CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	1999
DateRun:	11/19/1999
Experimenters:	Jason Marshall
ClientType:	Bellows Mfr
ProjectNumber:	Project #1
Substrates:	Brass
PartType:	Part
Contaminants:	Fluxes, Resins/Rosins
Cleaning Methods:	Ultrasonics
Analytical Methods:	Visual
Purpose:	To clean supplied parts using the proposed cleaning protocol.

Experimental Procedure:

Four products were selected based on the previous testing performed for the client. All products were heated to 130 F on a hot plate. Table 1 lists the products evaluated and the corresponding concentrations.

The cleaning solution/beaker was placed in a Crest 40 kHz ultrasonic tank model 4Ht 1014-6 filled with water heated to 130 F and degassed for five minutes.
Four parts, two of each supplied size, were placed into the suspended beaker and cleaned for five minutes. Rinsing used DI water at 130 F for 30 seconds. Drying was performed using a VWR Vacuum oven at 170 F for 20 minutes a vacuum of 30 in. Hg. At the end of dry parts were removed from the oven and each part was tapped ten times on a white paper towel to determine if any moisture was remaining. Observations were recorded for water and how clean parts looked.

SUBSTRATE MATERIAL: Brass parts-bellows
CONTAMINANTS: Kester Solder 1544 Rosin Flux-(Ethanol CAS#64-17-5;2-Butanol CAS#78-92-2*; Modified Rosin CAS#8050-09-7)

Results:

All the parts, except one, showed no signs of water after drying using the vacuum oven. One part that was cleaned with Envirosolutions had a small amount of water still left after drying. Cleanliness was determined to be about the same for the four products. For the small parts, Oakite Inproclean 4000 T appeared to be the cleanest looking part. For the larger bellows, Emkay Safety Wash CRC yielded the cleanest looking parts.

Summary:

Substrates:	Brass				
Contaminants:	Fluxes, Resins/Rosins				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Church & Dwight Co Inc.	Armakleen E 2002	10		☑	
Bio Chem Systems	Bio T 300 B	100		☑	
Oakite Products	Inproclean 4000 T	10		☑	
Emkay Chemical Company	Safety Wash CRC	10		☑	

Conclusion:

The cleaning system evaluated resulted in clean and dry parts for all of the cleaning solutions examined. Only one of the 16 parts had water remaining inside the bellows. Cleaning resulted in very similar effectiveness for all four cleaners.