CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2013
DateRun:	12/09/2013
Experimenters:	Jason Marshall, Junhee Cho, Loc Nguyen
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 three cleaners on GS 34 Soil-2 from stainless steel coupons using immersion technique.
Experimental Procedure:	wo sets of stainless-steel coupons were weighed. Both sets were soiled with GS 34 Soil-2. The soil was applied at the loading of ~100mg. The soiled coupons were oven dried for 30 minutes at 105 °C for GS 34 Soil-2. Dirty weights were recorded for all of the coupons. The nClean product was 6 oz/gal (4.7%), the Multipurpose Fury 14oz/gal (11%) and the Krud Kutter at the supplied ready to use concentration. Three coupons were placed in a Gardner Straightline Washability unit and spray with a cleaning solution and allowed to soak for 20 minutes. After soaking, the unit was run for 20 cycles (33 seconds) followed by a quick spray rinse using tap water at room temperature. Final weights were recorded the following day. Efficiencies were calculated and recorded. In addition to the manually wiped coupons, a second set of coupons was sprayed with the cleaners. These coupons were allowed to sit 20 minutes. No wiping was used, and the coupons were only rinsed with tap water. Final weights were recorded the following day. Efficiencies were calculated and recorded. Soil 2: Production soil = 200 ml Quench Oil and 200 ml cutting oil
Results:	The manual wiping of the maintenance soil was effectively removed with each of the three products with each product removing over 95% of the soil mixture. The Fury product had slightly better removal than the Krud Kutter and nClean (F: 98.32 – KK: 97.79-nC: 96.72). During the apply-and-rinse cleaning all three products had improved soil removal when allowing the products to soak for 20 minutes. The products performed in a better than the manual wiping with nearly complete removal of the soil. Removal rates were nearly identical for each of the three products.

Cleaner	Initial wt	Final wt	% Removed
nClean - wipe			
	0.1019	0.0023	97.74
	0.1018	0.0045	95.58
	0.1041	0.0033	96.83
Multiclean Fury - wipe			
	0.1042	0.0037	96.45
	0.1078	0.0010	99.07
	0.1076	0.0006	99.44
Krud Kutter - wipe			
	0.1096	0.0021	98.08
	0.1071	0.0018	98.32
	0.1091	0.0033	96.98
nClean - no wipe 20 soak			
	0.1075	0.0010	99.07
	0.1119	0.0001	99.91
	0.1090	0.0000	100.00
Multiclean Fury - no wipe and 20 soak			
	0.0899	0.0004	99.56
	0.1045	0.0004	99.62
	0.1069	0.0003	99.72

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Krud Kutter - no wipe and 20 soak			
	0.1011	0.0005	99.51
	0.1043	0.0002	99.81
	0.1198	0.0010	99.17

Summary:

Substrates:	Stainless Steel				
Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Geophia	nClean	4.7	99.66	☑	
Tower Products Inc	Multi clean Fury 80 product	11	99.63	☑	
Supreme Chemicals of Georgia	Original Krud Kutter concentrated cleaner degreaser stain remover	100	99.49	☑	

Conclusion:

The nClean product worked as well as the two comparative products under the manual wiping and extended soak and rinse scenarios.