

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2003  
 DateRun: 06/02/2003  
 Experimenters: Jason Marshall  
 ClientType: Medical Instrument Mfr  
 ProjectNumber: Project #1  
 Substrates: Copper, Nickel  
 PartType: Coupon  
 Contaminants: Carbon Deposits, Lubricating/Lapping Oils  
 Cleaning Methods: Immersion/Soak  
 Analytical Methods: Gravimetric  
 Purpose: To identify cleaning solutions for removing dry lubricant from nickel surfaces

**Experimental Procedure:** Eight products were selected from the laboratory's databases based on client supplied information. Seven of the eight were diluted to 5% and the eighth was diluted to 20%. All were diluted with DI water in 600 ml beakers. Solutions were heated to 125 F on a hot plate. Twenty-four preweighed coupons were coated with the Metalube Corp ML-119.2 dry lubricant (Molybdenum disulfide, graphite, silicates) using a hand held swab. Coupons were allowed to sit for 30 minutes and weighed again to determine the amount of lubricant applied. Three coupons were cleaned in each solution for five minutes using stir-bar agitation. Coupons were rinsed for 15 seconds in tap water at 120 F and dried using a Master Appliance Heat Gun for 30 seconds at 500 F. The coupons were then allowed to cool to room temperature and weighed a final time. Efficiencies were calculated for each product.

**Results:** A couple of the cleaners removed over 60% of the lubricant using immersion cleaning. A third product removed over 55%. The other five products removed less the 48%. The table below shows the amount of soil added and removed for each coupon cleaned.

Cleaner	Initial wt	Final wt	% Removed
Formula 815 GD	0.0300	0.0087	71.00
	0.0303	0.0097	67.99
	0.0589	0.0177	69.95
Solution 2000	0.0234	0.0158	32.48
	0.0143	0.0088	38.46
	0.0313	0.0076	75.72
SC Aircraft	0.0210	0.012	42.86
	0.0431	0.0114	73.55
	0.0167	0.0084	49.70
Daraclean 212	0.0249	0.0161	35.34
	0.0311	0.0243	21.86
	0.0179	0.0071	60.34
California Parts Washer	0.0143	0.0084	41.26
	0.0238	0.007	70.59
	0.0139	0.0098	29.50
Luminox	0.0582	0.0340	41.58
	0.0422	0.0233	44.79
	0.0096	0.0088	8.33
Polyspray Jet 790 P	0.0142	0.0054	61.97
	0.0199	0.0072	63.82
	0.0123	0.0042	65.85
Biosolve	0.0076	0.0045	40.79
	0.0227	0.0142	37.44
	0.0087	0.0066	24.14

<b>Summary:</b>	<b>Substrates:</b> Copper, Nickel					
	<b>Contaminants:</b> Carbon Deposits, Lubricating/Lapping Oils					
	<b>Company Name:</b>	<b>Product Name:</b>	<b>Conc.:</b>	<b>Efficiency:</b>	<b>Effective:</b>	<b>Observations:</b>

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Brulin Corporation	Formula 815 GD	5	69.65	<input checked="" type="checkbox"/>	
EnviroSan Products Ltd	Solution 2000	5	48.89	<input type="checkbox"/>	
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	5	55.37	<input type="checkbox"/>	
Magnaflux	Daraclean 212	5	39.18	<input type="checkbox"/>	
Phase III Inc	California Parts Washer Solution	20	47.11	<input type="checkbox"/>	
Alconox Inc	Luminox	5	31.57	<input type="checkbox"/>	
US Polychem Corporation	Polyspray Jet 790 P	5	63.88	<input checked="" type="checkbox"/>	
Westford Chemical Corporation	Biosolve	5	34.12	<input type="checkbox"/>	

Conclusion: Immersion cleaning had little effect on the dry lubricant. Ultrasonic energy will be attempted next with the most effective products. Additional products will also be selected for testing.