the designated solvent and left to dry for 0, 30, or 60 minutes. After the drying period, 3 drops of a soil (5g of ATTCC carpet soil in 20 mL of water) was pipetted onto the middle of the coupon. The coupon was then held vertically for 30 seconds to allow any soil to fall off. The coupons were assessed visually on a scale of 1 (completely clean) to 5 (covered in soil). The same coupons dried overnight and were then quickly dipped in water to evaluate if the soil would be further removed. The coupons were rated on the same scale of 1 (completely clean) to 5 (covered in soil).

Results:

Ratings on 0 Minutes of Drying						
Cleaner	Substrate	Tester 1	Tester 2	Tester 3	Average Rating	Overall Average Rating
Alpha Chemical Wheel Guard 1	Aluminum	2.5	2.5	2.5	2.67	2.69
		3	3	3		
		2	2.5	3		
	Ceramic	2.5	2	2.5	2.39	
		2.5	2	2.5		
		2.5	2	3		
	Plastic	3	2	3	3.00	
		3.5	2.5	3		
		3.5	3	3.5		
Alpha Chemical Wheel Guard 2	Aluminum	2.5	2	2	2.22	2.48
		2.5	2	2		
		2.5	2	2.5		
	Ceramic	2.5	2.5	2.5	2.39	
		2	2.5	2		
		2.5	2.5	2.5		
	Plastic	4	3.5	4	2.83	
		2.5	2	3		
		2	2.5	2		
Alpha Chemical Wheel Guard 3	Aluminum	1.5	1.5	1.5	1.50	1.98
		1.5	1.5	1.5		
		1.5	1.5	1.5		
	Ceramic	1.5	1.5	1.5	1.72	
		1.5	1	1.5		
		2.5	2	2.5		
	Plastic	2.5	3	2.5	2.72	
		2.5	3	2.5		
		2.5	3.5	2.5		
Ratings on 30 Minutes of Drying						
Cleaner	Substrate					

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		Tester 1	Tester 2	Tester 3	Average Rating	Overall Average Rating
Alpha Chemical Wheel Guard 1	Aluminum	3.5	4	4	3.83	3.80
		3	4	4		
		4	4	4		
	Ceramic	3	4	4	3.83	
		3.5	4	4		
		4	4	4		
	Plastic	3.5	4	4	3.72	
		3	4	4		
		3	4	4		
Alpha Chemical Wheel Guard 2	Aluminum	3	4	4.5	4.17	3.69
		3.5	4	4		
		4.5	5	5		
	Ceramic	3.5	4	3.5	3.39	
		2.5	3.5	3.5		
		3	3.5	3.5		
	Plastic	4	4	3.5	3.50	
		3.5	4	3.5		
		3	2.5	3.5		
Alpha Chemical Wheel Guard 3	Aluminum	4.5	5	5	4.72	4.15
		3.5	5	5		
		4.5	5	5		
	Ceramic	3	3.5	4	3.78	
		4	4	4		
		3.5	4	4		
	Plastic	4	4	4	3.94	
		3.5	4.5	4		
		3	4.5	4		

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Ratings on 60 Minutes of Drying						
Cleaner	Substrate	Tester 1	Tester 2	Tester 3	Average Rating	Overall Average Rating
Alpha Chemical Wheel Guard 1	Aluminum	5	5	4	4.44	4.04
		5	4.5	4		
		4.5	4	4		
	Ceramic	5	4	3.5	4.06	
		4.5	4	3.5		
		4.5	4	3.5		
	Plastic	4	3.5	3.5	3.61	
		3.5	3.5	3.5		
		4	3.5	3.5		
Alpha Chemical Wheel Guard 2	Aluminum	4	4	4	4.17	3.87
		4.5	4.5	4		
		4	4.5	4		
	Ceramic	4	4	3.5	3.72	
		3.5	4	3.5		
		3.5	4	3.5		
	Plastic	4	4.5	3.5	3.72	
		3.5	5	3.5		
		2.5	4	3		
Alpha Chemical Wheel Guard 3	Aluminum	3.5	4.5	4	3.83	4.07
		4	4.5	4		
		3	3.5	3.5		
	Ceramic	4	4.5	3.5	4.06	
		4	4.5	4		

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		4	4.5	3.5		
	Plastic	4.5	4.5	4	4.33	
		4.5	4.5	4		
		4.5	4.5	4		

The same coupons were then quickly immersed in a beaker of water to examine if addition soil would fall off.

