CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2000

DateRun: 11/28/2000

Experimenters: Jason Marshall

ClientType: Chemical Company

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Latex binder

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To identify an aqueous cleaner that would improve the cleaning of static mixers.

Experimental Procedure: Eight cleaners were selected from the lab's database of effective cleaning and vendor supplied information. All were diluted to 5% by volume using DI water in 600 ml beakers and heated to 130oF on a hot plate. Twenty-four preweighed coupons were coated with the binder mix and weighed a second time. Three coupons were immersed in a solution agitated with a magnetic stir bar. Cleaning lasted for 5 minutes and was followed by a 30 second rinse with tap water at 120oF. Drying was performed with a Master Appliance Corp, Hot-air gun model HG-301A for one minute at 500oF. Coupons were weighed a final time and cleaning efficiencies were calculated.

SUBSTRATE MATERIAL: stainless steel, 316
CONTAMINANTS: Latex binder (water 53.648%, Vultex CA-1 catalyst 0.724% (7664-41-7), Igepal CO-630 0.545% (9016-45-9), Biosoft D35 X 2.595%, Dur-O-Set NS 25-1823 24.447% (50-00-0), Fulatex Polymer 12.663%, Black pigment BS 15870 5.478%(1333-86-4), Repearl F-8025 0.900% (57-55-6)
CONTAMINATING PROCESS USED: Mixed binder was applied to coupons using a hand held swab and allowed to dry.

Results: Five of the eight products had cleaning efficiencies over 90%. Only one, Surface Cleanse, had performed poorly with only a 6% removal. Table 2 lists the efficiencies for all eight cleaners. It was observed that the majority of the cleaning was accomplished on the thicker build up of the binder material. The thin films were difficult to remove using immersion cleaning.

Table 2. Cleaning Results

	Luminox	Shopmaster	Surface Cleanse	Formula 625	440 R SMT	Beyond 2004	Jet 790	Daraclean
Coupon 1	65.79	86.36	5.33	95.24	95.92	98.90	96.00	65.52
Coupon 2	95.92	94.83	8.11	93.33	90.00	94.68	95.56	82.46
Coupon 3	90.20	100.00	6.00	94.29	92.68	95.56	95.65	81.48
Average	83.97	93.73	6.48	94.29	92.87	96.38	95.74	76.48

Summary:

Substrates:	Stainless Steel
Contaminants:	Latex binder

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Alconox Inc	Luminox	5	83.97	☐	
Buckeye International	Shopmaster	5	93.73	☑	
International Products Corporation	Surface Cleanse Concentrated Neutral 930	5	6.48	☐	
Quaker Chemical	Formula 625 XL	5	94.29	☑	
Smart Sonic Corp	440 R SMT Detergent	5	92.87	☑	
Today & Beyond	Beyond 2004	5	96.38	☑	
US Polychem Corporation	Polyspray Jet 790 P	5	95.74	☑	
Magnaflux	Daraclean 232	5	76.48	☐	

Conclusion: Five cleaners, Shopmaster, Formula 625 XL, 440 R SMT, Beyond 2004 and Polyspray Jet 790 P were very effective in the trial. Each will be tested using ultrasonic cleaning at 40 kHz. Water will also be included in the next phase of testing.