

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2013
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 Experimenters: Jonathan Oljey, Digvijay Devkota
 ClientType: Cleaner Manufacturer
 ProjectNumber: Project #1
 Substrates: Stainless Steel
 PartType: Coupon
 Contaminants: Oil
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric
 Purpose: To evaluate the efficiency of two cleaners in GS 34 Soil-1 and GS 34 Soil- 2 from stainless steel coupons using immersion technique.

Experimental Procedure: Stainless steel coupons were weighed. Half of these were soiled with GS 34 Soil-1 and the other half were soiled with GS 34 Soil-2. Both soils were applied at the loading of 100mg. The soiled coupons were oven dried for 30 minutes with 40 °C for GS 34 Soil-1 and 105 °C for GS 34 Soil-2. Dirty weights were recorded for all of the coupons.

Products were diluted at the 8:1 and 16:1 dilutions using DI water. The mixture was stirred using magnetic stir bar in a beaker. Three coupons were placed in the beaker for 20 minutes of immersion at a time then. The coupons were rinsed in DI water for 20 minutes for the same coupons. After the immersion cleaning and rinsing, the coupons were left for air dry for 30 minutes and oven dry for 30 minutes again with the same temperature as before. Final weights were recorded, efficiencies were calculated and recorded. Soil 1: Maintenance soil = 10 grams of carbon black, 10 grams iron oxide, 100 ml WD-40, 100 ml hydraulic oil, and 100 ml gear oil. Soil 2: Production soil = 200 ml Quench Oil and 200 ml cutting oil

Results: At the 8:1, ECS 770 was not effective in removing GS 34 Soil-1 and GS 34 Soil-2 at the 8:1 dilution. Multiclean Fury was more effective in removing GS 34 Soil-2 from the surface.
 At the 16:1 ECS 770 was not effective in removing GS 34 Soil-1 and Soil-2 from the surface of stainless steel. The Multiclean Fury was effective in removing both soils from the surface of the stainless steel.

Cleaner	Initial wt	Final wt	% Removed	Cleaner	Initial wt	Final wt	% Removed
ECS770_8-1_GS34Soil1				ECS770_16-1_GS34Soil1			
	0.0881	0.0164	81.38		0.0922	0.0710	22.99
	0.0866	0.0302	65.13		0.0843	0.0769	8.78
	0.1062	0.0393	62.99		0.0860	0.0519	39.65
	0.0774	0.0262	66.15		0.1015	0.0768	24.33
	0.1060	0.0316	70.19		0.1065	0.0803	24.60
	0.1061	0.0527	50.33		0.0918	0.0621	32.35
	0.0972	0.0064	93.42		0.0952	0.0827	13.13
	0.1065	0.0334	68.64		0.1093	0.0726	33.58
	0.0956	0.0319	66.63		0.1010	0.0740	26.73
MulticleanFury_8-1_GS34Soil1				MulticleanFury_16-1_GS34Soil2			
	0.0824	0.0424	48.54		0.0989	0.0182	81.60
	0.0842	0.0531	36.94		0.1015	0.0220	78.33
	0.0695	0.0393	43.45		0.1018	0.0388	61.89
	0.0748	0.0093	87.57		0.0958	0.0169	82.36
	0.1015	0.0119	88.28		0.0974	0.0073	92.51
	0.0864	0.0518	40.05		0.0903	0.0029	96.79
	0.0739	0.0179	75.78		0.0870	0.0080	90.80
	0.0978	0.0046	95.3		0.0903	0.0082	90.92
	0.0806	0.0109	86.48		0.1072	0.0071	93.38
ECS770_8-1_GS34Soil2				ECS770_16-1_Soil2			
	0.0962	0.0297	69.13		0.1024	0.0466	54.49
	0.1009	0.041	59.37		0.1092	0.0535	51.01
	0.0928	0.0434	53.23		0.1142	0.0468	59.02
	0.0912	0.0303	66.78		0.1005	0.0231	77.01

CLEANING LABORATORY EVALUATION SUMMARY

	0.0870	0.0281	67.70		0.1063	0.0350	67.07
	0.0725	0.0365	49.66		0.1105	0.0315	71.49
	0.1012	0.0295	70.85		0.0878	0.0260	70.39
	0.0986	0.0310	68.56		0.1040	0.0506	51.35
	0.0966	0.0351	63.66		0.1025	0.0045	95.61
MulticleanFury_8-1_GS34Soil2			MulticleanFury_16-1_GS34Soil2				
	0.0781	0.0003	99.62		0.0724	0.0050	93.09
	0.0777	0.0002	99.74		0.0922	0.0050	94.58
	0.1020	0.0021	97.94		0.1665	0.0735	55.86
	0.0962	0.0008	99.17		0.1044	0.0136	86.97
	0.1078	0.0005	99.54		0.1002	0.0092	90.82
	0.0871	0.0156	82.09		0.1078	0.0120	88.87
	0.0873	0.0039	95.53		0.1048	0.0021	98.00
	0.0915	0.0018	98.31		0.1156	0.0033	97.15
	0.0915	0.0019	97.92		0.0911	0.0066	92.76

Summary:

Substrates:	Stainless Steel				
Contaminants:	Oil				
Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Enviroclean Solutions	ECS 770 Hard Surface Degreaser-Cleaner	12.5	66.32	<input type="checkbox"/>	GS Soil 1
Enviroclean Solutions	ECS 770 Hard Surface Degreaser-Cleaner	6.25	45.76	<input type="checkbox"/>	GS Soil 2
Tower Products Inc	Multi clean Fury 80 product	12.5	81.86	<input type="checkbox"/>	GS Soil 1
Tower Products Inc	Multi clean Fury 80 product	6.25	87.04	<input checked="" type="checkbox"/>	GS Soil 2

Conclusion:

The Multiclean Fury product worked better at both dilutions than the ECS 770 product.