

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2019

DateRun: 07/26/2019

Experimenters: Ross Goding

ClientType: Cleaner Manufacturer

ProjectNumber: Project #1

Substrates: Textile

PartType: Coupon

Contaminants: Inks, Dirt, Oil, Food

Cleaning Methods: Mechanical Agitation

Analytical Methods: Colorimeter, Visual

Purpose: To evaluate the effectiveness of Better Life laundry detergent and a comparative product in removing soils from white cotton, purple nylon and orange polyester.

Experimental Procedure: Nine 4" x 5" swatches per cleaner, three of each fabric type, were contaminated with motor oil, ink, dirt, and mustard and air dried for 24 hours. Fabrics were washed at 88°F for 12 minutes per cleaner. Fabrics were placed in a five-minute spin cycle and a nine-minute rinse cycle before drying for 24 hours. A colorimeter was used to take initial, contaminated, and clean measurement values.

$$SRI = 100 - ((Lc-Lw)^2 + (ac-aw)^2 + (bc-bw)^2)^{1/2}$$

Where:

L = reflectance

A = redness/greenness

B = yellow/blueness

C = unstained fabric, washed in the treatment conditions

W = stained fabric, washed in the treatment conditions

Results: Table 1: Results from Cleaner 1

Cleaner	Fabric	Soil	SRI	Average
1	White Cotton	Oil	76.630	72.84
		Ink	54.80	
		Dirt	77.72	
		Mustard	82.22	
	Purple Nylon	Oil	93.70	72.48
		Ink	80.94	
		Dirt	23.13	
		Mustard	92.14	
	Orange Polyester	Oil	90.30	66.65
		Ink	55.77	
		Dirt	22.39	
		Mustard	98.12	

Table 2: Results from Cleaner 2

2	White Cotton	Oil	82.64	75.12
		Ink	57.92	
		Dirt	81.45	
		Mustard	78.47	
	Purple Nylon	Oil	93.79	77.19
		Ink	80.74	
		Dirt	40.62	
		Mustard	93.62	
	Orange Polyester	Oil	87.98	84.79
		Ink	56.69	
		Dirt	96.37	
		Mustard	98.11	

Table 3: Cleaner 1 L, a, and b values. % Difference is included

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	Initial			Clean			% Difference		
	L	A	B	L	A	B	L	A	B
White Cotton	85.59	-1.23	7.29	63.02	0.82	12.49	26.38	166.76	-71.25
	85.55	-1.16	7.32	41.75	0.89	-3.64	51.20	176.79	149.70
	85.77	-1.20	7.35	63.54	0.00	6.67	25.92	99.72	9.25
	85.53	-1.18	7.50	82.85	-2.42	25.01	3.13	-104.80	-233.47
Purple Nylon	30.00	17.04	-35.60	26.50	16.28	-30.42	11.65	4.46	14.55
	30.07	16.84	-35.36	26.63	8.16	-18.75	11.44	51.56	46.98
	30.34	26.42	-35.67	29.51	15.50	-33.79	2.75	41.35	5.27
	30.27	16.83	-35.58	29.37	12.14	-29.34	2.98	27.88	17.54
Orange Polyester	66.76	26.39	42.40	58.08	30.65	42.36	13.00	-16.14	0.10
	66.75	66.75	42.72	39.23	7.55	13.68	41.22	88.69	67.97
	66.66	66.66	42.29	64.53	25.76	41.48	3.19	61.36	1.92
	66.91	66.91	42.14	66.88	27.81	43.18	0.05	58.43	-2.48

Table 4: Cleaner 2 L, a, and b values. % Difference is included

	Initial			Clean			% Difference		
	L	A	B	L	A	B	L	A	B
White Cotton	85.80	-1.36	7.45	69.54	0.48	13.11	18.95	135.14	-75.94
	86.04	-1.26	7.46	44.31	0.89	-3.36	48.51	170.63	145.11
	87.15	-0.97	3.95	68.64	-0.03	4.44	21.24	96.90	-12.41
	88.41	-0.96	1.58	85.44	-3.35	22.75	3.36	-248.10	-1337.05
Purple Nylon	30.05	16.86	-35.48	26.71	15.94	-30.34	11.13	5.44	14.48
	30.28	16.86	-35.59	26.84	8.07	-18.81	11.37	52.14	47.16
	30.15	16.84	-35.39	29.07	15.56	-33.89	3.58	7.60	4.25
	29.85	16.74	-35.22	28.94	12.88	-30.24	3.05	23.06	14.15
Orange Polyester	66.80	26.23	42.11	55.91	31.24	42.06	16.31	-19.10	0.11
	66.92	26.29	42.13	39.49	8.37	13.81	40.98	68.17	67.23
	66.56	26.32	41.90	63.62	25.62	39.92	4.43	2.65	4.73
	66.95	26.51	42.53	65.94	27.91	42.98	1.51	-5.29	-1.06

Table 5: Average percent change in fabric color

	% Change		
Better Life Detergent	L	a	b
White Cotton	26.65	84.62	-36.44
Purple Nylon	7.20	31.31	21.09
Orange Polyester	14.37	48.09	16.88
7 th Generation Detergent	L	a	b
White Cotton	23.02	38.64	-320.07
Purple Nylon	7.28	22.06	20.01
Orange Polyester	15.81	11.60	17.75

Summary:

Substrates:	Textile				
Contaminants:	Inks, Dirt, Oil, Food				
Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Better Life	Laundry Detergent	100%	70.66	<input type="checkbox"/>	
Seventh Generation	Laundry Detergent	100%	79.03	<input type="checkbox"/>	

Conclusion:

Seventh Generation Laundry Detergent was slightly more effective at removing stains than Better Life Laundry Detergent. Neither were considered overall effective at removing the stains from the fabrics.