Ratings on 0 Minutes of Drying, Dipped in Water						
Cleaner	Substrate	Tester 1	Tester 2	Tester 3	Average Rating	Overall Average Rating
Alpha Chemical Wheel Guard 1	Aluminum	1.5	2	2	1.83	1.89
		1.5	1.5	2.5		
		1.5	2	2		
	Ceramic	1.5	1.5	2.5	1.89	
		1.5	1.5	2.5		
		2	2	2		
	Plastic	2	2	3	1.94	
		1.5	1.5	1.5		
		2	2	2		
Alpha Chemical Wheel Guard 2	Aluminum	1.5	2	1.5	1.67	1.83
		1.5	2	1.5		
		1.5	2	1.5		
	Ceramic	1.5	2	2	1.94	
		1.5	2	3		
		1.5	2	2		
	Plastic	1.5	2	2	1.89	
		1.5	2	1.5		
		1.5	2	3		
Alpha Chemical Wheel Guard 3	Aluminum	1.5	1.5	1.5	1.50	2.22
		1.5	1.5	1.5		
		1.5	1.5	1.5		
	Ceramic	1.2	1.5	4	2.16	
		1.2	1.5	3		
		2	2	3		
	Plastic	2.5	2.5	4	3.00	
		2.5	2.5	4		
		2.5	2.5	4		
Ratings on 30 Minutes of Drying, Dipped in Water						
Cleaner	Substrate	Tester 1	Tester 2	Tester 3	Average Rating	Overall Average Rating
Alpha Chemical Wheel Guard 1	Aluminum	1.5	2.5	2	2.17	2.69
		1.5	2	2		
		2	3	3		
	Ceramic	2	3	3	2.94	
		2.5	3	3		
		3	3.5	3.5		
	Plastic	2.5	3.5	3.5	2.94	
		2	3.5	3		
		2	3.5	3		
Alpha Chemical Wheel Guard 2	Aluminum	1.5	4	3.5	3.33	3.37
		2	4	4		
		3	4	4		
	Ceramic	2.5	3.5	3	2.83	
		2	3	2.5		
		2	4	3		
	Plastic	3.5	4.5	3.5	3.94	
		4	4.5	3.5		

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		3..5	4.5	3.5		
Alpha Chemical Wheel Guard 3	Aluminum	4.5	4.5	4	3.83	3.38
		4	4	3		
		3.5	4	3		
	Ceramic	2	3.5	2.5	2.75	
		2.5	3.5	2.5		
		2.5		3		
	Plastic	3.5	4	3.5	3.56	
		3	4	3.5		
		3	4	3.5		

Ratings on 60 Minutes of Drying, Dipped in Water						
Cleaner	Substrate	Tester 1	Tester 2	Tester 3	Average Rating	Overall Average Rating
Alpha Chemical Wheel Guard 1	Aluminum	2.5	4	3	3.17	2.94
		2	4	3		
		3	4	3		
	Ceramic	2.5	4	3	3.22	
		3	4	3		
		2.5	4	3		
	Plastic	3	3.5	3	2.44	
		2	2.5	2		
		2	2	2		
Alpha Chemical Wheel Guard 2	Aluminum	3	3.5	2.5	2.78	2.48
		2	3.5	2.5		
		2	3.5	2.5		
	Ceramic	2	2.5	3	2.33	
		2	2.5	2.5		
		2	2.5	2		
	Plastic	3	3	3	2.33	
		2	2	2		
		2	2	2		
Alpha Chemical Wheel Guard 3	Aluminum	3	3	2.5	2.61	2.52
		2	3	2.5		
		2	3	2.5		
	Ceramic	1.5	3	2.5	2.44	
		2	3	2.5		
		2	3	2.5		
	Plastic	2	3	2.5	2.50	
		2	3	2.5		
		2	3	2.5		

The best results from the drying test showed that with no drying the soil was better removed. This was partially due to the cleaner dripping off the substrate removing the soil with it. Alpha Chemical Wheel Guard 3 removed more soil visually than the other products, with the best substrate being aluminum. The longer the cleaner had to dry on the substrate, the less soil was removed. In the tests that dried the cleaner, Alpha Chemical Wheel Guard 3 performed the worst, while Alpha Chemical Wheel Guard 2 performed the best.

When the same coupons were dipped in water, all coupons removed more soil due a to the hydrophobic property of the cleaner's film. The longer the drying time, the more hydrophobic property the film seemed to have by significantly reducing the amount of visible soil. The coupons that had the cleaner dried for 60 minutes and then dipped into water had the greatest soil removal, visually.

All aluminum coatings had a visible fuzzy film formed by all cleaners when dried.

Company Name:	Product Name:	Avg. 0 min Drying Rating	Avg. 30 min Drying Rating	Avg. 60 min Drying Rating	Avg. 0 min, Water Rating	Avg. 30 min, Water Rating	Avg. 60 min, Water Rating
Alpha Chemical Services	Alpha Chemical	2.69	3.80	4.04	1.89	2.69	2.94

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	Wheel Guard 1						
	Alpha Chemical Wheel Guard 2	2.48	3.69	3.87	1.83	3.37	2.48
	Alpha Chemical Wheel Guard 3	1.98	4.15	4.07	2.22	3.38	2.52

Summary:

Substrates:	Aluminum, Ceramics, Plastic
Contaminants:	Carbon Deposits, Dirt, Clay, Oxides, Silicones

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Alpha Chemical Services	Alpha Chemical Wheel Guard 1	100%	0.00	☑	
Alpha Chemical Services	Alpha Chemical Wheel Guard 2	100%	0.00	☑	
Alpha Chemical Services	Alpha Chemical Wheel Guard 3	100%	0.00	☑	

Conclusion: All three cleaners were considered effective with keeping dirt off the substrate.