CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1999

DateRun: 12/19/1999

Experimenters: Jason Marshall

ClientType: Medical Instrument Mfr

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Pitch

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To further evaluate potential cleaners on the last type of contaminant.

Experimental Procedure: Six cleaning chemistries were selected based on the previous trial results. Five of these products were diluted to five percent and one to two percent by volume in 600 ml beakers using DI water. These six solutions were heated to 130 F on a hot plate. Eighteen preweighed stainless steel coupons were coated with the pitch compound and cooled for 30 minutes at room temperature and weighed again. (Note: The six contaminants provided were sub-grouped according to their make up. There were three Aluminum Oxide based buffing compounds, two mineral oil based products and one other. Separate testing has been performed according to these classifications.) Three coupons were cleaned for three minutes in a beaker using stir-bar agitation. Coupons were rinsed in DI water at 130 F for 30 seconds and dried using a Master Appliance Corp, Hot-air gun model HG-301A at 500 F for one minute. After the coupons cooled to room temperature, a final clean weight was recorded and cleaning efficiencies were calculated.
Two additional cleaners were evaluated after the six aqueous proved to be ineffective. One was selected from the previous trials for this client and the other was based on the Laboratories database of effective test conditions

SUBSTRATE MATERIAL: Stainless steel coupons (202-316 B-80)
CONTAMINANTS: Universal Photonics #48 Transparent Pitch (C19H29COOH w/ Hydrocarbon resins & natural materials)
CONTAMINATING PROCESS USED: Pitch heated and applied by rubbing onto coupons.

Results: The six aqueous products were very ineffective in removing the pitch from the coupons. Only the Oakite cleaner had moderate success after a gently wipe of the coupon removed pitch that had become brittle. Two additional cleaners were evaluated due to the lack of positive results. These products were very effective in removing the contaminant from the coupons at room temperature and using ultrasonic energy. Table 3 lists the calculated efficiencies for all of the cleaning products tested.

Table 3. Calculated Efficiencies

Chemsitry:	Oakite	Texo Corp	US Poly	Valtech	WR Grace	International	Oakite 2nd	Envirosolution	Safe Science
Coupon 1	6.97	6.27	8.10	3.32	7.73	10.59	69.39	98.88	99.12
Coupon 2	14.39	4.49	7.25	5.34	3.32	2.73	73.59	99.96	94.08
Coupon 3	4.00	3.23	9.52	7.77	8.14	7.07	57.37	99.75	98.00
Average	8.45	4.66	8.29	5.47	6.40	6.80	66.78	99.53	97.07

Summary:

Substrates:	Stainless Steel
Contaminants:	Pitch

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Oakite Products	Inproclean 3800	5	8.45	☐	
Texo Corporation	Texolite 1734 XL	5	4.66	☐	
US Polychem Corporation	Polychem A 2000 XS	5	8.29	☐	
Valtech Corporation	Valtron SP 2250 2LF	5	5.47	☐	
Magnaflux	Daraclean 282 GF	5	6.40	☐	
International Products Corporation	Micro 90 Conc.	2	6.80	☐	
Safe Science Inc	Safe Science Engine Degreaser (Industrial)	100	97.07	☑	
Bio Chem Systems	Bio T Max	100	99.53	☑	

Conclusion:

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Safe Science, from previous testing and Envirosolutions, both were effective in removing nearly all of the pitch from the coupons. Oakite's Inproclean 3800 was the most successful aqueous cleaner for the removal of the contaminant. The solution made the pitch brittle, which resulted in easy manual removal. An additional trial will be conducted for cleaning supplied parts.