CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1999

DateRun: 08/01/1999

Experimenters: Jason Marshall, Nicole Vayo

ClientType: Brazing-Heat Treating

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To evaluate possible aqueous replacement cleaners for Trichloroethylene.

Experimental Procedure: Six cleaners were selected for evaluation based on vendor supplied information and through the use of the lab's Effective Test Conditions database. The cleaners were made into five percent solutions using DI water in 600 ml beakers. The solutions were heated to 130 F on a hot plate. Twenty-one preweighed coupons were contaminated with the quench oil and weighed again. Three coupons per solution were cleaned for five minutes using stir-bar-agitated immersion. Rinsing was performed using a tap water bath at 120 F for 30 seconds. Coupons were dried using a Master Appliance Corp, Hot-air gun model HG-301A at 500 F for one minute. After returning to room temperature, the coupons were weighed again and cleaning efficiencies were calculated.

SUBSTRATE MATERIAL: Stainless Steel Coupons (202-316 B-80)
CONTAMINANTS: Quenching Oil (CAS #s64742-54-7; 64742-56-9; 8052-42-4)
CONTAMINATING PROCESS USED: Coupons were coated with quench oil using handheld swab.

Results: Three cleaning, AW Chesterton, Calgon and US Polychem, solutions removed over 90% of the quench oil from the coupons. The other three, WR Grace, Gemtek and Savogran, removed 86-90% of the oil and water removed only
78% of the oil. Table 2 lists the efficiencies for each of the cleaning solutions.

	AW Chesterton	Calgon	US Polychem	WR Grace	Gemtek	Savogran	DI Water
Coupon 1	96.29	91.35	97.5	89.04	92.05	83.63	79.35
Coupon 2	96.75	95.87	98.19	91.17	92.84	88.17	80.46
Coupon 3	98.61	94.28	96.81	89.62	84.45	87.76	76.02
Ave	97.21	93.84	97.5	89.94	89.78	86.52	78.61
Std Dev	1.23	2.29	0.69	1.1	4.63	2.51	2.31

Summary:

Substrates:	Stainless Steel				
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
AW Chesterton	KPC 820 N	5	97.21	☑	
Calgon Corporation	Geo Guard 2215	5	93.84	☑	
US Polychem Corporation	Polyspray Jet 790 P	5	97.50	☑	
Magnaflux	Daraclean 282 GF	5	89.94	☐	
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	5	89.78	☐	
Savogran Company	Dirtex Prepaint Cleaner	5	86.52	☐	
Water	DI Water	100	78.61	☐	

Conclusion: The AW Chesterton, Calgon and US Polychem products were effective in removing over 94% of the quench oil. These three solutions will be used to clean client supplied parts.