CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2001
DateRun:	03/15/2001
Experimenters:	Jason Marshall
ClientType:	Electronics Manufacturer
ProjectNumber:	Project #3
Substrates:	Copper, Plastic, Teflon, Electronics
PartType:	Part
Contaminants:	Fluxes
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Visual
Purpose:	To evaluate selected cleaners for the removal of flux.

Experimental Procedure:

Three products were selected for evaluation. One product was selected from the lab's database of effective trials and the other two were requested by the client. All three were used at full strength and room temperature. A half a liter of solution was poured into a tray and the tray was set in the ultrasonic tank and degassed for about five minutes. One circuit board was place into the tray and cleaned for two minutes. Following cleaning the part was rinsed in a DI water spray for 30 seconds and dried under a IR heat lamp for about 10 minutes. After drying the parts were analyzed visually to determine how clean the board was. The two best solutions, based on the visual observations, were used to clean the same parts for an additional three minutes.
The transformers were cleaned in one cleaner for five minutes using ultrasonic cleaning. The parts were not rinsed and dried under the IR heat lamp for 10 minutes.

SUBSTRATE MATERIAL: Circuit board (plastic epoxy); Transformers (copper wire 40%, plastic bobbin 40% and Teflon tape 20%)
CONTAMINANTS: Wave Flux - RMA Flux (7440-31-5, 7439-92-1, 7440-22-4, 7740-69-9, 65997-06-0, 6852-86-3, 98-55-5, 8009-03-8); Surface Flux - GF 1400 Series Flux (8050-09-7, 67-63-0, 64-17-5, 64741-65-7)

Results:

During the first two minutes of cleaning, the two Kyzen products removed only a portion of the surface flux and little if any of the wave flux. The newer version of the Ionox solution (HC 2) was the better performer of the two Kyzen products. The Envirosolution product was very successful in removing the surface flux and moderately removed the wave flux. The additional three minutes of cleaning for Bio T Max and HC 2 improved the removal of both fluxes.
The transformers were not observed in the lab for cleanliness. They were taken back to the client's facility for analysis.

Product	Concentration	Temperature	Effective
Bio T Max	100	68	Yes
Ionox HC	100	68	No
Ionox HC 2	100	68	Yes

Summary:

Substrates:	Copper, Plastic, Teflon, Electronics				
Contaminants:	Fluxes				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Bio Chem Systems	Bio T Max	100	0.00	☑	
Kyzen Corporation	Ionox HC	100	0.00	☐	
Kyzen Corporation	Ionox HC 2	100	0.00	☑	

Conclusion:

Envirosolutions Bio T Max was very effective in cleaning the two fluxes after 5 minutes of cleaning. The cleaning methods used in the lab were not ideal. The trays used for holding the parts in the ultrasonic may have decreased the benefits of using ultrasonic cleaning by dampening the energy available. The cleanliness of the parts cleaned in the lab should not be compared directly with the parts cleaned under current conditions. The effectiveness of the new cleaning method should increase when the parts are cleaned directly in an ultrasonic tank containing the selected cleaners.