CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1998

DateRun: 02/27/1998

Experimenters: Jason Marshall, Prashant Trivedi

ClientType: Manufacturer of Ceramic Capacitors

ProjectNumber: Project #1

Substrates: Alumina

PartType: Part

Contaminants: Inks, Paints

Cleaning Methods: Ultrasonics

Analytical Methods: Visual

Purpose: Determine if ultrasonics would aid cleaning

Experimental Procedure: The same 5% concentrations of the cleaners were used from the previous trial. The cleaning procedure included using a 40kHz Crest ultrasonic cleaning tank heated to 130 F. Beads in glass beakers were suspended in the tank to be cleaned at one and five minute intervals. After the first minute, a portion of the beads was removed and placed into another beaker. The original beaker was then returned to the ultrasonic tank for an additional four minutes of cleaning. Each beaker was rinsed and dried as in the previous two trials.

SUBSTRATE MATERIAL: Al2O3 beads
CONTAMINANTS: Ink/paint

Results: Ultrasonic cleaning appeared to aid both cleaners in removing the ink/paint from the beads. Table 1 shows the results of the cleaning after the first and fifth minute of cleaning.
Table 1 Cleaning Efficiency and Comparison

CLEANER	1 MINUTE	5 MINUTE
Inpro-Clean	Beads slightly better than without the ultrasonics	Some beads were very clean and others only slightly clean
Daraclean	Beads were better than without the ultrasonics	Excellent cleaning of the beads. Very white when compared to the other cleaners.

In Inpro-Clean, it was noted that the beads did not have a uniform cleaning. Some beads were very clean while others only marginally clean. The beads that were cleaned without temperature and ultrasonics, had a uniform level of cleanliness. This difference suggests that the ultrasonically cleaned beads benefit from having an additional form of energy added. Agitation of the beads, lifting or swirling, may allow for the cleaner and the ultrasonic bubbles to reach more of the beads resulting in better cleaning. An additional set of beads was cleaned using Inpro-Clean and ultrasonics for 10 minutes. Extending the cleaning cycle produced excellent results. In Daraclean, after the first minute a small portion of the beads were poured off into another beaker. This action added enough additional agitation to allow for more efficient cleaning of the remaining beads.

Summary:

Substrates:	Alumina				
Contaminants:	Inks, Paints				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Oakite Products	Inproclean 3800	5	0.00	☑	
Magnaflux	Daraclean 282	5	0.00	☑	

Conclusion: Daraclean 282 performed very well using a heated solution and ultrasonics, but it cannot be used with plastics. Inpro-Clean 3800, while not as successful, can be used on both the client's substrates of aluminum oxide and plastic.
The next step in testing will be to find other cleaners that can be used to clean the client's plastic bottles.